SSE RIGA

# Shadow Economy Index for the Baltic Countries 2009–2024

# Authors of the study

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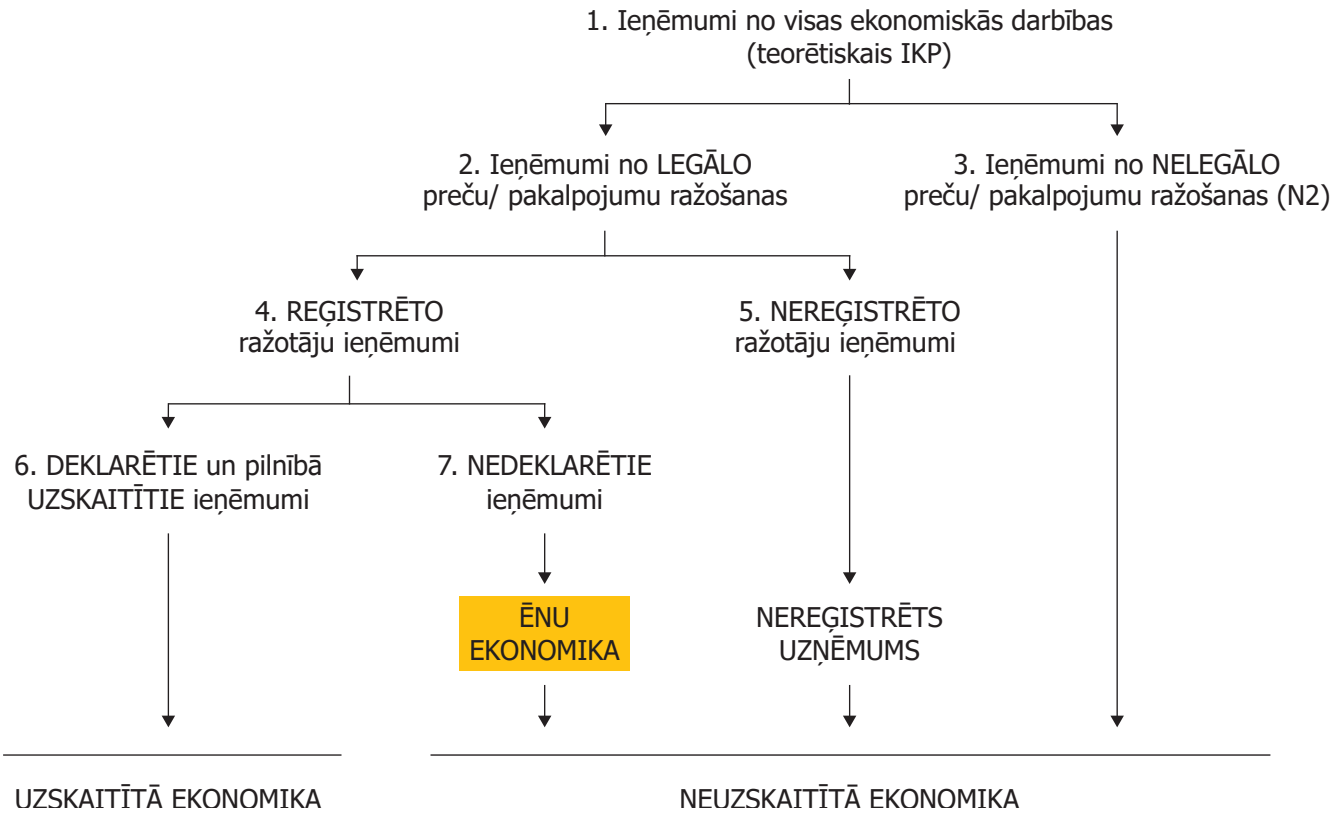
SSE RIGA

Since 2009:

- What is the size of the shadow economy in Latvia, Lithuania, and Estonia?
- What are the main determinants of the shadow economy?
- What can be done to reduce the shadow economy?

# Observed and non-observed components of GDP



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# Measuring the shadow economy using company managers

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# Study

- "Direct survey method": interviews with company owners/managers in the Baltic countries
- Entrepreneurs as experts
- In 2025 about 2024 and 2023
- 506 telephone interviews in Latvia, 502 in Lithuania, 500 in Estonia (the 2025 survey)
- Random sampling, Orbis database
- Interviews performed by Norstat Latvija
- The Index is based on the income approach in measuring GDP

# Key components of the shadow economy

- Underreporting of business income (profits)
- Underreporting of the number of employees
- Envelope wages
- % of revenue spent on payments 'to get things done': bribery
- % of the contract value paid to secure a contract with the government: corruption

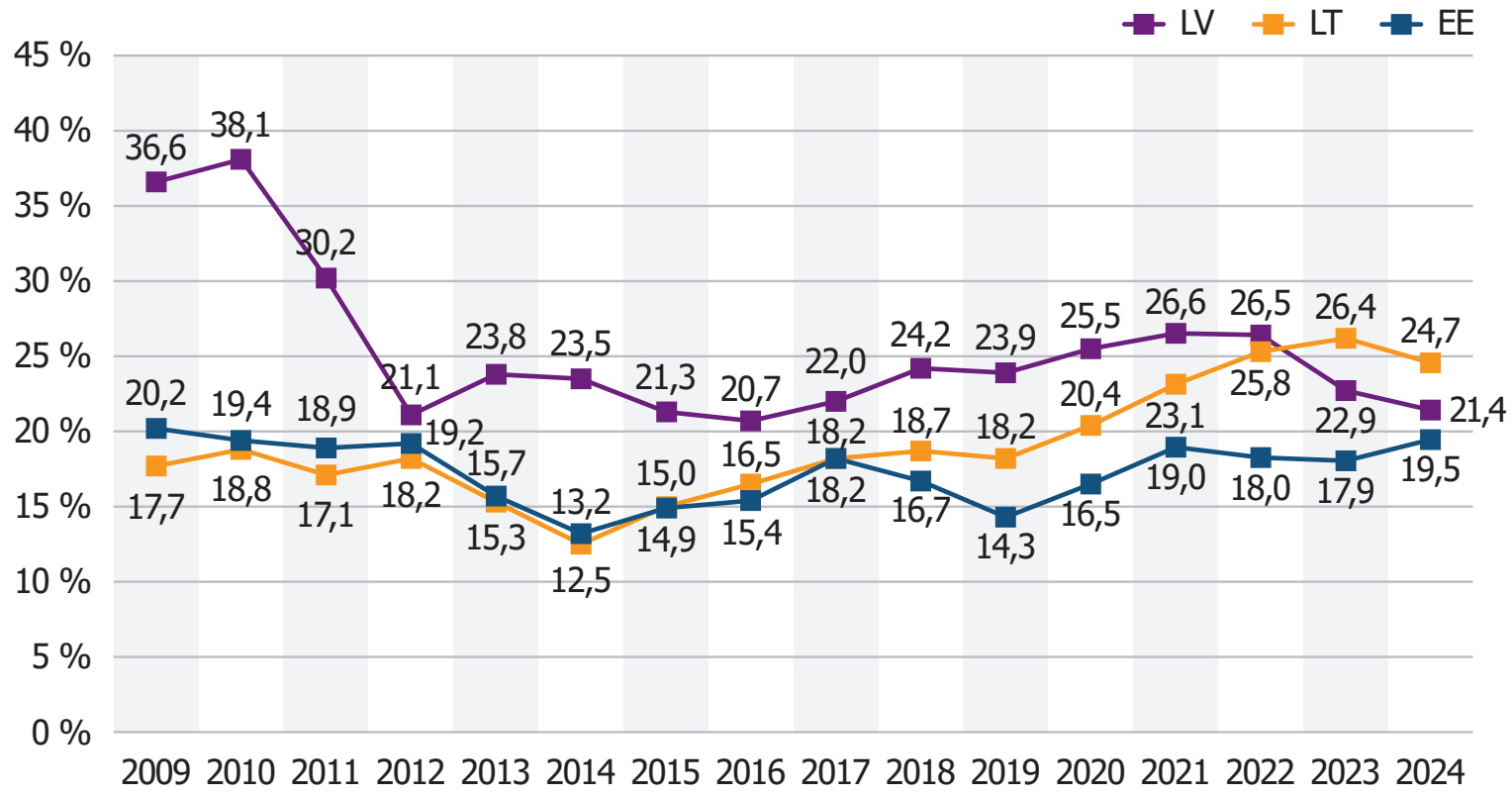
# Size of the shadow economy in Latvia, Lithuania, and Estonia 2009–2024
# Results

# Shadow Economy Index for the Baltic countries (% of GDP), 2009–2024

| | 2024–2023 | 2024 | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|---|---|
| LV | -1,5 (-3,7 -0,9) | 21,4 (18,7 24,2) | 22,9 (20,2 25,5) | 26,5 (24,5 28,5) | 26,6 (24,9 28,3) | 25,5 (23,6 27,4) | 23,9 (21,4 26,3) | 24,2 (21,5 26,8) |
| LT | -1,7 (-4,1 0,7) | 24,7 (22,1 27,3) | 26,4 (23,1 29,7) | 25,8 (22,2 29,5) | 23,1 (20,6 25,7) | 20,4 (18,4 22,3) | 18,2 (16,5 19,9) | 18,7 (17,0 20,4) |
| EE | +1,6 (-0,4 3,5) | 19,5 (17,1 21,8) | 17,9 (15,6 20,2) | 18,0 (15,3 20,7) | 19,0 (16,1 21,9) | 16,5 (14,3 18,8) | 14,3 (12,3 16,3) | 16,7 (14,5 18,8) |

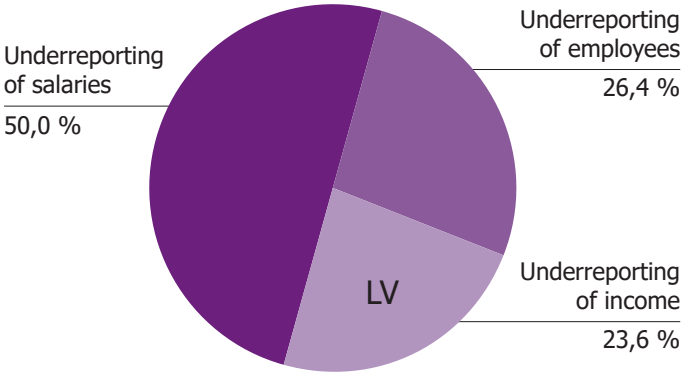
| | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|---|---|---|---|
| LV | 22,0 (19,6 24,5) | 20,7 (18,0 22,6) | 21,3 (19,0 23,7) | 23,5 (20,5 26,6) | 23,8 (20,7 26,9) | 21,1 (18,5 23,6) | 30,2 (27,6 32,7) | 38,1 (35,9 40,3) | 36,6 (34,3 38,9) |
| LT | 18,2 (16,1 20,4) | 16,5 (14,8 18,3) | 15,0 (13,8 16,3) | 12,5 (11,0 13,9) | 15,3 (13,6 17,1) | 18,2 (16,4 20,1) | 17,1 (15,2 19,0) | 18,8 (16,9 20,6) | 17,7 (15,8 19,7) |
| EE | 18,2 (16,1 20,3) | 15,4 (13,1 17,8) | 14,9 (12,4 17,4) | 13,2 (11,3 15,1) | 15,7 (13,5 17,9) | 19,2 (16,6 21,9) | 18,9 (16,8 20,9) | 19,4 (18,0 20,8) | 20,2 (18,7 21,7) |

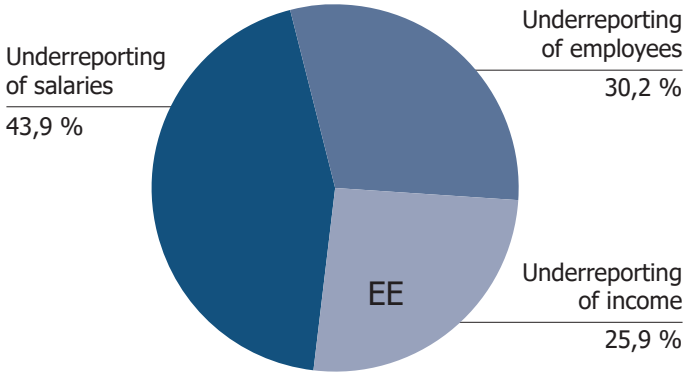
# Dynamics of the shadow economy in the Baltic countries (% of GDP), 2009–2024

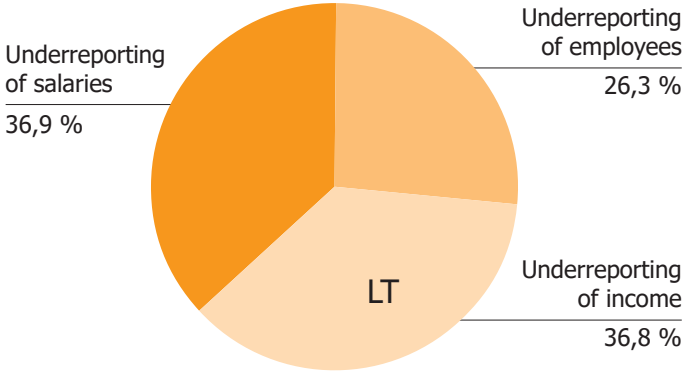



**Size of the shadow economy in Latvia, Lithuania, and Estonia 2009–2024**

# Components of the shadow economy in 2024

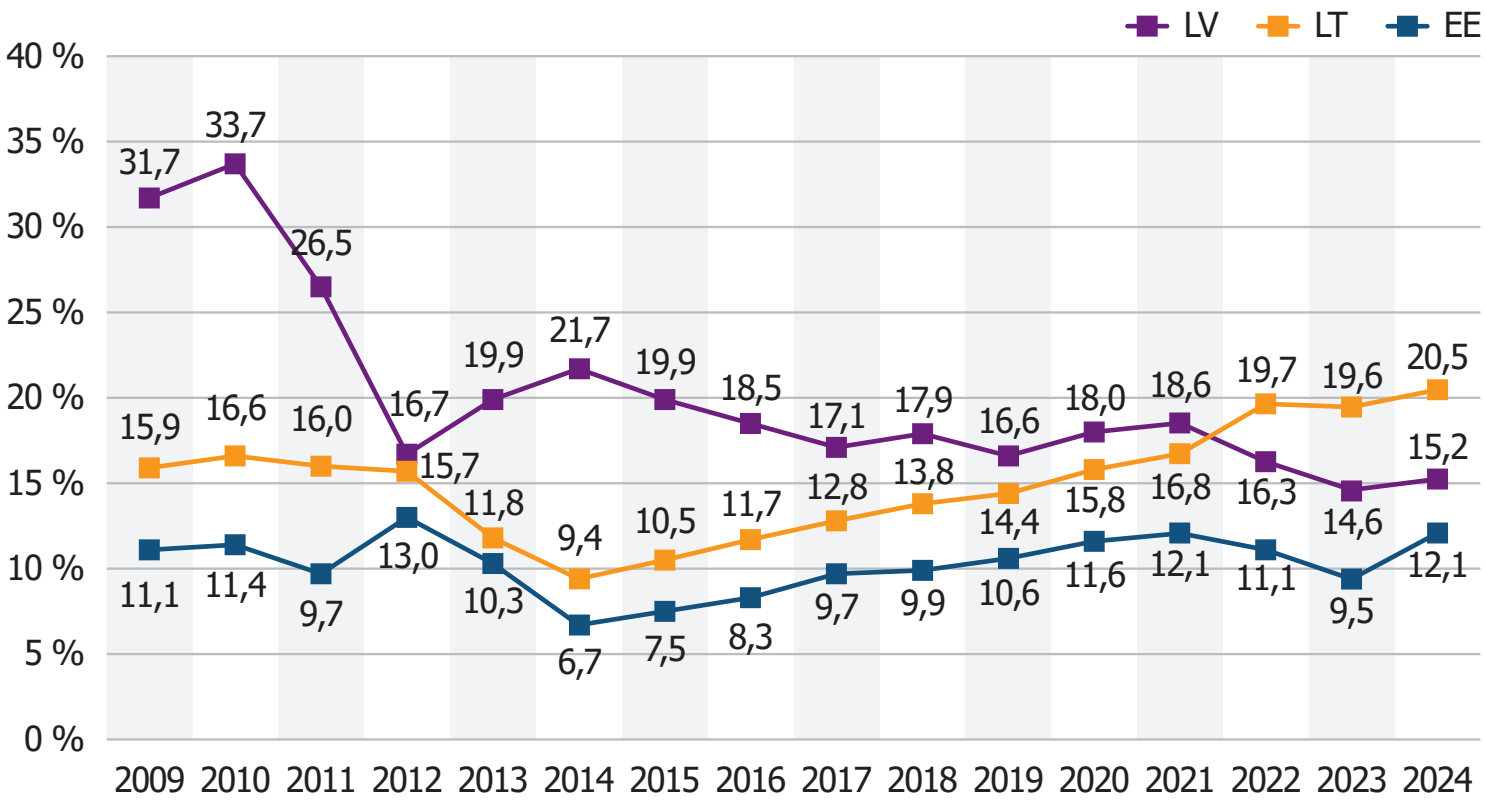


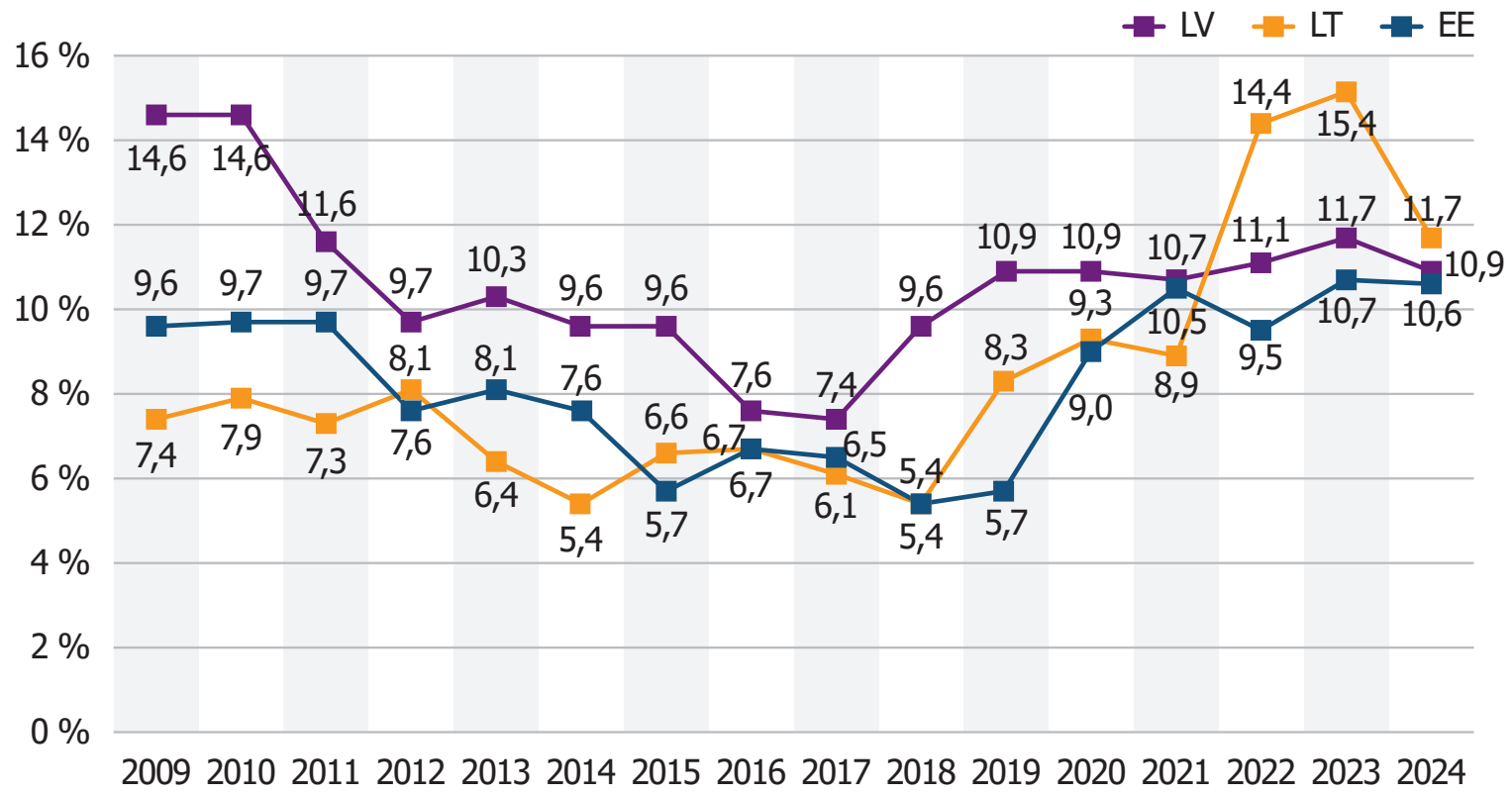




**Size of the shadow economy in Latvia, Lithuania, and Estonia 2009–2024**

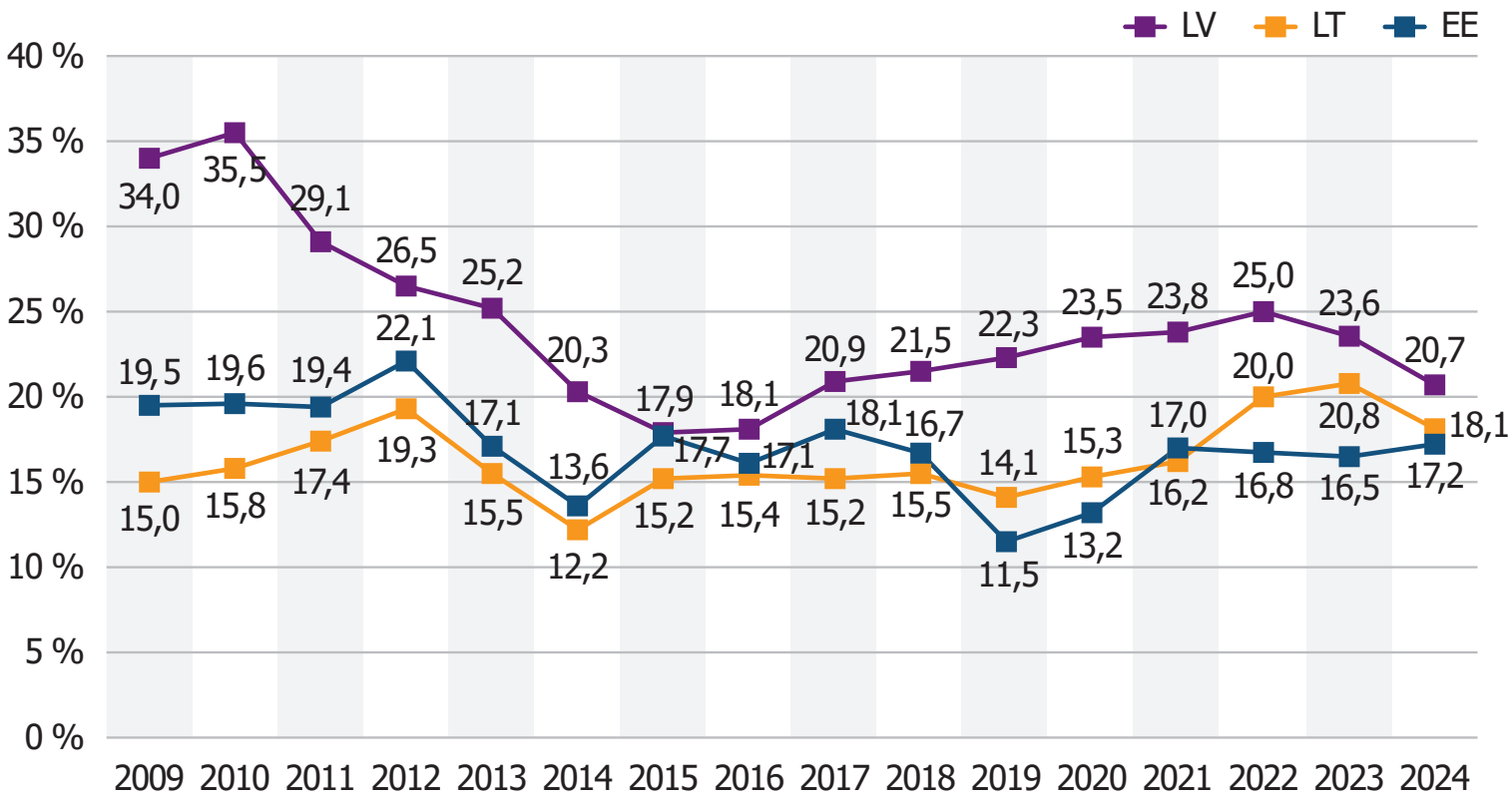
# Underreporting of business income 2009–2024 (average share of revenue in % that companies conceal from the government)



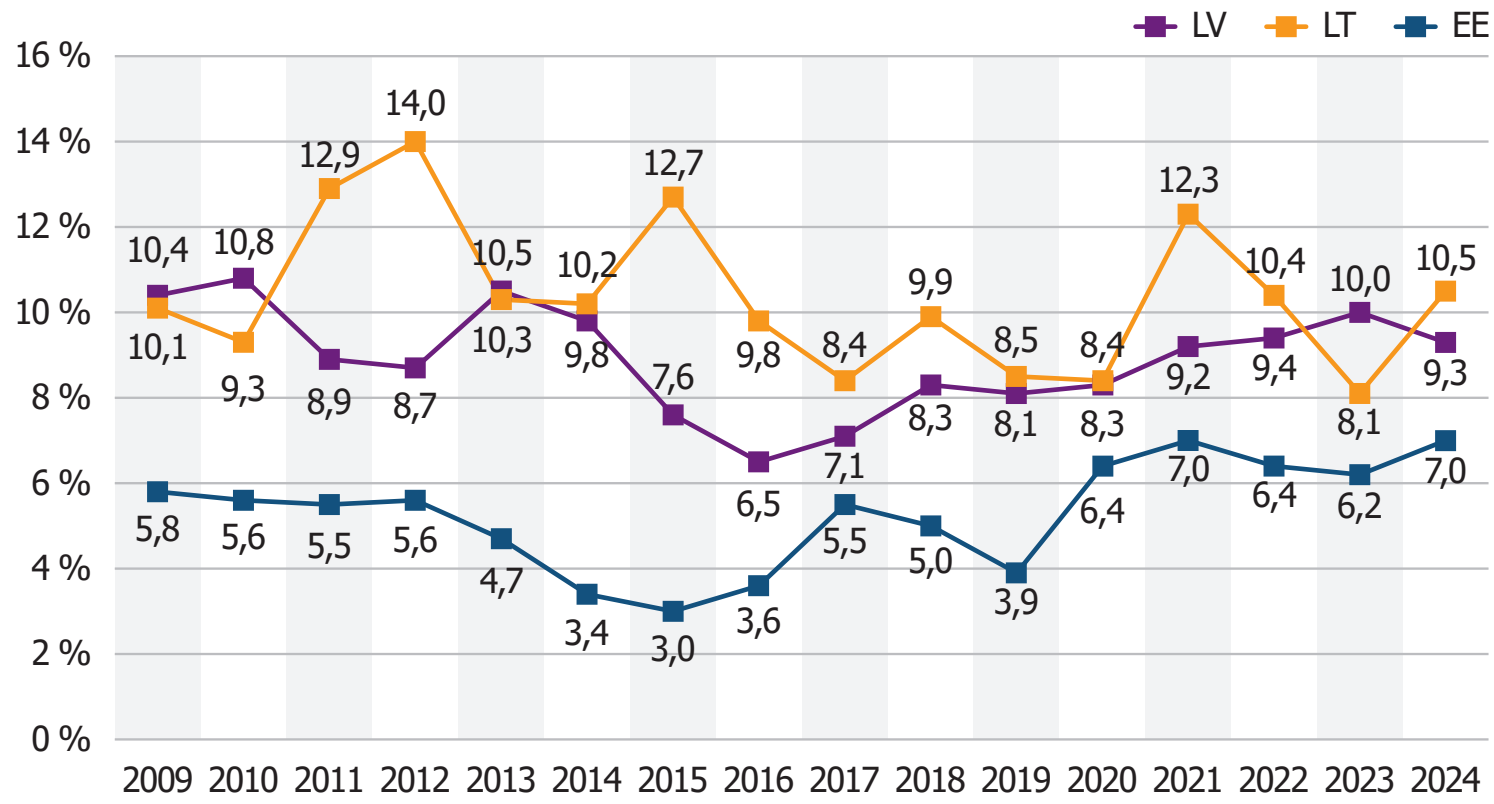
# Underreporting of the number of employees, 2009–2024 (average share of the employees in % working without a contract)



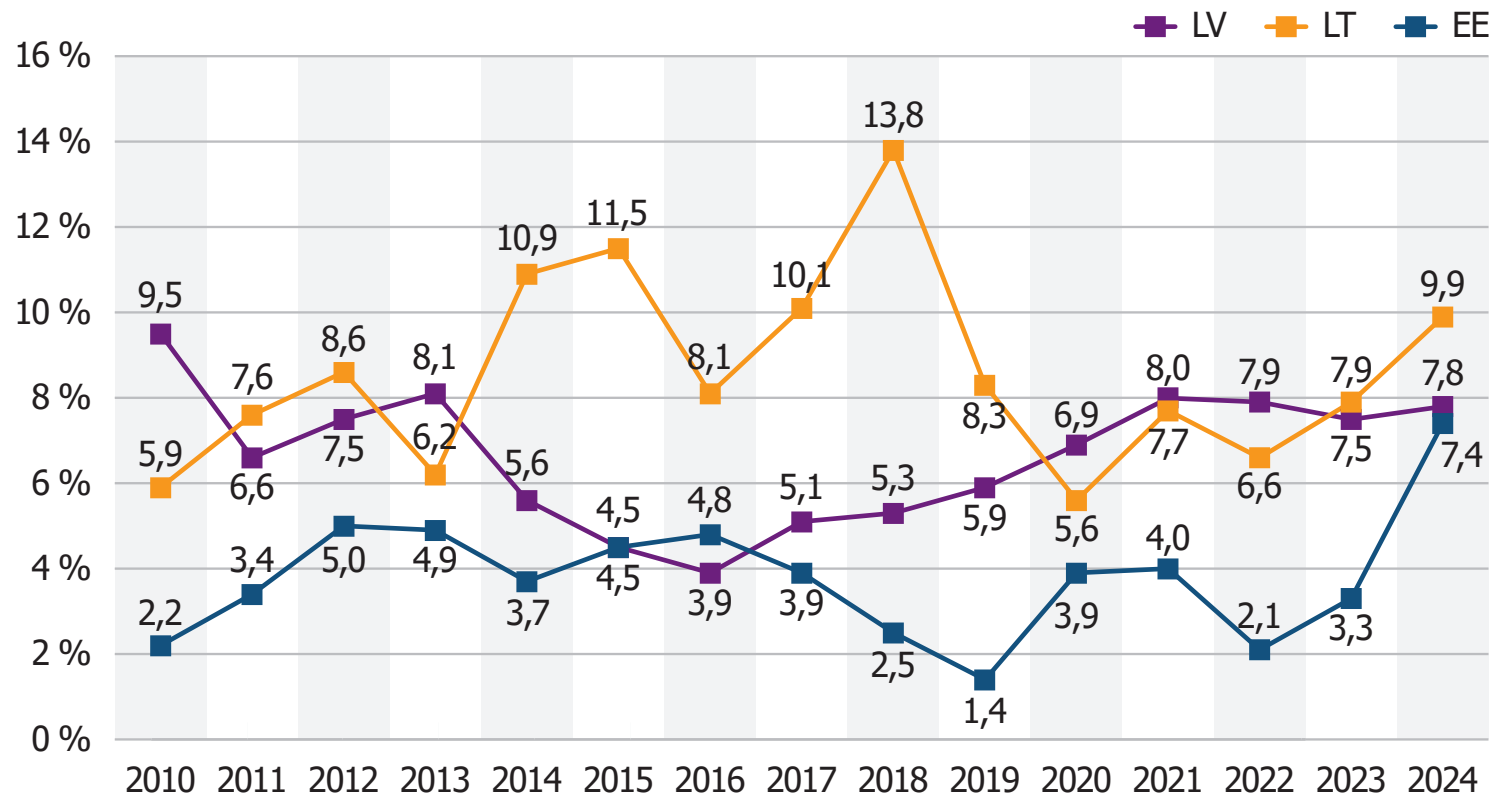
# Envelope wages, 2009–2024 (average share of salaries in % which is paid by the employers, but concealed from the government)



# % of payments 'to get things done', 2009–2024 (average percentage of revenue paid as 'bribes')



# % of the contract value paid to secure contracts with the government, 2010–2024

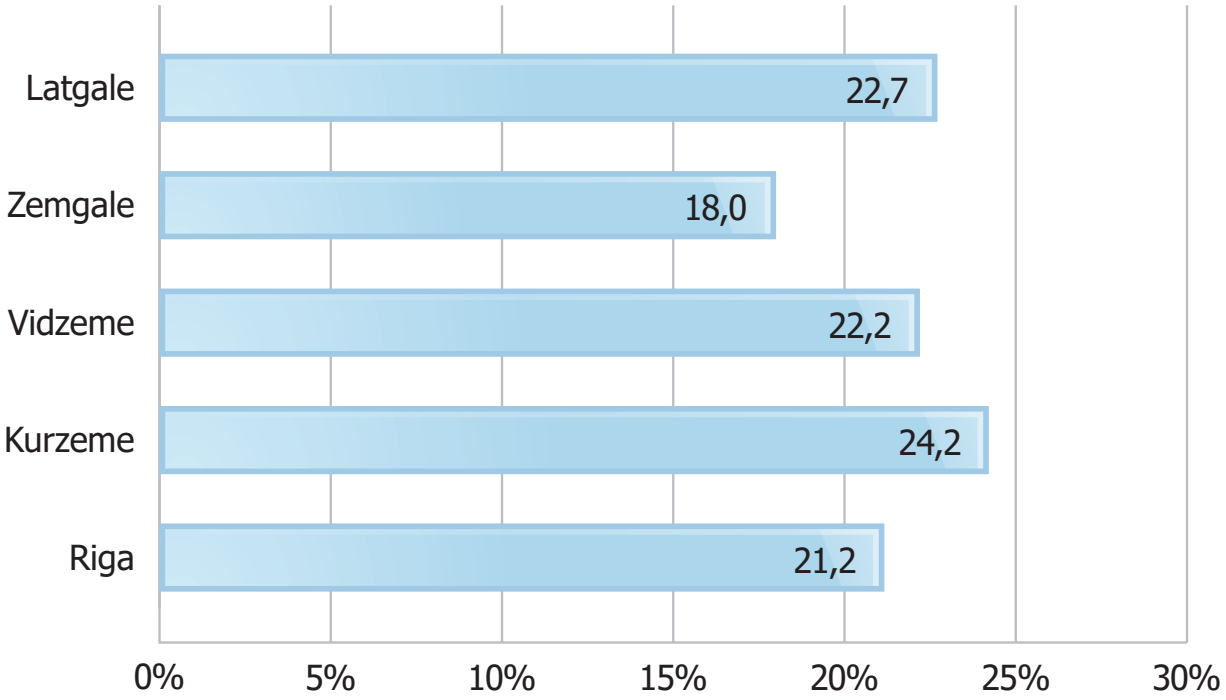


# The proportion (%) of goods or services provided by unregistered companies in the Baltic countries, 2013–2024

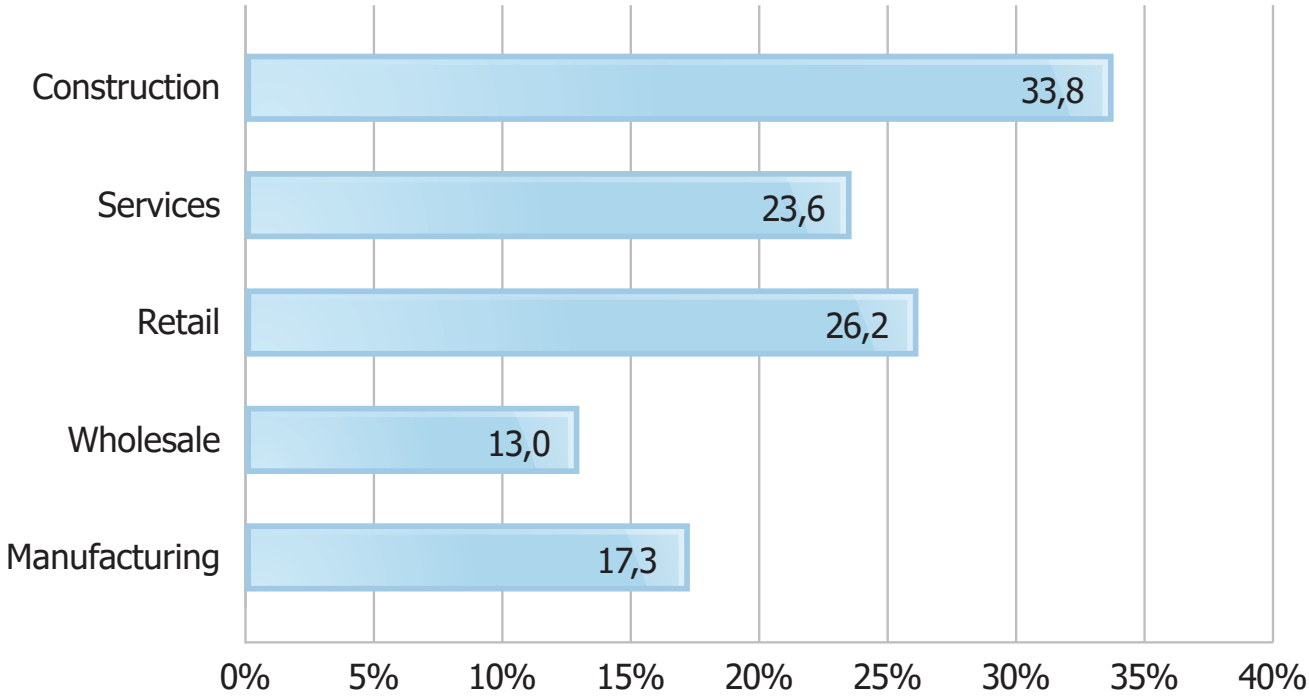
| | Latvia | Lithuania | Estonia |
|---|---|---|---|
| 2024 | 10,1 (8,4 11,9) | 9,4 (8,0 10,9) | 8,6 (7,0 10,1) |
| 2023 | 8,8 (7,3 10,4) | 8,4 (6,9 9,9) | 6,5 (5,3 7,8) |
| 2022 | 8,5 (7,2 9,9) | 9,5 (7,8 11,2) | 6,3 (5,0 7,6) |
| 2021 | 8,6 (7,5 9,7) | 9,0 (7,5 10,6) | 6,7 (5,4 8,0) |
| 2020 | 8,4 (6,7 9,2) | 6,2 (4,9 7,4) | 4,0 (3,1 5,0) |
| 2019 | 8,0 (6,7 9,2) | 9,2 (7,8 10,6) | 4,0 (3,0 5,1) |
| 2018 | 8,6 (7,3 10,1) | 10,0 (8,8 11,3) | 6,4 (5,0 7,9) |
| 2017 | 6,5 (5,3 7,8) | 8,6 (7,5 9,8) | 7,0 (5,7 8,5) |
| 2016 | 5,3 (4,1 6,5) | 8,4 (7,5 9,4) | 6,1 (5,1 7,1) |
| 2015 | 5,2 (4,1 6,3) | 7,3 (6,5 8,1) | 5,8 (4,5 7,1) |
| 2014 | 5,6 (4,5 6,7) | 5,2 (4,5 6,0) | 6,3 (4,5 8,2) |
| 2013 | 5,4 (4,2 6,6) | 6,2 (5,3 7,1) | 7,6 (5,4 9,9) |

# Size of the shadow economy in the regions, sectors, companies of different sizes

# Size of the shadow economy (% of GDP) by region in Latvia (2024)



# Size of the shadow economy (% of GDP) by sector in Latvia (2024)



# Involvement in the shadow economy

- Smaller firms (e.g., those with fewer employees) engage in more shadow activity than larger firms
- Younger firms engage in more shadow activity than older firms

# Main determinants of the shadow economy

# Statistically significant determining factors (using regression analysis)

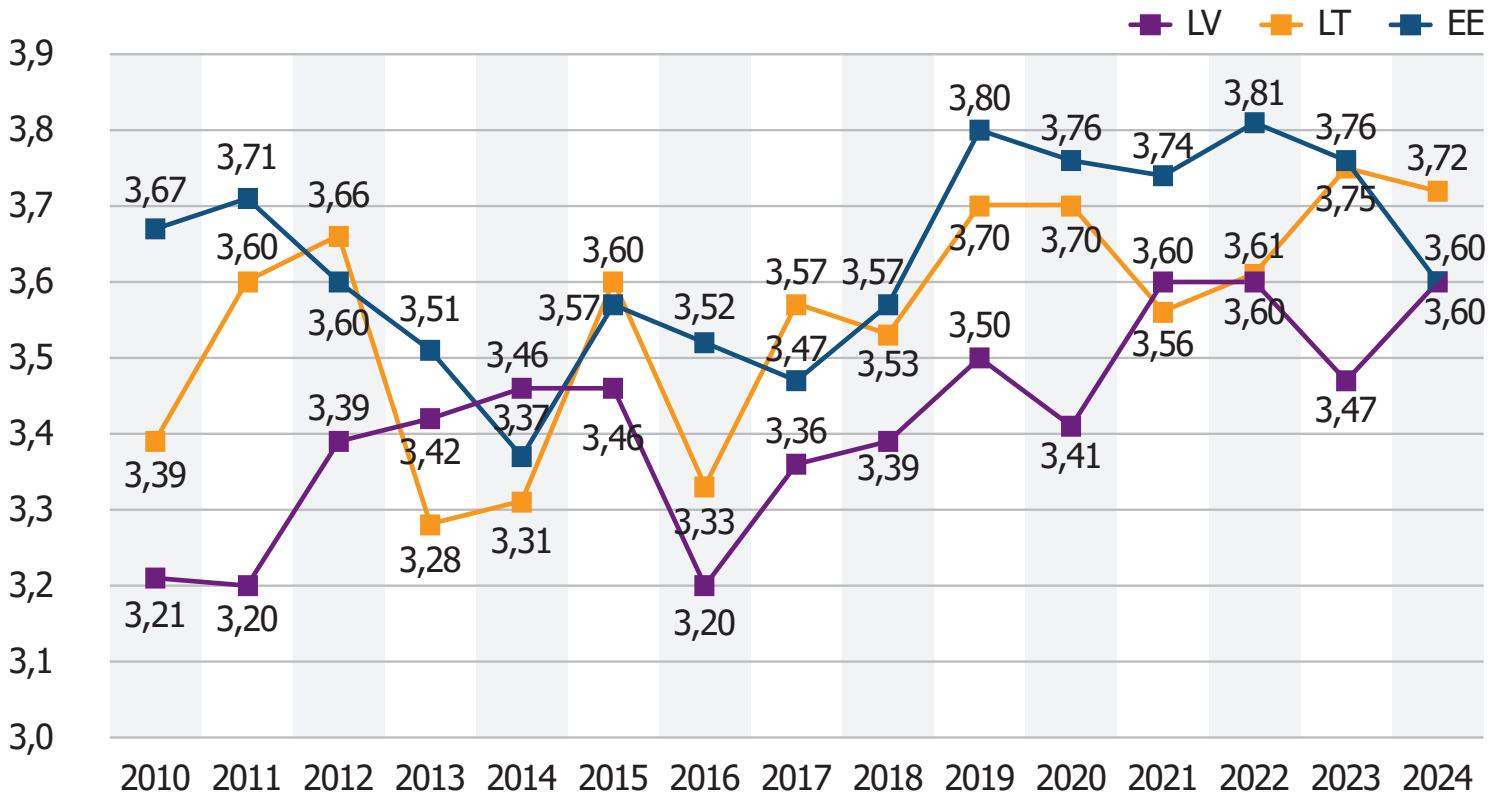
- Greater probability of being caught not paying taxes and more serious consequences ➔ fewer entrepreneurs getting involved in shadow economy activities

# Statistically significant determining factors (using regression analysis)

- Dissatisfaction ➔ more shadow activity
- Involvement in shadow economy is greatly determined by dissatisfaction with:
  - Business legislation (greatest effect)
  - Performance of SRS
  - Tax policy
  - Government support (least effect)

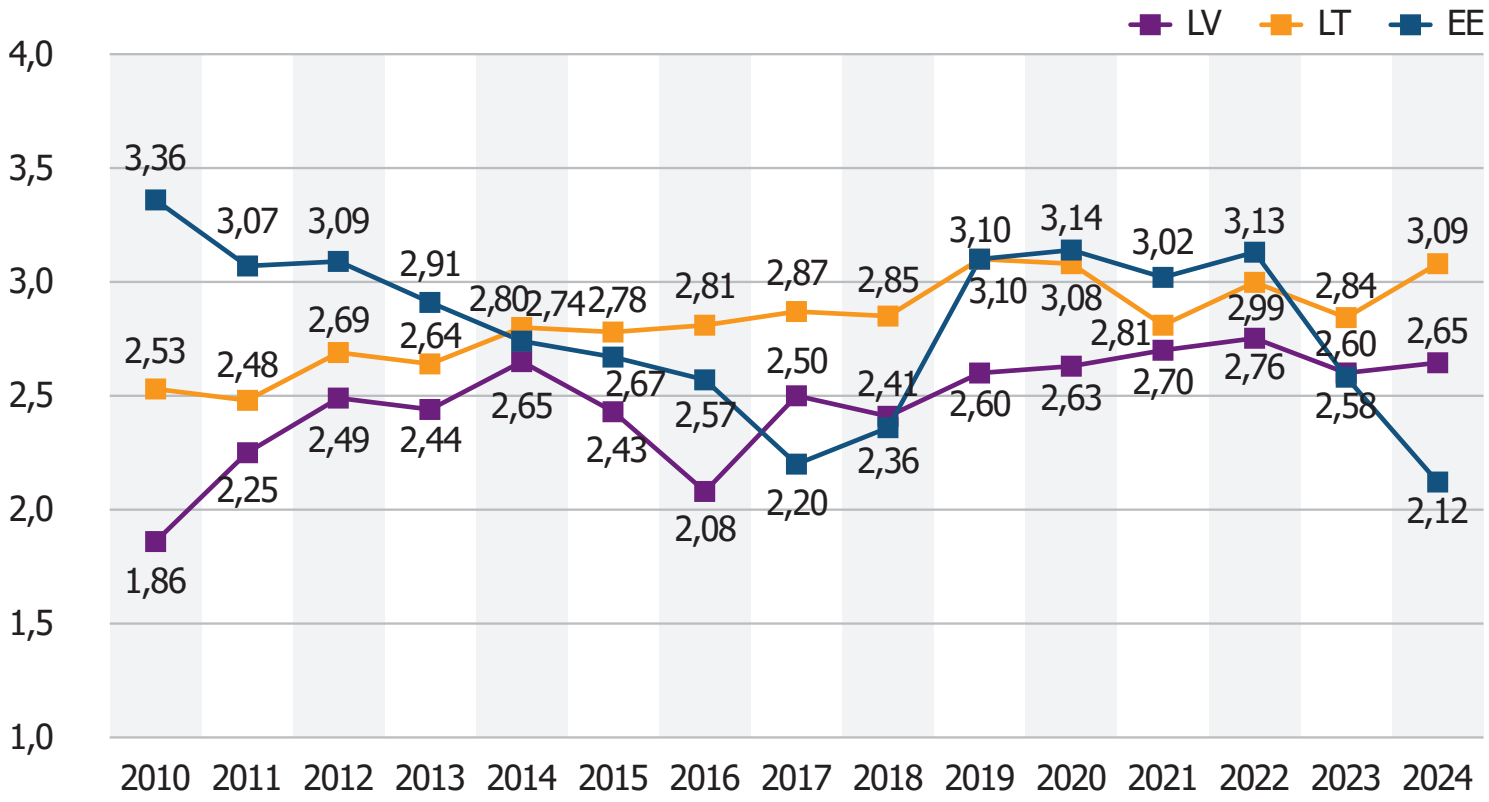
# Satisfaction with the performance of the State Revenue Service, 2010–2024

**(Average. '1'- very low satisfaction, but '5'- very high satisfaction)**



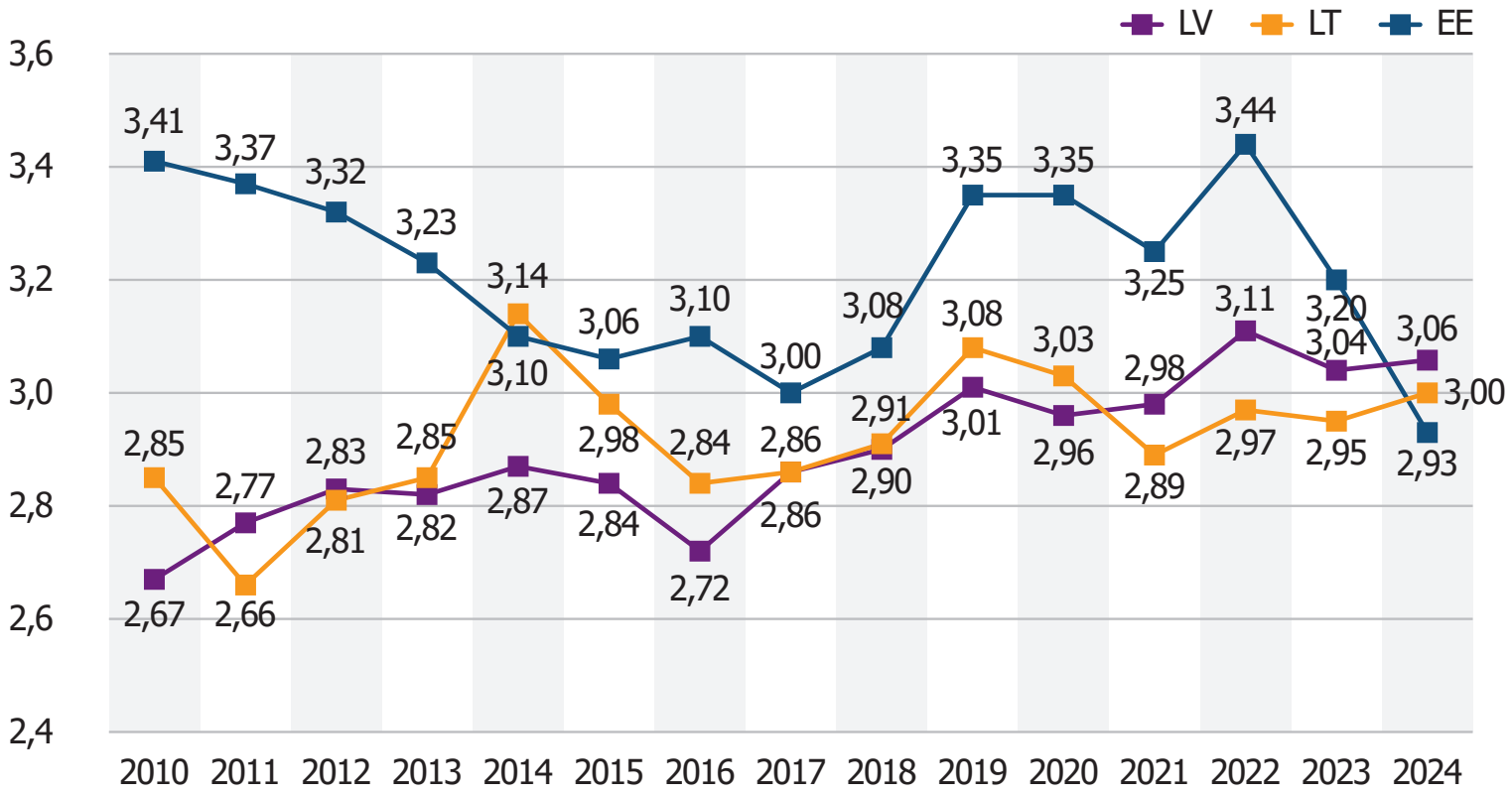
# Satisfaction with the tax policy, 2010–2024

**(Average. '1'- very low satisfaction, but '5'- very high satisfaction)**



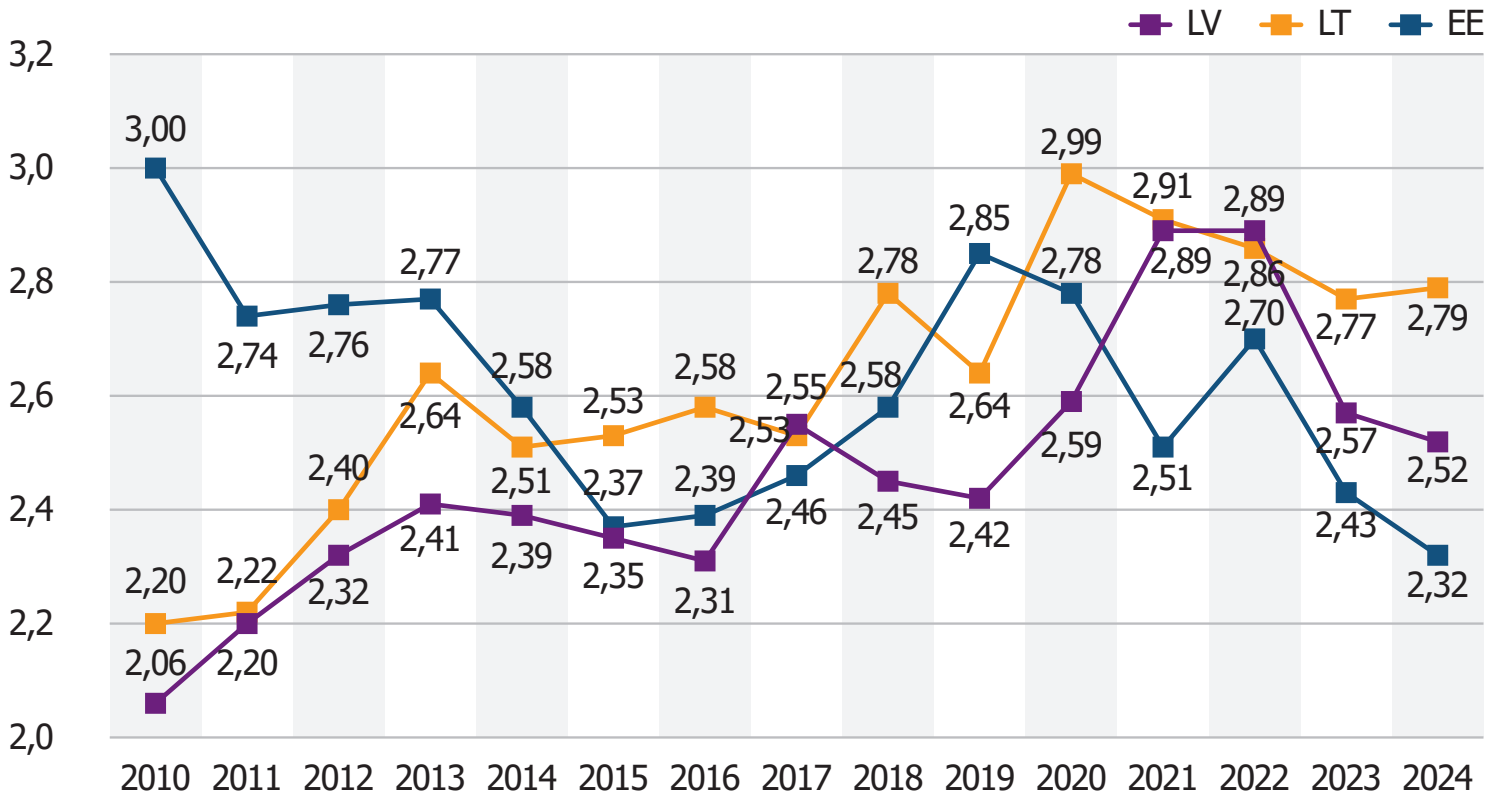
# Satisfaction with the quality of business legislation, 2010–2024

**(Average. '1'- very low satisfaction, but '5'- very high satisfaction)**



# Satisfaction with the government's support to entrepreneurs, 2010–2024

**(Average. '1'- very low satisfaction, but '5'- very high satisfaction)**



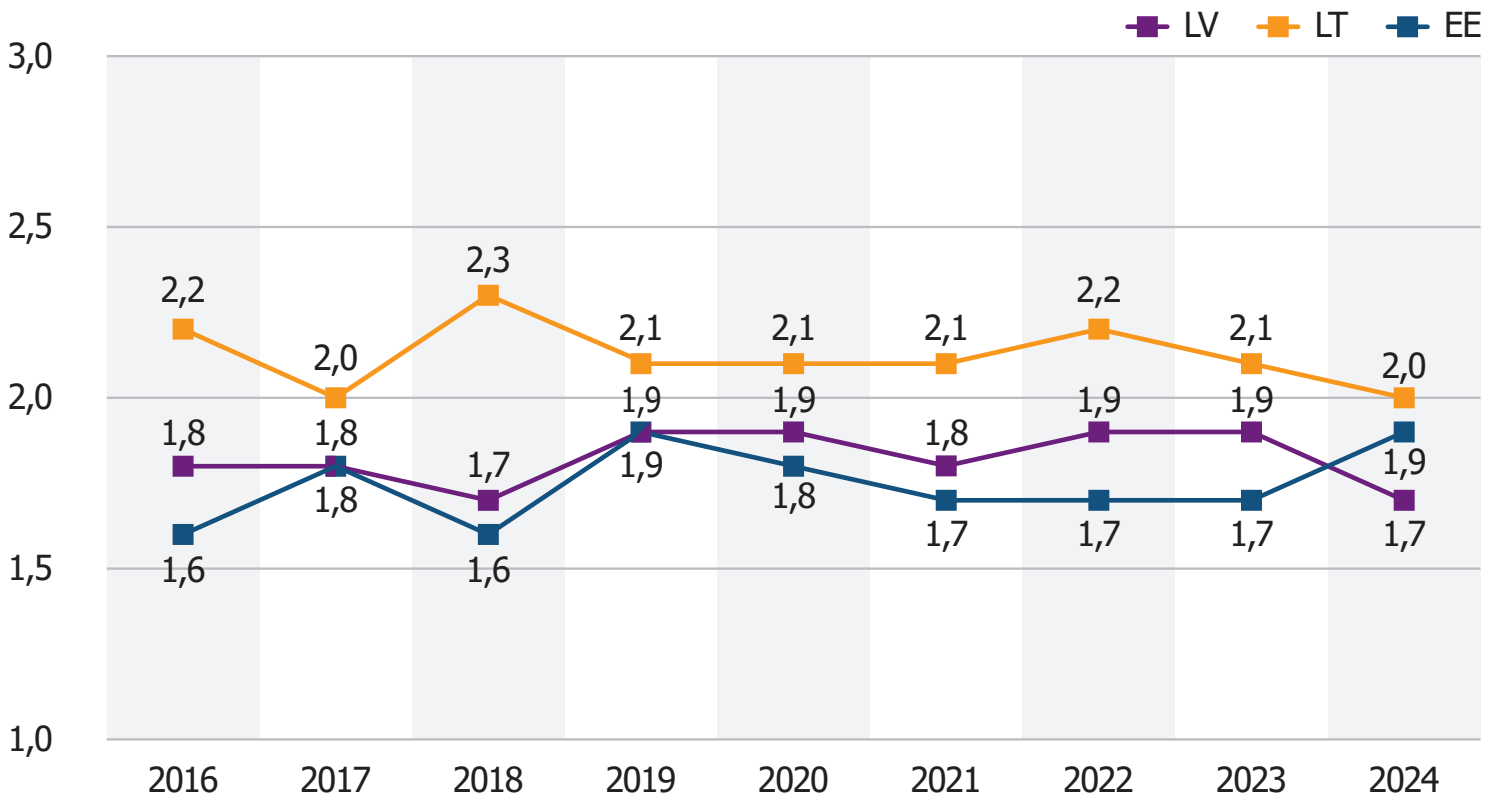
# Statistically significant determining factors (using regression analysis)

- Greater tolerance towards involvement in shadow economy ➔ greater involvement in shadow economy

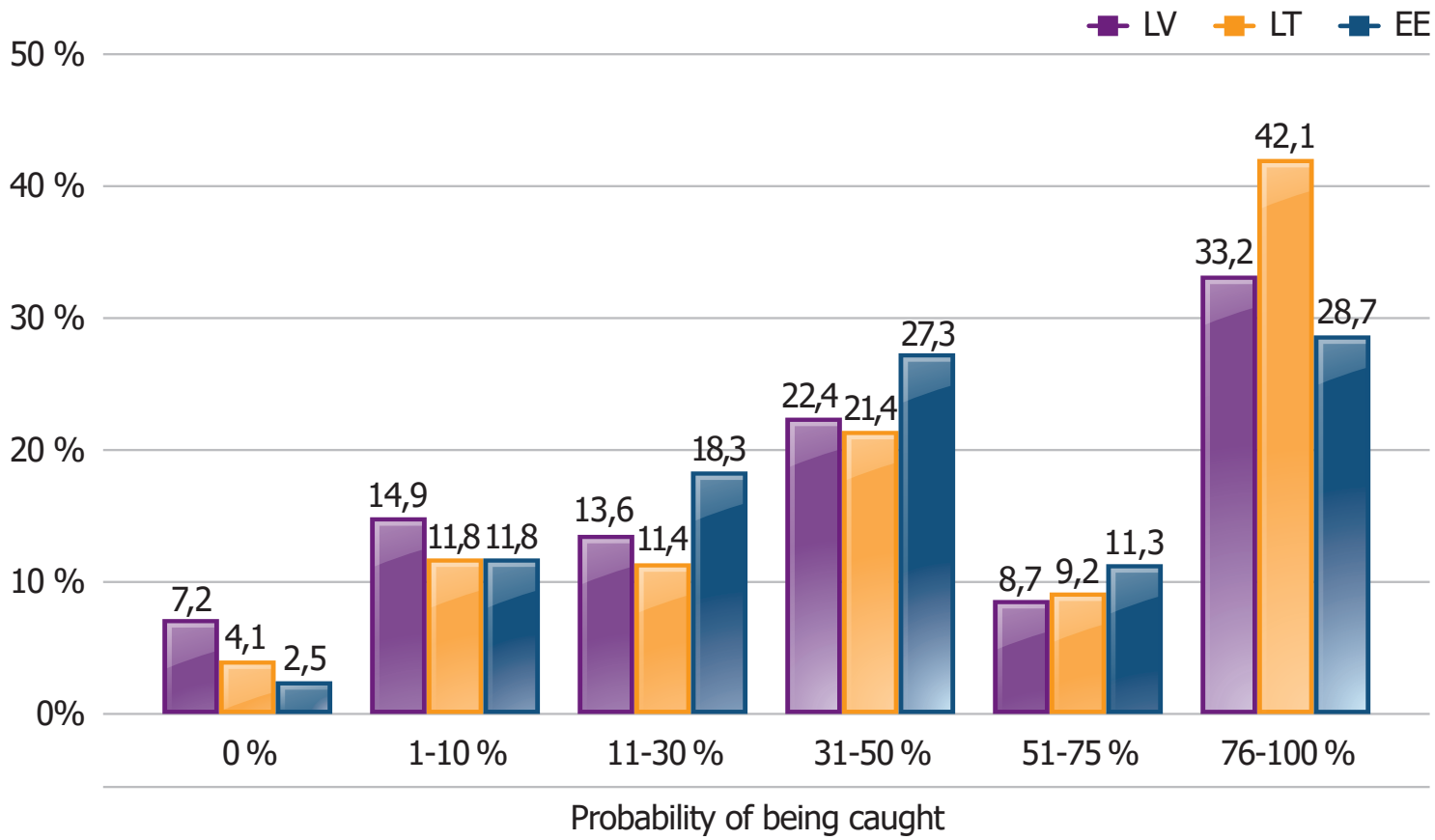
# Tax morale

**It is always justified to cheat on tax if there is a chance.**

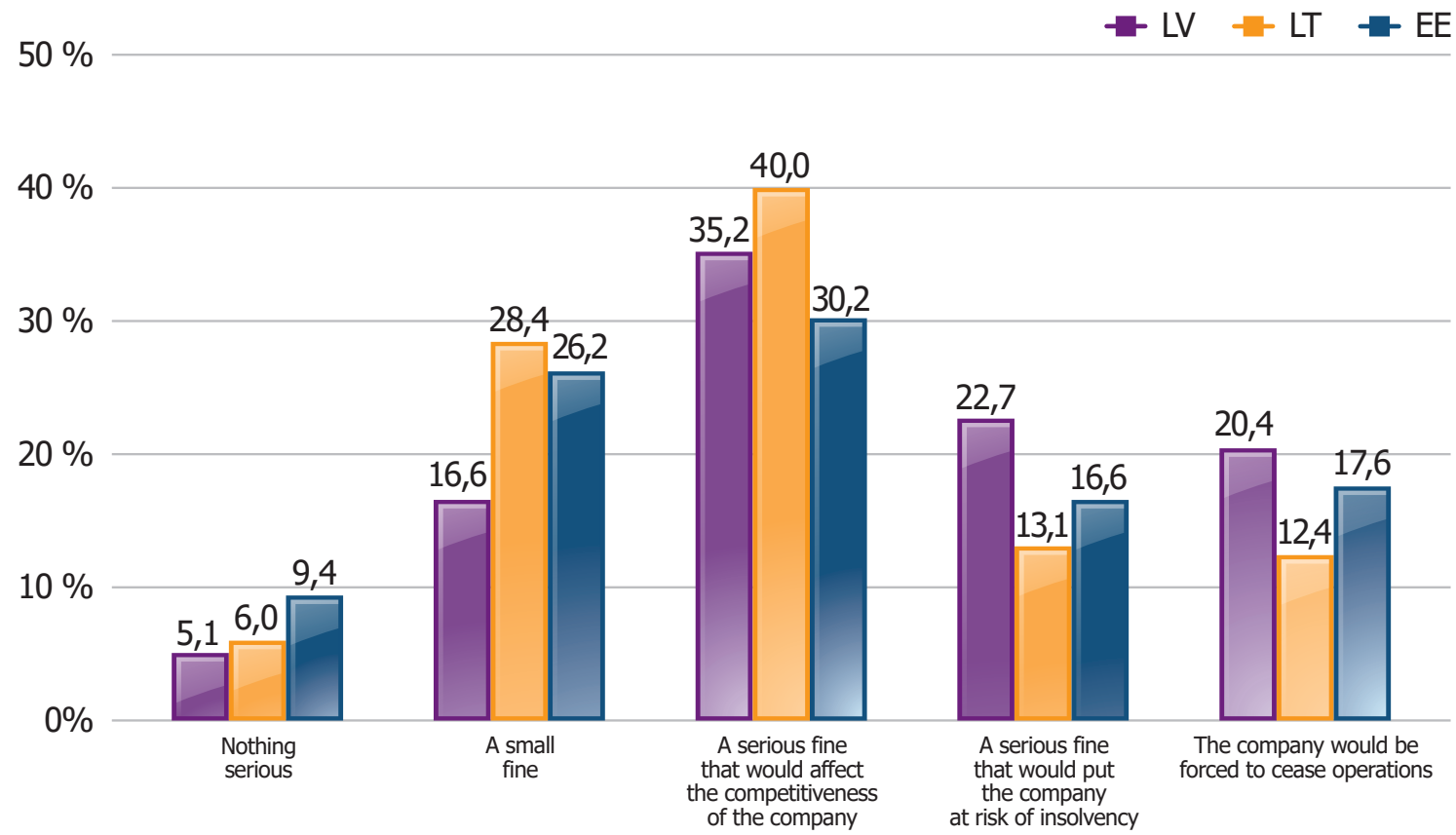
**(Scale of 1 to 5, where 1 means – completely disagree (high tax morale), 5 means – completely agree).**



# Probability of being caught if the company pays envelope wages, 0–100%, 2024



## If a company in your industry was caught for deliberate misreporting, what would typically be the consequence to that company?



# Summary and conclusions

The aim of the SSE Riga Shadow Economy Index for the Baltic countries is to measure the size of the shadow economies in Estonia, Latvia and Lithuania, as well as to explore the main factors that influence participation in the shadow economy. We use the term "shadow economy" to refer to all legal production of goods and services that is deliberately concealed from public authorities. The Index has been published annually since 2010 to provide policy makers with information for making justified policy decisions, as well as to foster a deeper understanding of entrepreneurship processes in the Baltic countries.

The SSE Riga Shadow Economy Index for the Baltic countries is calculated annually based on a methodology developed by Putniņš and Sauka (published in the *Journal of Comparative Economics* in 2015) and using surveys of company managers in the Baltic countries: Latvia, Lithuania and Estonia. This method makes use of a number of surveying and data collection techniques shown in previous studies to be effective in eliciting more truthful responses. The Index combines estimates of misreported business income, unregistered or hidden employees, as well as unreported "envelope" wages to obtain estimates of the shadow economies as a proportion of GDP. This methodology has been also applied to estimate the size of the shadow economy in other countries such as Ukraine, Moldova, Romania, Poland, Kyrgyzstan, Georgia, Russia and Kosovo.

# Summary and conclusions

In this study, the main focus is on estimates of the shadow economy in 2024 and trends covering the period 2009–2024. It also provides evidence about the main factors that influence entrepreneurial involvement in the shadow economy as well as some policy recommendations.

According to our calculations, the size of the shadow economy in Latvia from 2016 to 2022, with a slight exception in 2019, has had an increasing trend: 20.7% of GDP in 2016, 22.0% in 2017 and 24.2% of GDP in 2018, 23.9% of GDP in 2019. In 2020, the shadow economy in Latvia increased to 25.5% of GDP, in 2021 it reached 26.6% of GDP, and in 2022: 26.5% of GDP. In 2023, the shadow economy in Latvia decreased to 22.9% of GDP. In Lithuania, meanwhile, an increase in the size of the shadow economy was observed almost every year from 2014 to 2023. Namely, in Lithuania: in 2014 it was 12.5% of GDP, increasing to 18.2% in 2019, and, respectively, 20.4%, 23.1%, 25.8% and 26.4% of GDP in 2020, 2021, 2022 and 2023. In Estonia, according to our data, the size of the shadow economy has varied, experiencing both increase and decrease. For example, in 2014, the size of the shadow economy in Estonia was 13.2% of GDP, in 2015: 14.9% of GDP, but in 2017: 18.2% of GDP, in 2020: 16.5% of GDP, and in 2023: 17.9% of GDP.

# Summary and conclusions

According to the recent Shadow Economy Index results, the size of the shadow economy in Latvia in 2024 has continued to decrease, reaching 21.4% of GDP, which is 1.5 percentage points less compared to 2023. A decrease in the shadow economy in 2024 is also observed in Lithuania: -1.7 percentage points, compared to 2023, reaching 24.7% of GDP. In Estonia, in 2024, the shadow economy has increased to 19.5%, which is 1.6 percentage points more than a year earlier. Although Estonia still has the lowest shadow economy level among the Baltic countries, this is the highest shadow economy indicator in the country since 2009, when we started measuring the shadow economy in the Baltics.

The results of the Shadow Economy Index study show that in Latvia, Estonia and also in Lithuania, the most significant component of the shadow economy in 2024 was envelope wages. In Latvia, envelope wages, accounted for 50.0% (48.2% in 2023), in Estonia: 43.9% (45.3% in 2023), but in Lithuania 36.9% (35.5% in 2023) of the total shadow economy. Unreported income in Latvia in 2024 amounted to 24.6% (25.8% in 2023) of the total shadow economy, but the component of undeclared employees: 27.4% (26.0% in 2023). Unreported workers in Estonia in 2024 were 30.2% (32.0% in 2023) of the total shadow economy, but undeclared income: 25.9% (22.7% in 2023). In Lithuania, on the other hand, undeclared income in 2023 amounted to 36.8% of the total shadow economy (34.5% in 2023), but the component of undeclared workers: 26.3% (30.0% in 2023).

# Summary and conclusions

According to the results of our study, envelope wages (average share of salaries in % which is paid by the employers, but concealed from the government) has decreased both in Latvia and Lithuania in 2024, compared to 2023. Namely, in Latvia, envelope wages decreased by 2.9 percentage points and reached 20.7%, but in Lithuania: by 2.7 percentage points, reaching 18.1%. In Estonia, however, envelope wages increased to 17.2% in 2024, which is 0.7 percentage points more compared to 2023.

Underreporting of business income (average share of revenue in % that companies conceal from the government), however, increased in all three Baltic countries in 2024, compared to 2023. The largest increase is observed in Estonia, where underreporting of business income increased from 9.5% to 12.1% (+2.6 percentage points)- yet, Estonia still has the lowest level of business income underreporting among the Baltic countries. This underreporting it is the highest in Lithuania: 20.5% in 2024, which is +0.9 percentage points more compared to 2023. In Latvia, underreporting of business income increased by 0.6 percentage points in 2024 and reached 15.2%.

# Summary and conclusions

According to the latest data from the Shadow Economy Index, in 2024, compared to 2023, a decrease in underreporting of the number of employees (average share of the employees in % working without a contract) was observed in all three Baltic countries. Namely, in Latvia, underreporting of employees reached 10.9% in 2024 (-0.8 percentage points, compared to 2023), in Lithuania: 11.7% (-3.7 percentage points), and in Estonia: 10.6% (-0.1 percentage points).

Given the relatively high proportion of envelope wages in the shadow economy in all three Baltic countries, we asked business leaders "What is the approximate probability (0-100%) of being "caught" by a typical company in your industry if the company pays envelope wages?" According to the results, the largest proportion of entrepreneurs believe that there is a "76-100%" probability of being caught: this was the response of 42.1% of Lithuanian entrepreneurs surveyed, as well as 28.7% of Estonian entrepreneurs surveyed and 33.1% of Latvian entrepreneurs surveyed. Accordingly, 9.2% of Lithuanian, 11.3% of Estonian and 8.7% of Latvian entrepreneurs answered that the probability of being caught is within the range of "51-75%", while 21.4% of Lithuanian, 27.3% of Estonian and 22.4% of Latvian entrepreneurs answered that the probability of being caught is within the range of "31-50%. 4.1% of Lithuanian, 2.5% of Estonian and 7.2% of Latvian entrepreneurs believe that the probability of being caught paying envelope wages is "0%", i.e. companies cannot be caught.

# Summary and conclusions

We also asked respondents the question "If a company in your industry was caught for deliberate misreporting, what would typically be the consequence to that company?". 5.1% of respondents in Latvia, 6.0% in Lithuania and 9.4% in Estonia answered "nothing serious". 35.2% of respondents in Latvia, 40.0% in Lithuania and 30.2% in Estonia answered this question with "a serious fine that would affect the company's competitiveness". In turn, 20.4% of Latvian, 12.4% in Lithuania and 17.6% in Estonia answered "the company would be forced to cease operations".

In addition to measuring the involvement of registered businesses in the shadow economy, we also calculate the proportion of unregistered entrepreneurship in the Baltic States. According to our estimates, the amount of goods or services provided by unregistered entrepreneurs in Latvia, Lithuania and Estonia in 2024 (in 2023) was, respectively, 10.1% (8.8%), 9.4% (8.4%) and 8.6% (6.5%%).

According to our results, an average percentage of revenue paid as 'bribes' (% of payments 'to get things done) in Latvia decreased from 10.0% in 2023 to 9.3% in 2024, or by 0.7 percentage points. In turn, an increase in the bribery was observed in Estonia (by 0.8 percentage points), and in Lithuania (by 2.4 percentage points): reaching, respectively, 7.0% and 10.5%.

# Summary and conclusions

Our research results also show that in all Baltic States, in 2024, compared to 2023, the average % of the contract value paid to secure contracts with the government has increased. A particularly pronounced increase is observed in Estonia, where the average % of the contract amount to secure government procurement has increased from 3.3% in 2023 to 7.4% in 2024 (by 4.1 percentage points, or more than twice). In Latvia, this component has increased by 0.3 percentage points, reaching 7.8% in 2024, but in Lithuania: by 2.0 percentage points, to 9.9%.

The highest level of shadow economy in Latvia in 2024 is observed in Kurzeme (24.2%), followed by Latgale (22.7%), Vidzeme (22.2%), Riga region (21.2%), and Zemgale (18.0%). The highest level of the shadow economy in Latvia is still observed in the construction sector: 33.8% (-0.4 percentage points, compared to 2023). The volume of the shadow economy in Latvia in 2024 reached 26.2% in retail (27.0% in 2023), in the service sector: 23.6% (26.4%% in 2023), in manufacturing: 17.3% (18.9% in 2023), and in wholesale: 13.0% (13.0% in 2023).

# Summary and conclusions

When it comes to attitudes, companies in the Baltic States are still relative satisfied with the activities of the State Revenue Service (SRS), which, according to the latest data, is rated slightly higher in Lithuania. Namely, on a scale from 1-5, where 5 means very high satisfaction, in 2024, satisfaction with the SRS in Latvia increased to 3.60 (3.47 in 2023), and the same rating was also obtained in Estonia - which is a decrease from 3.76 in 2023. In Lithuania, in 2024, entrepreneurs' satisfaction with the SRS was rated at 3.72 (3.75 in 2023). The results of the study show that in 2024, compared to 2023, entrepreneurs' satisfaction with the tax policy has improved in Latvia and Lithuania: from 2.60 in 2023 to 2.65 in 2024 in Latvia; from 2.84 to 3.09 in Lithuania. In turn, Estonia has the lowest satisfaction with tax policy among the Baltic countries, decreasing from 2.58 in 2023 to 2.12 in 2024.

In 2024, compared to 2023, Estonian entrepreneurs' satisfaction with the quality of business legislation also decreased: from 3.20 to 2.93. According to the latest research results, entrepreneurs' satisfaction with the quality of business legislation has increased slightly in Latvia: from 3.04 in 2023, to 3.06 in 2024; in Lithuania: from 2.95 to 3.00. In turn, satisfaction with government support for entrepreneurs in Latvia, in 2024, compared to 2023, has decreased to 2.52 (2.57 in 2023), in Estonia: to 2.32 (2.43 in 2023), but in Lithuania it has increased slightly: rating 2.79 (2.77 in 2023).

# Summary and conclusions

Since 2016, we have also been measuring the "tax morale" of entrepreneurs in the Baltic States, asking entrepreneurs whether "companies in your industries would think it is always justified to cheat on tax if they have the chance". The research data shows that in 2024, tax morale is higher in Latvia, where, on a scale from 1-5, where 1 means that you completely disagree with the above statement, and 5 means that you completely agree with it, the average rating in 2024 was 1.7. In Estonia, this rating was 1.9, and in Lithuania: 2.0.

We use regression analysis to identify the statistically significant determinants of firms' involvement in the shadow economy. For the regressions, we use pooled data from the past 13 survey rounds (years), which gives a panel that spans the years 2010-2024 and has a cross-section of approximately 1,500 firms per year. The dependent variable in all regressions is the level of the firm's involvement in the shadow economy. The independent variables are various firm-level characteristics, attitudes, sector dummy variables, region and year fixed effects.

# Summary and conclusions

The regression coefficients indicate that the effect of perceived detection probabilities and penalties on the tendency for firms to engage in deliberate misreporting is consistent with the predictions of rational choice models, i.e., the higher the perceived probability of detection and the larger the penalties, the lower the amount of tax evasion and misreporting. The effect of detection probability in particular stands out as being a particularly strong deterrent of shadow activity. This evidence suggests a possible policy tool for reducing the size of the shadow economies, namely increasing the probability of detection of misreporting. This could be done via an increased number of tax audits, whistle-blower schemes that provide incentives to report information to authorities about non-compliant companies, and investment in tax evasion detection technology.

The regression results show that tolerance towards tax evasion is positively associated with the firm's stated level of income/wage underreporting, i.e., entrepreneurs that view tax evasion as a tolerated behaviour tend to engage in more informal activity. The measures of tolerance also serve an important role as control variables for possible understating of the extent of shadow activity due to the sensitivity of the topic.

# Summary and conclusions

The regression results also indicate that a firm's satisfaction with the tax system and the government is negatively associated with the firm's involvement in the shadow economy, i.e., dissatisfied firms engage in more shadow activity, satisfied firms engage in less. Analysing each of the four measures of satisfaction separately we find that shadow activity is most strongly related to dissatisfaction with business legislation and the State Revenue Service, followed by the government's tax policy and support for entrepreneurs.

Another strong (and statistically significant) determinant of involvement in the shadow economy is firm size, with smaller firms (e.g., those with fewer employees) engaging in more shadow activity than larger firms, although the descriptive statistics suggest the relation may be non-monotonic. The statistically significant coefficient on firm age suggests that younger firms engage in more shadow activity than older firms. A possible explanation for these two relations is that small, young firms use tax evasion as a means of being competitive against larger and more established competitors. The sector dummy variables suggest that firms in the construction sector tend to engage in more shadow activity than firms in other sectors.

# Methods used in constructing the Index

## Survey of entrepreneurs

The SSE Riga Shadow Economy Index is based on an annual survey of company owners/managers in Estonia, Latvia, and Lithuania, following the method of Putniņš and Sauka (2015). The surveys are conducted between February and April of each year and contain questions about shadow activity during the previous two years. For example, the survey conducted in January–March 2025 collects information about shadow activity during 2024 and 2023. The overlap of one year in consecutive survey rounds, e.g., collecting information about 2023 shadow activity in both the 2024 and 2025 survey rounds, is used to validate the consistency of responses.

We use random stratified sampling to construct samples that are representative of the population of firms in each country. Starting with all active firms in each of the three Baltic countries (obtained from the *Orbis* database maintained by *Bureau Van Dijk*), for each country we form size quintiles (using book value of assets) and take equal sized random samples from each size quintile. In total a minimum of 500 phone interviews are conducted in each of the three Baltic countries in each survey round. More specifically, in 2025 survey we interviewed 502 respondents in Lithuania, 500 respondents in Estonia and 506 respondents in Latvia. 2025 survey was implemented in cooperation with Norstat Latvija.

# Methods used in constructing the Index

## Calculation of the Index

The Index measures the size of the shadow economy as a percentage of GDP. There are three common methods of measuring GDP: the output, expenditure, and income approaches. Our Index is based on the income approach, which calculates GDP as the sum of gross remuneration of employees (gross personal income) and gross operating income of firms (gross corporate income). Computation of the Index proceeds in three steps:

(i) estimate the degree of underreporting of employee remuneration and underreporting of firms' operating income using the survey responses;

(ii) estimate each firm's shadow production as a weighted average of its underreported employee remuneration and underreported operating income, with the weights reflecting the proportions of employee remuneration and firms' operating income in the composition of GDP;

(iii) calculate a production-weighted average of shadow production across firms.

# Methods used in constructing the Index

In the first step, underreporting of firm *i*'s operating income $UR_i^{Operating\ Income}$, is estimated directly from the corresponding survey question. Underreporting of employee remuneration, however, consists of two components: (i) underreporting of salaries, or 'envelope wages' (question 11); and (ii) unreported employees. Combining the two components, firm *i*'s total unreported proportion of employee remuneration is:

$$UR_i^{EmployeeRemuneration} = 1-(1- UR_i^{Salaries})(1- UR_i^{Employees})$$

In the second step, for each firm we construct a weighted average of underreported personal and underreported corporate income, producing an estimate of the unreported (shadow) proportion of the firm's production (income):

$$ShadowProportion_i = \alpha_c UR_i^{EmployeeRemuneration} + (1- \alpha_c) UR_i^{OperatingIncome}$$

where $\alpha_c$ is the ratio of employees' remuneration (*Eurostat* item D.1) to the sum of employees' remuneration and gross operating income of firms (*Eurostat* items B.2g and B.3g). We calculate $\alpha_c$ for each country, *c*, in each year using data from *Eurostat*. Taking a weighted average of the underreporting measures rather than a simple average is important to allow the Shadow Economy Index to be interpreted as a proportion of GDP.

# Methods used in constructing the Index

In the third step we take a weighted average of underreported production, $ShadowProportion_i$, across firms in country $c$ to arrive at the Shadow Economy Index for that country:

$$INDEX_C^{Shadow\ Economy} = \sum_{i=1}^{N_c} w_i\, ShadowProportion_i$$

The weights, $w_i$, are the relative contribution of each firm to the country's GDP, which we approximate by the relative amount of wages paid by the firm. Similar to the second step, the weighting in this final average is important to allow the Shadow Economy Index to reflect a proportion of GDP.

As a final step, we follow the methodology of the *World Economic Forum* in their *Global Competitiveness Report*, and apply a weighted moving average of $INDEX_C^{Shadow\ Economy}$ calculated from the most recent two survey rounds. There are several reasons for doing this, including: (i) it increases the amount of available information and hence precision of the Index by providing a larger sample size; and (ii) it makes the results less sensitive to the specific point in time when the survey is administered.

# Methods used in constructing the Index

The weighting scheme comprises two overlapping elements:

(i) more weight is given to the more recent survey round as that contains more recent information (past information is "discounted");

(ii) more weight is placed on larger sample sizes as they contain more information.

Following the approach of the *World Economic Forum*, for years in which there are no previous surveys (the 2009 and 2010 results, which are based on the first survey round conducted in 2011) the Index is simply based on the one survey round. Consequently, the first two annual Index estimates (2009 and 2010) are more prone to sampling error than subsequent annual estimates, which benefit from larger samples via the moving average. To allow comparisons across countries we apply consistent methodology in calculating the Shadow Economy Index for each of the Baltic countries.

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