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Shadow Economy Index for the Baltic Countries 2009–2018

Authors of the study

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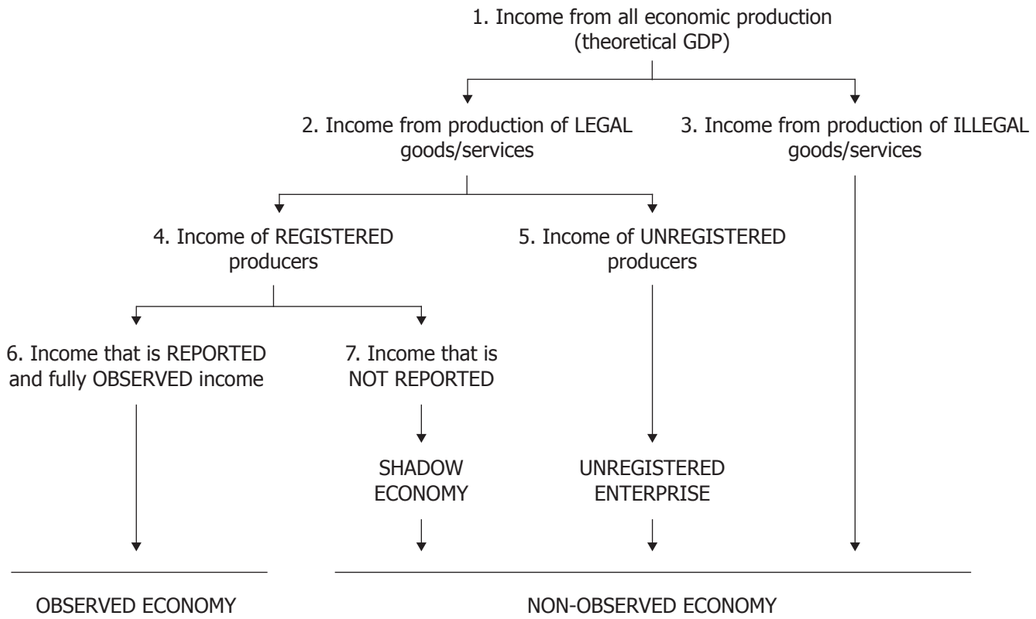
Since 2009:

- 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



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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

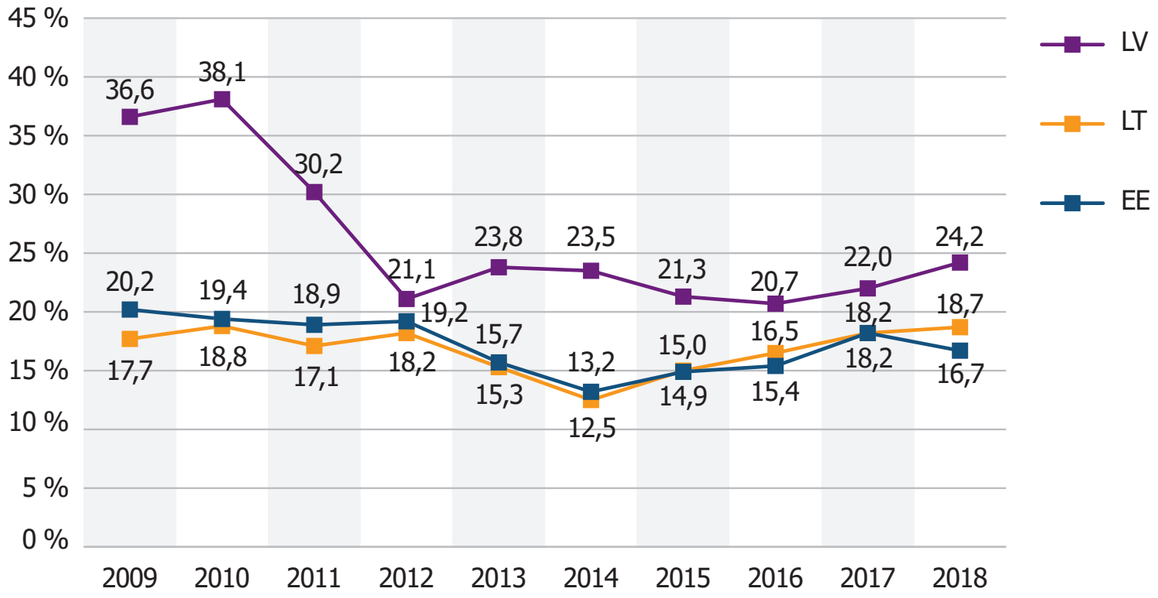
Size of the shadow economy in Latvia, Lithuania, and Estonia 2009–2018
Results

Shadow Economy Index for the Baltic countries (% of GDP), 2009–2018

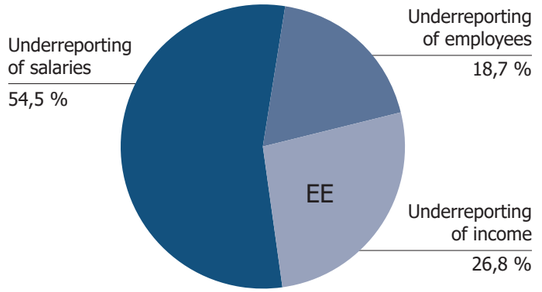
	2018–2017	2018	2017	2016	2015
Latvia	+2,2 (0,0 4,3)	24,2 (21,5 26,8)	22,0 (19,6 24,5)	20,7 (18,0 22,6)	21,3 (19,0 23,7)
Lithuania	+0,5 (-1,1 2,1)	18,7 (17,0 20,4)	18,2 (16,1 20,4)	16,5 (14,8 18,3)	15,0 (13,8 16,3)
Estonia	-1,5 (-3,3 0,3)	16,7 (14,5 18,8)	18,2 (16,1 20,3)	15,4 (13,1 17,8)	14,9 (12,4 17,4)

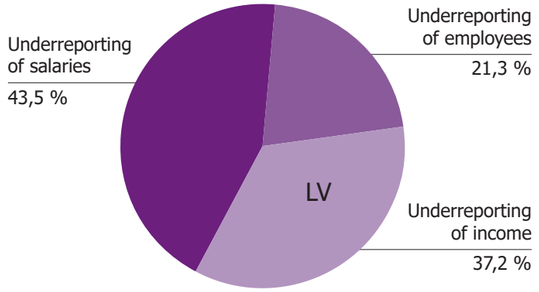
	2014	2013	2012	2011	2010	2009
Latvia	23,5 (20,5 26,6)	23,8 (20,7 26,9)	21,1 (18,5 23,6)	30,2 (27,6 32,7)	38,1 (35,9 40,3)	36,6 (34,3 38,9)
Lithuania	12,5 (11,0 13,9)	15,3 (13,6 17,1)	18,2 (16,4 20,1)	17,1 (15,2 19,0)	18,8 (16,9 20,6)	17,7 (15,8 19,7)
Estonia	13,2 (11,3 15,1)	15,7 (13,5 17,9)	19,2 (16,6 21,9)	18,9 (16,8 20,9)	19,4 (18,0 20,8)	20,2 (18,7 21,7)

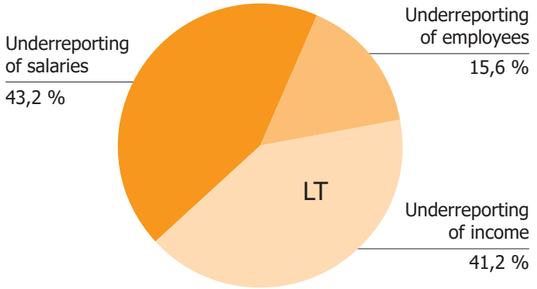
Dynamics of the shadow economy in the Baltic countries, 2009–2018



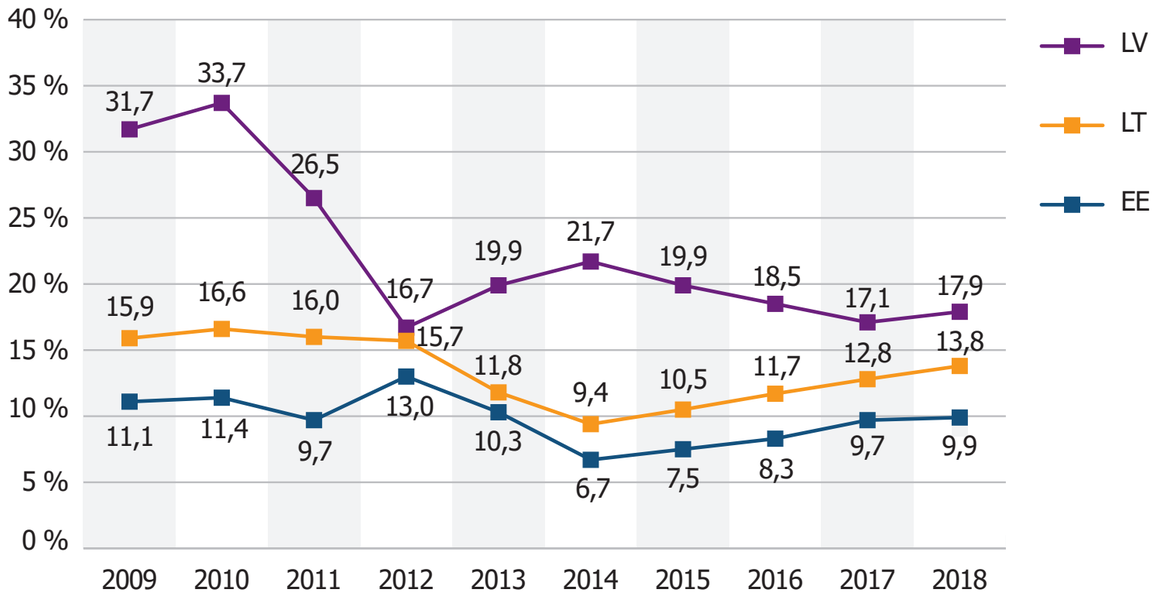
Components of the shadow economy in 2018



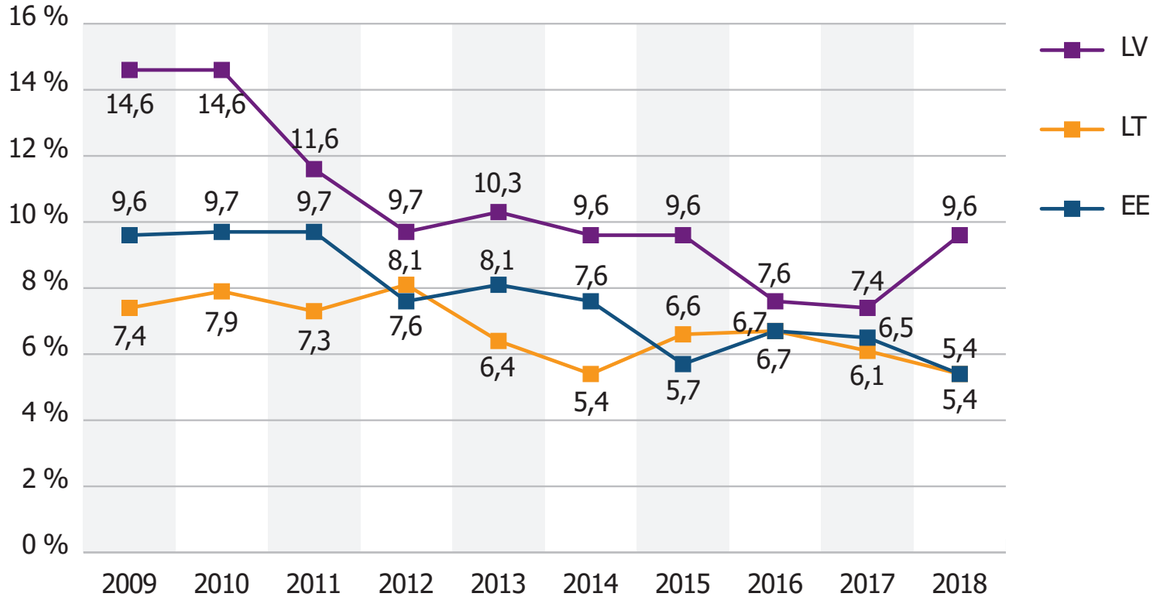




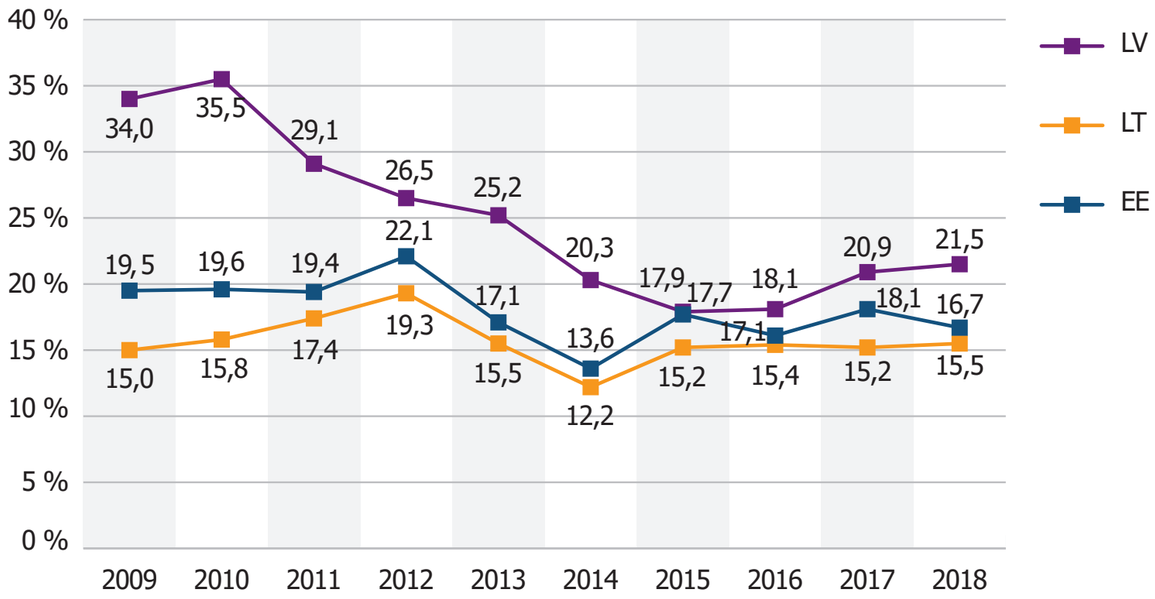
Underreporting of business income 2009–2018 (average share of revenue in % that companies conceal from the government)



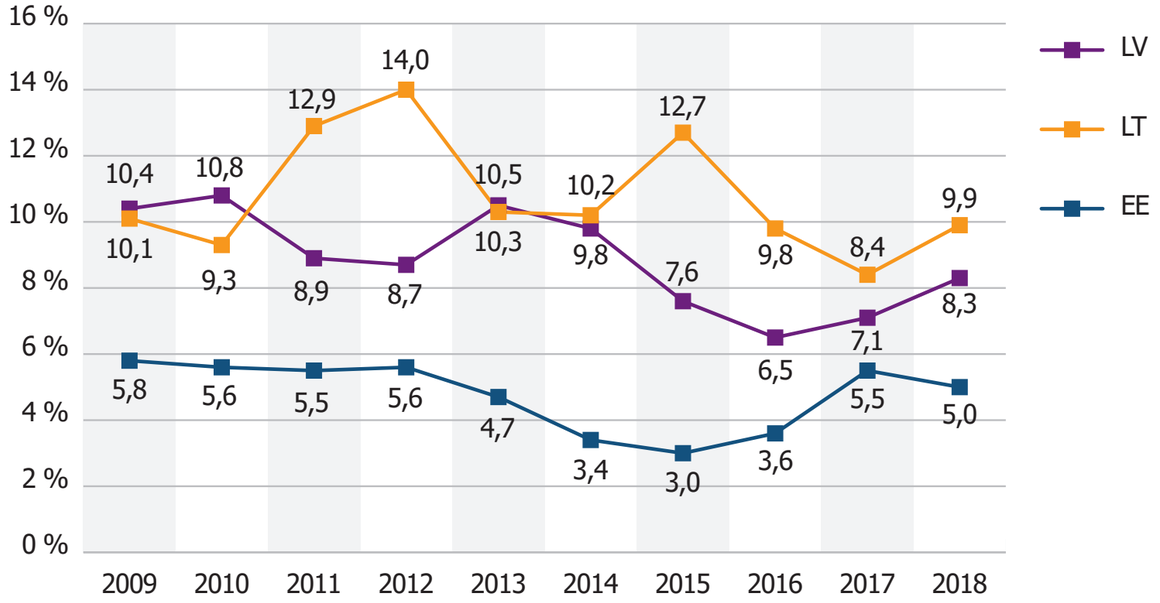
Underreporting of the number of employees, 2009–2018 (average share of the employees in % working without a contract)



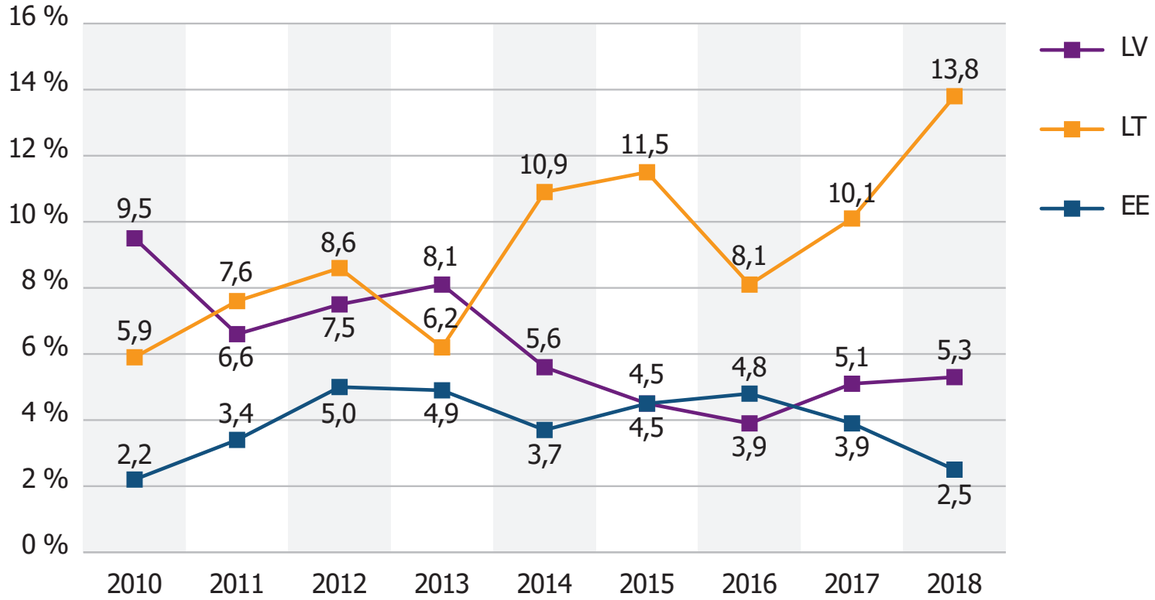
Envelope wages, 2009–2018 (average share of salaries in % which is paid by the employers, but concealed from the government)



% of payments 'to get things done', 2009–2018 (average percentage of revenue paid as 'bribes')



% of the contract value paid to secure contracts with the government, 2010–2018

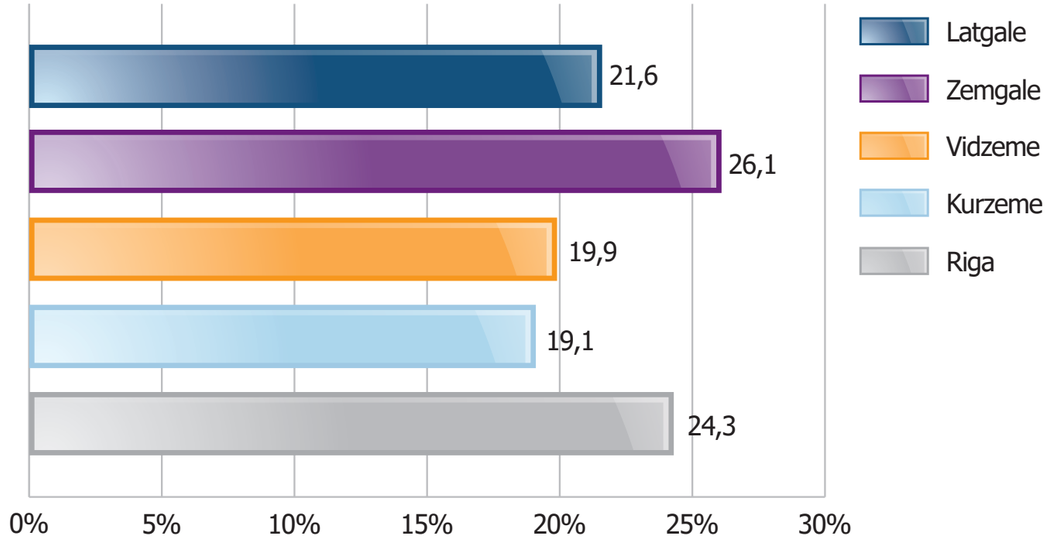


Proportion of unregistered enterprises in the Baltic countries (% of GDP), 2013–2018

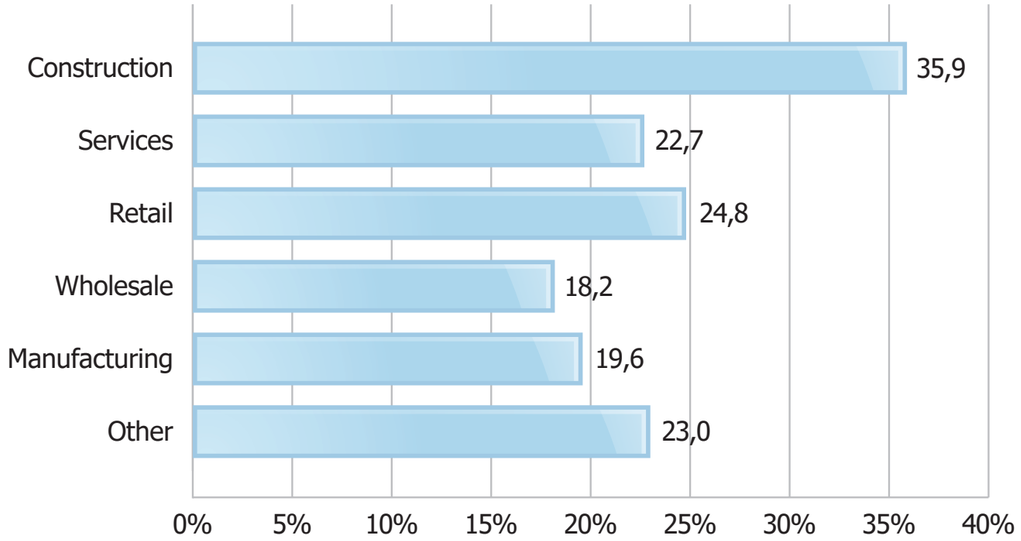
	Latvia	Lithuania	Estonia
2018	8,6 (7,3 10,1)	10,0 (8,8 11,3)	6,4 (5,0 7,9)
2017	6,5 (5,3 7,8)	8,6 (7,5 9,8)	7,0 (5,7 8,5)
2016	5,3 (4,1 6,5)	8,4 (7,5 9,4)	6,1 (5,1 7,1)
2015	5,2 (4,1 6,3)	7,3 (6,5 8,1)	5,8 (4,5 7,1)
2014	5,6 (4,5 6,7)	5,2 (4,5 6,0)	6,3 (4,5 8,2)
2013	5,4 (4,2 6,6)	6,2 (5,3 7,1)	7,6 (5,4 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 (average, 2016–2018)



Size of the shadow economy (% of GDP) by sector in Latvia (average, 2016–2018)



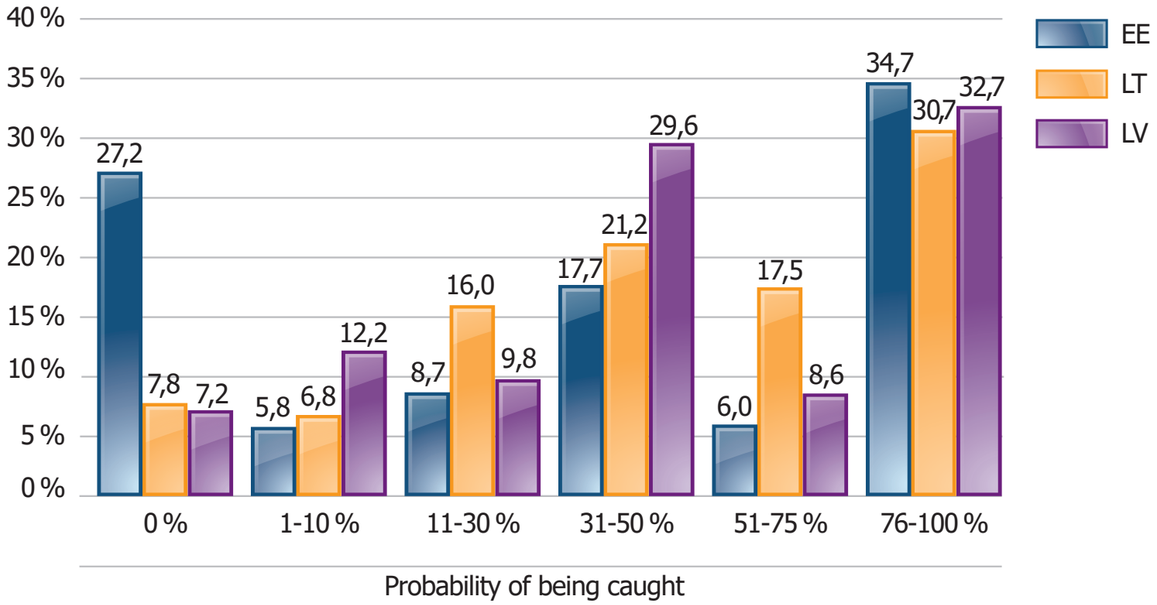
Smaller firms (e.g., those with fewer employees) engage in more shadow activity than larger firms.

Younger firms engage in more shadow activity than older firms.

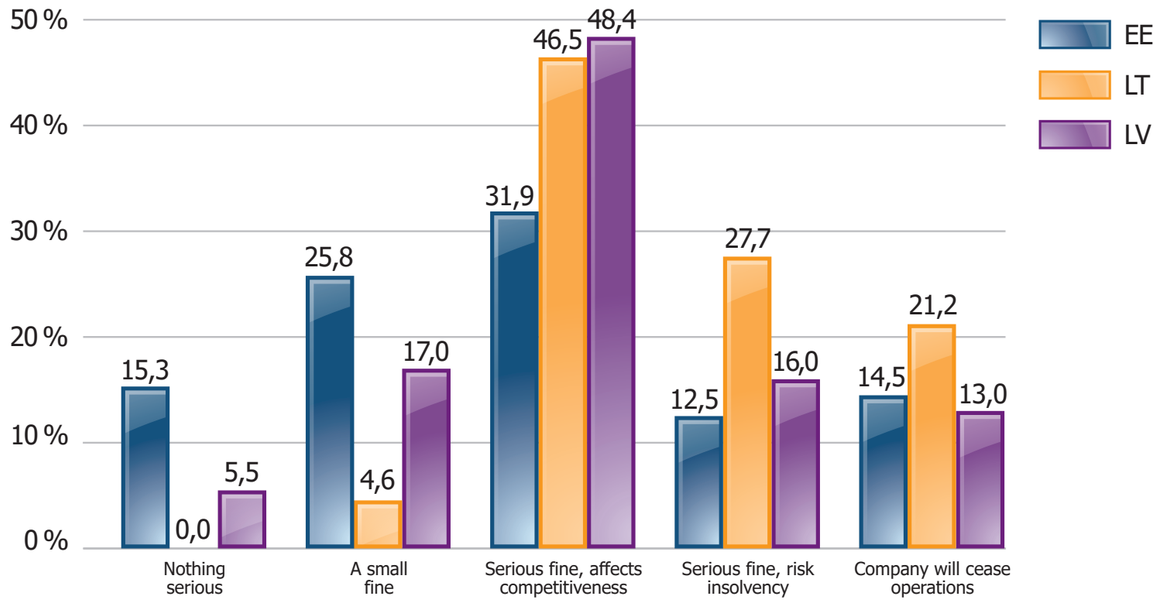
Main determinants of the shadow economy

- 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, 2018



Consequences if caught for deliberate misreporting, 2018

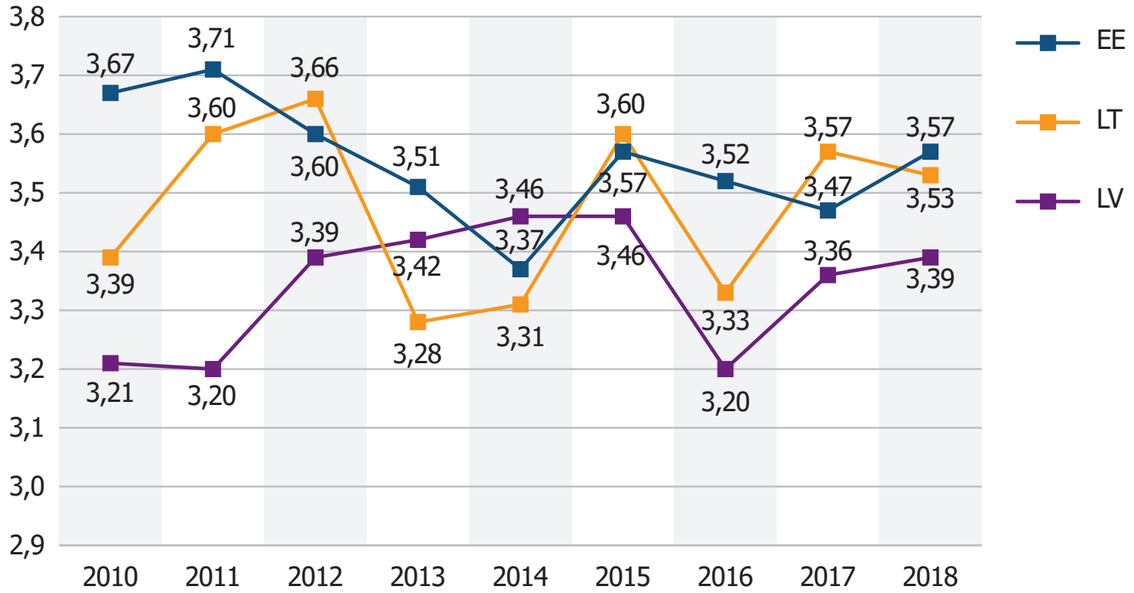


Statistically significant determining factors (using regression analysis)

- 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)

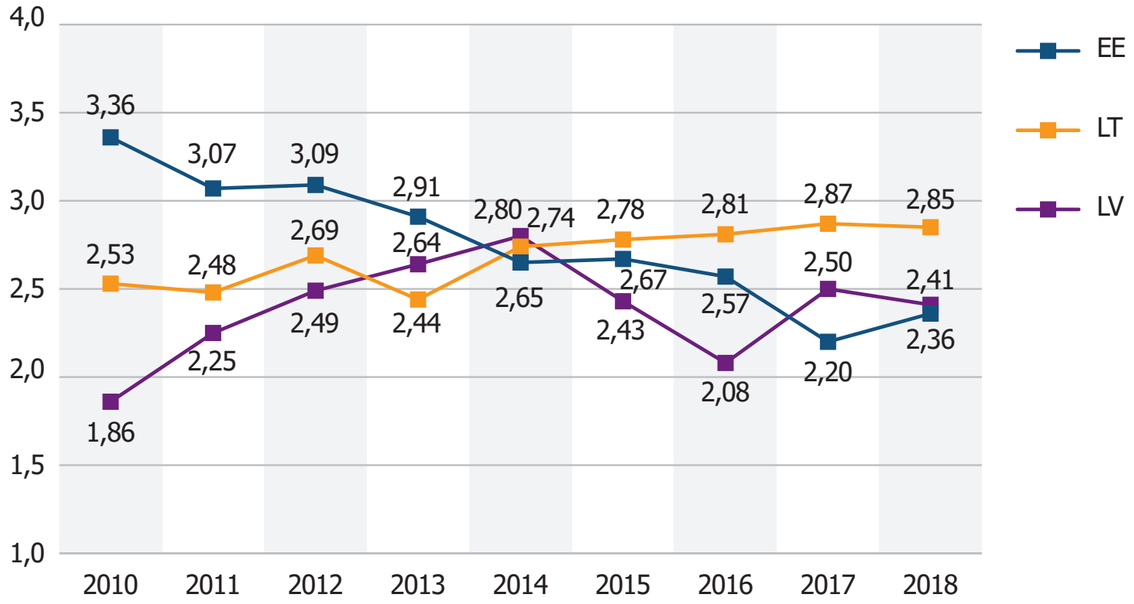
Satisfaction with the performance of the State Revenue Service, 2010–2018

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



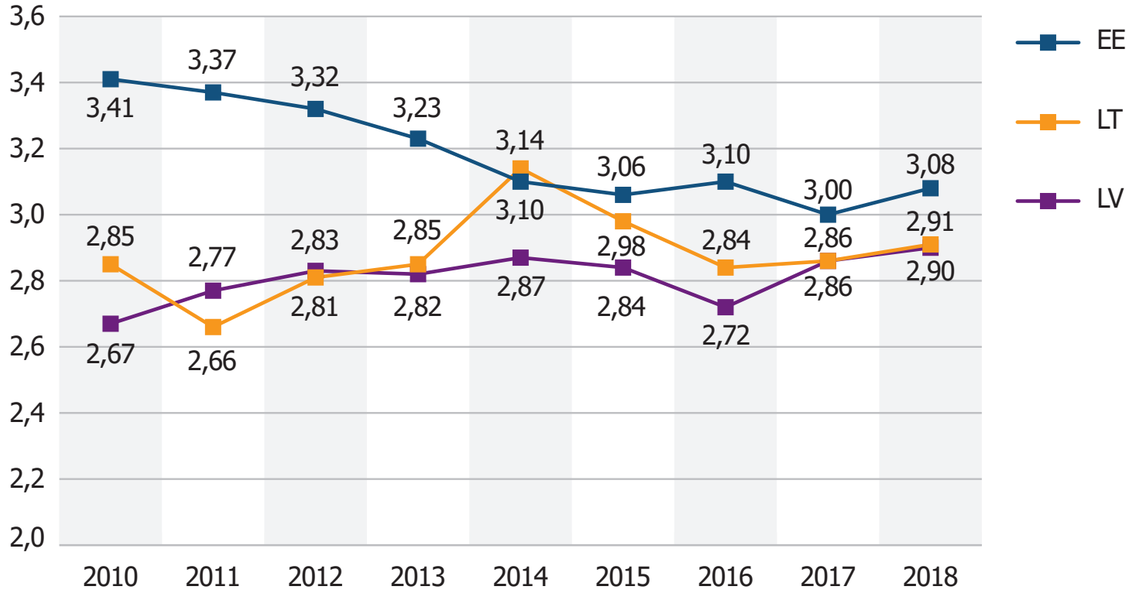
Satisfaction with the tax policy, 2010–2018

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



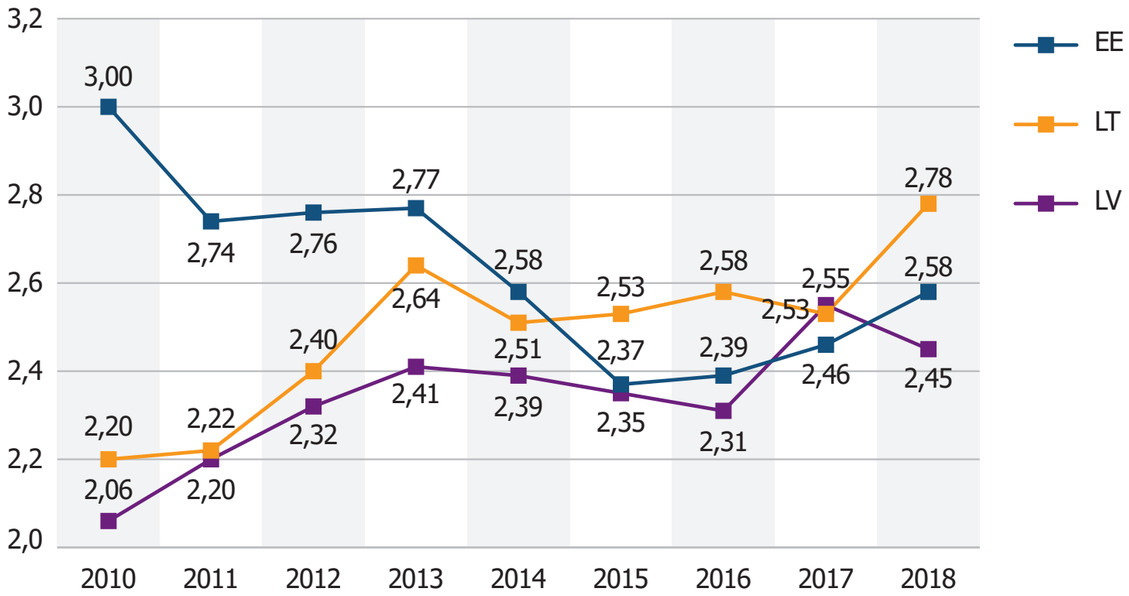
Satisfaction with the quality of business legislation, 2010–2018

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



Satisfaction with the government's support to entrepreneurs, 2010–2018

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

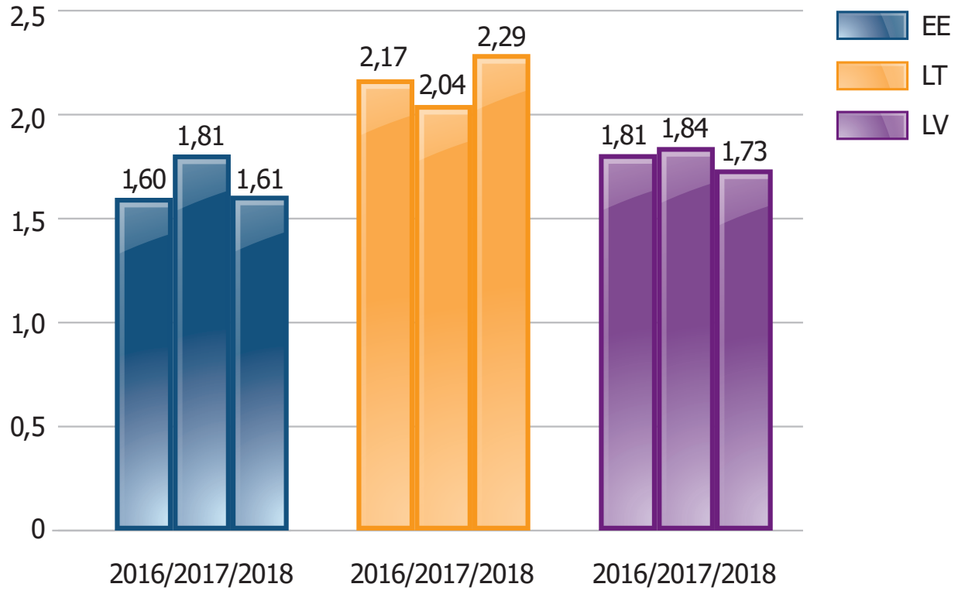


Statistically significant determining factors (using regression analysis)

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

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

(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 determined annually based on the methodology developed by Putniņš and Sauka (2015) and using Business surveys in Baltic countries. Several surveying and data collection techniques are used in surveys, which have been shown to be effective in eliciting relatively truthful responses. In order to calculate the size of the shadow economy as a percentage of GDP, the index includes calculations on the under-reporting of business income, the under-reporting or hiding of workers, as well as unreported "envelope" wages. In this study, the main focus is on estimates of the shadow economy in 2018 and the trends covering the period 2009–2018.

One of the most important facts found in this year's research refers to the development trends of the shadow economy in the Baltic countries. According to our estimates, the shadow economy in Latvia continued to grow in 2018: from 20,7% in 2016 and 22,0% in 2017 to 24,2% of GDP in 2018 (an increase of 2,2% compared to 2017). Slight growth of the shadow economy is also observed in Lithuania: +0,5% (from 18,2% in 2017 to 18,7% in 2018). In Estonia, however, the shadow economy decreased by -1,5% in 2018 (from 18,2% to 16,7% of GDP, respectively). The trend in the size of the shadow economy in Latvia and Lithuania shows an alarming trend, given the rapid economic growth in both countries.

Summary and conclusions

Our estimates suggest that in all three Baltic countries the largest component of the shadow economy in 2018 (similar to 2017) is "envelope" wages, comprising 43,5% of the overall shadow economy in Latvia and 54,5% and 43,2% in Estonia and Lithuania respectively. The average share (%) of wages, that entrepreneurs do not report to the state in 2018 is relatively similar in Lithuania and Estonia (15,5% and 16,7%, respectively) and slightly higher in Latvia (21,5%).

The under-reporting of income (which amounts to approximately 35,2% of the entire shadow economy in Latvia), similarly to "envelope" wages, is the component that causes the biggest differences in the size of the shadow economy among the three Baltic countries. Namely, in Latvia the average share of income (%) not reported by entrepreneurs to the state in 2018 has increased to 17,9% (from 17,1% in 2017), while in Estonia it is 9,9% (a slight increase compared to 2017: from 9,7%), but in Lithuania: 13,8% (increase from 12,8% in 2017). Both of these factors—"envelope" wages and not reporting income—should receive serious attention when developing policies to fight the shadow economy, especially in Latvia.

Summary and conclusions

The number of non-reported employees in 2018 has decreased in Lithuania, as well as in Estonia, reaching 5,4%. In Latvia, however, the number of non-reported employees in 2018 has increased significantly: from 7,4% to 9,6%. According to our estimates, the non-reporting employee component is relatively important in all three Baltic countries, forming 21,3%, 18,7% and 15,6% of the total shadow economy, respectively, in Latvia, Estonia and Lithuania.

We also evaluated the proportion of unregistered companies. According to our data, unregistered companies in Latvia account for 8,6% of all companies, and in Lithuania and Estonia, respectively, 10,0% and 6,4% of all companies.

Summary and conclusions

Lithuania still stands out with the highest level of bribery in the Baltic countries, especially regarding government procurement. According to the study, in 2018, Lithuanian companies paid an average of 13,8% of the contract amount in order to be awarded public procurement contracts. In 2017, this figure was "only" 10,1%. In Latvia and Estonia, these figures are 5,3% (a slight increase from 5,1% in 2017) and 2,5% (a decrease from 3,9% in 2017), respectively, from the contract amount. Unfortunately, the general level of bribery is increasing both in Lithuania and Latvia: from 7,1% in 2017 to 8,3% (from total revenue) in 2018 in Latvia; from 8,4% in 2017 to 9,9% (of total revenue) in 2018 in Lithuania. However, in Estonia, the overall level of bribery in 2018 reaches 5,0%, a decrease of -0,5% compared to 2017.

The highest level of shadow economy in Latvia was in Riga and Zemgale regions. By sector, the highest share of the shadow economy remains in the construction sector.

Summary and conclusions

Regarding attitude, companies in Baltic countries are still relatively satisfied with the work of the State Revenue Service (SRS). In 2018, the satisfaction level with the tax revenue service increased in Latvia and Estonia, but in Lithuania it slightly decreased. After the fall in 2017, satisfaction with national tax policy in Estonia also slightly increased, where entrepreneurs show almost the same satisfaction as in Latvia (average rating in Estonia: 2,36, on a scale of 1–5, where "5" means very high satisfaction, compared to 2,41 in Latvia). In Lithuania, entrepreneurs are a little more satisfied with national tax policy (rating 2,85). In all three Baltic countries, the level of satisfaction with the quality of business legislation has slightly risen, ranging from 2,90–3,08 in 2018.

Using regression analysis, we identified a number of factors that contribute to the involvement of Baltic entrepreneurs in the shadow economy. Companies that are not satisfied with tax policy or government tend to be more involved in the shadow economy; satisfied companies do it less often. This result is in line with previous studies about tax evasion and it has an impact on policy-making measures aimed at reducing the shadow economy.

Avoiding tax evasion and a deliberate failure to report income in the Baltic states is linked to both—the presumption of the possibility of being caught and the presumption of anticipated punishment in the event of capture. Those companies that believe that the probability of being caught or the penalty in the case of being caught is more severe, tend to be less involved in the shadow economy. Our results also show that newer companies are more involved in activities of the shadow economy than older companies. The possible explanation for this result is that younger companies use tax evasion to be more competitive with companies that have been in business for a longer time.

Summary and conclusions

Our results indicate the need for continued reforms and other policy initiatives to reduce the shadow economy: In Latvia, to decrease the gap with the neighbouring countries, but in Estonia and Lithuania, to change the trend of growth in the shadow economy observed in previous years.

Survey of entrepreneurs

The SSE Riga Shadow Economy Index is based on an annual survey of business owners/managers in Estonia, Latvia and Lithuania, based on the method of Putniņš and Sauka (2015). Surveys are held every year in February and April, asking questions about the shadow economy over the past two years. For example, during the survey conducted in February–March 2019, information on the shadow economy in 2018 and 2017 was compiled. To ensure consistent responses, one year overlaps in successive surveys (for example, gathering information on the 2017 shadow business with surveys conducted in 2018 and 2019).

We sample our surveyed companies by random stratified order, with a representative number of companies in each country. When working with active companies in each Baltic country (we use the Orbis database maintained by Bureau Van Dijk), for each of them and for each country, we form size quintiles (using the book value of assets) and take equal sized random samples from each size quintile. At least 500 telephone interviews have been carried out in each country. The survey was conducted in cooperation with SKDS.

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.

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:

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

Methods used in constructing the Index

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 α_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 α_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.

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.

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Shadow: An exploration of the nature of informal economies and shadow practices in the former USSR region (Project Number: 778188)

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