Shadow Economy Index
for the Baltic Countries
2009–2012

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Foreword

This is the third report on the Shadow Economy Index for the Baltic countries. The Report is published annually and written within the framework of the Centre for Sustainable Business at the Stockholm School of Economics in Riga, and with the support of SEB.

It is our hope that the Report will contribute to an informed debate on the size of the shadow economy and its causes in the Baltic countries. As is known from economic theory, the size of the shadow economy not only affects government tax revenue, it also affects the allocation of an economy’s resources and thereby its competitiveness. Hence, the Report could also be seen as a contribution to the ongoing discussion on how to enhance the competitiveness of the three Baltic economies.

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instance, entrepreneurs, (i) know and, (ii) are willing to share information on the extent of their involvement in the shadow economy. Kazemier and van Eck (1992) provide an example of the use of micro-level surveys to estimate shadow activity. They survey households about home maintenance and repair, including questions on the use of unreported labour and evasion of tax on construction materials. Zienkowski (1996) provides an example of using survey methods to estimate the amount of unreported labour within an economy.

The SSE Riga Shadow Economy Index takes the third approach and is based on annual surveys of entrepreneurs in the three countries. The reason for adopting this approach is that those most likely to know how much production/income goes unreported are the entrepreneurs that themselves engage in the misreporting and shadow production. The Index combines estimates of misreported business income, unregistered or hidden employees, as well as unreported “envelope” wages to obtain estimates of the size of the shadow economies as a proportion of GDP. The method used in this report for estimating the size of the shadow economy requires fewer assumptions than most existing methods, in particular compared to methods based on macro indicators. Furthermore, the SSE Riga Shadow Economy Index can be used through time or across sectors and countries and thus is a useful tool for evaluating the effectiveness of policy designed to minimise the shadow economy.

Survey-based approaches face the risk of underestimating the total size of the shadow economy due to non-response and untruthful response given the sensitive nature of the topic. The SSE Riga Shadow Economy Index minimises this risk by employing a number of survey and data collection techniques shown in previous studies to be effective in eliciting more truthful responses. These include framing the survey as a study of satisfaction with government policy, gradually introducing the most sensitive questions after less sensitive questions, phrasing misreporting questions indirectly and, in the analysis, controlling for factors that correlate with potential untruthful response such as tolerance towards misreporting.

The next section describes how the Index is constructed, starting with the survey and then the calculations. The third section of this report presents estimates of the Index and analyses the various forms of shadow activity. Sections 4 and 5 analyse the determinants of entrepreneurs’ involvement in the shadow sector and their attitudes towards shadow activities. Finally, Section 6 discusses the conclusions that we can draw from the results and identifies some policy implications.

2. Methods used in constructing the Index

2.1. 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. The surveys are conducted between March and April of each year and contain questions about shadow activity during the previous two years. For example, the survey conducted in March-April 2013 collects information about shadow activity during 2011 and 2012. The overlap of one year in consecutive survey rounds is used to validate the consistency of responses. The sample of surveyed companies is constructed from all active firms in each of the three Baltic countries contained in 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. The 2013 survey collected responses from 500 company owners/managers in Estonia, 501 in Latvia and 501 in Lithuania. The survey is conducted in cooperation with SKDS, funded by the Centre for Sustainable Business at SSE Riga and the Centre for Media Studies at SSE Riga.

The questionnaire form (see Appendix 1) contains four main sections: (i) external influences; (ii) shadow activity; (iii) company and owner characteristics; and (iv) entrepreneurs’ attitudes. To increase the response rate and truthfulness of responses the questionnaire begins with non-sensitive questions about satisfaction with the government and tax policy, before moving to more sensitive questions about shadow activity and deliberate misreporting. This ‘gradual’ approach is recommended by methodological studies of survey design in the context of tax evasion and the shadow economy (e.g., Gerxhani, 2007; and Kazemier and van Eck, 1992). Further, the survey is framed as a study of satisfaction with government policy, rather than a study of tax evasion and misreporting (similar to Hanousek and Palda, 2004).

In the first survey block, ‘external influences,’ respondents are asked to express their satisfaction with the State Revenue Service, tax policy, business legislation and government support for entrepreneurs in the respective country. The questions use a five point Likert scale, from “1” (“very unsatisfied”) to “5” (“very satisfied”). The first section of the questionnaire also includes two questions related to entrepreneurs’ social norms: entrepreneurs’ tolerance towards tax evasion and towards bribery. Previous studies argue that entrepreneurs are likely to engage in more tax evasion when such behaviour is tolerated (Baumol, 1990). The measures of tolerance serve a second important role as control variables for possible underestimating of the extent of shadow activity due to the sensitivity of the topic.

The second section of the questionnaire, ‘informal business,’ is constructed based on the concepts of productive, unproductive and destructive entrepreneurship by Baumol (1990), assessment of ‘deviance’ or ‘departure from norms’ within organisations (e.g., Warren, 2003) and empirical studies of tax evasion in various settings (e.g., Faulstich, 2002; Asida and Van Praag, 2007). We assess the amount of shadow activity by asking entrepreneurs to estimate the degree of underreporting of business income (net profits), underreporting of the number of employees, underreporting of salaries paid to employees and the percentage of revenues that firms pay in bribes.

We employ the ‘indirect’ approach for questions about informal business, asking entrepreneurs about ‘firms in their industry’ rather than ‘their firm.’ This approach is discussed by Gerxhani (2007) as a method of obtaining more truthful answers, and is used by Hanousek and Palda (2004), for example. The study conducted by Sauka (2008) shows that even if asked...
indirectly entrepreneurs’ answers can be attributed to the particular respondent or company that the respondent represents. Furthermore, experience from Sauka (2008) suggests that phone interviews are an appropriate tool to elicit information about tax evasion. The second section of the questionnaire also elicits entrepreneurs’ perceptions of the probability of being caught for various forms of shadow activity and the severity of penalties if caught deliberately misreporting.

We use the overlapping years (e.g., answers in both the 2013 survey and 2012 survey about the level of shadow activity in 2012) to filter out inconsistent responses. This is only possible in instances where a respondent participates in repeated survey rounds. In particular, our filter drops responses when the same respondent in two different survey rounds answers the same shadow activity questions about the same reference year with a difference of +/- 20%. This filtering helps increase the reliability of survey responses used in calculating the Index.

2.2. 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 extent 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, \( UR_i^{\text{Operating Income}} \), is estimated directly from the corresponding survey question (question 7). Underreporting of employee remuneration, however, consists of two components: (i) underreporting of salaries, or ‘envelope wages’ (question 11); and (ii) unreported employee remuneration, however, consists of shadow production as a weighted average of underreported personal and underreported corporate income, producing an estimate of the unreported (shadow) proportion of the firm’s production (income):

\[
\text{ShadowProportion}_i = α_i \cdot \frac{\text{EmployeeRemuneration}_i}{\text{OperatingIncome}_i} + (1 - α_i) \cdot \frac{\text{ OperatingIncome}_i}{\text{OperatingIncome}_i}
\]

where \( α_i \) is the ratio of employees’ remuneration (Eurostat item D.3) to the sum of employees’ remuneration and gross operating income of firms (Eurostat items B.2g and B.3g). We calculate \( α_i \) 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.

In the second step, we take a weighted average of underreported production, \( \text{ShadowProportion}_i \), across firms in country \( c \) to arrive at the Shadow Economy Index for that country:

\[
\text{INDEX}_c = \sum_{i=1}^{n_c} w_i \cdot \text{ShadowProportion}_i
\]

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):

\[
\text{ShadowProportion}_i = α_i \cdot \frac{\text{EmployeeRemuneration}_i}{\text{OperatingIncome}_i} + (1 - α_i) \cdot \frac{\text{ OperatingIncome}_i}{\text{OperatingIncome}_i}
\]

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 \( \text{INDEX}_c \), \( \text{ShadowEconomy} \) 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.
This section reports the levels of the Shadow Economy Index in the Baltic countries during the past four years. We also separately examine each of the types of shadow activity that make up the Index, as well as bribery and forms of corruption.

Table 1 reports the size of the shadow economies in Estonia, Latvia and Lithuania as a percentage of GDP in the years 2009-2012. The change from 2011 to 2012 is not statistically significant for Lithuania or Estonia (+1.1% and +0.3 accordingly), i.e., the level of shadow economy has remained approximately unchanged from 2011 to 2012 in both countries. In Latvia, however, the size of shadow economy in 2012 contracted by 9.1% of GDP compared to the level in 2011. This considerable decline in shadow activity follows a similarly notable decrease in the previous year (2011) of 7.9% of GDP. As a result, the estimates in Table 1 suggest that the size of the shadow economy in 2012 is no longer considerably higher in Latvia than in Estonia and Lithuania (21.1% compared to 19.2% and 18.2%, respectively). The differences between the three countries in 2012 are marginally statistically significant.\footnote{The p-values for independent samples t-tests of the differences in the mean level of shadow economy for the pairs Latvia-Lithuania and Latvia-Estonia are 0.08 and 0.33, respectively.}

The dynamics of the SSE Riga Shadow Economy Index, shown in Figure 1, are largely consistent with estimates from other studies that use different estimation methods. This increases the confidence one can place in the overall conclusions about the Baltic shadow economies. For example, Schneider (2013) uses an indirect latent variable method and obtains the same dynamics for Latvia (an increase from 2009 to 2010 and two subsequent years of decreases). Schneider’s estimates also concur with the dynamics of the Index for Estonia and Lithuania, other than the statistically insignificant changes from 2011 to 2012. The point estimates, however, differ in magnitude between the two studies. In contrast to Schneider’s indirect latent variable method, our approach is able to provide more detailed information on the components of the shadow economy, which we turn to now.

![Figure 1. SSE Riga Shadow Economy Index for the Baltic countries 2009-2012.](image)

![Figure 2. Components of the shadow economies in each of the Baltic countries, 2012.](image)

Figure 2 illustrates the relative size of the components of the shadow economy in each of the three countries. Envelope wages constitute a large proportion of the shadow economies in all three countries: they account for 52.3% of the shadow economy in Estonia, 42.9% in Latvia and 39.3% in Lithuania. The next largest component is unreported business income, which makes up between 28.5% and 42.7% of the shadow economy depending on the country. Finally, unreported employees makes up the remainder, and accounts for between 17.6% and 19.2% of the shadow economy in each of the countries.
Figures 3 and 4 illustrate the amount of underreporting of business income (profits). Figure 3 shows the distribution of firms that underreport profits within a given range, whereas Figure 4 shows the dynamics of underreporting profits from 2009 to 2012. Approximately 30.6% of respondents from Estonia, 14.6% from Lithuania and 14.1% from Latvia state that underreporting ‘in the industry’ in 2012 is 0%, i.e. that companies report 100% of their actual profits. The numbers for 2011 where: 21.4% in Estonia, 10.9% in Lithuania and 14.8% in Latvia, with a similar pattern also in 2010.\footnote{See SSE Riga Shadow Economy Index for the Baltic countries 2009-2010, and 2009-2011. \texttt{http://www.sseriga.edu/en/centres/csb/shadow-economy-index-for-baltics/}} In contrast to 2010 and 2011, however, Latvian companies no longer fall into higher ranges of profit underreporting, and the gap between the countries has substantially decreased.

Following the trend in Figure 3, we can see from Figure 4 that the average level of profit underreporting in 2012 is rather similar in Latvia, Lithuania and Estonia (16.7% in Latvia, 15.7% in Lithuania and 13.0% in Estonia, compared to 26.5%, 16.0% and 9.7% in 2011, respectively). The overall decrease in the underreporting of business profits from 2011 to 2012 among Latvian companies is a substantial 9.8%, whereas during the same period profit underreporting has increased by +3.3% in Estonia, and remained relatively stable in Lithuania.

Figures 5 and 6 illustrate the level of underreporting of the number of employees. Figure 6 suggests that underreporting of employees in Lithuania has increased slightly in 2012 (8.1% in 2012 compared to 7.3% in 2011). In contrast the level of underreporting of employees has decreased in Estonia and Latvia, to 7.6% and 9.7%, respectively. Similarly to 2011, a relatively low proportion of respondents claim that underreporting of employees in 2012 represents more than 50% of employees (Figure 5).
Figure 8 indicates that in 2012 Latvian companies still pay a higher percentage of salaries in the form of undisclosed “envelope wages” (26.5% in Latvia, 19.3% in Lithuania and 22.1% in Estonia). Even though underreporting of salaries still seems to be the main driver of the shadow economy in Latvia, among the three Baltic countries only Latvia managed to decrease the level of envelope wages in 2012 compared to 2011. Figure 7 shows that most frequently Latvian companies underreport 11-30% and 31-50% of actual salaries. In Lithuania and Estonia, however, more often companies underreport salaries by 1-10% and 11-30%.

Figure 9 suggests that during 2012 Lithuanian companies paid proportionally more in bribes (revenues spent on “getting things done”) than Latvian and Estonian companies: 26.3% of respondents reporting that more than 25% of revenues are paid “to get things done” (in comparison to 6.2% in Estonia and 8.8% in Latvia), and a further 24.5% (12.4% in Estonia and 16.3% in Latvia) report paying bribes in the range of 13-25%. This trend can also be observed in Figure 10, which shows that the percentage of revenue spent on bribes has increased in Lithuania during the last two years, whereas has been declining or stable in other two Baltic countries.
Finally, Figures 11 and 12 illustrate the percentage of the contract value that firms typically offer as a bribe to secure a contract with the government. Opposite to the general level of bribery reported in Figure 10, the level of government bribery has increased in all three Baltic countries (see Figure 12). Figure 11 illustrates the most frequent size of government bribes (proportion of the contract value), suggesting that considerable proportion of companies in all Baltic countries pay more than 10% of the contract value to secure a contract with the government.

4. Determinants of shadow activity

In this section we examine the factors that influence firms’ decisions to participate in the shadow economy. We start by reporting the size of the shadow economy by company characteristics including operating region, sector and firm size. Next, we report descriptive statistics of how the size of the shadow economies varies with attitudes and perceptions towards tax evasion. Finally, we use regression analysis to identify the drivers of firms’ involvement in the shadow economy, while controlling for other factors.

4.1. Company characteristics

Figures 13-15 report the size of the shadow economy by region, in Estonia, Latvia and Lithuania. As displayed in Figure 13, the size of the shadow economy has decreased in all regions of Latvia. Similar to 2011, shadow activity seems to be less widespread in Vidzeme (12.4% in 2012) than other regions of Latvia, where the shadow economy ranges from 21.2% to 25.2%. In Lithuania, the level of shadow activity seems to be lowest in Siaulių, Klaipėdos and Vilnius regions in 2012. This is in contrast to the findings from 2010 and 2011, where lowest level of
shadow economy was reported in the Panevėžio region. In Estonia, however, the regions with the lowest level of shadow activity in 2012 are Põlva and Pärnu (13.5% and 15.4%, respectively), and the highest level of shadow economy can be observed in Ida-Viru and Valga regions (34.0% and 29.5%, respectively). The small number of observations in some of the regions in Estonia, however, create a relatively large margin of error and therefore the Estonian estimates by region should be interpreted with caution.

Figure 16 summarises how the size of the shadow activity varies by sector in 2012. Changes in the size of the shadow economy across the sectors in 2011 and 2012 are presented in Figures 17-19.

Figure 17 suggests that the substantial decrease in the size of the shadow economy in Latvia has occurred predominantly in retail, services, construction and the category ‘other’, whereas the level of shadow activity in wholesale has remained at approximately the same level as in 2011 (29.7%). With these changes, wholesale seems to be the sector with the highest level of shadow activity in Latvia in 2012, which is in contrast to the pattern observed in 2011 and 2010. In Lithuania, however, the level of shadow economy in 2012 is relatively similar in all main sectors compared to 2011 (range from approximately 18% to 22%), with a slight decrease in the wholesale sector and slight increase in the service sector (see Figure 18). In Estonia the pattern of shadow activity across sectors in 2012 is similar to that of 2011, with the exception of the construction sector, which increased to 33.4% in 2012, up by 10% compared to 2011 (Figure 19).
Determinants of shadow activity

The literature on entrepreneurship and tax evasion identifies two main groups of factors that affect the decision to evade taxes and participate in the shadow economy. The first set emerges from rational choice models of the decision to evade taxes. In such models, individuals or firms weigh up the benefits of evasion in the form of tax savings against the probability of being caught and the penalties that they expect to receive if caught. Therefore the decision to underreport income and participate in the shadow economy is affected by the detection rates, the size and type of penalties, firms’ attitudes towards risk-taking and so on. These factors are likely to differ across countries, regions, sectors of the economy, size and age of firm.

4.2. How attitudes and perceptions affect shadow activity

Finally, Figure 20 shows the level of shadow activity for firms of different sizes, measured by the number of employees. The trends for Lithuania and Estonia are similar to what was observed in 2010. In Latvia, however, in 2012 large companies are proportionally less involved in shadow activity compared to 2010 and 2011. High levels of underreporting are still common among smaller Latvian companies (see Figure 21).
Determinants of shadow activity

The results suggest that entrepreneurs in Estonia perceive the risk of being caught for misreporting as significantly lower than entrepreneurs in Latvia and Lithuania (see Figures 22-25). This is similar to what we observed in 2011. The level of 'confidence' of Estonian entrepreneurs about not being caught, however, has decreased. For example, in 2012, 23.2% of Estonian entrepreneurs believe there is zero likelihood that they would be caught for underreporting profits, whereas in 2011 the proportion was a staggering 44.4%. Similar changes have also occurred for the likelihood of being caught for underreporting employees, underreporting wages and being involved in bribing. Similar to 2011, a relatively high proportion of both Latvian and Lithuanian entrepreneurs estimate the risk of being caught as very high. Approximately ⅓ of entrepreneurs in Latvia and Lithuania perceive the probabilities of being caught for underreporting profits, employees and salaries as being in the range 76%-100% (Figures 22-25).

Both Latvian and Estonian entrepreneurs perceive the potential consequences for being caught as being more severe than the consequences perceived by Lithuanian entrepreneurs. Approximately 34.6% of Latvian respondents (32.6% in 2011) and 30.8% of Estonian respondents (27.6% in 2011) state that being caught for deliberate underreporting will result in either a serious fine or closure of the business. The corresponding proportion of Lithuanian respondents is 21.7% (23.8% in 2011). Furthermore, approximately ⅓ of all respondents from Estonia, Latvia and Lithuania stated that being caught for underreporting will have only minor or no consequences (Figure 26).
Empirical studies find that the actual amount of tax evasion is considerably lower than predicted by rational choice models and the difference is often attributed to the second, broader, set of tax evasion determinants – attitudes and social norms. These factors include perceived justice of the tax system, i.e., attitudes about whether the tax burden and administration of the tax system are fair, attitudes about how appropriately taxes are spent and how much firms trust the government. Finally, tax evasion is also influenced by social norms such as ethical values and moral convictions, as well as fear of feelings of guilt and social stigmatisation if caught. We measure firms’ attitudes using four questions about their satisfaction with the State Revenue Service, the government’s tax policy, business legislation and the government’s support for entrepreneurs (see Q1-Q4 in Appendix I). Figures 27-30 illustrate the distribution of firms’ satisfaction with the State Revenue Service, the government’s tax policy, business legislation and the government’s support for entrepreneurs, in each of the Baltic countries in 2012. Figure 31 summarises the degree of satisfaction, reporting the country means in each of the satisfaction areas, with higher scores indicating more satisfaction.

Similar to what we observed in 2011 and 2010, across all three countries firms tend to be most satisfied with the State Revenue Service (SRS). In particular, satisfaction with the SRS has increased in Latvia: in 2012 as many as 58.6% of Latvian respondents reported that they are satisfied or very satisfied with SRS, compared to 41.9% in 2010 and 42.7% in 2011. Nevertheless, 17.9% Latvian companies are unsatisfied or very unsatisfied with the SRS (20.7% in 2011) (Figure 27).

Even though some positive progress can be observed compared to 2011, dissatisfaction in Latvia in 2012 is particularly high with the government’s tax policy. Approximately 60% of respondents (70% in 2011) are “unsatisfied” or “very unsatisfied” with tax policy (Figure 28). Furthermore, both Latvian and Lithuanian entrepreneurs seem to be less satisfied with the quality of business legislation (Figure 29) and with government support (Figure 30), than entrepreneurs in Estonia. For instance 39.2% of Estonian respondents in 2012 stated that they are unsatisfied or very unsatisfied with government support to business, compared to 63.1% of respondents from Latvia and 53.1% from Lithuania.
Figures 32 and 33 illustrate the distribution of firms’ stated tolerance of tax evasion and bribery. Figure 34 summarises the degree of tolerance in each of the countries with higher scores indicating more tolerance.

The results for 2012 show that both Estonian and Latvian respondents view tax avoidance and bribery as less tolerated behaviour than their Lithuanian counterparts. Furthermore, as many as 43% of Lithuanian entrepreneurs (compared to 23.2% Latvian entrepreneurs and 25.2% Estonian entrepreneurs), either “agree” or “completely agree” that tax avoidance is tolerated behaviour in Lithuania in 2012 (Figure 32). A very similar pattern can be observed for tolerance towards bribery (Figure 33).

4.3. Multivariate tests of the determinants of shadow activity

We use regression analysis to identify the statistically significant determinants of firms’ involvement in the shadow economy. The regression results are reported in Appendix 2. Model 1 includes most of the possible influential factors and dummy variables for Estonian and Lithuanian firms (Latvian firms are the base case). Model 2 replaces the country dummy variables with country*region dummy variables (with Kurzeme, Latvia, as the omitted category). Model 3 drops statistically insignificant determinants.
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.

Another strong determinant of involvement in the shadow economy is firm size, with smaller firms engaging in more shadow activity than larger firms, although the descriptive statistics suggest the relation may be non-monotonic. Firm age, although not statistically significant, 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 are not statistically significant but suggest that firms in the construction sector tend to engage in more shadow activity. There is no evidence of an association between shadow activity and the average wage paid by a firm or a firm’s change in profits (or employees or turnover).

In addition to estimating the size of shadow economy and its influential factors, we also elicited entrepreneurs’ opinions regarding various aspects of the shadow economy in the Baltic countries. We believe that some of these data might be useful to policy makers, at least as complementary information.

We asked entrepreneurs a number of questions about the motivation for participating in tax evasion. Entrepreneurs were presented with various statements, which they were asked to assess on a 1-7 scale, where ‘1’ represents ‘completely agree’ and ‘7’ represents ‘completely disagree’. The results are summarised in Figure 35.

Interestingly, even though the size of the shadow economy has decreased considerably in Latvia compared to 2011, entrepreneurs’ attitudes in 2012 are very similar to those in 2011. Latvian companies continue to emphasise tax evasion as a possible tool to ensure competitiveness (and survival) of the firm. For example, in response to the statement “to ensure successful performance of a company (including survival) it is much more important to have an appropriate product than to evade taxes”, both Estonian and Lithuanian entrepreneurs reported more towards ‘1 completely agree’ (1.6 and 1.4 in 2012; 1.6 and 1.7 in 2011), whereas the average response from Latvian entrepreneurs in 2012 was 3.0 (3.5 in 2011). Also, Latvian entrepreneurs, relative to Estonian and Lithuanian entrepreneurs, tend to agree with the statement that evading taxes is necessary to survive (response scores of 3.9 in Latvia, 5.1 in Lithuania and 5.2 in Estonia in 2012, compared to 3.8 in Latvia, 4.8 in Lithuania and 5.0 in Estonia in 2011). Furthermore, Latvian entrepreneurs are more inclined to link higher levels of tax evasion with lower past performance. Finally, entrepreneurs from all three Baltic countries seem to agree that performance of their companies very much depends on the economic situation in the country.
Entrepreneurs' attitudes regarding shadow activities

Performance of companies in your industry is very much influenced by their choice to pay or evade taxes: by evading taxes firms in your industry considerably increase their profits.

Performance of your company very much depends on the economic situation in the country: your company performs considerably better during economic growth, but during economic recession performance gets considerably worse.

To ensure successful performance of a company (including survival) it is much more important to have appropriate product and business strategies than to evade taxes.

Tax evasion is primarily entrepreneurs’ response to what they believe are incorrect actions by the State with regard to promoting entrepreneurship.

Entrepreneurs in Latvia trust the Government, and believe that their tax money is spent appropriately.

Whenever possible, entrepreneurs will try to decrease their business costs, which also includes evading taxes, regardless of the nature of the Government’s entrepreneurship policy in Latvia (state support, tax legislation, etc.).

Whenever possible, entrepreneurs will try to decrease their business costs, which also includes evading taxes, regardless of how their company performs.

Entrepreneurs in your industry evade taxes because this is the only way to survive.

Firms in your industry tend to evade taxes more if they are having relatively bad times (for instance, decrease in profits or turnover in comparison to previous years).

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 in previous studies to be effective in eliciting relatively truthful responses. The Index combines estimates of misreported business income, unreported or hidden employees, as well as unreported “envelope” wages to obtain estimates of the shadow economies as a proportion of GDP. This report is the third in the series and focuses on the shadow economy estimates for the year 2012, as well as trends during the years 2009-2012.

One of the key findings of this report is that Latvia has experienced a considerable decrease in the size of its shadow economy in 2012. This is the second consecutive year in which the Latvian shadow economy has contracted and as a result it has brought the size of the Latvian shadow economy as a proportion of GDP to similar levels as neighbouring Estonia and Lithuania. In 2012 the estimated sizes of the Estonian and Lithuanian shadow economies are 19.2% and 18.2% of GDP, respectively, and the Latvian shadow economy is only marginally larger at an estimated 21.1% of GDP. This is a stark contrast to the situation in 2009, when the size of the Latvian shadow economy was estimated to be almost twice that of Estonia and Lithuania. The sizes of the Estonian and Lithuanian shadow economies have not changed significantly in 2012.

Interestingly, the dynamics of the shadow economies in the Baltic countries during the period 2009-2012 appear to reflect macroeconomic conditions. For example, in 2009, when the Latvian shadow economy was estimated to be considerably larger than that of Estonia and Lithuania, the macroeconomic conditions in Latvia were also considerably more adverse: real GDP was falling at a rate of 17.7% p.a. compared to 14.1% in Estonia and 14.8% in Lithuania, and unemployment in Latvia was 17.5% compared to 13.8% in Estonia and 13.7% in Lithuania. In 2012, the shadow economies are estimated as being more similar in size and the macroeconomic conditions also display less disparity: real GDP is growing at a rate of 5.6% p.a. in Latvia, 3.2% in Estonia and 3.6% in Lithuania, and unemployment in Latvia is 14.9% compared to 9.8% in Estonia and 13.2% in Lithuania. These observations are consistent with the notion that some proportion of shadow sector activity is a natural response to difficult times in the business environment. Latvia was hit the hardest in the recent crisis, causing a relatively large amount of shadow activity during the crisis period, which has subsequently contracted towards more “normal” levels as the economy recovers. Additionally, deliberate policy efforts aimed at reducing shadow sector activity in Latvia may have also contributed to the decrease.

The dynamics of the SSE Riga Shadow Economy Index are consistent with estimates from other studies that use different estimation methods, e.g., Schneider (2013). This increases the confidence one can place in the overall conclusions about the Baltic shadow economies. An advantage of our approach is that we are able to provide more detailed information on the components and determinants of the shadow economy. The micro-level evidence suggests that the decline in the size of the shadow economy in Latvia has been driven mainly by decreases in underreporting of business profits, followed by decreasing envelope wages. The Vidzeme region, and the retail, services and construction sectors have seen the most significant improvements. Large firms have also experienced a considerable improvement in the amount of misreporting and tax evasion. Finally, the increasing satisfaction of Latvian entrepreneurs with the State Revenue Service (SRS) may account for some of the reduction in the level of the Latvian shadow economy.
The results of our analysis also indicate a number of areas for improvement in each of the Baltic countries. First, envelope wages continue to make up a large component of the shadow economies in all three countries: they account for 52.3% of the shadow economy in Estonia, 42.9% in Latvia and 39.3% in Lithuania. The next largest component is unreported business income. Therefore, targeting these component of the shadow economies, has the potential to create a significant decrease in the size of the shadow economies overall.

Second, dissatisfaction with government, tax policy, and business legislation is still relatively high across all three countries. Third, bribery in association with government contracts has increased in all three countries in 2012.

There are also a number of country-specific areas of concern. In Latvia, shadow activity is particularly high among small companies. Also, Latvian entrepreneurs are still more dissatisfied with tax policy and the SRS than entrepreneurs in the other two countries, which is likely to contribute to the marginally larger shadow economy in Latvia. In Estonia, shadow activity is particularly high in the construction sector. Also, Estonian entrepreneurs perceive the risk of being caught for misreporting business income, paying envelope wages and paying bribes as being considerably lower than entrepreneurs in the other two countries. These perceptions are likely to contribute to shadow activity in Estonia. In Lithuania, shadow activity is particularly high in the Siaulių region as well as construction and services companies. A recent concern in Lithuania is the increasing level of general bribery, which has grown from 9.3% of revenue in 2010 to 14% in 2012. In contrast, neither Latvia nor Estonia has had an increase in the level of general bribery during this period.

This year’s study confirms some of our previous findings regarding what makes Baltic entrepreneurs more likely to operate in the shadow sector and adds some new ones. 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. We also find that smaller, younger firms engage in proportionally more shadow activity than larger, older firms, consistent with the anecdotal evidence that tax evasion is used by firms to gain a competitive edge, and that having an edge is important in competing in an established market. Finally, the level of tax evasion and deliberate misreporting among Baltic companies is responsive to the perceived probabilities of being caught and to the expected penalties for being caught. In particular, companies that perceive the probability of being caught as being higher tend to engage in less shadow activity.

The findings of this study suggest a number of approaches for policymakers to reduce the size of the Baltic shadow economies. First, reducing dissatisfaction with the tax system is likely to decrease the size of the shadow economies. Addressing this issue could involve actions such as making tax policy more stable (less frequent changes in procedures and tax rates), making taxes more “fair” from the perspective of businesses and employees, and increasing the transparency with which taxes are spent. Second, increasing the probability of detection is expected to reduce shadow activity. This could be achieved 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.

References


Gerzhanli, K. (2007): “Did you pay your taxes?” How (not) to conduct tax evasion surveys in transition countries, in Social Indicators Research, 80, pp. 555-582.


Appendix 1: Questionnaire form used in 2013

Entrepreneurs' satisfaction with government policy / informal entrepreneurship in the Baltic countries

My name is __________ from the Stockholm School of Economics in Riga (SSE Riga). We are conducting a survey aimed at understanding entrepreneurs’ satisfaction with government policy in Latvia (Lithuania, Estonia). The main interest of the study is to find out to what extent entrepreneurs are happy with the government's activity as well as how government policy influences entrepreneurial behaviour, including tax avoidance.

I would like to emphasize that we are only interested in your expert opinion and in no way are we indicating, for instance, that your company is involved in any type of tax avoidance activities.

The interview will last approximately 15 minutes. We guarantee 100% confidentiality as neither your name nor your company’s name will appear in the data analysis. Data will be analysed using a computer program without any reference to the data source. If you are interested, we can also send you the summary of the survey results once the survey is complete.

If respondent hesitates or says ‘no’: This survey is very important to foster the knowledge about the entrepreneurship in Latvia (Lithuania, Estonia). By participating in this survey you are helping to improve such knowledge. All your answers will be 100% confidential and no one will be able to track you or your company. Moreover we are interested in your expert opinion and what you say will be attributed to the industry or your competitors, not your firm.

1. Please evaluate your satisfaction with the performance of the State Revenue Service in Latvia (Lithuania, Estonia) with regards to tax administration in 2012.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unsatisfied</td>
<td>Unsatisfied</td>
<td>Neither satisfied nor unsatisfied</td>
<td>Satisfied</td>
<td>Very satisfied</td>
</tr>
</tbody>
</table>

2. Please evaluate your satisfaction with the government’s tax policy in Latvia (Lithuania, Estonia) in 2012.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unsatisfied</td>
<td>Unsatisfied</td>
<td>Neither satisfied nor unsatisfied</td>
<td>Satisfied</td>
<td>Very satisfied</td>
</tr>
</tbody>
</table>

3. Please evaluate your satisfaction with the quality of business legislation in Latvia (Lithuania, Estonia) in 2012.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unsatisfied</td>
<td>Unsatisfied</td>
<td>Neither satisfied nor unsatisfied</td>
<td>Satisfied</td>
<td>Very satisfied</td>
</tr>
</tbody>
</table>

4. Please evaluate your satisfaction with the government’s support to entrepreneurs in Latvia (Lithuania, Estonia) in 2012.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unsatisfied</td>
<td>Unsatisfied</td>
<td>Neither satisfied nor unsatisfied</td>
<td>Satisfied</td>
<td>Very satisfied</td>
</tr>
</tbody>
</table>

5. Tax avoidance is tolerated behaviour in Latvia (Lithuania, Estonia).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely disagree</td>
<td>Disagree</td>
<td>Neither agree nor disagree</td>
<td>Agree</td>
<td>Completely agree</td>
</tr>
</tbody>
</table>

6. Bribery is tolerated behaviour in Latvia (Lithuania, Estonia).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely disagree</td>
<td>Disagree</td>
<td>Neither agree nor disagree</td>
<td>Agree</td>
<td>Completely agree</td>
</tr>
</tbody>
</table>

Government policy and amount of informal business

7. Please estimate the approximate degree of underreporting business income by firms in your industry in 2012: Firms underreported business income by approximately \( \% \) in 2012.

8. Please estimate the approximate degree of underreporting business income by firms in your industry in the previous year (2011): Firms underreported business income by approximately \( \% \) in 2011.

9. Please estimate the approximate degree of underreporting number of employees by firms in your industry in 2012: Firms underreported approximately \( \% \) of the actual number of employees in 2012.

10. Please estimate the approximate degree of underreporting number of employees by firms in your industry in the previous year (2011): Firms underreported approximately \( \% \) of the actual number of employees in 2011.

11. Please estimate the approximate degree of underreporting salaries paid to employees by companies in your industry in 2012 (for instance, if in reality an employee receives EUR 400, but the reported salary is EUR 100, then underreporting is 75%, if EUR 400 and EUR 200, then underreporting is 50%): Firms underreported actual salaries by approximately \( \% \) in 2012.

12. Please estimate the approximate degree of underreporting salaries paid to employees by companies in your industry in 2011. Firms underreported actual salaries by approximately \( \% \) in 2011.
13. On average, approximately what percent of revenue (turnover) did firms in your industry pay in unofficial payments to ‘get things done’ in 2012? In 2012 firms paid approximately \[ \_\_]% of their revenue in order to get things done.

14. On average, approximately what percent of revenue (turnover) did firms in your industry pay in unofficial payments to ‘get things done’ in 2011? In 2011 firms paid approximately \[ \_\_]% of their revenue in order to get things done.

15. When other firms in your industry do business with the government, approximately how much of the contract value would firms typically offer in unofficial payments to ‘secure’ the contract? (year 2012) \[ \_\_]%

16. For a typical company in your industry, what would you say is the approximate probability (0-100%) of being caught if the company were to:
   (i) underreport its business income? \[ \_\_]%
   (ii) underreport its number of employees? \[ \_\_]%
   (iii) underreport the amount it pays to employees in salaries? \[ \_\_]%
   (iv) make unofficial payments to ‘get things done’? \[ \_\_]%

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

<table>
<thead>
<tr>
<th>Nothing serious</th>
<th>A small fine</th>
<th>A serious fine that would affect the competitiveness of the company</th>
<th>A serious fine that would put the company at risk of insolvency</th>
<th>The company would be forced to cease operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

18. What is the approximate percentage change in your net sales profit, sales turnover and total employment in 2012 compared to 2011? For example: +20%, –15%, 0 (no change)

<table>
<thead>
<tr>
<th>Change (increase or decrease in %)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>as compared to 2011.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For example:</td>
<td>+20%, –15%, 0 (no change)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. Do you consider that businesses such as yours contribute to the growth of the Latvian (Estonian, Lithuanian) economy and society in general?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, to a very large extent</td>
<td>Yes, to a large extent</td>
<td>Yes, to some extent</td>
<td>Yes, but very little</td>
<td>No</td>
</tr>
</tbody>
</table>

20. Has your company been involved in sponsorship for social needs (for example, hospitals, social organisations, sport) during 2012? If so, approximately what percentage of your annual after-tax profits was spent on sponsorship during 2011? \[ \_\_]% (0-100 from annual profits after taxes)

21. How many years of business management experience do you have? \[ \_\_] years

22. In which year did your company start operation? \[ \_\_] Year

23. What is the main activity (i.e. sector) that your company is engaged in?
   - Manufacturing
   - Wholesale
   - Retail
   - Services (please specify)
   - Construction
   - Other, please specify

24. What is the highest level of education you have attained?
   - Primary school
   - Vocational education
   - Vocational secondary education
   - Secondary school education
   - Undergraduate (Bachelor’s degree or equivalent)
   - Engineering degree
   - Master’s degree
   - PhD degree
   - Other, please specify

25. What was the operating profit of your company in 2012? \[ \_\_] EUR

26. How many employees are currently employed in your company (full time equivalent, including you)? \[ \_\_] employees

27. Approximately what was the average reported salary in your company in 2012? \[ \_\_] EUR / month

28. In which region does your company conduct most of its business? (note: different list of regions for Lithuania and Estonia)
   - Riga
   - Kurzeme
   - Vidzeme
   - Zemgale
   - Latgale
**Appendix 1:** Questionnaire form used in 2013

**Thank you!**

**Firms in your industry tend to evade taxes more if they are having relatively bad times (for instance, decrease in profits or turnover in comparison to previous years):**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>entrepreneurs</td>
<td>evade</td>
<td>taxes</td>
<td>because</td>
<td>this</td>
<td>is</td>
<td>the</td>
</tr>
<tr>
<td>entrepreneurs</td>
<td>will</td>
<td>try</td>
<td>to</td>
<td>decrease</td>
<td>their</td>
<td>business</td>
</tr>
<tr>
<td>entrepreneurs</td>
<td>in</td>
<td>Latvia</td>
<td>(Estonia,</td>
<td>Lithuanian)</td>
<td>trust</td>
<td>the</td>
</tr>
<tr>
<td>Tax</td>
<td>evasion</td>
<td>is</td>
<td>primarily</td>
<td>entrepreneurs’</td>
<td>response</td>
<td>to</td>
</tr>
<tr>
<td>To</td>
<td>ensure</td>
<td>successful</td>
<td>performance</td>
<td>of</td>
<td>a</td>
<td>company</td>
</tr>
<tr>
<td>Performance</td>
<td>of</td>
<td>your</td>
<td>company</td>
<td>very</td>
<td>much</td>
<td>depends</td>
</tr>
<tr>
<td>Performance</td>
<td>of</td>
<td>companies</td>
<td>in</td>
<td>your</td>
<td>industry</td>
<td>is</td>
</tr>
</tbody>
</table>

**Appendix 2:** Regression results

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>30.502***</td>
<td>24.578***</td>
</tr>
<tr>
<td>(4.24)</td>
<td>(2.85)</td>
<td>(5.60)</td>
</tr>
<tr>
<td>D_EE</td>
<td>-2.103</td>
<td>-0.68</td>
</tr>
<tr>
<td>D_LT</td>
<td>-3.026</td>
<td>-0.99</td>
</tr>
<tr>
<td>Tolerance_TaxEvasion</td>
<td>1.781**</td>
<td>1.932**</td>
</tr>
<tr>
<td>(2.28)</td>
<td>(2.38)</td>
<td>(3.64)</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-1.738*</td>
<td>-2.022**</td>
</tr>
<tr>
<td>(-1.78)</td>
<td>(-2.36)</td>
<td>(-2.86)</td>
</tr>
<tr>
<td>DetectionProbability</td>
<td>-3.847***</td>
<td>-3.040***</td>
</tr>
<tr>
<td>(-2.79)</td>
<td>(-2.81)</td>
<td>(-2.96)</td>
</tr>
<tr>
<td>ln(FirmAge)</td>
<td>-0.144</td>
<td>-0.049</td>
</tr>
<tr>
<td>(-0.15)</td>
<td>(-0.05)</td>
<td></td>
</tr>
<tr>
<td>ln(Employees)</td>
<td>-1.976</td>
<td>-0.715</td>
</tr>
<tr>
<td>(-0.98)</td>
<td>(-0.33)</td>
<td></td>
</tr>
<tr>
<td>ln(FirmAge)</td>
<td>-1.458***</td>
<td>-1.335***</td>
</tr>
<tr>
<td>(-2.18)</td>
<td>(-1.86)</td>
<td>(-2.21)</td>
</tr>
</tbody>
</table>

**Determinants of firms’ involvement in shadow activity.**

This table reports coefficients from regressions of firms’ unreported proportion of production in 2012 (dependent variable; see Section 2 for details of calculation) on various determinants of shadow activity, using the pooled sample of Estonian, Latvian, and Lithuanian firms. D_EE, and D_LT are dummy variables for Estonian and Lithuanian firms, respectively (Latvian firms are the omitted category). Tolerance_TaxEvasion is the firm’s response to Question 5, with higher scores indicating more tolerance. Satisfaction is the first principal component of the firm’s responses to Questions 1-4, with higher scores indicating higher satisfaction with the country’s tax system and government. DetectionProbability and PenaltyForDetection measure the firm’s perception of the probability of being caught for shadow activity and the severity of penalties conditional on being caught (calculated as the first principal component of responses to Questions 16(i)-16(iv), and the response to Question 17, respectively). ln(FirmAge) and ln(Employees) are the natural logarithms of the firm’s age in years and its number of employees. AverageWage is the average monthly salary in EUR paid by the firm. ChangeInProfit is the firm’s percentage change in net sales profit from 2011 to 2012. D_Wholesale to D_OtherSector are sector dummy variables with manufacturing as the omitted category. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels. T-statistics are reported in parentheses.
The Centre for Sustainable Business at SSE Riga

The Centre works in the areas of research, training, and popularising sustainable business activities in the Baltic countries.