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Global Shocks and Local Responses: Labour Hoarding in Slovakia and Beyond

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GLOBAL SHOCKS AND LOCAL RESPONSES: LABOUR HOARDING IN SLOVAKIA AND BEYOND *

Nataliia Ostapenko †

Abstract

We evaluate the drivers of labour hoarding in various sectors in Slovakia and also assess how macroeconomic shocks influence these behaviours. In the construction sector and retail trade, firms' decisions to retain employees despite declining output are primarily driven by domestic economic conditions and employment expectations, whereas in the industrial sector, foreign business cycles also play an important role. In the service sector, labour hoarding is influenced by both domestic and external economic trends. Global economic activity and monetary policy shocks have the most significant effect on labour hoarding in both the service and industrial sectors.

JEL codes: E24, E32, J23, J63
Keywords: labour hoarding, survey data, shocks.

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The views and results presented in this paper are those of the authors and do not necessarily represent the official opinion of the National Bank of Slovakia. Any errors that remain are my own.

This paper uses data from the EC/ECB Survey on the access to finance of enterprises.

Labour hoarding occurs when firms do not dismiss workers due to short-term fluctuations in demand because of the high costs of dismissing or hiring workers. This indicator is inversely related to productivity. We calculate the indicator using forward-looking responses from Slovak firms regarding their expected output and employment, as described in European Commission (2023).

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Non-technical summary

Some firms tend not to lay off workers during economic downturns (known as labour hoarding) because of the difficulty and cost of rehiring and finding new skilled workers, or because they expect these downturns to be temporary. However, if firms retain unused labour for an extended period, this could negatively impact long-term productivity and keep labour markets tight, thereby maintaining high wage growth even during a recession. This could prevent the central bank from lowering interest rates.

After the pandemic, Slovakia had a relatively low level of labour hoarding compared to the core euro area economies, mainly due to positive expectations of Slovak firms about future macroeconomic conditions.

Generally, labour hoarding in Slovakia appears to follow a cyclical pattern, which suggests that Slovak firms often choose to retain workers during economic downturns because they believe such downturns will be temporary.

An unexpected rise in global economic activity, which boosts demand for Slovak exports, tends to reduce labour hoarding – particularly in the industrial and service sectors. In the industrial sector, when there is an unexpected upturn in global economic activity, firms become more optimistic about future demand. As a result, fewer firms expect their output to decline. However, over time, among those that still anticipate a decline in output, a growing number expect to retain their employees. In the service sector, a sudden improvement in demand conditions also leads to fewer firms expecting a fall in output. But unlike in industry, among those that still foresee a drop in output, the share of firms planning to maintain employment actually decreases.

When interest rates rise unexpectedly, a larger number of firms anticipate a decline in output, and fewer intend to retain their workers in response. Nonetheless, the net effect on labour hoarding remains slightly positive, as the anticipated drop in output has a stronger effect. This pattern is broadly consistent across sectors, though it is particularly pronounced in services, where more firms expect a downturn in output.

1. Introduction

Why do some firms retain their workers during economic downturns while others do not? This study tries to answer this question by identifying the causes of labour hoarding in Slovakia in different sectors. To this end, we use a Random Forest model to identify the main drivers of labour hoarding in Slovakia. Furthermore, we use a Bayesian Vector Autoregression (BVAR) model to investigate the heterogeneous effects of global economic activity and monetary policy shocks on labour hoarding in different sectors in Slovakia.

The main findings are as follows. The main reasons for labour hoarding are that firms expect a decline in output to be temporary and that the availability of skilled labour and labour costs appear to be a problem for them, which means those firms might face difficulties in hiring skilled labour in an eventual upturn. The main indicators of the share of firms expecting their output to fall are mainly cyclical. Nevertheless, firms expecting a decline in their output but not in their employment typically attribute this to aggregate employment expectations – except in the service sector, where external conditions play a more significant role.

Positive global economic activity shocks have the strongest negative effect on labour hoarding in services and industry in Slovakia. This may be because these sectors are export-oriented and depend on global demand, making them more sensitive to global shocks than other sectors. Contractionary monetary shocks have a mainly positive effect on labour hoarding in industry and services in Slovakia, which may be because these sectors are relatively more dependent on credit availability, consumer spending and demand, including external demand.

The rest of the paper is structured as follows: Section 2 discusses the methodology and comparisons of different measures of labour hoarding, Section 3 compares Slovakia with other countries in terms of labour hoarding and also examines differences in labour hoarding across sectors in Slovakia, Section 4 discusses the main drivers of labour hoarding across different sectors and examines the effects of macroeconomic shocks, and Section 5 concludes.

2. Labour hoarding indicator

2.1. The European Commission indicator

Labour hoarding indicates the utilisation of labour in the economy and can serve as a cyclical indicator of productivity or as an indicator of a subdued wage response to demand pressures in the economy. Firms might decide not to adjust their labour force in response to short-term fluctuations in demand because it may be costly for them to fire old employees or, conversely, to hire new ones, so a firm may decide to keep unused labour. Therefore, labour hoarding aims to capture cyclical movements in the economy due to unused labour force and might indicate cyclical movements in productivity (Felices, 2003).

In order to track this unused labour, the European Commission has developed a new survey-based[1] indicator of labour hoarding, where firms in different sectors expect their output to decrease in the next

[1]The European Commission uses business confidence surveys (European Commission, 2025). These surveys cover four sectors, namely industry, retail, services and construction.

three months, but they do not expect their employment to decrease, namely:

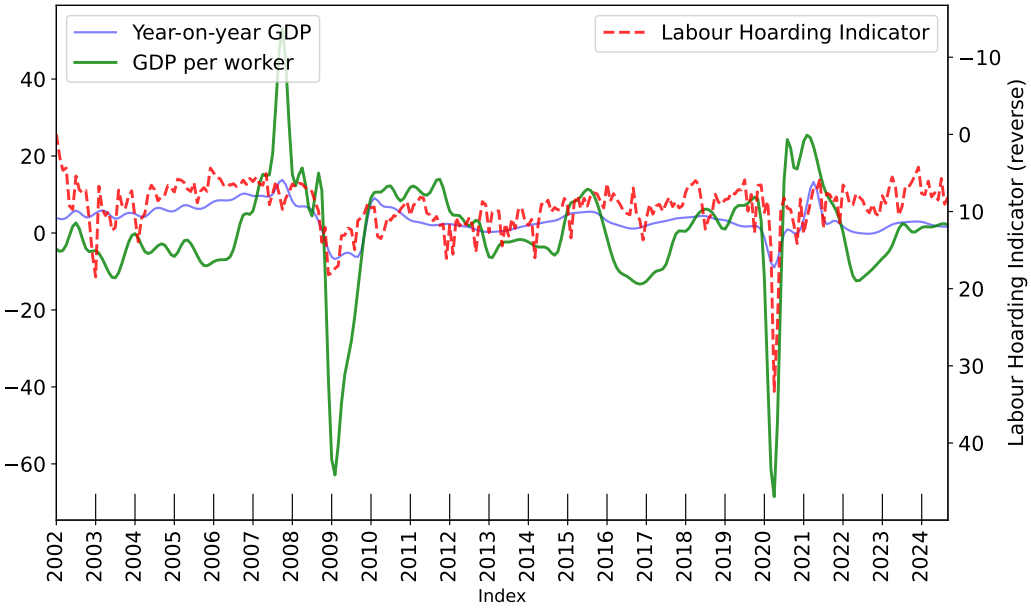
Table 1: Survey results on output and employment

Surveyed Sector	Output	Employment
Industry/Services/Retail trade/Construction	decrease	increase or remain unchanged

Source: European Commission (2023).

Labour hoarding is equal to 1 if a firm responds to a survey as mentioned above. To obtain the monthly indicator, we further aggregate these responses by year and month, weighting by the employment share of each firm.

Figure 1: Labour hoarding and productivity



Notes: Seasonally adjusted.
Source: Národná banka Slovenska (NBS) (2025), European Commission (2025) and author's calculations.

The labour hoarding indicator is negatively correlated with GDP growth in Slovakia, i.e. there is an inverse relationship. The correlation coefficient between the labour hoarding indicator and GDP year-on-year growth is -0.54 and with detrended GDP to employment it is -0.42. Labour hoarding is therefore a counter-cyclical indicator of the economy (Figure 1).

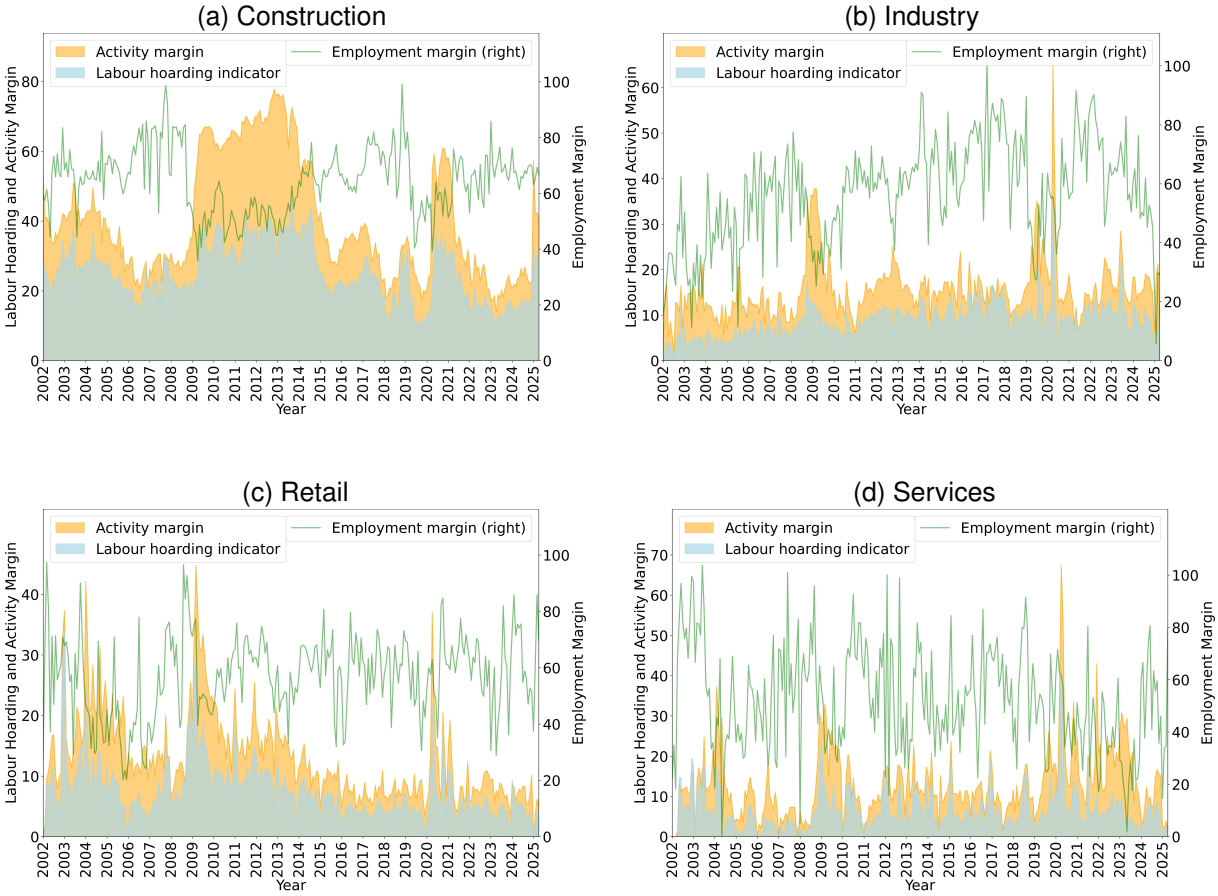
2.2. Activity and employment margins of labour hoarding

It is possible to decompose the labour hoarding indicator into an activity margin and an employment margin, as the labour hoarding indicator is calculated using two questions from the business surveys (Table 1). The activity margin represents the share of firms that expect their output to fall over the next three months, while the employment margin represents the share of firms that do not expect their employment to fall among those that expect their output to fall. These two margins together give rise to labour hoarding. For a firm to be recorded as hoarding labour, it should (1) expect a fall in future output and (2) not expect its employment to fall. Thus, a firm may not be hoarding labour either because

it does not expect its future output to fall or because it expects it to fall but does not expect to retain its employees. The activity and employment margins of labour hoarding in different sectors in Slovakia are shown in Figure 2. The correlations between these margins in different sectors and labour market indicators in Slovakia are discussed in Appendix A (Figure A.1).

The activity margin is counter-cyclical, i.e. it increases during economic downturns and decreases during economic booms. However, the employment margin of labour hoarding is more volatile and does not show such cyclical behaviour, as it may be driven by structural factors as well as the overall labour market situation in Slovakia.

Figure 2: Breakdown of the labour hoarding indicator in Slovakia by sectors and activity and employment margins



Notes: Seasonally adjusted.
Source: Statistical Office of the Slovak Republic (SU SR) (2025) and author's calculations.

The employment margin of labour hoarding usually falls before macroeconomic downturns, even before the real activity margin rises. This pattern is clearly visible in the decompositions for construction (Figure 2 (a)) and industry (Figure 2 (b)) in the case of the 2008 financial crisis. Therefore, the level of labour hoarding during this episode could have been even higher had the employment margin not fallen. A similar pattern can be seen during the COVID pandemic: the employment margin also started to fall in early 2019 in construction and industry, and therefore the indicator was not as high in these sectors during the COVID pandemic as it might otherwise have been.

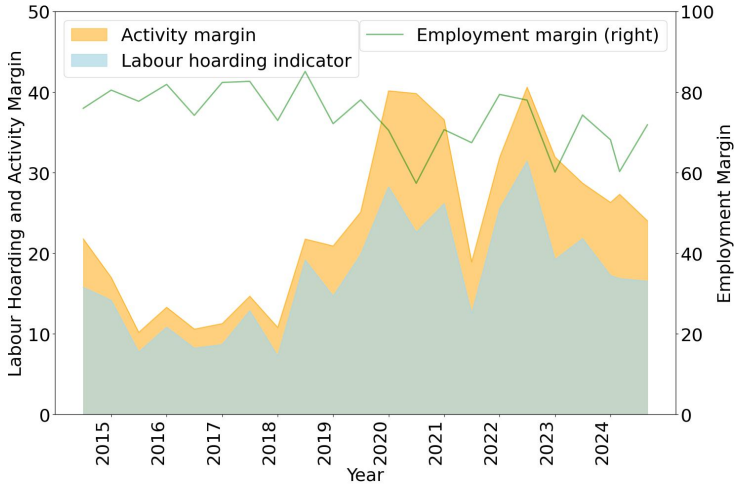
Low values of the composite labour hoarding indicator in 2021–2024 (Figure 1) could be explained

by relatively low activity margins in construction, industry and retail trade, but also by a relatively low employment margin in services in 2023 and its low activity margin in 2024.

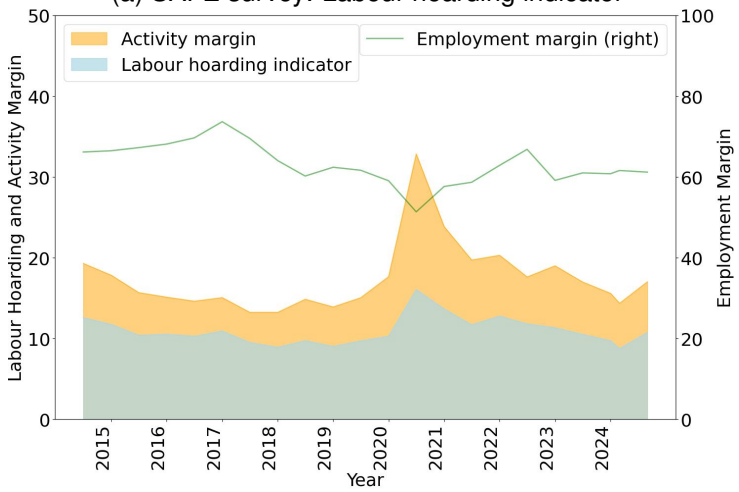
2.3. Comparison of different labour hoarding indicators

Alternative labour hoarding indicators allow us to cross-check results and develop the intuition further. It is, for example, also possible to calculate the labour hoarding indicator using another survey of small and medium-sized enterprises (EC/ECB Survey on the access to finance of enterprises[2]). For example, Botelho (2024) used this dataset to study the effect of profit margins on labour hoarding in the European Union. This survey was conducted every six months before 2024 and has been conducted every quarter since 2024.

Figure 3: Comparison of labour hoarding indicators in Slovakia



(a) SAFE survey: Labour hoarding indicator



(b) EC survey: Labour hoarding indicator

Notes: Seasonally adjusted.

Source: EC/ECB Survey on the access to finance of enterprises, European Commission (2025).

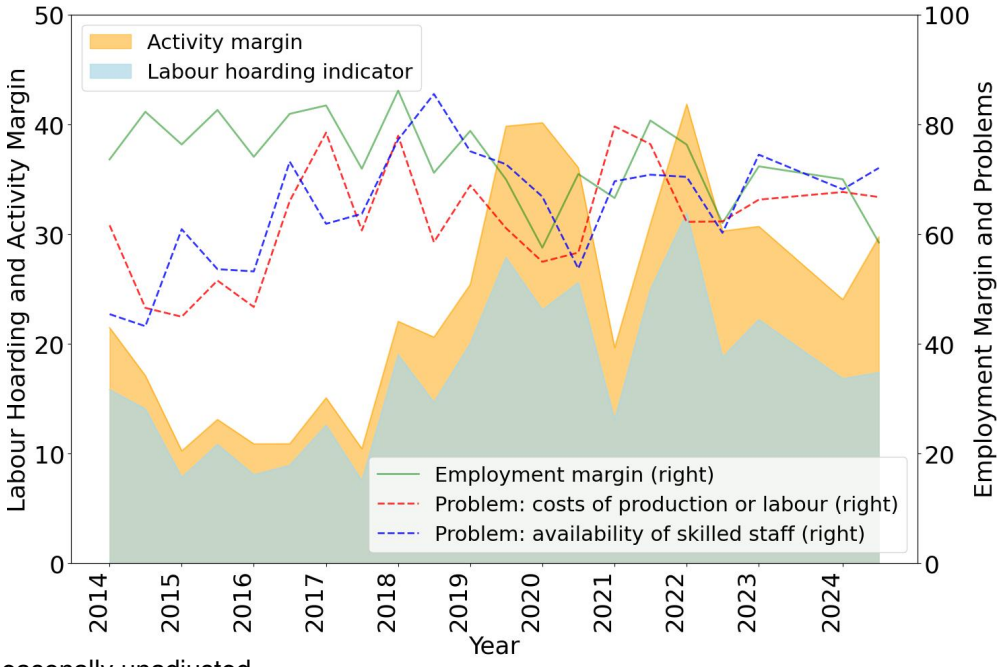
[2]Slovakia started participating in the EC/ECB Survey on the access to finance of enterprises (SAFE) in 2009, but only began participating regularly in 2014. Therefore, we use data from 2014 onwards. There are around 500 respondents per wave.

The questions are similar to those used in the European Commission's business surveys but ask firms about their situation in terms of the number of persons employed and the firm-specific outlook for their turnover and profitability in the current quarter.

Since the SAFE dataset uses only small and medium[3] sized enterprises for their surveys, in order to compare both measures we selected only small and medium sized enterprises from the European Commission surveys, calculated labour hoarding for those and then aggregated at the same frequency as using the SAFE dataset. Figure 3 presents the comparison between labour hoardings, their activity and employment margins[4] using different datasets. The correlation between labour hoarding indicators is 0.42, while the correlations between real activity margins and employment margins are 0.61 and 0.70 respectively.

Around 60–80% of firms that hoard labour consider labour costs and the availability of skilled workers to be very important challenges for their business (Figure 4). Figure 4 shows the labour hoarding indicator for Slovakia from the SAFE dataset, together with its activity and employment margins. In addition, the right-hand-side y-axis shows the share of those firms that hoard labour and consider production costs, labour costs and the availability of skilled labour to be an important problem.

Figure 4: Labour hoarding and barriers to business from the SAFE dataset



Notes: Seasonally unadjusted.
Source: EC/ECB Survey on the access to finance of enterprises.

As the indicators are correlated, and the European Commission (2023) indicator is available at a monthly frequency, only this indicator will be used in the analysis from the next section onward.

[3] A medium-sized enterprise is defined as one with fewer than 250 employees.

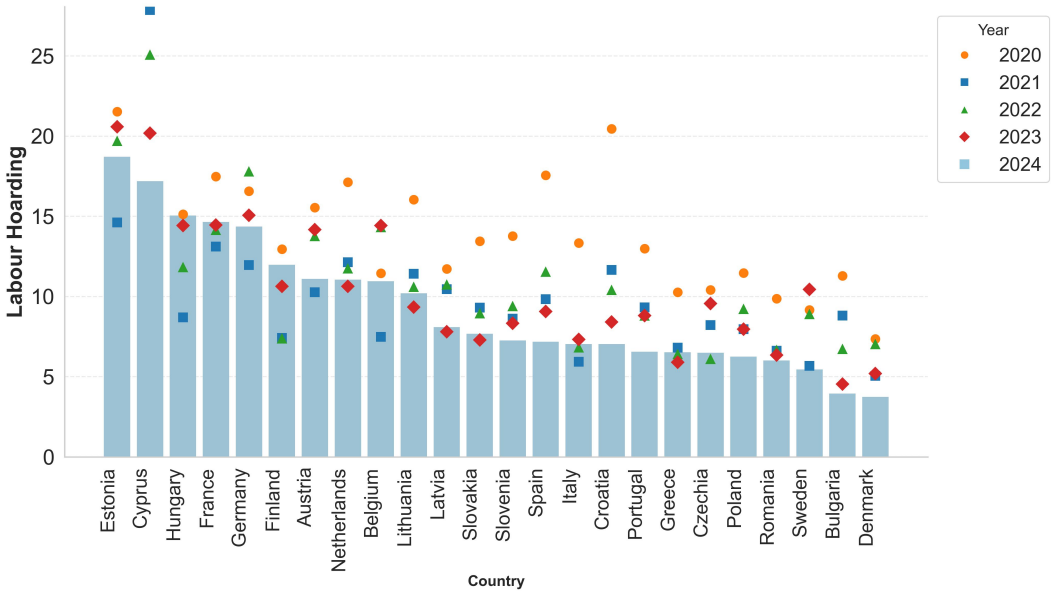
[4] The activity margin represents the share of enterprises that expect their output to fall over the next three months, while the employment margin represents the share of enterprises that do not expect their employment to fall among those that expect their output to fall.

3. Labour hoarding in Slovakia

3.1. Comparison between labour hoarding in Slovakia and other EU countries

Labour hoarding in Slovakia is at a relatively low level compared to larger European Union economies (Figure 5). On average, labour hoarding was higher in most of the European Union countries in 2020, probably due to the COVID pandemic, when companies, especially in the service sector, had to temporarily interrupt their business activities. Although government employment support programmes during the pandemic were implemented at a national level and differ from country to country, they may only affect the employment margin of labour hoarding and not the activity margin (as discussed in Figure 2). One of the highest indicators of labour hoarding in 2020 was reported in Cyprus[5], Croatia and Spain, probably due to their tourist orientation.

Figure 5: The labour hoarding indicators among EU countries



Source: European Commission (2025).

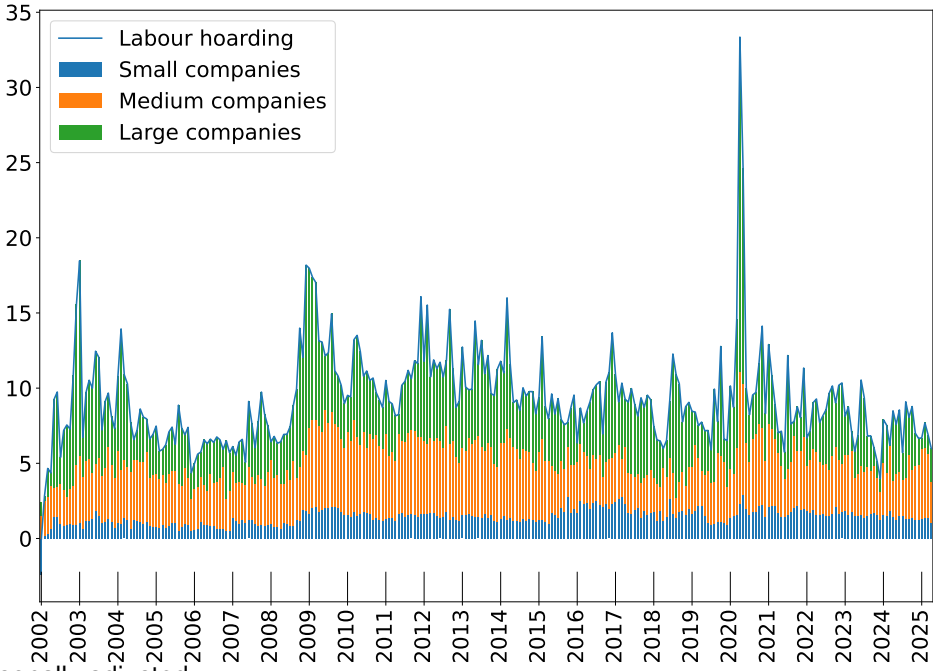
Slovakia's labour hoarding indicator has shown a decreasing trend from 2020 onwards, while in countries such as Belgium, Germany and Sweden levels of hoarding exceeded those of 2020 in subsequent years. Estonia had one of the highest labour hoarding indicators in 2022–2024, probably due to slower wage growth, relatively high corporate profits and fears of labour shortages (Eesti Pank, 2024). In general, Slovakia's level of labour hoarding in 2021–2024 was closer to that of Lithuania, Latvia and Slovenia than to that of large EU economies such as France, Germany, Finland, Austria, the Netherlands or Belgium. Furthermore, Slovakia had one of the lowest labour hoarding indicators among all EU countries in 2023, with only Romania, Greece, Denmark and Bulgaria having lower indicators (Figure 5). After the pandemic, there was a drop in labour hoarding to pre-pandemic levels due to a fall in the activity margin of labour hoarding (Figure 2), i.e. firms became more optimistic about their future output.

[5]Labour hoarding in Cyprus was 47.47 in 2020.

3.2. Sectoral differences in labour hoarding

Figure 6 discusses the time series trend of labour hoarding in Slovakia by firms' size. **Medium and large[6] companies are more likely to hoard labour than small ones, with the exception of the construction sector** (Figure 6)[7]. In general, medium and large companies may find it more advantageous and less costly not to adjust their labour force in response to short-term fluctuations in the economy. In industry, for example, it is mainly medium and large companies that hoard labour over the whole period. This is not the case in construction, where it is mainly small and medium-sized companies that tend to hoard labour.

Figure 6: Breakdown of the labour hoarding indicator in Slovakia by firm size[8]



Notes: Seasonally adjusted.
Source: Statistical Office of the Slovak Republic (SU SR) (2025) and author's calculations.

In general, labour hoarding in Slovakia is lower in the retail and service sectors than in other sectors (Figure A.3). In the construction and industrial sectors, it may be more difficult to find skilled labour force, and companies may therefore decide to retain idle labour rather than engage in lay-off and recruitment processes.

During the COVID-2019 pandemic, there was a sharp increase in labour hoarding in Slovakia, mainly driven by large and medium-sized firms. In the case of large companies, this was the largest increase in labour hoarding since 2002. The largest increase in labour hoarding during the COVID-19 pandemic was observed in industry and services (Figure A.3). In retail trade, services and industry, the indicator peaked in April 2020, while in construction it peaked in June 2020.

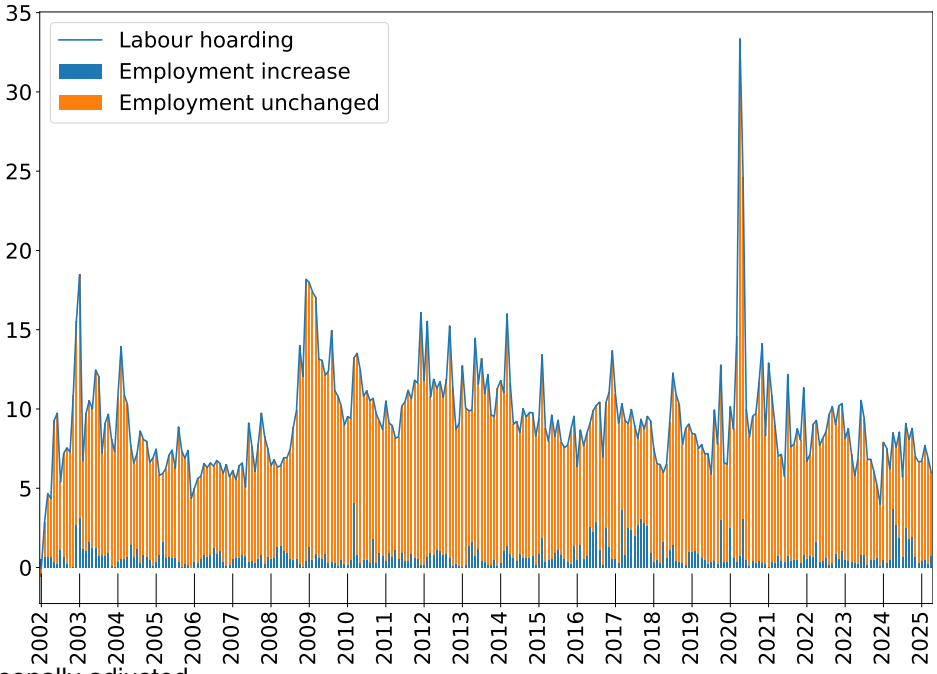
[6] An firm is defined as small if it has less than 50 employees, medium-sized if it has between 50 and 500 employees and large if it has more than 500 employees. The shares of firms are weighted by their employment shares.

[7] To ensure that the results are not influenced by the general representativeness of the companies in the surveys, the general characteristics of the companies by size and by weighted size are presented in Appendix B.

[8] Firm sizes were weighted by their employment shares.

Shortly after March 2020, the level of labour hoarding in Slovakia returned to its pre-pandemic level and even declined in 2023–2024. This is mainly due to the rapid decline in labour hoarding in industry and services (Figure A.3), which together account for 70 per cent of employment in the Slovak economy. This rapid decline was primarily caused by a decrease in the activity margin of labour hoarding in industry and services, meaning that more firms became optimistic about their future output (Figure 2). Interestingly, the lowest level of hoarding in the industry was observed in July 2020. Labour hoarding in construction and retail remained higher for a longer period, probably due to government support programmes in retail (Figure 2 shows a high employment margin) and more pessimistic expectations in construction (Figure 2 shows a high activity margin).

Figure 7: Breakdown of the labour hoarding indicator in Slovakia by expectations regarding future employment



Notes: Seasonally adjusted.
Source: Statistical Office of the Slovak Republic (SU SR) (2025) and author's calculations.

In general, those companies hoarding labour did not expect employment to increase from 2002 onwards, but rather expected it to remain at the current level (Figure 7). In 2024, however, more firms expected a decrease in output and an increase in employment, particularly in the service and retail sectors (Figure A.4).

4. Determinants of Labour Hoarding in Slovakia

4.1. Factors driving labour hoarding

Next, we access the non-linear relationship between the activity and employment margins of labour hoarding in Slovakia and other economic indicators to determine whether these margins

and labour hoarding as a whole are driven by cyclical or structural factors. For this task, we use monthly macroeconomic indicators from the Národná banka Slovenska (NBS) (2025) and the Eurostat (2025), where all variables are lagged by one month. The resulting data include hard macroeconomic indicators (such as industrial production, unemployment, turnover), interest rates, spreads, real effective exchange rates, stock market variables (the S&P 500, Euro Stoxx 50, VIX, DAX, and PX), as well as expectations in Slovakia (from the European Commission (2025)) and in the EU (such as the German manufacturing purchasing managers' index, the economic sentiment indicator).[9] Stationary variables are not transformed, all others are transformed into year-on-year growth rates. To find the most important indicators of activity and employment margins of labour hoarding in different sectors in Slovakia, we use a random forest model[10], which allows us to rank the indicators according to their importance and to exploit non-linearity in the relationship between indicators.

Again, the activity margin represents the share of firms expecting their output to fall (which may or may not expect to retain their employees) and the employment margin represents the share of those expecting their employment not to fall among those expecting their output to fall. In this case, these two margins show different sides of labour hoarding: first, a firm should expect its output to fall, and second, it should expect its employment not to fall. Together, these margins represent labour hoarding (Figure 2). Therefore, the purpose of using a random forest to check which macroeconomic variables are good indicators of these margins is to see whether or not firms' output and employment expectations might be driven by the same factors.

Employment expectations for the economy as a whole are the main indicator of both the activity margin and the employment margin of labour hoarding in retail trade (Figure 8). In the case of the activity margin, this means that employment expectations are a domestic cyclical indicator of future developments, reflecting future job growth and wage stability, which could lead consumers to spend more on retail products. The finding that it is also an important indicator for the employment margin means that this margin is procyclical in the retail sector, i.e. firms in the retail sector adjust their workforce in response to rising future demand. Another indicator that is important for both margins is labour input in construction. This could be a good indicator of the expansion of new retail centres, shopping malls, retail infrastructure, improved supply chain and stock developments.

In addition, the activity margin of labour hoarding in retail trade is related to the cyclical indicators in the euro area (the amplitude-adjusted CLI in the euro area) and to expectations of purchases and savings in the next 12 months. Other indicators of the employment margin of labour hoarding in retail trade are the retail trade index, the volume of international trade with the EU and the economic sentiment indicator. The latter may be a good indicator of expectations and the business cycle, while the first two indicators related to trade may signal the dependence of employment in this sector on developments in the external environment.

Overall, retail trade is a demand-driven sector. This holds even though employment expectations are a good indicator of both the activity margin and the employment margin of labour hoarding in retail trade. However, the second and third most important indicators for the activity margin are the most important

[9] There are a total of 96 monthly indicators spanning the period from 2001:M12 to 2024:M5. These indicators capture economic developments, consumer surveys, EU-level surveys and indicators, interest rates (both EU and US), various interest rate spreads, and measures of uncertainty.

[10] We used 10-fold cross-validation for time series data also taking into account the time series nature of the data. For hyperparameter tuning, we used grid search to find the best hyperparameters among a number of threes in a forest, maximum depth of a three, minimum sample to split a node, and minimum number of samples for a leaf node.

indicators for labour hoarding in retail trade, namely expected major purchases over the next 12 months, which indicates domestic demand, and the amplitude-adjusted CLI in the euro area, which indicates external demand.

The most important indicator for both margins and total labour hoarding in construction is the construction confidence indicator. This is a forward-looking indicator of construction activity. However, this indicator is almost twice as important for the activity margin as for the employment margin. Contrary to the results for retail trade, the output and employment expectations of construction firms do not depend on future demand in the economy as a whole, but in the construction sector in particular, probably due to expectations of investment in construction. And as the construction sector is labour intensive, it is not surprising to observe that employment expectations in construction also depend on confidence. The second most important indicator for the employment margin in construction is the unemployment expectations for the next 12 months, followed by turnover, the 10-year government bond yield in the US (which could indicate shifts in global financial conditions) and expected consumer purchases in the next 12 months in the EU.

For the activity margin of labour hoarding in the industrial sector in Slovakia, the most important role is played by indicators related to the external environment: production expectations in the industrial sector in Germany (which could indicate the integration of the Slovak industrial sector with the German one), the purchasing managers' index in the EU (which could be related to the EU business cycles), production expectations in the EU (which in turn could indicate the integration of the Slovak industrial sector with that of the European Union) and consumer confidence (which could indicate domestic demand). The external environment might be important for production capacity, costs, demand and business conditions.

For the employment margin in industry, the most important indicator is employment expectations. In addition, order books in industry in Germany, the Euribor, savings expectations for the next 12 months and consumer confidence in Germany are important indicators for the employment margin of labour hoarding in industry. Therefore, indicators related to employment and the external environment are important for the employment margin of labour hoarding in industry.

For total labour hoarding in industry the most important indicator, apart from production expectations and industrial production in Germany, a major Slovakian trading partner, is confidence in the service sector. Confidence in services may reflect strong domestic demand, which can contribute to a tighter labour market through increased hiring activity and competition for workers. Additionally, the strength of supply chain and logistics services is crucial for supporting the industrial sector, while investment in services may further stimulate industrial demand.

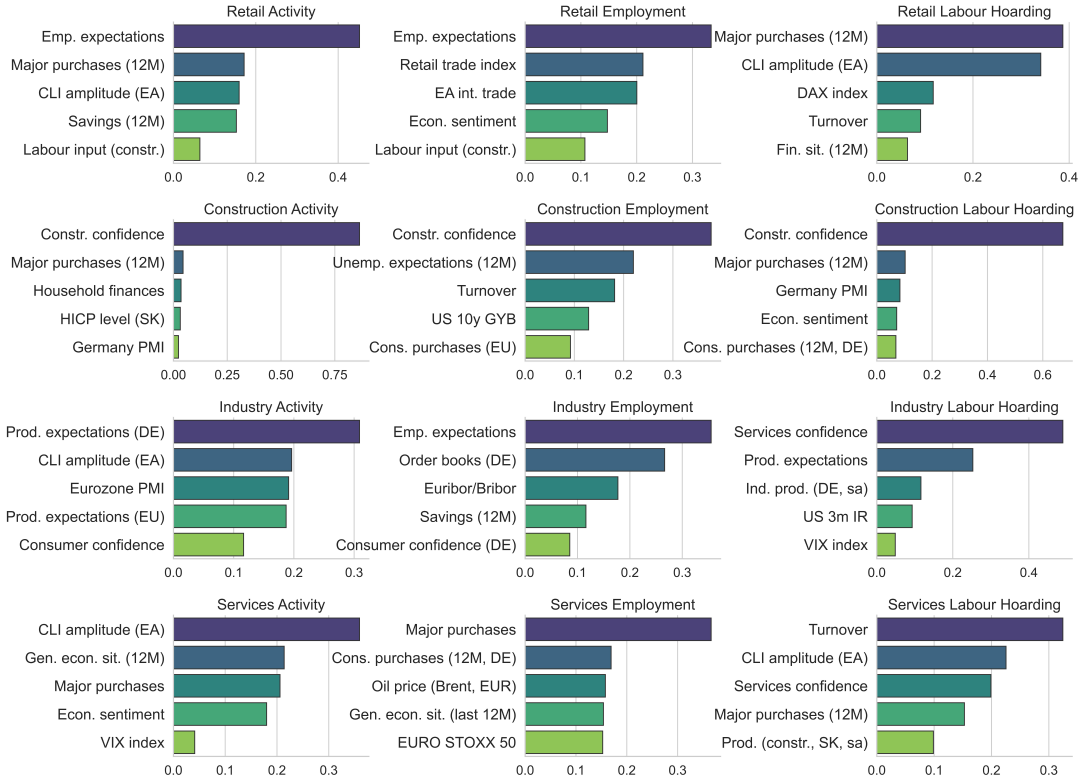
The activity margin of labour hoarding in services is also mainly explained by various business cycle indicators: the amplitude-adjusted CLI in the euro area, the general economic situation of households over the next 12 months, current major purchases, the economic sentiment and VIX indices. The latter could also serve as an indicator of uncertainty or of the impact of economic downturns when uncertainty is high. The service sector is highly sensitive to changes in expected economic activity, as business cycles affect demand, investment, credit availability and profitability in the service sector.

In contrast to the previous findings for the employment margins in retail trade, construction and industry, employment expectations do not play an important role for the employment margin in services. It also appears that the employment margin in services is mainly explained by cyclical macroeconomic indicators, such as current major purchases, consumer purchases in the next 12 months

in Germany, oil prices, general economic situation of households in the last 12 months and the Euro Stoxx 50. This may indicate that the sector is mainly driven by external and domestic demand and that the employment margin therefore fluctuates with the business cycle. This can also be confirmed by the rather low correlations between the employment margin of labour hoarding in services and labour market indicators in Slovakia (Figure A.1).

Domestic and external cyclical factors, such as turnover in wholesale and retail trade, the amplitude-adjusted CLI in the euro area and confidence in services are important indicators of labour hoarding in services. Turnover may be an important indicator of future demand conditions, as some services may be related to wholesale and retail trade, such as transport, distribution, logistics and marketing.

Figure 8: Indicators of labour hoarding in Slovakia by sectors and margins



The first column shows important indicators for activity margins in different sectors in Slovakia, the second column – for employment margins, and the third one – for labour hoarding indicators

Notes: Seasonally adjusted.

Source: Statistical Office of the Slovak Republic (SU SR) (2025), Eurostat (2025), Národná banka Slovenska (NBS) (2025), European Commission (2025) and author's calculations.

4.2. Macroeconomic shocks and labour hoarding

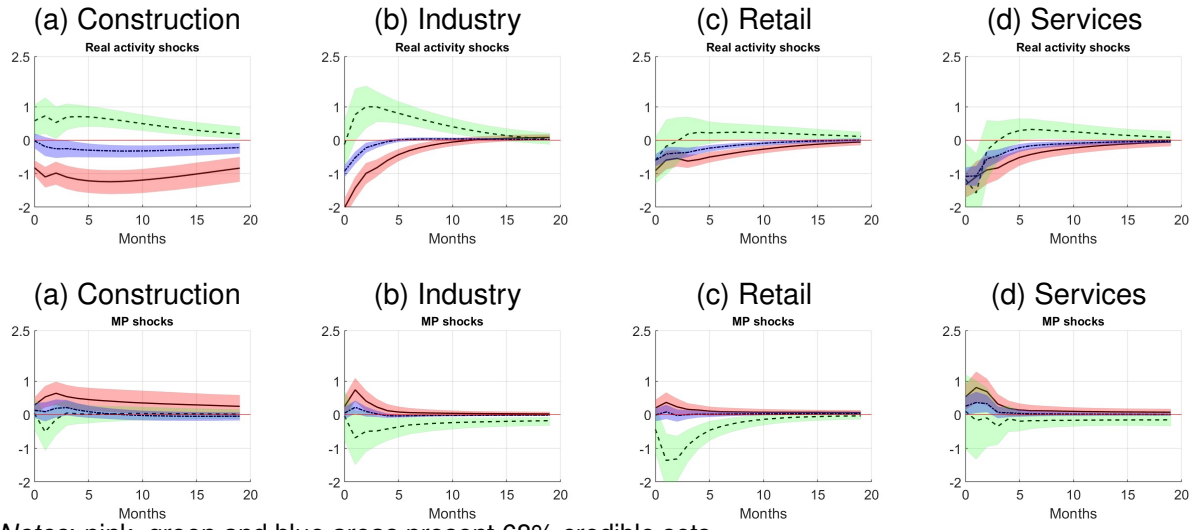
To understand the driving forces of labour hoarding in Slovakia, we calculate the effects of various macroeconomic shocks on different margins of the labour hoarding indicators. To achieve this, we use a Vector Autoregression model[11] at a monthly frequency with the following macroeconomic

[11] Estimation details of the model are presented in Appendix C. The studies period is 2002:M1–2024:M4 (2023M:10 for monetary policy shocks).

variables: industrial production[12], the Harmonised Index of Consumer Prices (HICP)[13], the three-month Euribor rate (BRIBOR until 2008), the one-year Euribor rate, the ten-year government bond yield in the euro area (Eurostat, 2025) and the margins of labour hoarding. The main shocks of interest are global economic activity and monetary policy shocks. The impact of these shocks on labour hoarding in Slovakia is interesting because Slovakia is a small open economy that should be vulnerable to global economic fluctuations and, moreover, the rise in inflation in 2022 was tackled with a strong monetary policy response.

Global real activity shocks that increase oil prices and global economic activity have negative effects on the activity margins of labour hoarding in all sectors in Slovakia. However, they have positive effects on the employment margins in construction and industry, thereby making the overall impact in these sectors less negative than the effect on activity margins alone (Figure 9). The effect of the shock on the employment margin in retail trade is less negative than on the activity margin, resulting in an overall effect that is also less negative than the impact on the activity margin. The shocks have the most negative effect on labour hoarding in services, as they adversely affect both the activity and employment margins. As a result, the overall impact on labour hoarding in this sector closely mirrors the effect on the activity margin, but is less persistent due to a smaller effect on the employment margin.

Figure 9: The effects of macroeconomic shocks on labour hoarding in Slovakia



Notes: pink, green and blue areas present 68% credible sets.
Black line with pink area – effects on real activity margins, dashed line with green area – effects on employment margins; black dash-dotted line with blue area – effects on labour hoarding.
A positive effect on the activity margin means more firms anticipate a fall in output. A positive effect on the employment margin means that more firms expecting lower output choose to retain employees. If one margin rises and the other falls, the total effect depends on the magnitude of each change.

Contractionary monetary shocks move the activity and employment margins of labour hoarding in opposite directions across all sectors, increasing the activity margins while reducing the employment margins. In terms of activity margins, the shocks primarily affect the industrial and service sectors in terms of magnitude and the construction sector in terms of persistence. In terms of employment margins, the shocks primarily impact the retail, industrial and construction sectors in order of

[12]Euro area, fixed composition as of 2015.
[13]Euro area (changing composition).

decreasing magnitude. Overall, the impact of contractionary monetary policy shocks is strongest in the service sector, driven by a large shift in the activity margin and a muted response in the employment margin, followed by industry and retail trade.

5. Conclusions

From 2020 to 2024, labour hoarding in Slovakia was lower than in most major EU economies, such as Germany, Austria, and France. Furthermore, Slovakia exhibited a downward trend in labour hoarding from 2021 onwards compared to the EU average. This was primarily due to a smaller proportion of firms anticipating a decline in output rather than increased layoffs. As labour hoarding is negatively correlated with productivity indicators, lower hoarding could suggest higher productivity in the country.

There are visible differences in labour hoarding across sectors. It is generally higher in construction and industry than in retail trade and services. However, the impact of the pandemic was more negative on labour hoarding in retail and services due to a higher proportion of firms expecting lower output but retaining their workforce.

Domestic and external cyclical variables are good indicators of the activity margins of labour hoarding in different sectors in Slovakia. Domestic indicators are more important for retail trade and construction, while external indicators are more important for industry and services. Domestic and external indicators of the business cycle play the most important role for the employment margin of labour hoarding in services, while aggregate employment expectations are important for the employment margins of labour hoarding in other sectors.

Positive global economic activity shocks have the strongest negative effect on labour hoarding in services and industry, probably due to the dependence of these sectors on external demand. A contractionary monetary policy shock has a mainly positive effect on labour hoarding in industry and services, probably due to the dependence of these sectors on external financing and credit.

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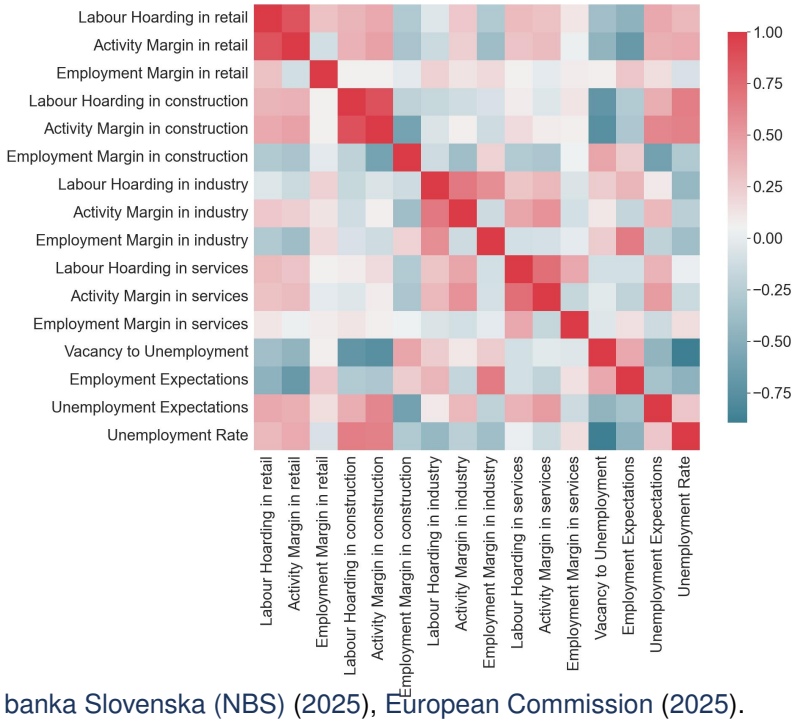
Appendices

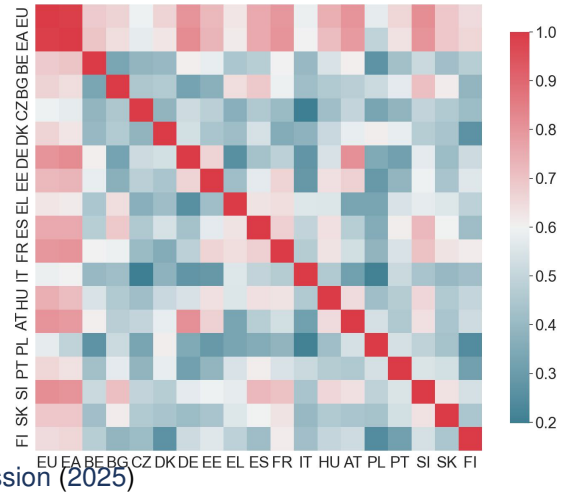
A. Additional figures

Figure A.1: Correlation matrix between labour hoarding, its margins and labour market indicators



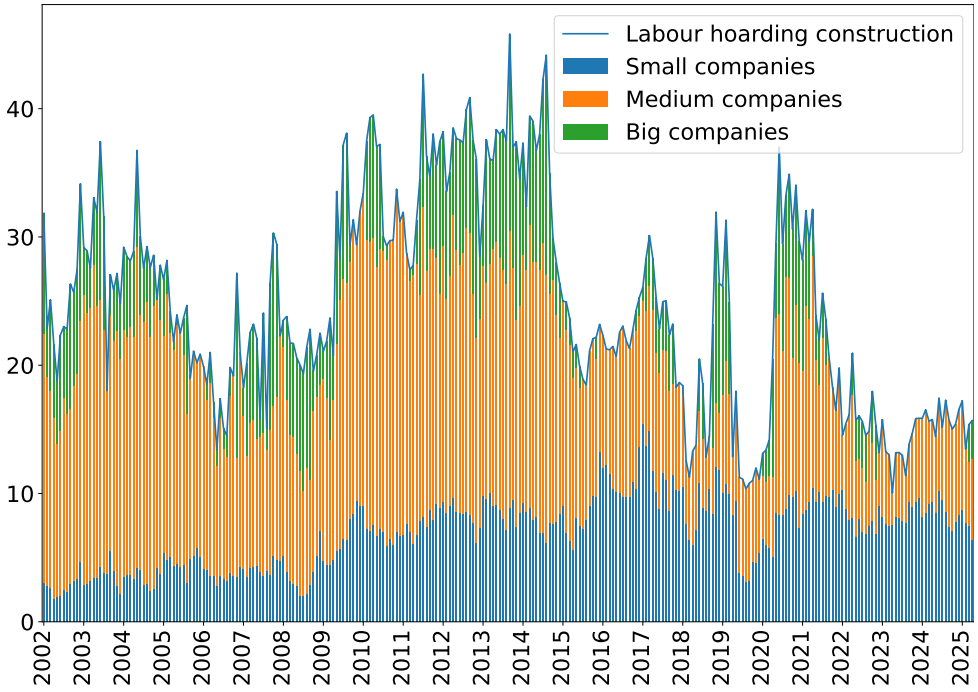
Source: Národná banka Slovenska (NBS) (2025), European Commission (2025).

Figure A.2: Correlation matrix between labour hoarding indicators in the EU, 2003–2024

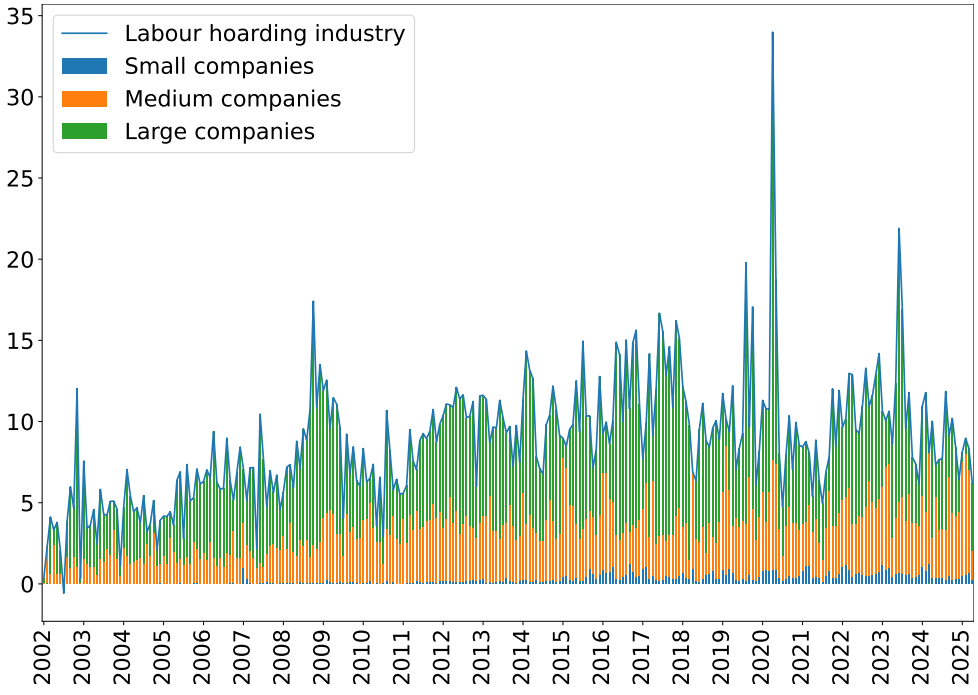


Source: European Commission (2025)

Figure A.3: Breakdown of the labour hoarding indicator in Slovakia by sector and firm size[14]

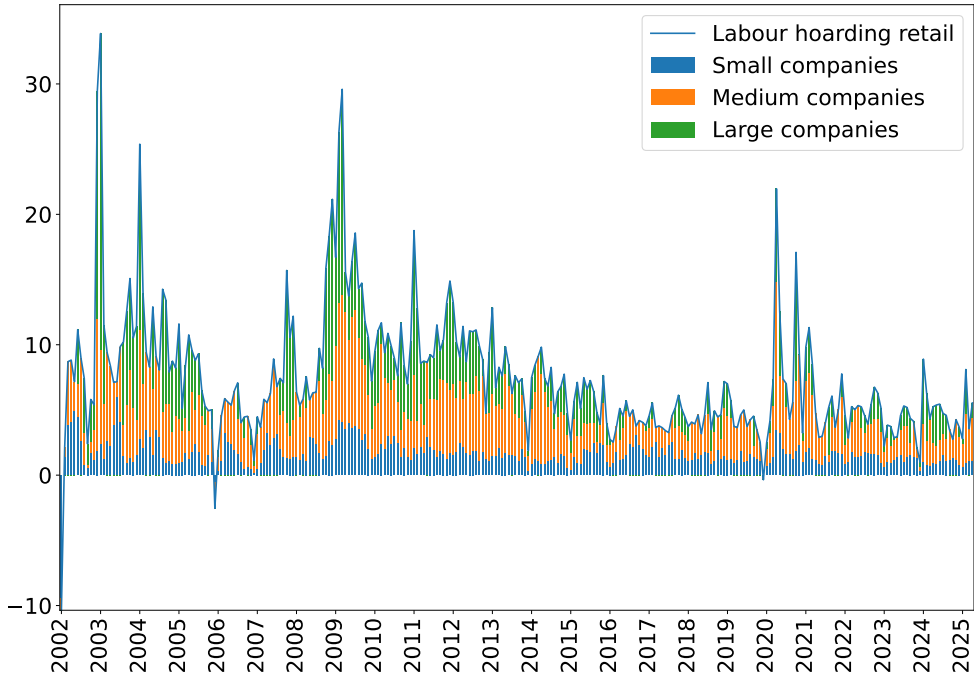


(a) Construction

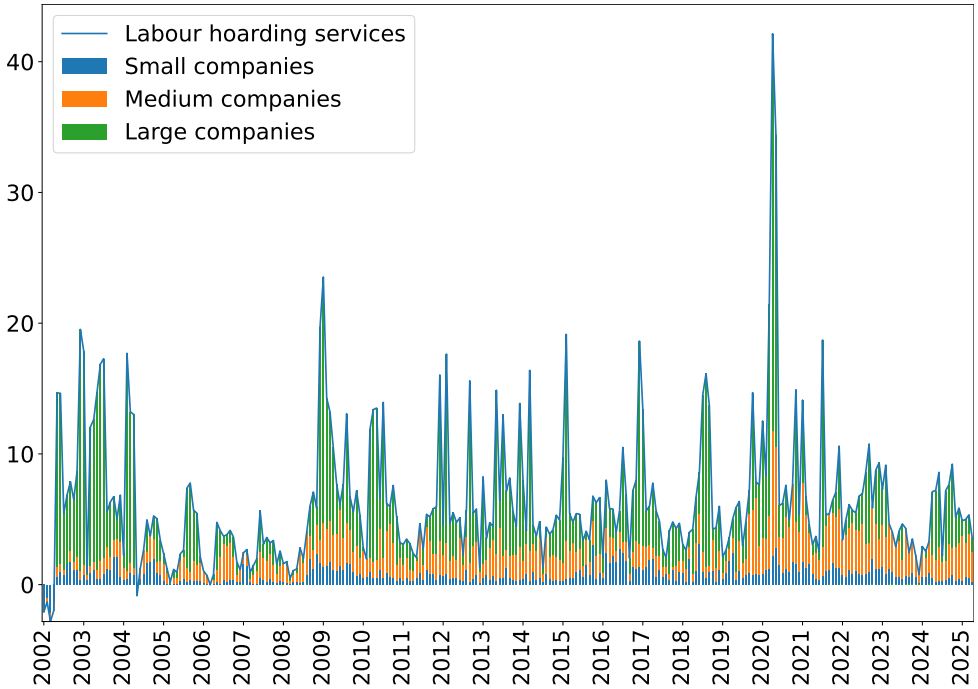


(b) Industry

[14] Firm sizes were weighted by their employment shares.



(c) Retail

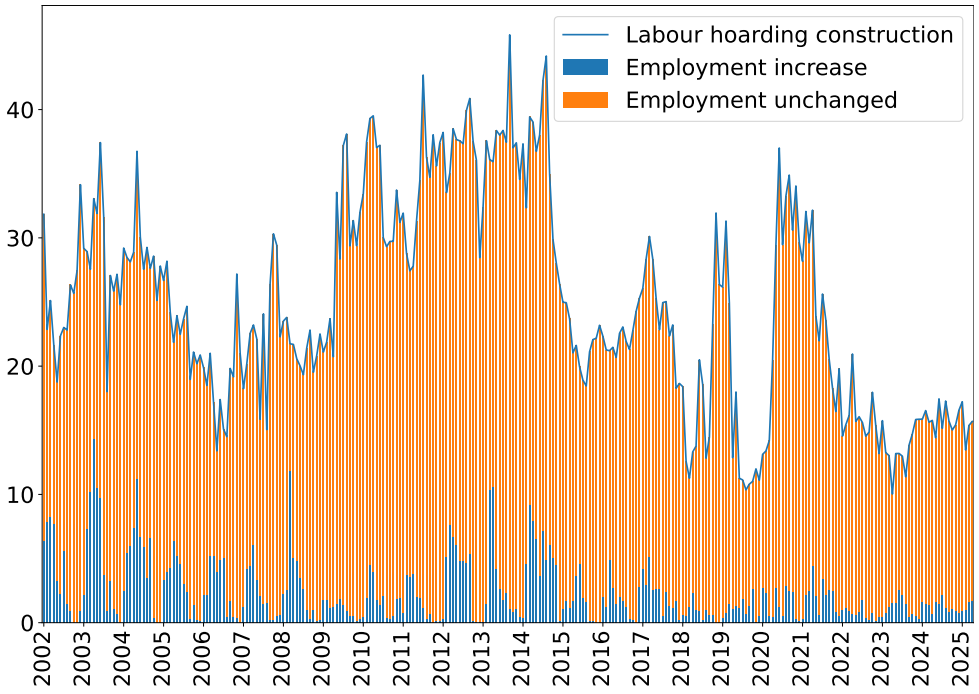


(d) Services

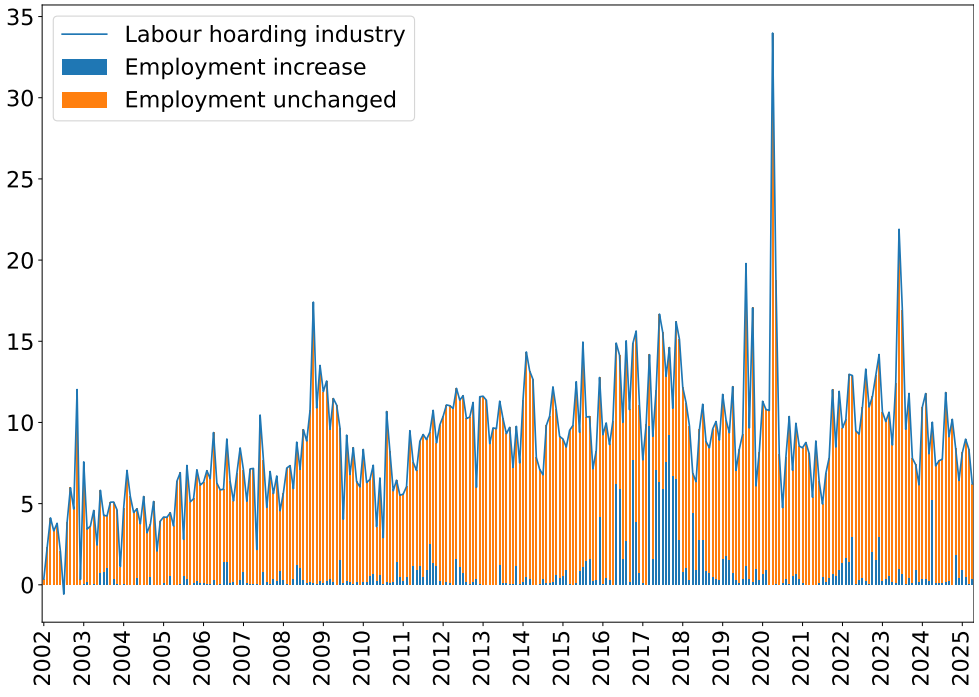
Notes: Seasonally adjusted.

Source: Národná banka Slovenska (NBS) (2025), European Commission (2025) and author's calculations.

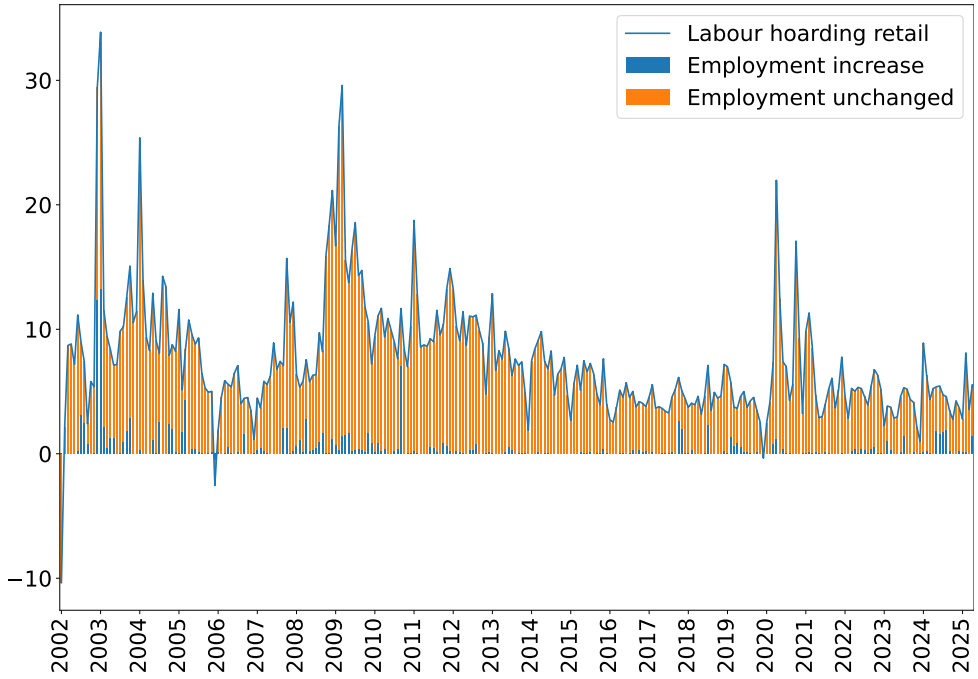
Figure A.4: Breakdown of the labour hoarding indicator in Slovakia by sector and firm size



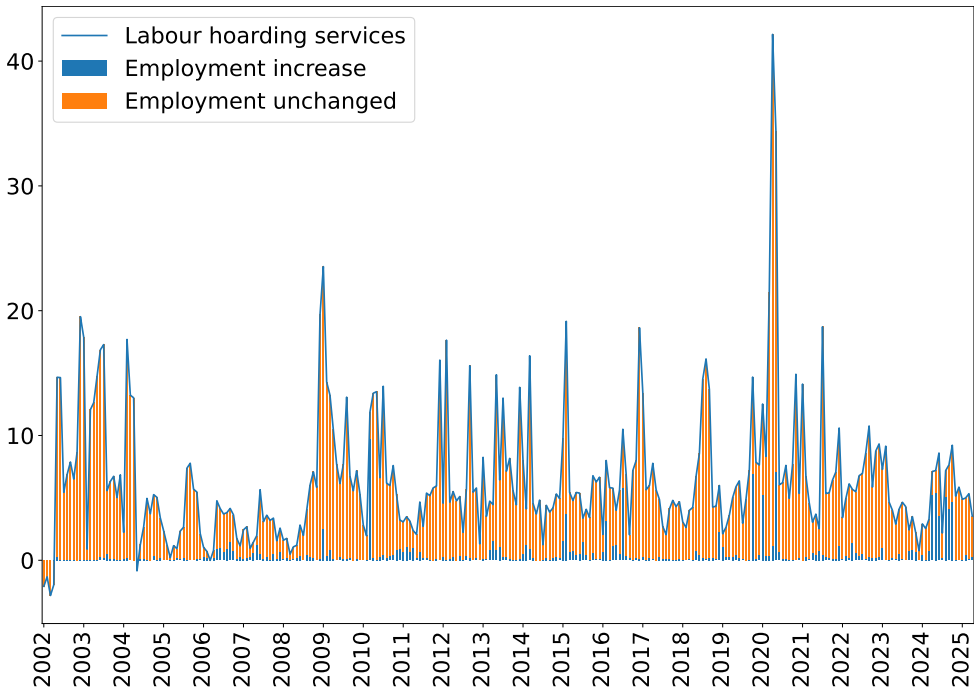
(a) Construction



(b) Industry



(c) Retail



(d) Services

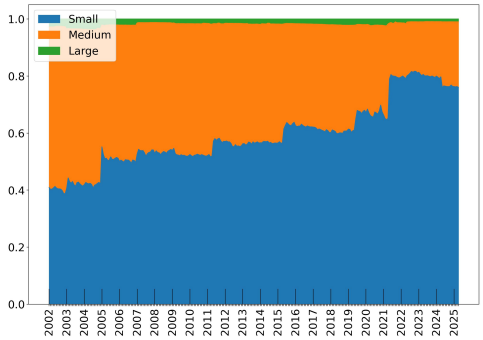
Notes: Seasonally adjusted.

Source:Národná banka Slovenska (NBS) (2025), European Commission (2025) and author's calculations.

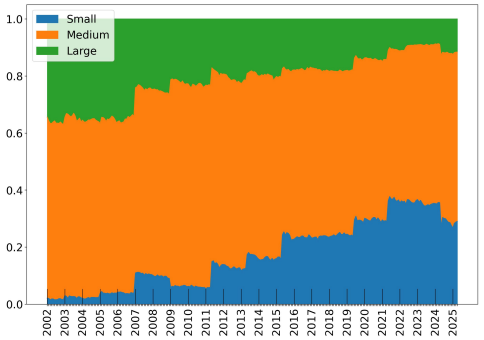
B. Characteristics of the firms included in the surveys

Figure A.5: The proportions of firms by size[15] in each wave.

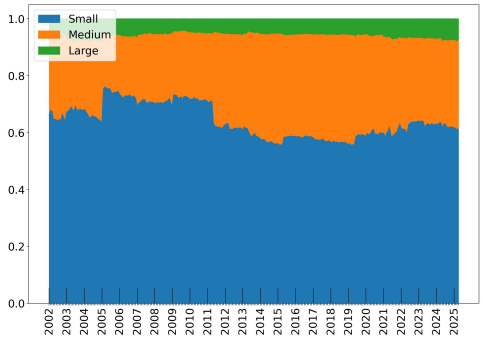
(a) Construction



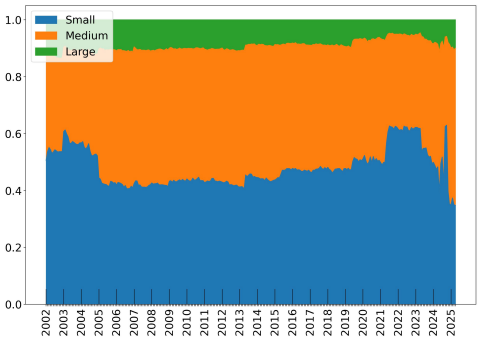
(b) Industry



(c) Retail



(d) Services



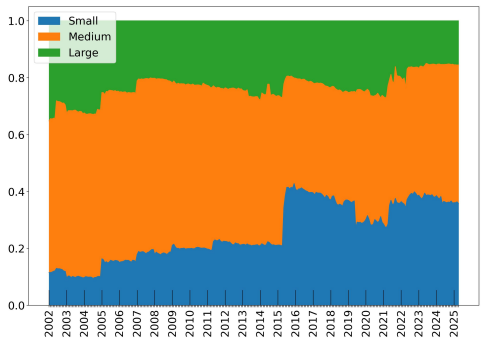
Notes: Blue – small firms; orange – medium firms; green – large firms.

Source: Statistical Office of the Slovak Republic (SU SR) (2025) and author's calculations.

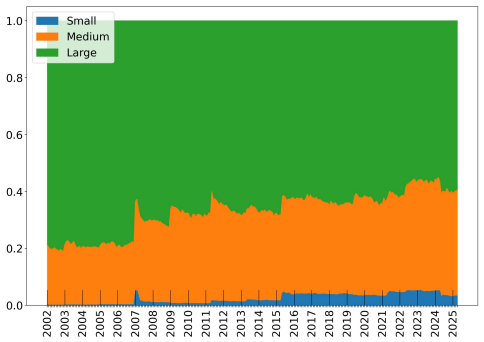
[15] A firm is defined as small if it has less than 50 employees, medium if it has between 50 and 500 employees and large if it has more than 500 employees.

Figure A.6: The proportions of firms by size in each wave weighted by their employment shares.

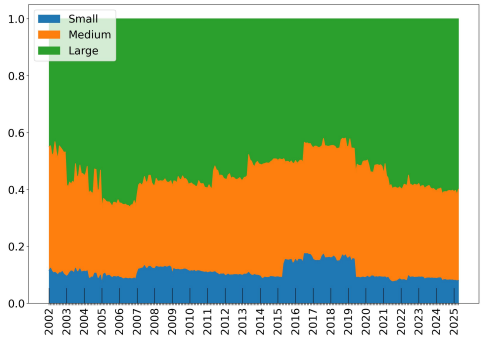
(a) Construction



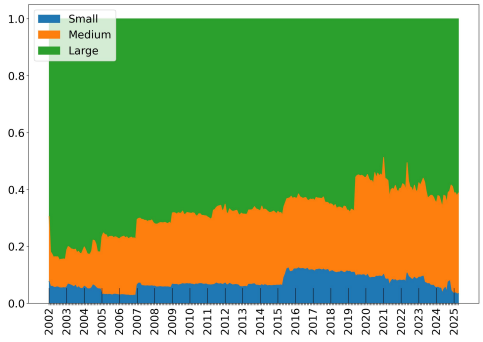
(b) Industry



(c) Retail



(d) Services



Notes: Blue – small firms; orange – medium firms; green – large firms.
Source: Statistical Office of the Slovak Republic (SU SR) (2025) and author's calculations.

C. Structural Vector Autoregression model

We use the following economic indicators in a structural vector autoregression (SVAR) model to decompose labour hoarding indicators in Slovakia into the effects of global economic activity and monetary policy shocks: industrial production in Slovakia, the Harmonised Index of Consumer Prices (HICP), the 3-month Euribor rate (BRIBOR until 2008), the 1-year Euribor rate, the 10-year government bond yield in the euro area (Eurostat, 2025). As exogenous shocks, we use the following series: economic activity shocks until 2024:M3 from Baumeister and Hamilton (2019) and monetary policy shocks until 2023:M10 from Altavilla et al. (2019). As Slovakia joined the euro area in January 2009, the values of monetary policy shocks before this date are set to zero.

All variables have a monthly frequency. Industrial production and the HICP have been transformed as 100*ln(variable). The model was estimated using Bayesian methods and Normal Inverse Wishart prior with a hyperparameter associated with the first lag of the variables equal to one. All other hyperparameters are standard as in the literature. We use the Cholesky identification scheme. The variables are ordered as follows: one of the shock series (economic activity or monetary policy shocks), industrial production, the HICP, the 3-month Euribor rate, the 1-year Euribor rate, the 10-year government bond yield in the euro area, an indicator of labour hoarding. Since the frequency is monthly, we use twelve lags of the variables. We run 10,000 iterations after 5,000 burn-ins. The model is estimated using the BEAR toolbox (Alistair and van R. Björn, 2016).