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# Shadow Economy Index for the Baltic Countries 2009–2017

# Authors of the study



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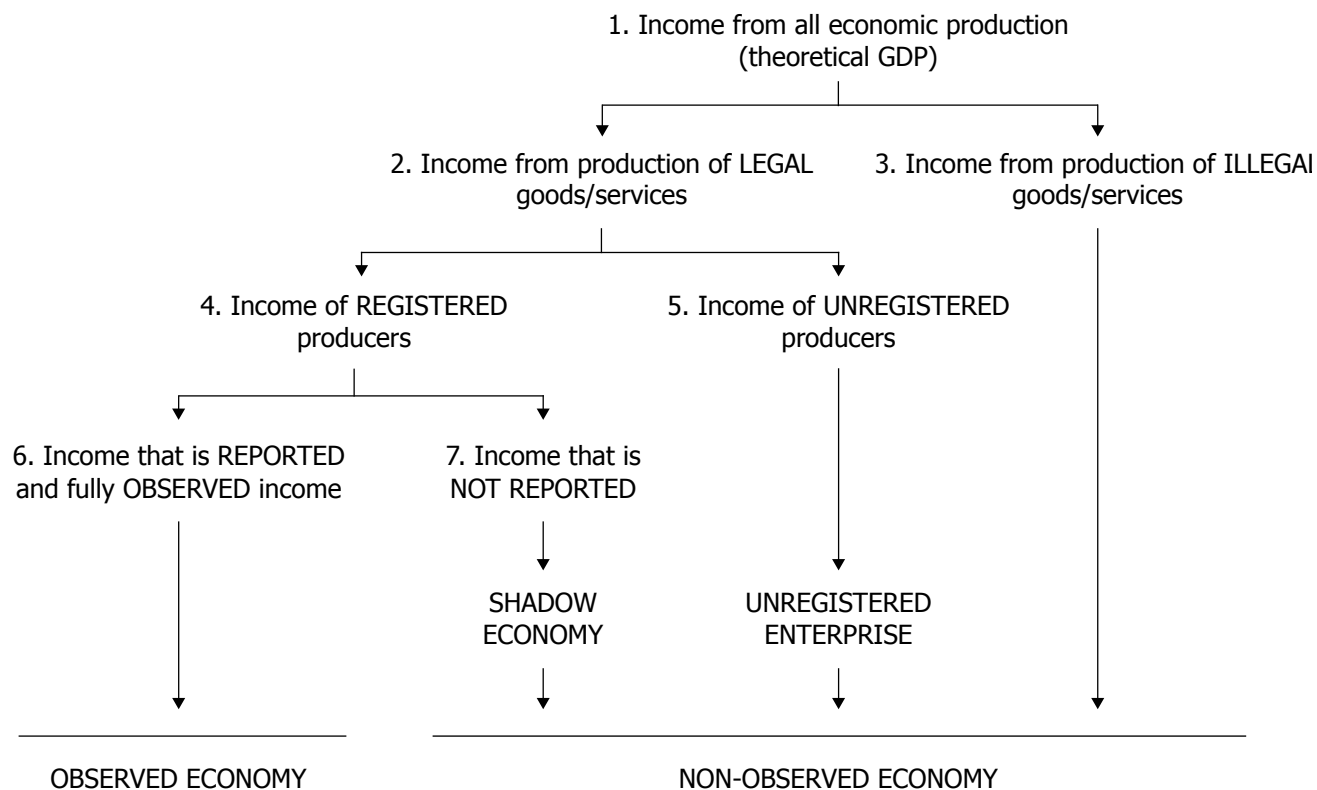
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Since 2009:

- 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



## Results from the previous years. Shadow economy index (% of GDP), 2015–2016

	2015	2016	Changes
Moldova	29,8 (27,0 32,6)	29,7 (26,9 32,5)	-0,1 (-0,6 0,3)
Romania	35,6 (32,2 39,0)	33,3 (30,4 36,3)	-2,3 (-3,4 -1,7)
Latvia	21,3 (19,0 23,7)	20,7 (18,0 22,6)	-0,6 (-3,4 1,3)
Estonia	14,9 (12,4 17,4)	15,4 (13,1 17,8)	+0,5 (-1,9 2,9)
Lithuania	15,0 (13,8 16,3)	16,5 (14,8 18,3)	+1,5 (-0,1 3,0)
Poland	24,5 (n/a)	25,0 (n/a)	+0,5 (n/a)

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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 2018 about 2017 and 2016
- Approximately 500 telephone interviews in Latvia, 500 in Lithuania, 500 in Estonia every year
- Random sampling, Orbis database
- Interviews performed by SKDS
- 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



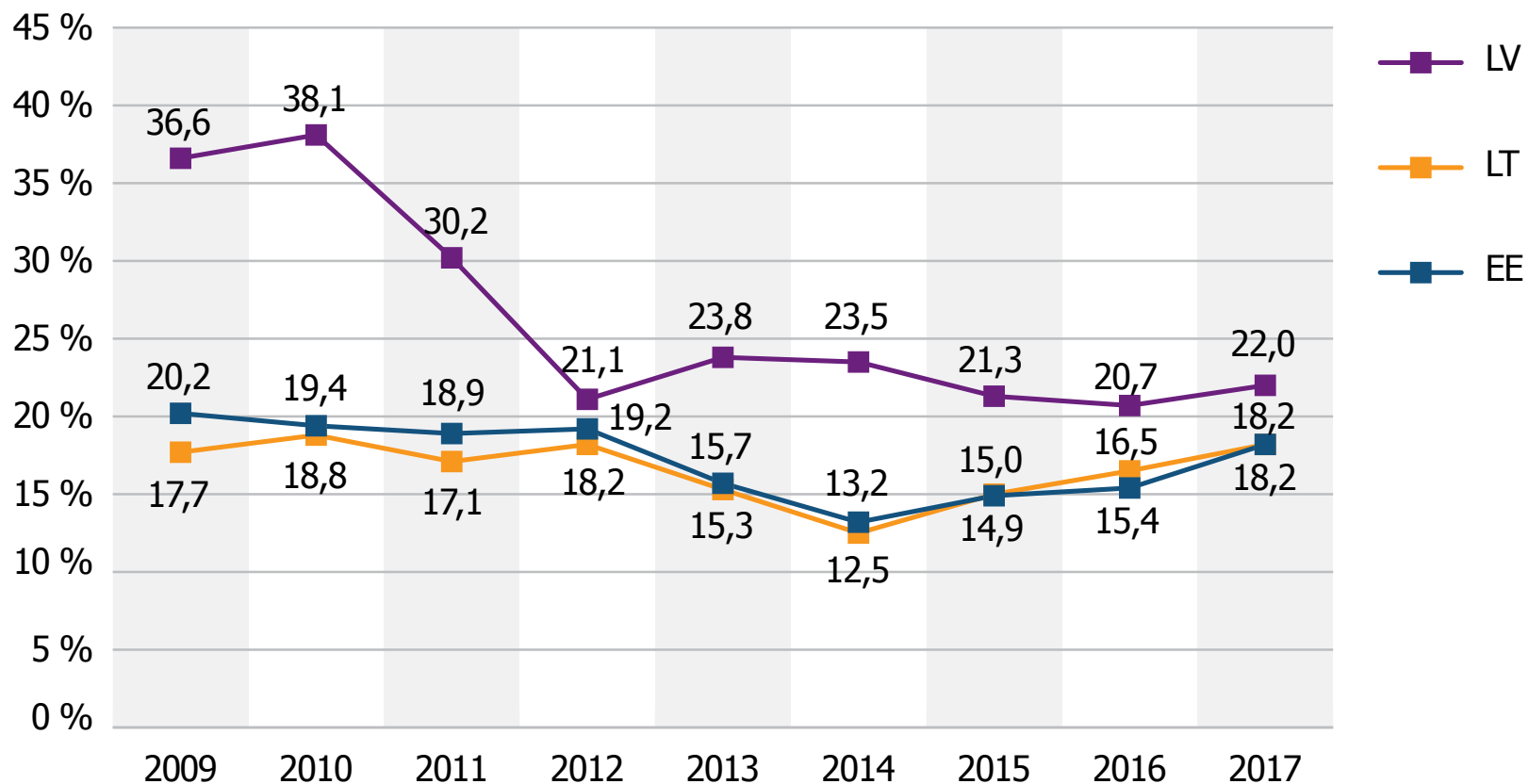
# **Size of the shadow economy in Latvia, Lithuania, and Estonia 2009–2017 Results**

# Shadow Economy Index for the Baltic countries (% of GDP), 2009–2017

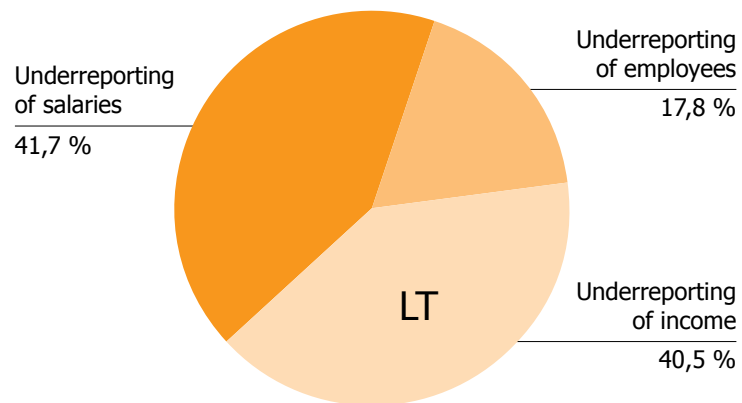
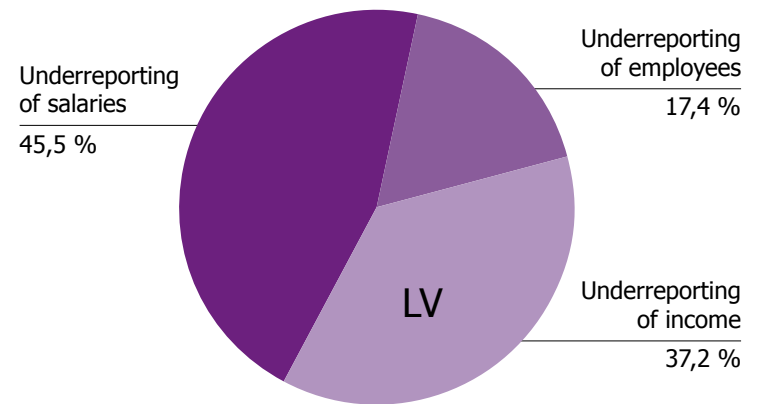
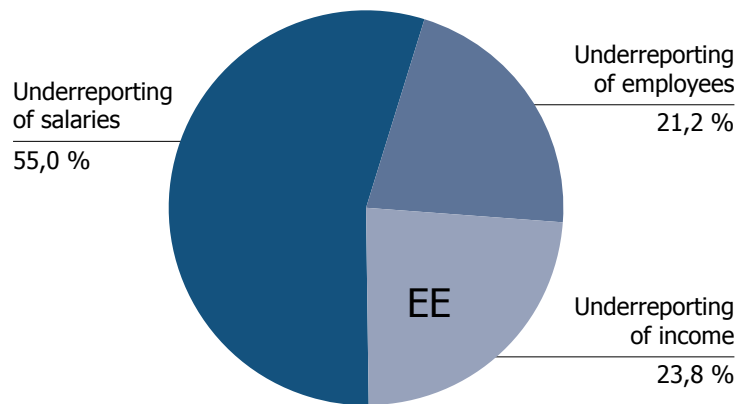
	2017–2016	2017	2016
Latvia	+1,3 (-1,0 3,8)	22,0 (19,6 24,5)	20,7 (18,0 22,6)
Lithuania	+1,7 (-0,2 3,7)	18,2 (16,1 20,4)	16,5 (14,8 18,3)
Estonia	+2,8 (0,6 5,0)	18,2 (16,1 20,3)	15,4 (13,1 17,8)

	2015	2014	2013	2012	2011	2010	2009
Latvia	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)
Lithuania	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)
Estonia	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)

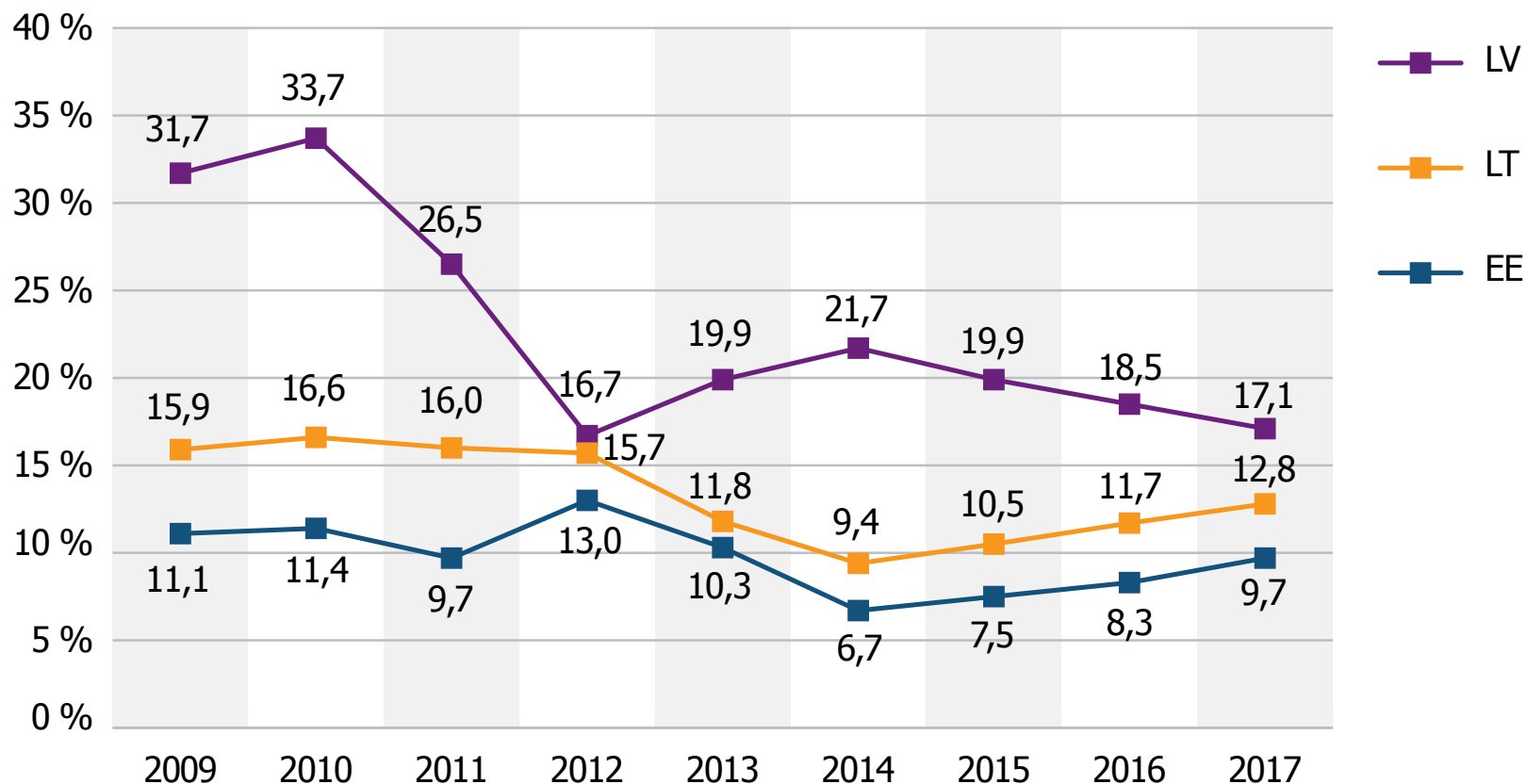
# Dynamics of the shadow economy in the Baltic countries, 2009–2017



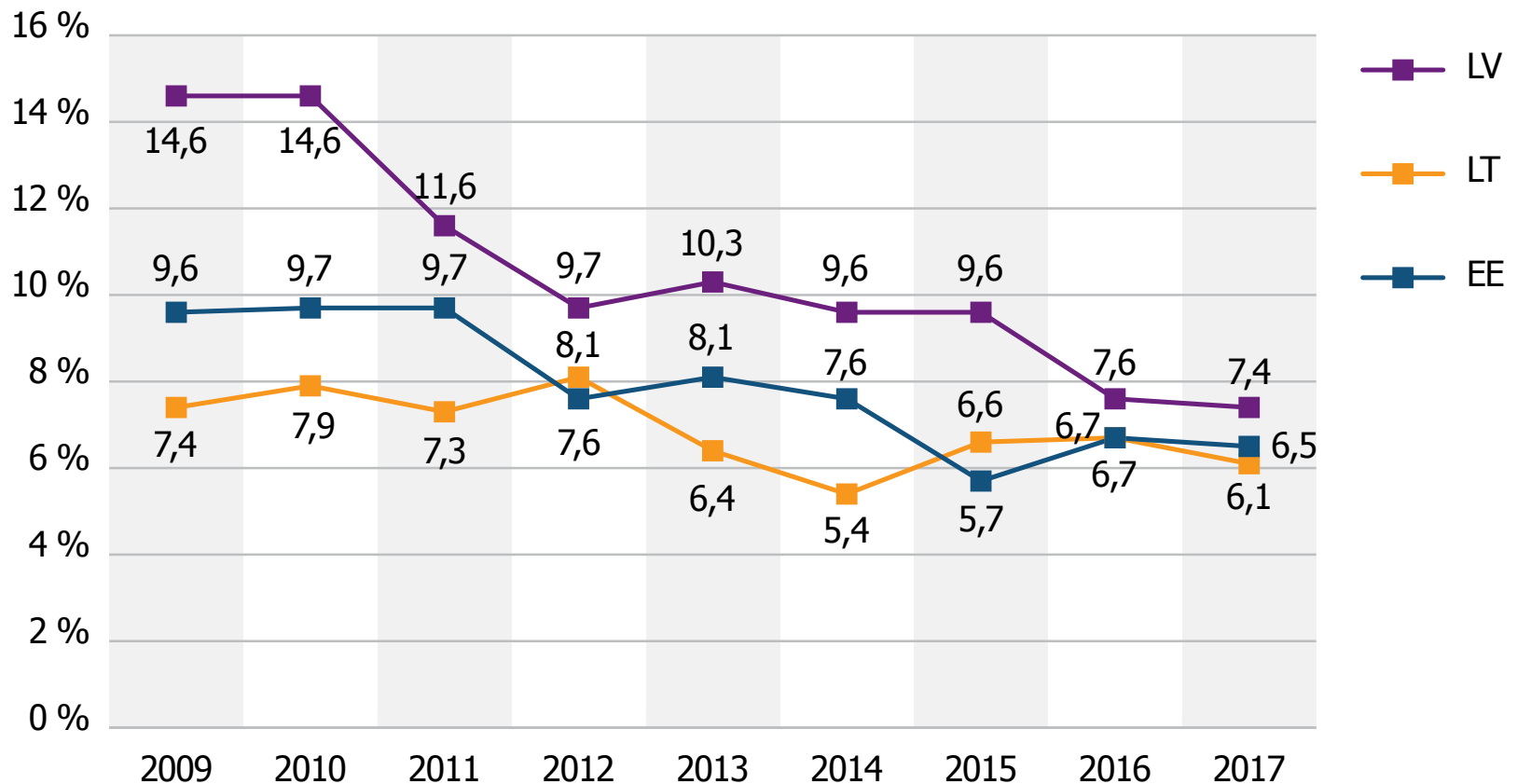
# Components of the shadow economy in 2017



## Underreporting of business income 2009–2017 (average share of revenue in % that companies conceal from the government)

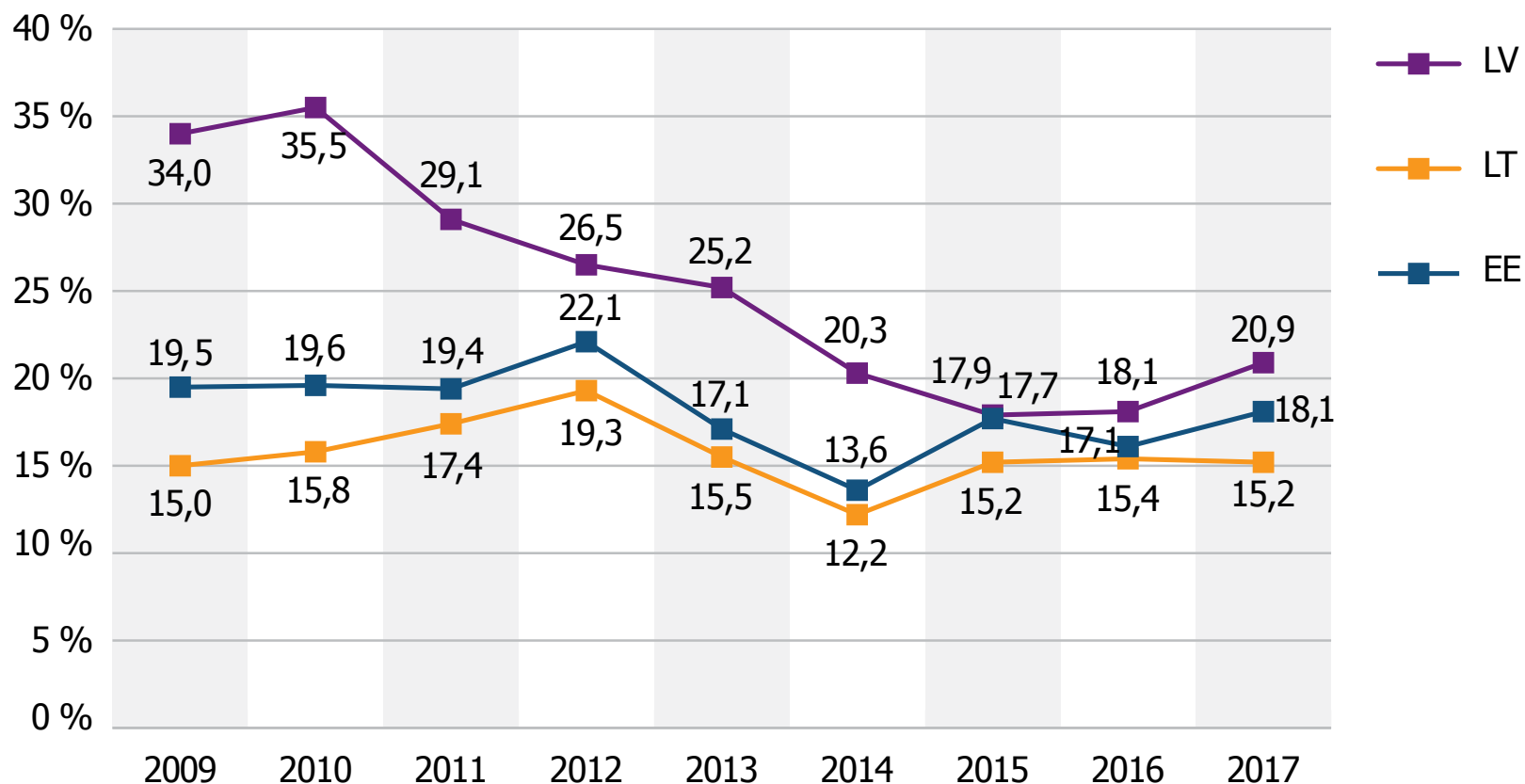


## Underreporting of the number of employees, 2009–2017 (average share of the employees in % working without a contract)

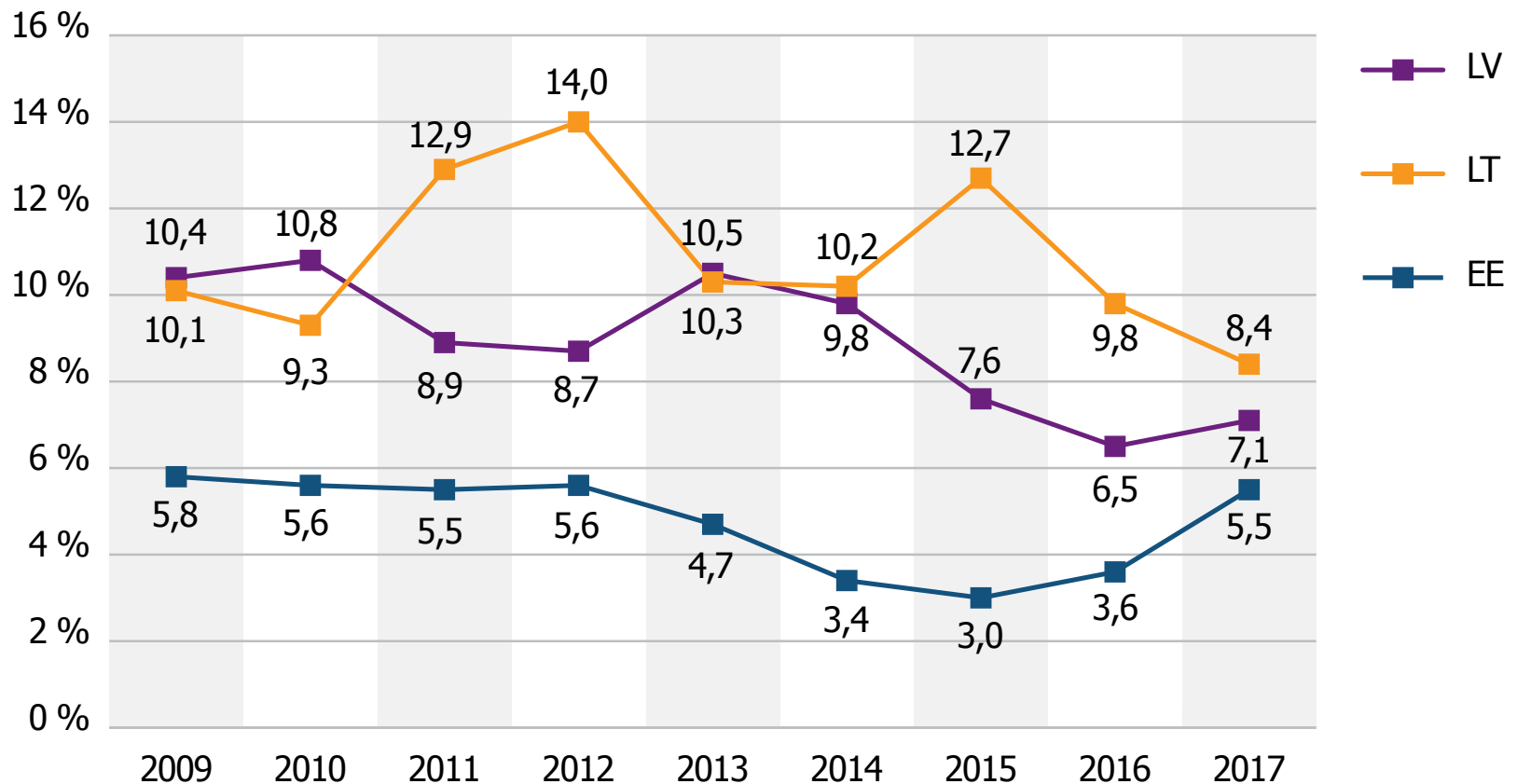


## Envelope wages, 2009–2017

(average share of salaries in % which is paid by the employers, but concealed from the government)

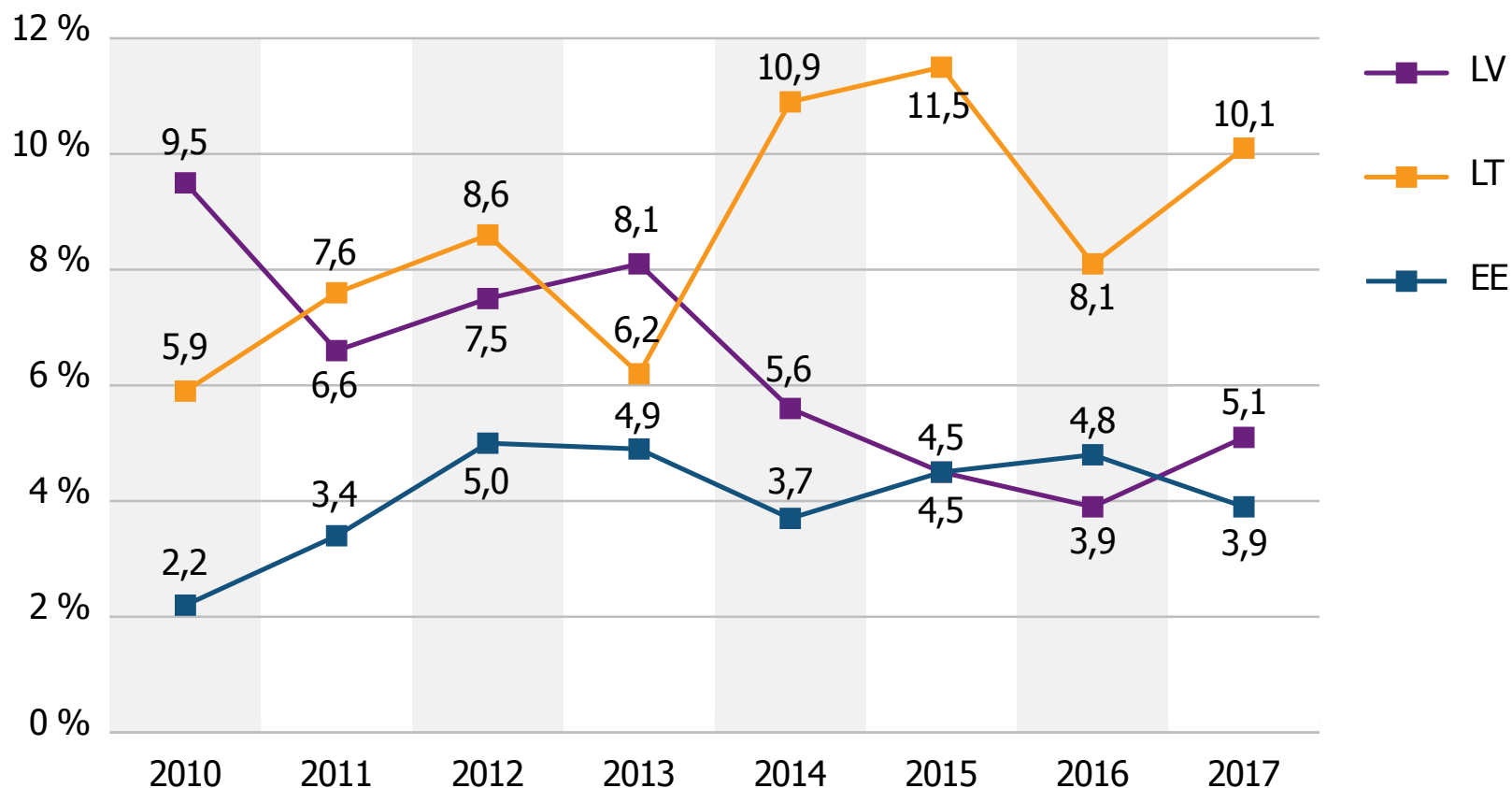


# **% of payments 'to get things done', 2009–2017 (average percentage of revenue paid as 'bribes')**





## % of the contract value paid to secure contracts with the government, 2010–2017

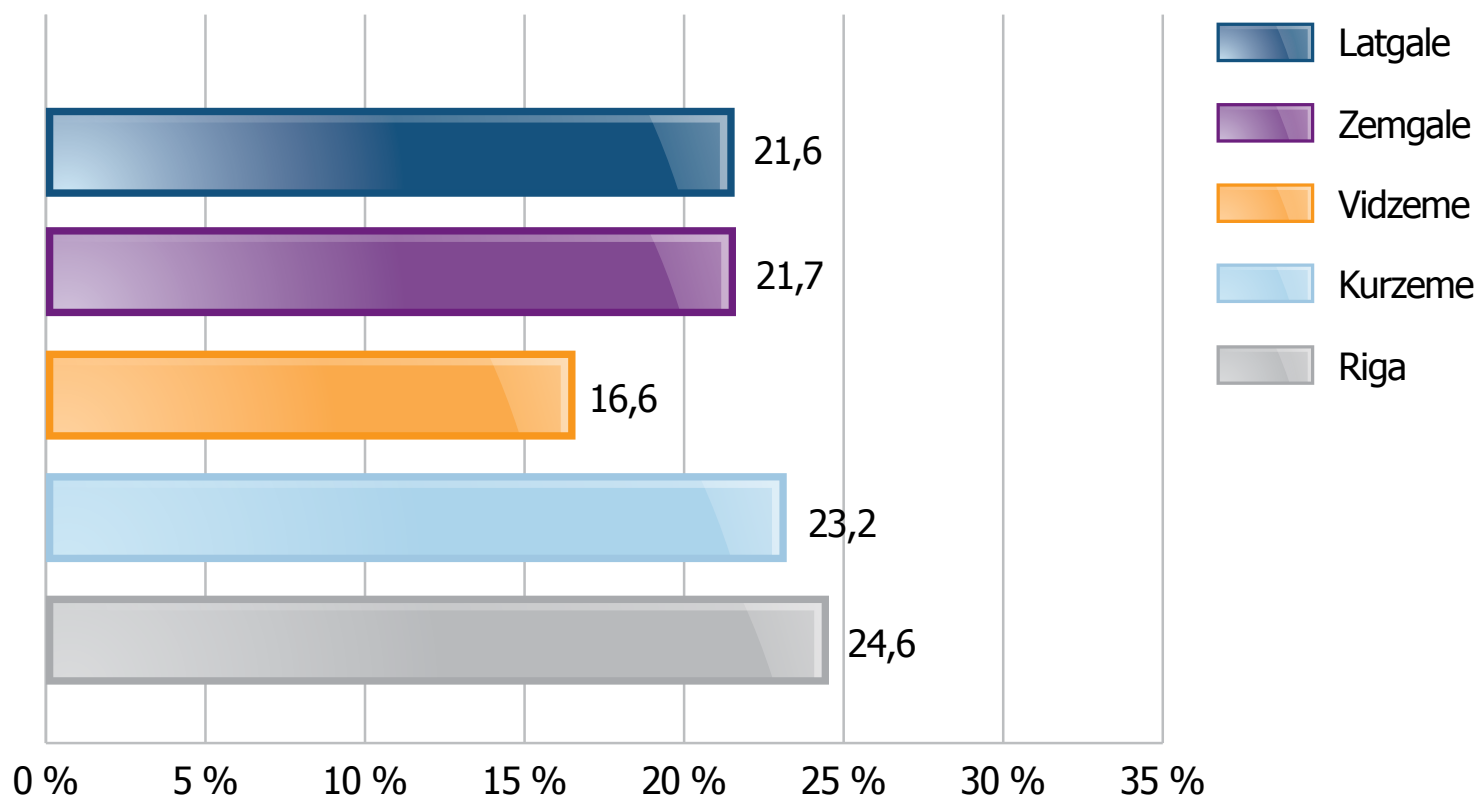


## Proportion of unregistered enterprises in the Baltic countries (% of GDP), 2013–2017

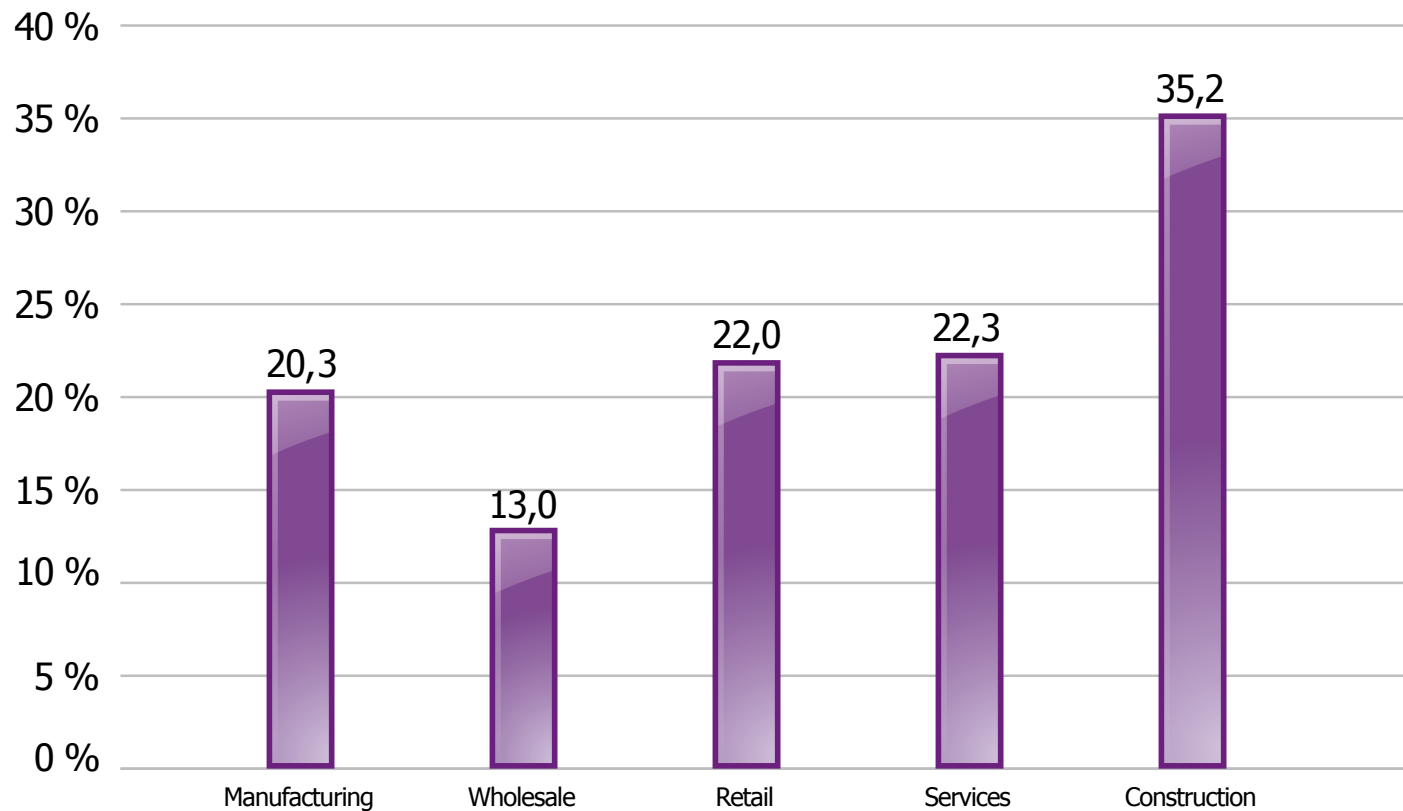
	Latvia	Lithuania	Estonia
2017	6,5 (5,3, 7,8)	8,6 (7,5, 9,8)	7,0 (5,7, 8,5)
2016	5,3 (4,1, 6,5)	8,4 (7,5, 9,4)	6,1 (5,1, 7,1)
2015	5,2 (4,1, 6,3)	7,3 (6,5, 8,1)	5,8 (4,5, 7,1)
2014	5,6 (4,5, 6,7)	5,2 (4,5, 6,0)	6,3 (4,5, 8,2)
2013	5,4 (4,2, 6,6)	6,2 (5,3, 7,1)	7,6 (5,4, 9,9)

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

## Size of the shadow economy (% of GDP) by region in Latvia (average, 2015–2017)



## Size of the shadow economy (% of GDP) by sector in Latvia (average, 2015–2017)



There are no significant differences in the proportion of the shadow economy within smaller or bigger companies in Latvia:  
on average 21-24% regardless of the company size!

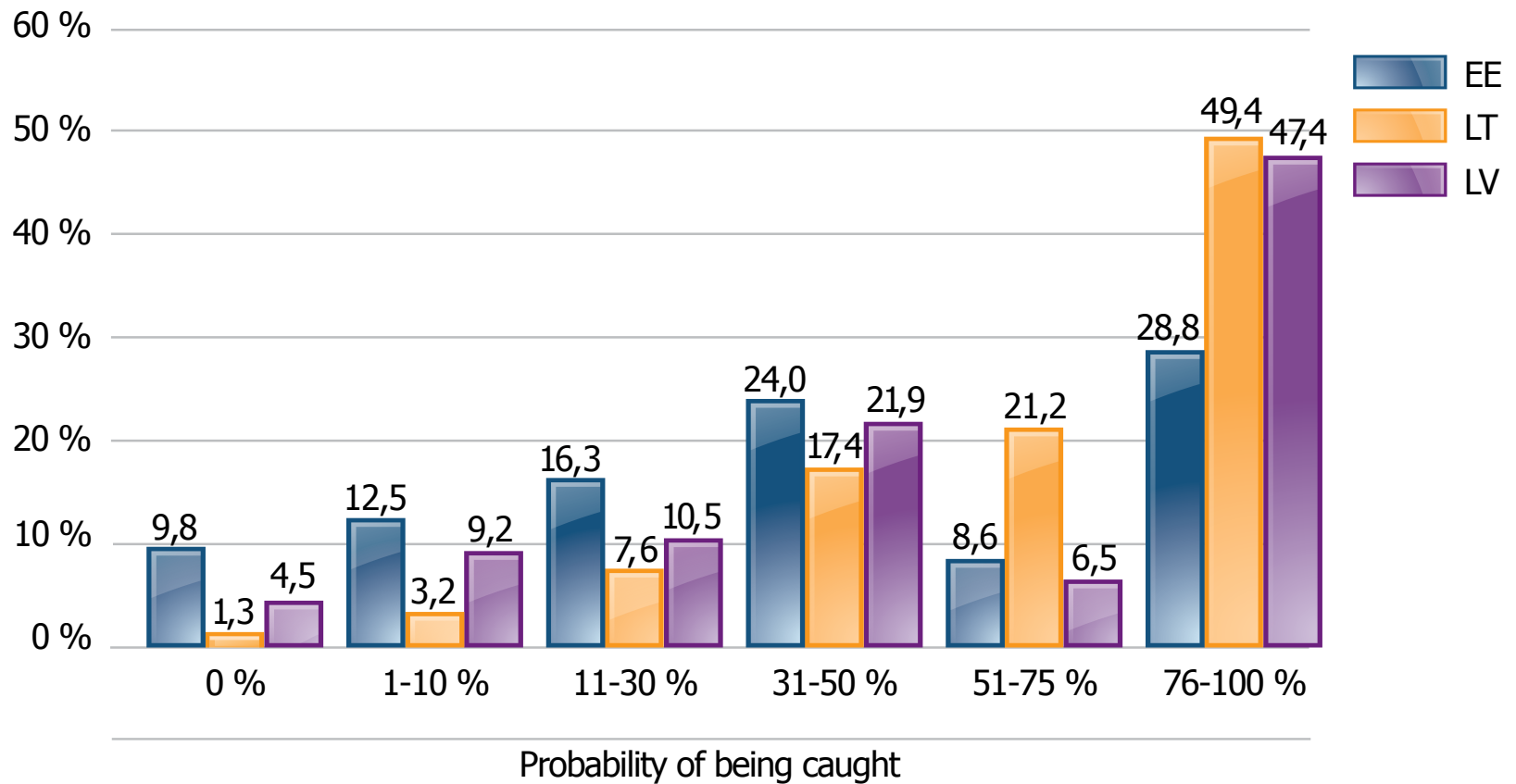
# **Main determinants of the shadow economy**

## Statistically significant determining factors (using regression analysis)

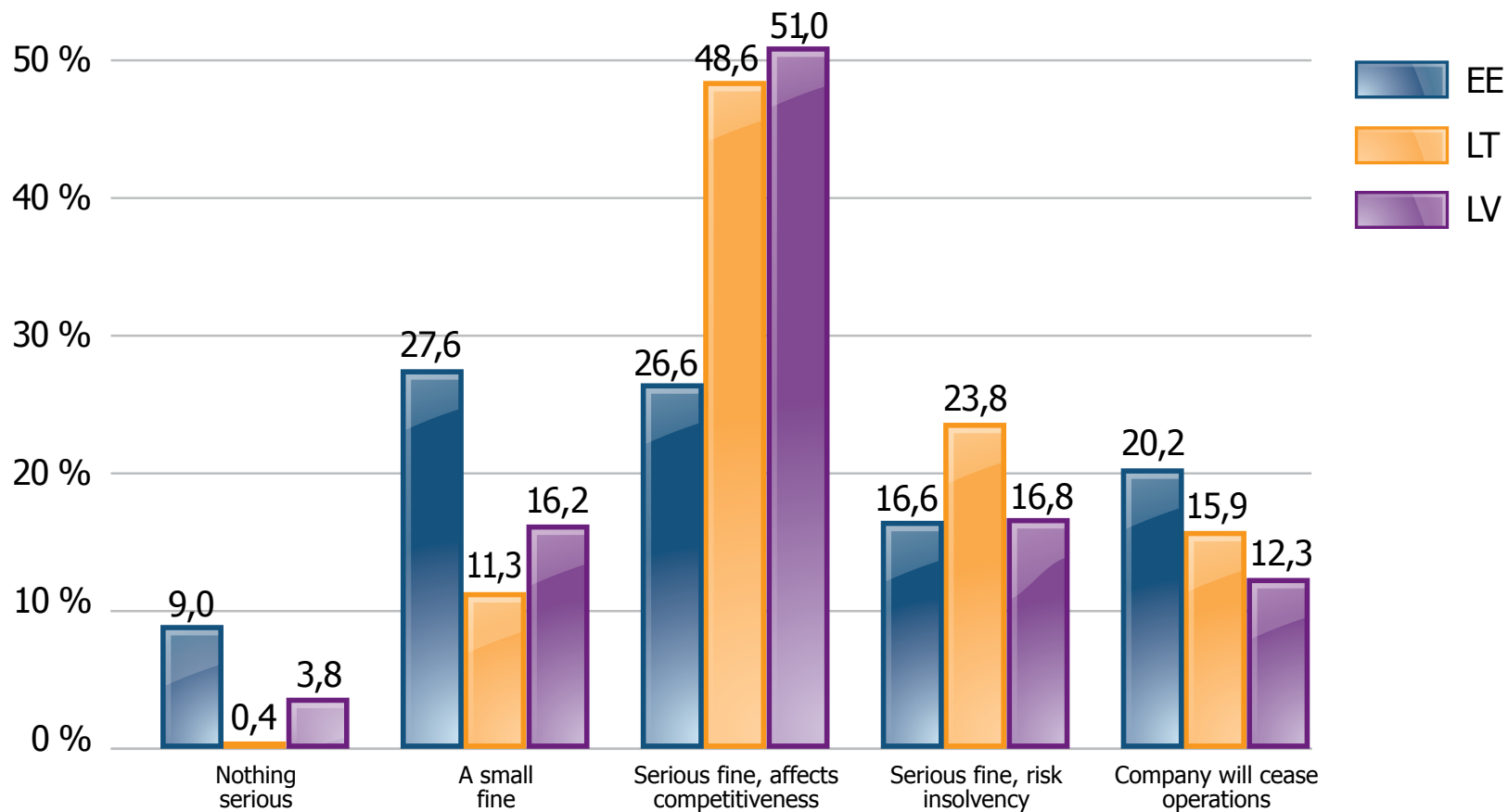
- Greater probability of being caught not paying taxes and more serious consequences → fewer entrepreneurs getting involved in shadow economy activities



# Probability of being caught for underreporting business profits, 2017



## Consequences if caught for deliberate misreporting, 2017

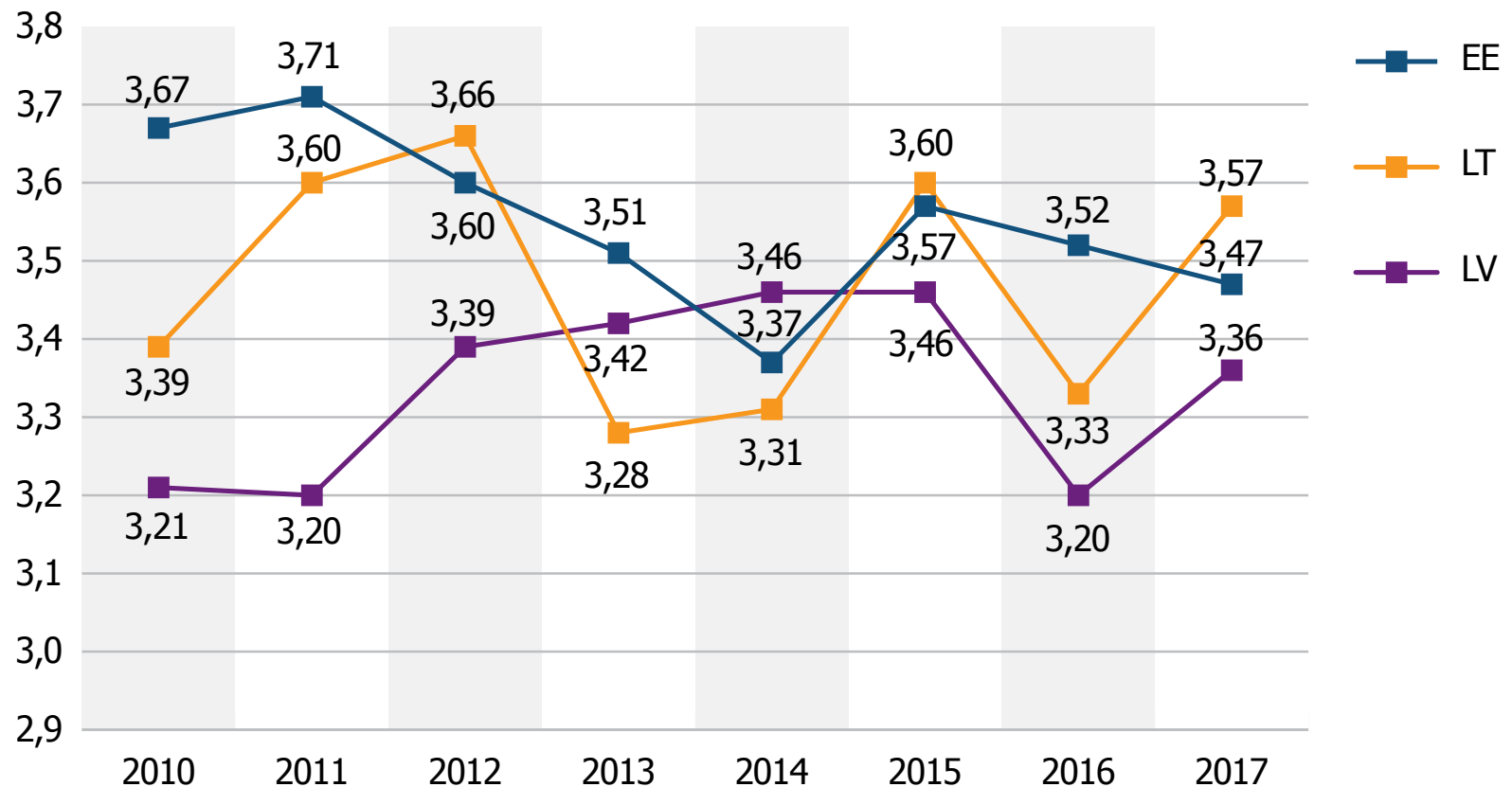


# Statistically significant determining factors (using regression analysis)

- 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)

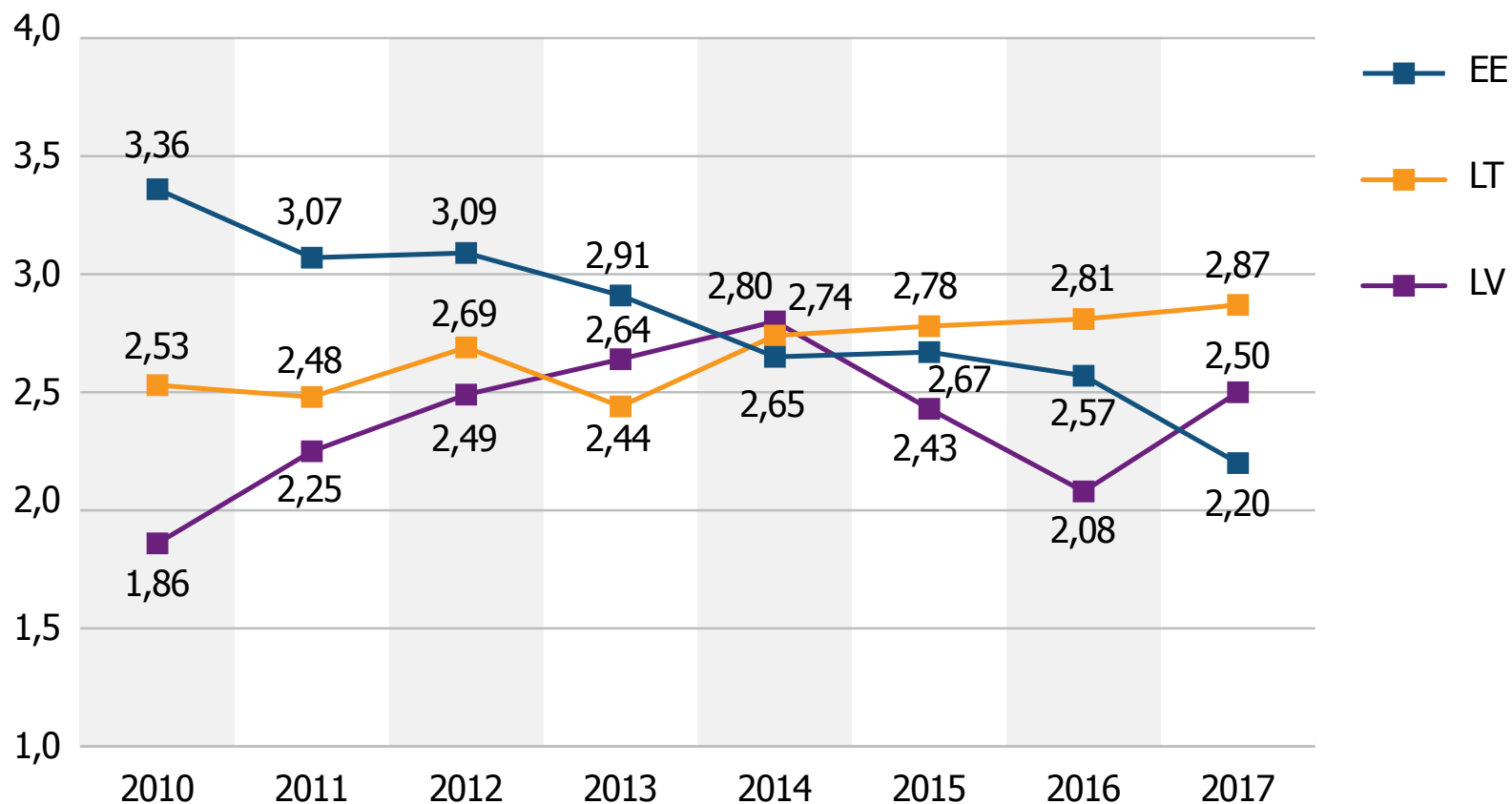
# Satisfaction with the performance of the State Revenue Service, 2010–2017

(Average, in scale from 1-5, where '1': very low satisfaction, but '5'- very high satisfaction)



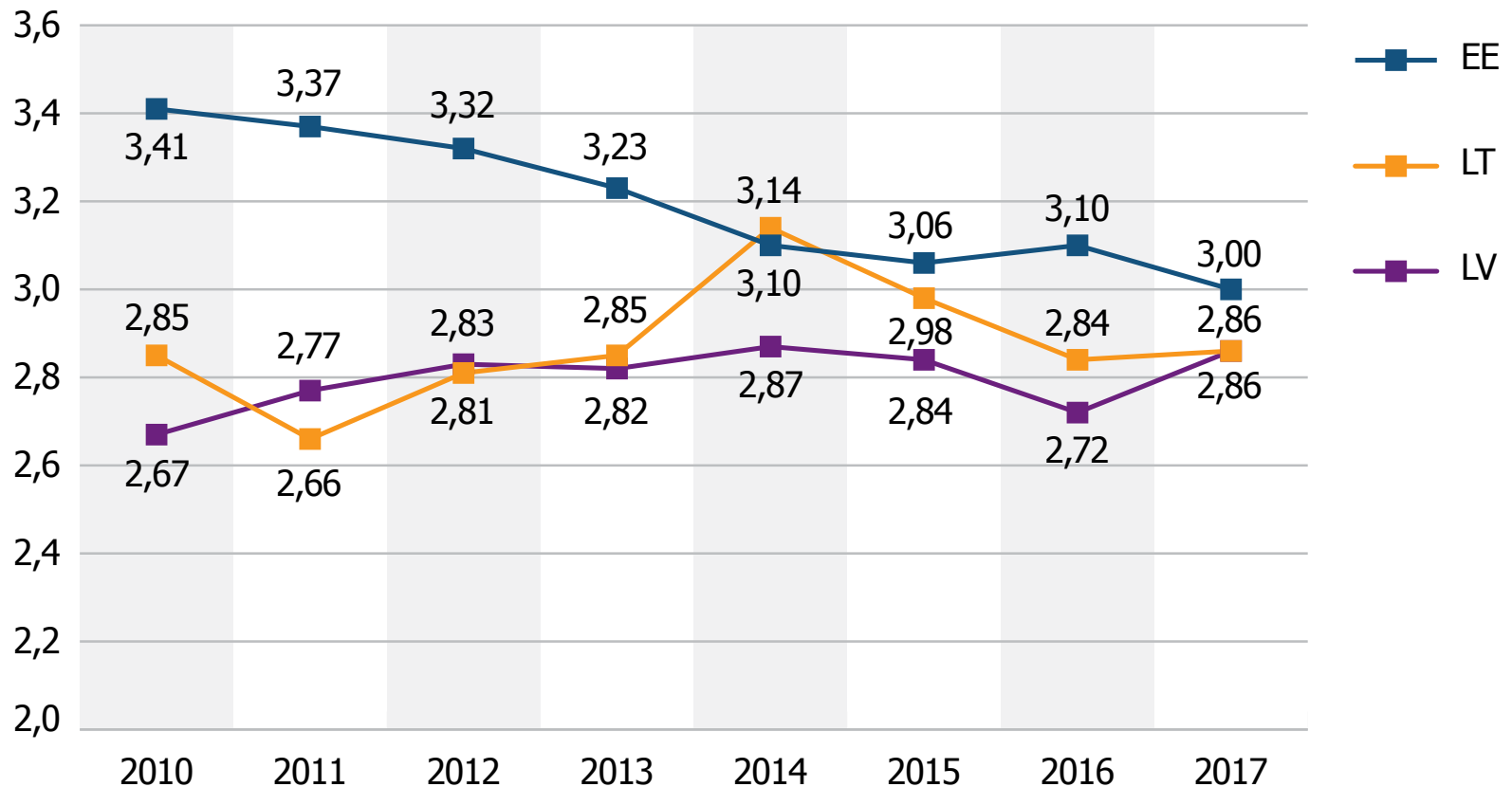
# Satisfaction with the tax policy, 2010–2017

(Average, in scale from 1-5, where '1': very low satisfaction, but '5'- very high satisfaction)



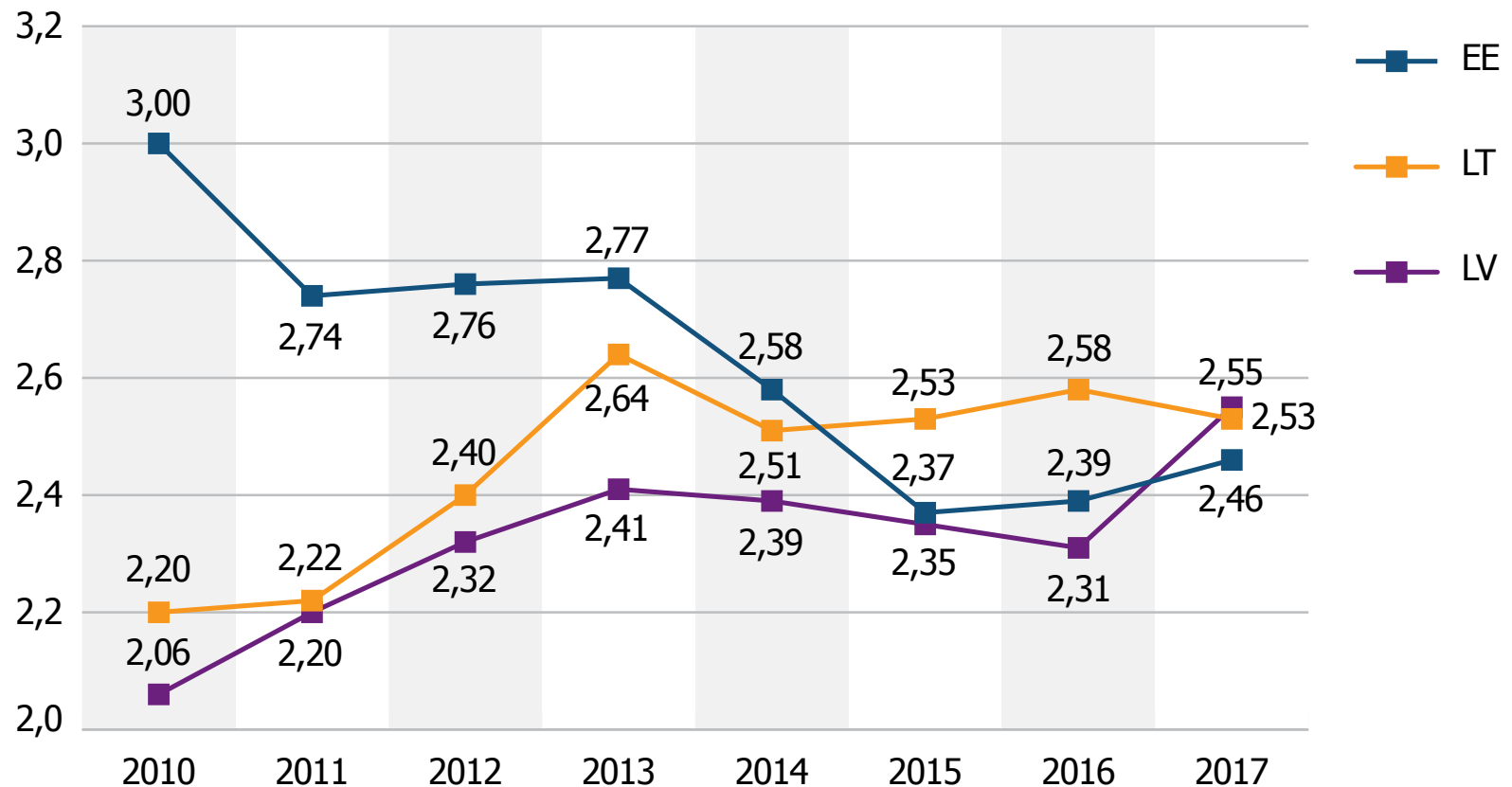
# Satisfaction with the quality of business legislation, 2010–2017

(Average, in scale from 1-5, where '1': very low satisfaction, but '5'- very high satisfaction)



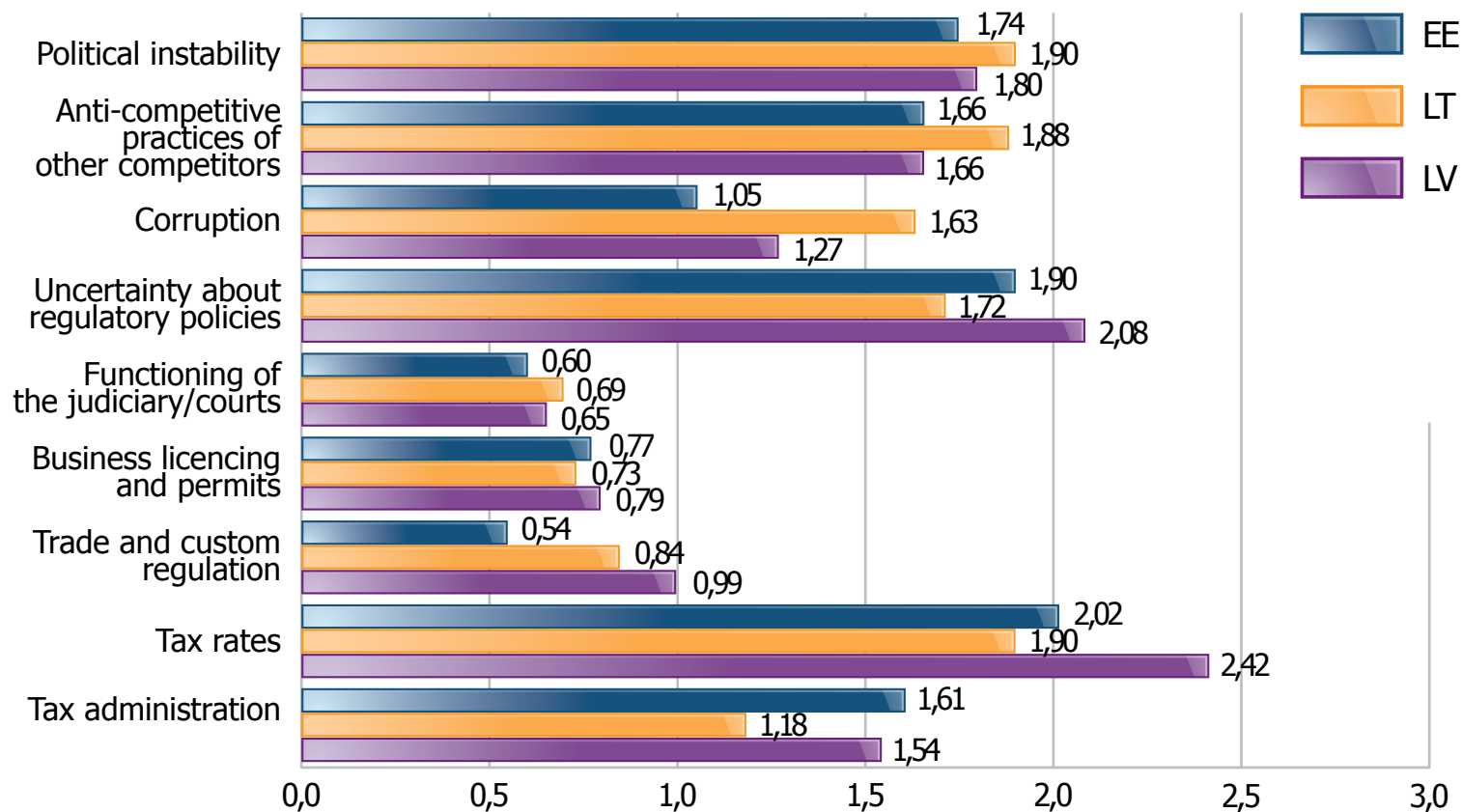
# Satisfaction with the government's support to entrepreneurs, 2010–2017

(Average, in scale from 1-5, where '1': very low satisfaction, but '5'- very high satisfaction)



# External environment: quality of formal and informal institutions, 2017

(Average, in scale 0- 4, where '0' means: it is not a problem for my business, but '4'- it is very big problem for my business)



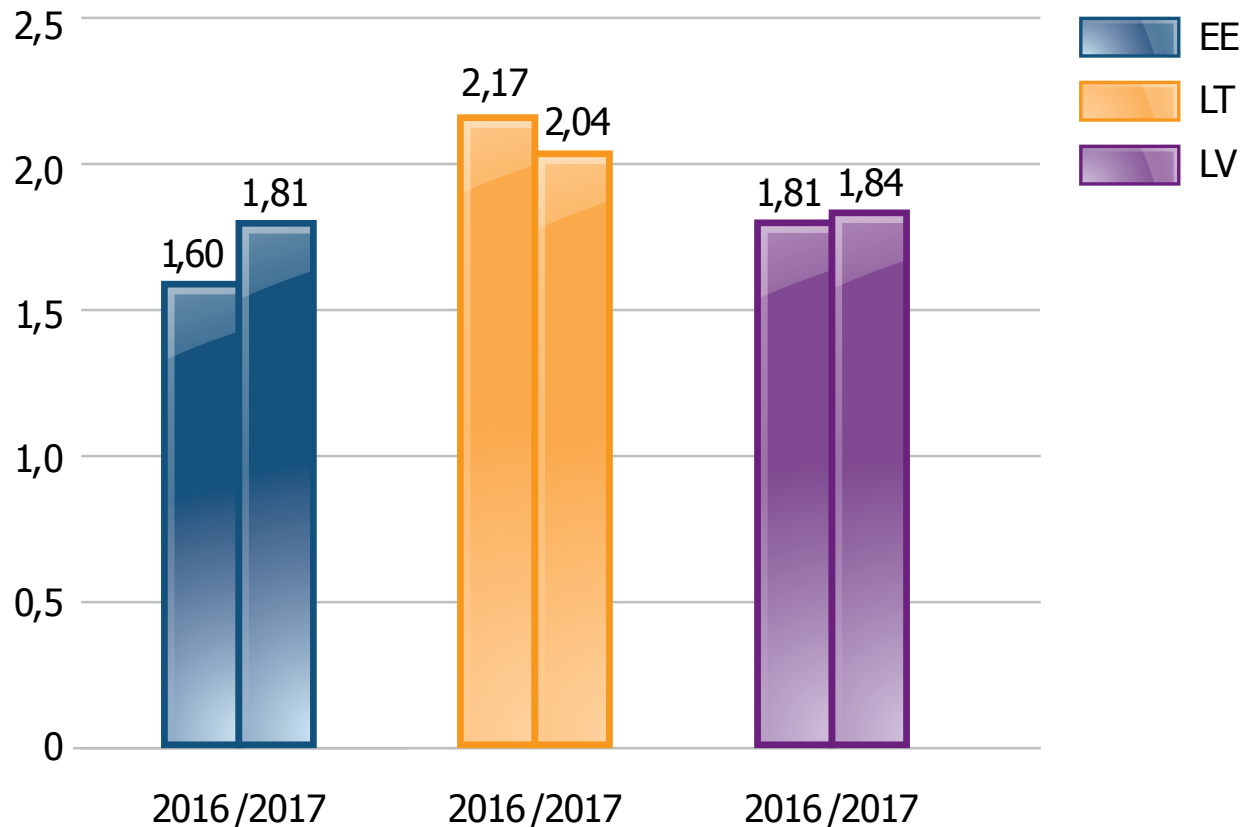


# Statistically significant determining factors (using regression analysis)

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

# Tax morale: cheating on tax, if there is a chance, can always be justified, 2017

(Average, in scale from 1-5, where '1': very low satisfaction, but '5'- very high satisfaction)



# Summary and conclusions

The SSE Riga Shadow Economy Index is estimated annually based on surveys of entrepreneurs in the Baltic countries using a number of surveying and data collection techniques shown to be effective in eliciting relatively 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 study focuses on the shadow economy estimates for the year 2017, as well as trends during the years 2009–2017.

Our first key finding is about the dynamic trends in the Baltic shadow economies. According to our estimates, the size of the shadow economies in all three Baltic countries increased in 2017. The largest increase was in Estonia (+2.8% of GDP), followed by Lithuania (+1.7% of GDP), and a more modest increase in Latvia (+1.3% of GDP). These changes decrease the differences between the three Baltic countries. Despite this, Latvia still has a larger shadow economy (22.0% of GDP) than Estonia and Lithuania (18.2% of GDP in each country). The changes in the shadow economies of Estonia and Lithuania continue a somewhat concerning trend, adding a third consecutive year of shadow economy growth in these countries from lows of 12.5% and 13.2% of GDP in 2014. For Latvia, the size of the shadow economy has remained fairly stable during the past six years, between 20.7% and 23.8% of GDP.

# Summary and conclusions

Underreporting of business income (which makes up around 37.2% of the total Latvian shadow economy in Latvia) still explains most of the difference in the size of the shadow economies across the three countries. The average share of business income that Latvian companies conceal from the government decreased to 17.1% in 2017 (as compared to 18.5% in 2016), but remains higher than in Estonia (9.7%) and Lithuania (12.8%). We suggest policy makers to pay attention to underreporting of business income in developing policy measures to combat the shadow economy, especially in Latvia.

Our findings suggest that in all three Baltic countries the largest component of the shadow economy is “envelope” wages, accounting for 45.5% of the shadow economy in Latvia, 55.0% in Estonia, and 41.7% in Lithuania. The average share of salaries that is concealed from the government is relatively similar in Latvia and Estonia (20.9% and 18.1% of salaries in 2017, respectively), yet slightly lower in Lithuania (15.2% of salaries). The share of unregistered employees in the Baltic countries in 2017 remains similar to 2016: 6.1% in Lithuania, 6.5% in Estonia, and 7.4% in Latvia.

# Summary and conclusions

We also estimate the proportion of unregistered companies. According to our data, unregistered companies in Latvia make up around 6.5% of all companies, while in Lithuania and Estonia they are 8.5% and 7.0% of all companies, respectively.

Lithuania still stands out as having the highest level of bribery of all three Baltic countries, especially for public procurements. In 2017, a Lithuanian company would on average pay 10.1% of the contract value as a bribe to secure a contract with government. In Latvia and Estonia, these figures are 5.1% and 3.9% of the contract value, respectively. Consistent with having the highest level, bribery is also perceived by company managers as more tolerated in Lithuania than in Estonia and Latvia. Encouragingly, the amount of general business bribery in Lithuania is decreasing: from 12.7% of revenues in 2015 to 9.8% in 2016 and further to 8.4% in 2017.

# Summary and conclusions

The highest levels of shadow economy are observed in the Riga and Kurzeme regions of Latvia. By sector, the highest share of the shadow economy remains in the construction sector. Our results also suggest that there is no significant difference between the size of the shadow economy in larger or smaller Latvian enterprises: in 2017 it ranged from 21-24%, depending on the size of the company.

When it comes to attitudes, companies in the Baltic countries continue to be relatively satisfied with the State Revenue Service (SRS). Satisfaction with the SRS has slightly increased in Latvia and Lithuania in 2017, while in Estonia it has decreased. Satisfaction with the government's tax policy, has also decreased in Estonia, where entrepreneurs are less satisfied than in Latvia and Lithuania (satisfaction of 2.20 in Estonia on a 5-point scale, compared with 2.50 and 2.87 in Latvia and Lithuania). Similarly, satisfaction with the quality of business legislation has decreased in Estonia from 3.10 in 2016 to 3.00 in 2017, while in Latvia and Lithuania this indicator has risen to 2.86. We suggest policy makers in Estonia pay serious attention to these concerning trends as they at least partly explain the relatively large increase of the Estonian shadow economy in 2017.

# Summary and conclusions

Using regression analysis, we identify several factors that make Baltic entrepreneurs more likely to participate in the shadow economy. Firms that are dissatisfied with the tax system or the government tend to engage in more shadow activity; satisfied firms engage in less. This result is consistent with previous research on tax evasion, and has implications for policy measures to reduce the size of the shadow economy. The level of tax evasion and deliberate misreporting among Baltic companies is influenced by the perceived probabilities of being caught and the expected penalties for being caught. Companies that perceive a higher probability of being caught or a more severe penalty tend to engage in less shadow activity.

We also find that younger firms engage in more shadow activity than older firms. A possible explanation is that young firms use tax evasion as a means of being competitive against more established competitors.

# Summary and conclusions

Our assessment of the impact of the business environment on Baltic companies reveals that high tax rates remain one of the main obstacles for Latvian entrepreneurs, in particular when compared with Lithuanian and Estonian entrepreneurs. Hopefully forthcoming corporate tax reforms in Latvia will improve this difference in future years. Companies in Latvia are also significantly more concerned about uncertainty of regulatory policies. Political instability seems to be a big problem in all three Baltic States, while corruption and anti-competitive practices of other competitors are both significant challenges for entrepreneurs in Lithuania.

Our results highlight the need for continued reforms and policy actions that combat the shadow economy; in Latvia, to close the gap compared to the neighbouring countries, and for Estonia and Lithuania, to reverse the consecutive increases in the size of the shadow economies in recent years.



# Methods used in constructing the Index

## The 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 March-April 2018 collects information about shadow activity during 2017 and 2016. The overlap of one year in consecutive survey rounds (e.g., collecting information about 2016 shadow activity in both the 2017 and 2018 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.

# 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; and
- (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.

# Methods used in constructing the Index

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. 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”); and (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.

# Methods used in constructing the Index

## References

Putnins, T. and A. Sauka (2015), Measuring the Shadow Economy Using Company Managers. *Journal of Comparative Economics*, 43 (2), 471-490.

# Acknowledgments

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