

How thick is the envelope? Worker-level estimates of undeclared earnings in Latvia and Estonia before, during and after the crisis

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Introduction

- ▶ The size of Latvia's informal economy was estimated at 24% of GDP in 2015 (Schneider, 2015).
- ▶ Putniņš & Sauka (2017) estimate that in 2016, among Baltic countries, the shadow economy is still largest in Latvia (20.3% of GDP), followed by Lithuania (16.5%) and then Estonia (15.4%).
- ▶ Widespread phenomenon of "envelope wages": part of workers' pay is received informally, in the form of undeclared earnings. In Putniņš & Sauka (2017), envelope wages represent one of the largest components of the shadow economy.
- ▶ Special Eurobarometer 402 (2014) showed that, among EU countries, Latvia had the highest share of workers who report receiving envelope wages.

Introduction

- ▶ Previous research on undeclared earnings in EU countries (Merrikull and Staehr, 2010; Williams and Padmore, 2013; Williams and Horodnic, 2015; etc.) relies on surveys asking respondents directly about the size of their undeclared earnings.
- ▶ In this paper (a background study for OECD Reviews of Labour Market and Social Policies Latvia, 2016), we suggest a new method of estimating undeclared earnings at employee level, based on EU-SILC data.
- ▶ Our method:
 - ▶ we identify informal employees as employees with positive earnings for whom SSC has not been paid
 - ▶ for other employees, declared earnings are identified using SSC and compared with earnings provided by the respondent in the survey.

Presentation plan

1. Methodolgy
2. Results

Methodology

- ▶ Make use of EU-SILC data for Estonia and Latvia.
- ▶ Major differences between the two countries:
 - ▶ in Latvia, respondent-reported earnings are compared to administrative data; the latter are included in the dataset if they are larger and in the cases of non-response. The Estonian SILC relied (until 2013) only on self-reported earnings (+ imputation for non-response).
 - ▶ **in Latvia, SSC come from administrative data while in Estonia they are self-reported (this appears to be a major problem for Estonian estimates).**
 - ▶ in Latvia, we deduce mandatory social security contributions by substrating optional contributions from total ones; in Estonia, SSC reported in the survey are mandatory ones;
 - ▶ in Latvia, we can identify individuals who worked abroad; this is not possible for Estonia.

Methodology

- ▶ EU-SILC variables used: employee gross and net earnings; employer's social insurance contributions; optional employer's social insurance contributions.
- ▶ Additional survey items used for Latvia: "Did the respondent during the income reference period gain some earnings abroad?". Respondents with earnings abroad are excluded from the analysis.
- ▶ Additional SRS data for Latvia: employee earnings from microenterprises and share of these earnings in total declared earnings.
- ▶ Informal employees are defined as individuals with gross earnings > 0 , that equal net earnings, for whom employers did not pay any SSC and whose microenterprise earnings are 0.

Methodology

Estimating employee earnings (in all jobs) during the last calendar year last calendar year in the Latvian and Estonian national EU-SILC data, 2008-2013

Data collection method or EU-SILC variable	Data content and/or calculation formula	
	Latvia	Estonia
Survey item	E1: net earnings	E1: net earnings
Administrative (SRS) data	E2: net earnings	None
Statistical imputation	E3, only when E1 is missing (non-response) and E2 is missing as well (no earnings recorded in SRS)	E3, only when E1 is missing (non-response)
SILC, net earnings	E1 if E2 missing or $E1 > E2$; E2 if E1 missing or $E2 > E1$; E3 if both E1 & E2 missing	E1 or E3

Methodology

- ▶ When survey-based earnings are recorded, derive declared earnings using SSC and then estimate envelope. For informal workers, declared earnings are 0.
- ▶ We also derive declared earnings for microenterprise workers (in Latvia).
- ▶ We get an estimate of undeclared earnings if earnings recorded in SILC exceed estimated declared ones.

Methodology

- ▶ When survey-based earnings are imputed rather than provided by the respondent, we combine two methods. We estimate the "envelope share" by using the rotating panel structure of SILC and by applying several rounds of statistical matching to find a similar respondent with estimated envelope share:
 - ▶ first round: match by year, education, gender and industry
 - ▶ second round: replace industry with ethnicity, citizenship, establishment size, type of contract and main group of occupations
 - ▶ third round: drop the three latter variables but include the region.

Results

Estimated prevalence of undeclared earnings in Latvia and Estonia (% of employees)

	Envelope share in annual earnings					
		Latvia			Estonia*	
	$\geq 25\%$	$\geq 50\%$	100%	$\geq 25\%$	$\geq 50\%$	100%
2007	42.3	24.6	8.0	3.9	3.5	3.2
2008	34.9	19.2	7.7	2.8	2.6	2.4
2009	36.3	20.4	8.2	1.8	1.5	0.9
2010	39.1	24.5	8.9	1.1	0.8	0.7
2011	31.8	17.5	5.6	1.2	1.1	0.6
2012	32.2	17.2	6.3	1.6	1.5	1.5

* Estonian figures appear are significantly underestimated, likely because SSC are self-reported.

Source: Calculation with EU-SILC microdata 2008-2013.

Results

- ▶ Informal employment and high shares of envelope earnings are more recurrent in Latvia than in Estonia.
- ▶ This result is consistent with previous studies (Merrikull and Staehr, 2010; Williams and Padmore, 2013; Williams and Horodnic, 2015).
- ▶ However, for Latvia, our paper shows higher prevalence of envelope wages and higher envelope shares than previous research.
- ▶ On the aggregate level, our estimates for Latvia are consistent with those of Putnins and Sauka (2015).

Results

- ▶ For Estonia, our estimates are in line with Williams and Padmore (2013) though somehow lower than in Williams and Horodnic (2015) for 2012.
- ▶ However, our estimates for Estonia are well below those in Paulus (2015) for 2008 and those of the Estonian Institute of Economic Research (2016) for 2007-2012.
- ▶ This may be due to the different collection method of SSC data between Latvian (administrative SRS) and Estonian (questions to the respondents) SILC for 2008-2013.
- ▶ We conclude that our method works well only when EU-SILC data collection procedure includes use of administrative data.

Results

- ▶ In the following, we report results of econometric analysis of Latvian data.
- ▶ Estimate several ordered probit models with dependent variable based on either envelope share or the absolute size of envelope earnings.

Results

	Envelope share			Amount of envelope wage
	Model 1	Model 2	Model 3	Model 3
Female	-.2505***	-.3282***	-.2850***	-.2436***
Education level				
Low education level	.1301***	.0794***	.1079***	.0398*
Post-secondary education	-.0500*	-.0453*	-.0479*	-.0695**
Tertiary education	-.1705***	-.0891***	-.1369***	-.1063***
Experience	-.0227***	-.0179***	-.0208***	-.0150***
Age	.0123***	.0082***	.0106***	.0052***
With partner	-.0567***	-.0391**	-.03491***	-.0161
With kids	-.0196	-.0164	-.0145	-.0185
Ethnicity & citizenship				
Non-Latvian, LV citizen	.0735***	.0517***	.0650***	.0261
Non-Latvian, not LV citizen	.1304***	.1029***	.1198***	.1064***
Chronic illness	-.1293***	-.1452***	-.1371***	-.0975***
Region				
Vidzeme	-.1341***	-.1661***	-.1482***	-.1325***
Kurzeme	-.0880***	-.1205***	-.1026***	-.0548*
Zemgale	-.0383	-.0603**	-.0480*	-.0266
Latgale	-.1189***	-.2029***	-.1552***	-.1288***
Log gross earnings		-.3334***		
Log net earnings			-.1502***	-.0558***

Source: Calculation with EU-SILC microdata 2008-2013.

Results

	Envelope share			Amount of envelope wage
	Model 1	Model 2	Model 3	Model 3
Establishment size				
6-10	.0087	.0317	.0184	.0287
11-49	-.0895***	-.0416*	-.0701***	-.0432*
50+	-.4006***	-.2968***	-.3593***	-.3023***
Contract, current/last job				
Temporary	.5488***	.4187***	.4945***	.2431***
None	.4837***	.4471***	.4709***	.2084***
Occupation (vs. elementary)				
Managers	-.1964***	.0092	-.1069***	.0007
Professionals	-.2314***	-.0648**	-.1600***	-.1143***
Technicians	-.1262***	-.0131	-.0777***	-.0465
Clerical support workers	-.2459***	-.1497***	-.2059***	-.1092***
Services and sales workers	-.1256***	-.0745***	-.1036***	-.0536
Skilled agricultural workers	.1502***	.1659***	.1588***	.2012***
Craft workers	-.0064	.0582**	.0224	.0393
Plant and machine operators	-.1195***	-.0444	-.0868***	-.0255
Part-time worker				
Switching	.1034	-.0301	.0460	-.0540
Part-time	.0774**	-.1525***	-.0216	-.1048***

Source: Calculation with EU-SILC microdata 2008-2013.

Results

	Envelope share			Amount of envelope wage
	Model 1	Model 2	Model 3	Model 3
Sector (top 10, vs. Forestry)				
A1_AgrFish	-.0996	-.1663**	-.1295**	-.1202
C_Manuf	-.2825***	-.3223***	-.3021***	-.1985***
F_Construction	-.0190	-.0235	-.0221	.0038
G_Trade	-.2752***	-.3111***	-.2932***	-.1721***
H_Land Transport	-.1850***	-.1511**	-.1718***	-.1771**
I_Accom&Food	.0143	-.03497	-.0147	.0657
J_Info&Comm	-.3663***	-.3565***	-.3658***	-.3076***
M_Professional services	-.1386***	-.1613**	-.1489**	-.0772
N_Admin	-.2191***	-.2721***	-.2446***	-.2313***
STU_OthServ	.2194***	.1748***	.2017***	.1587*
Year (vs. 2007)				
2008	-.3055***	-.3017***	-.3030***	-.3560***
2009	-.2588***	-.3290***	-.2890***	-.3767***
2010	-.0850***	-.1737***	-.1277***	-.1767***
2011	-.2730***	-.3547***	-.3136***	-.3134***
2012	-.2624***	-.3274***	-.2951***	-.2777***

Source: Calculation with EU-SILC microdata 2008-2013.

Results

- ▶ Envelope wages tend to be larger for men and for single individuals. They decrease with education level and labor market experience but increase with age (when experience is not controlled for, the envelope share decreases with age, as in found in other studies).
- ▶ Envelope wages decrease with earnings, they are larger for non-Latvians (especially those without Latvian citizenship), in Riga and its surroundings.
- ▶ They are smaller for persons with limitations in activities or chronic illnesses.
- ▶ Envelope wages are larger in establishments with up to 10 workers, among employees with fixed-term contracts and among manual workers.

Results

- ▶ As far as sectors of economic activity are concerned, the thickest envelopes are found in Agriculture, Construction, Forestry, Accommodation and Food services, Technical, Research and other professional activities. These are followed by Land Transport, Administrative and Support Service activities, Personal Services, Trade, Manufacturing, Information and Communication.
- ▶ Finally, envelope wages are smaller starting from 2008 than in the growth period. The temporary increase when recovery started (2010) was overturned by introduction of the Microenterprise tax regime in 2011

Conclusions

- ▶ We provide estimates of earnings under-reporting in Latvia and Estonia based on a methodology that relies on EU-SILC microdata.
- ▶ Our estimates cover pre-crisis, crisis and post-crisis periods and suggest pro-cyclical nature of the share of envelope wages.

Conclusions

- ▶ For Estonia, our results provide a lower bound estimate as SSC were self-reported in Estonian SILC microdata data until 2013.
- ▶ Further research can explore more recent Estonian data: Estonia started to use registry data for SSC in 2014.
- ▶ Overall, our paper proposes a new methodology to estimate envelope wages. This methodology works well on Latvian data. The analysis can be extended to more countries for which SSC data rely on administrative sources.
- ▶ Our results support the idea of combining administrative and survey data in analysis of tax evasion.