

Title: Diversity of motivations to engage in tax evasion in Hungary

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Abstract

Hungary's, like many other countries', failure to effectively address tax evasion is partially due to simplistic views on tax evasion which fail to recognise the diversity of phenomenon. This paper identifies types of tax evaders and explores their divergent motivations for evading taxation. The data derives from two large-scale population surveys conducted in 2008 and 2012 in Hungary. Cluster analysis captured two distinct types of tax evaders: 1) poverty escape-type and 2) better-off fake entrepreneurship-type, partially confirming existing typologies. Logistic regression analysis reveals that these two groups are characterised by distinct motivations to evade taxation: the first group acts predominantly out of necessity; the second group's choice is primarily driven by rational calculation.

Keywords: hidden employment, unreported employment, tax evasion typology, motivations for evasion

1. Introduction

Taxation is one of the primary means of interaction between state and its citizens. Evading all or some of the duties to pay one's taxes may be a rational decision, but may also reflect citizens' detachment from the common good or simply the public services they receive from the state. Tax evasion and the corresponding hidden employment are diverse phenomena concerning people of different socio-economic status and different motivations. Failing to recognise this diversity not only limits clear understanding of the phenomena, but also cripples effective policy response.

Hungary, like many developed countries, aims to tackle tax evasion primarily based on a deterrent strategy implicitly assuming that tax evasion is a rational decision whereby the probability of detection and the amount of fines play the main roles. The country, like many of its peers, have failed to address its tax evasion problems at least partially due to the excessive reliance on a deterrence approach. Even policies which succeeded in a narrow budgetary sense most likely have had adverse consequences for the poor and micro enterprises. More unique is the way in which Hungary was touched by the global economic crisis and the series of policy shocks impacting on tax evasion behaviour and creating a generally uncertain regulatory environment. A large and ill-treated tax evasion and hidden employment problem make Hungary an excellent case for exploring the diversity of motivations to evade taxation.

This paper seeks to explore two research questions in the case of Hungary, but bearing interesting conclusions for a wider set of countries:

1. What kind of distinct types of hidden employment can be identified if any?
2. Do these types of evaders differ in their motivations to engage in hidden employment?

Using data from two large scale population surveys conducted in 2008 and 2012 in Hungary, our empirical evidence points at two conclusions. First, we identified two distinct types of tax evaders: 1) poverty escape-type and 2) better-off fake entrepreneurship-type. This partially confirms the typology deriving from qualitative studies conducted in other countries (e.g. Pfau-Effinger, 2009). These groups differ in terms of tax evasion technology (cash-in-hand versus false invoicing) and socio-economic variables (e.g. income). Second, these two groups display fundamentally different motivations to evade taxation: 1) the poverty escape type acts predominantly under the influence of necessity and considerations of tax morale; 2) while the better-off fake entrepreneurship type's choice to engage in tax evasion is primarily driven by rational calculation. Our main contribution to the literature lies in the rigorous statistical identification of hidden employment types and the comparison of their motivations calling for further research into the diversity of tax evasion.

The paper is structured as follows: first, the theoretical background is outlined providing basic definitions and hypotheses to test. Second, the two surveys, the resulting data, and key variables are discussed. Third, clustering and regression results are presented. Finally, discussion of findings and conclusions are offered.

2. Theoretical background

There are two underlying definitions of this study. First, hidden or shadow economy is defined in the following way: Those regular economic activities which are legal in their substantive nature, but are not registered partially or completely with the statistical office or the tax authorities. These economic activities also involve payments in kind or in financial terms. This definition is in correspondence with Feige (1990) and OECD (2005). It clearly excludes all those activities which are based on favours help only or which are not regular. Second, the definition of hidden employment directly follows from the above:

Those regular employment relationships whose production process and output are legal by nature, but which are partially or completely not reported to the statistical office or the tax authorities. These employment relations also involve payments in kind or in financial terms.

These definitions consider tax evasion irrespective of the intentions of the actors, this is because intentionality is a complicated matter (Braithwaite & Wenzel, 2008) not the least because researchers, tax payers, and tax authorities tend to have distinctively different interpretations of what counts as tax evasion (Elffers, Robben, & Hessing, 1991; Elffers, Weigel, & Hessing, 1987).

While, by far, there is no scientific consensus about the list of factors determining tax evasion behaviour, our thorough review of the literature identified three major groups of factors impacting on tax evasion behaviour corresponding to dominant scientific views on tax evasion:

- A) External coercion,
- B) Intrinsic motivation, and
- C) Direct exchange.

Factors of external coercion reflect the view that taxpaying has no intrinsic or exchange value: it is an obligation which individuals try to avoid. These factors correspond to the micro-economic approach of a rational cost-benefit calculation whereby the decision to evade taxation depends on the difference between the expected cost of tax evasion (probability of detection*fine if detected) and the expected benefits (value of unpaid tax)¹ (Allingham & Sandmo, 1972; Alm, 1988; Srinivasan, 1973). While the original model has been extended countless times, its basic setup and the key variables remained the same (Kirchler, Hoelzl, & Wahl, 2008; Schnellenbach, 2010; Slemrod & Yitzhaki, 2002). An important extension for our purposes is the consideration of unemployment impacting on the benefits of tax evasion (Feige & Cebula, 2011). Hence, the following theoretical expectations are developed (only those predictions are highlighted which can be tested later on):

- A1) Higher probability of detection² leads to a lower level of tax evasion.
- A2) Higher fines lead to a lower level of tax evasion.
- A3) Higher risk aversion leads to a lower level of tax evasion.
- A4) Lower incidence of unemployment leads to a lower level of tax evasion.

¹ The cost benefit calculation is carried out in utility terms according to these models. We leave aside this complication in the above discussion to make the text more tractable.

² Probability of detection can be interpreted in an objective sense which route is typically taken by most economic models; however, empirical research points at the persistent divergence of subjective and objective detection probabilities (Fischer, Wartick, & Mark, 1992). Due to our survey setup, we only consider subjective probability.

These predictions which were only partially confirmed by empirical tests (Kirchler, Muehlbacher, Kastlunger, & Wahl, 2010) lay the foundation to a deterrence-based policy approach taken by many governments (Williams, 2009a).

Factors of intrinsic motivation reflect the view that paying taxes has an inherent moral value. These factors correspond to psychological and sociological approaches to tax evasion typically revolving around terms such as tax morale and willingness to pay taxes (Lago-Peñas & Lago-Peñas, 2010; Torgler, 2007). These factors derive from perception of public sector integrity, trust in public institutions and the legal framework, and group norms (Portes & Haller, 2005; Torgler, 2007, 2011). These theories predict that:

- B1) Higher tax morale leads to a lower level of tax evasion.
- B2) Higher perceived public sector integrity leads to a lower level of tax evasion.
- B3) Higher trust in public institutions leads to a lower level of tax evasion.
- B4) Higher trust in the legal framework leads to a lower level of tax evasion.

Factors of direct exchange reflect the view that paying taxes is like an exchange whereby taxpayers directly benefit from public services such as pension or subsidised schooling for which they pay a price (i.e. taxes). These factors are typically discussed by economic sociology, albeit they have received the least attention in the literature. Typical formulation of this group of factors refers to a psychological tax contract between the taxpayer and the tax authorities/the state (Feld & Frey, 2002; see Feld & Frey 2007). While the terms of such a contract are given on the short term in most respects, the literature predicts that

- C1) Higher exchange value of taxpaying leads to a lower level of tax evasion.

While these three groups of determinants of tax evasion decision derive from different scientific perspectives and understandings of taxpaying, it is possible to combine them and explore the interactions among them. One such attempt to reconciling the approach of the rational calculation and tax morale is the slippery slope framework (Kirchler et al., 2008).

While clear predictions follow from the theoretical literature many of which have been at least partially confirmed by the empirical literature, the direction of causality is unclear in most cases. A typical concern relates to the effect of tax morale on tax evasion behaviour revolving around the dilemma between motivation and rationalization (Wenzel, 2005). However, direction of causality may be problematic for factors of rational calculation as tax evading individuals can intentionally manipulate their probability of detection (e.g. investing in 'warm' relationships with local tax inspectors) (e.g. Semjén, Tóth, & Fazekas, 2009).

There is a considerable literature which highlights the diversity of tax evasion and hidden employment in a range of contexts (Fazekas, Medgyesi, & Tóth, 2010; Marcelli, Williams, & Joassart, 2010; Perry et al., 2007; Pfau-Effinger, 2009; Williams & Windebank, 2005). The review of the literature reveals that there are three most often quoted types, even though there are different terms used and there can be disagreements about details:

- Poverty escape type,
- Solidarity, friendship-based type, and
- Better-off entrepreneur type (self-employed or through incorporation).

The poverty escape type (also called survival oriented) encompasses those employees, temporarily employed, and self-employed who are on the periphery of the labour market finding it hard to obtain a regular, full-time job. Typically, they have a low level of education and lower income. This type often would like to have a regular, non-hidden job, but they cannot find it as their skills' labour market value is too low. This also implies that they are in a weak position towards their employers (Perry et al., 2007; Pfau-Effinger, Flaquer, & Jensen, 2009; Pfau-Effinger, 2009; Portes & Haller, 2005; Semjén, Tóth, Fazekas, & Makó, 2009). Employment of this type is hidden primarily because they receive all or some of their wage in unreported cash.

The solidarity, friendship-based type cannot clearly be identified based on socio-economic status and labour market position. Rather, it is defined through the motivations to engage in hidden employment: mutual help between friends and kins, for example employing a poor relative to keep the garden tidy. While this type is occasionally difficult to differentiate from non-market exchange (i.e. relationships outside the scope of our study), it typically involves regular paid exchange using cash in hand (Pfau-Effinger et al., 2009; Pfau-Effinger, 2009; Williams & Windebank, 2005; Williams, 2004).

The better off entrepreneur-type encompasses those self-employed or companies owners who have a stable, non-hidden job clearly indicating that they are not on the periphery of the labour market. For them, hidden employment typically represents secondary income to their full-time job. This type consists of highly educated and higher income individuals who engage in hidden employment primarily based on their own decision (Perry et al., 2007; Pfau-Effinger et al., 2009; Pfau-Effinger, 2009; Portes & Haller, 2005; Williams, 2009b). However, this group may be diverse within itself and can be further divided into sub-groups according to the motivations of the actors such as those who wish to increase employment flexibility (Perry et al., 2007; Portes & Haller, 2005) or those who use hidden employment to support enterprise growth (Williams & Nadin, 2010; Williams, 2009b). Entrepreneurs who engage in hidden employment either pay envelope wages to their employees engage in fake entrepreneurial activities – invoicing instead of receiving salary - to lower their tax burden.

As direct measurement of motivations to engage in hidden employment is problematic and socio-economic characteristics are not sufficient to identify the solidarity, friendship-based type, we only hypothesize two types for our empirical investigation:

- D1. There are two distinct types of hidden employment identifiable by socio-economic status and tax evasion technology: 1) poverty escape type and 2) better-off entrepreneur type.

Beyond the differences in socio-economic status and tax evasion technology, these two groups are also predicted to differ in their motivations for and dominant factors of the decision to engage in hidden employment. The corresponding hypotheses are:

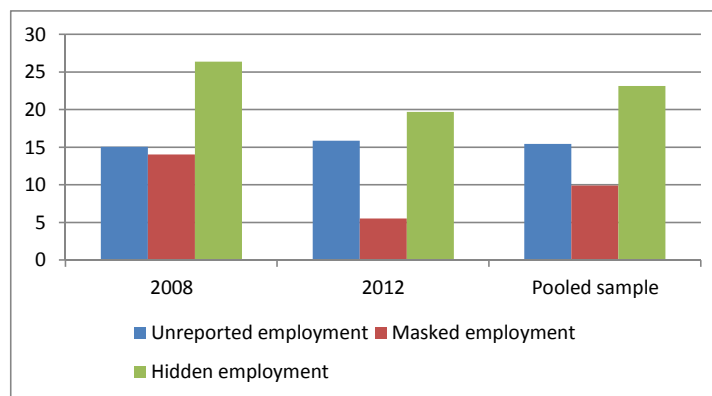
- D2. The poverty escape type engages in hidden employment primarily driven by necessity.
- D3. The better-off entrepreneur type engages in hidden employment as a result of choice influenced by the factors identified above.

3. Data and variables

Our empirical analysis is based on two representative surveys of the Hungarian working age population (those between 18 and 60 years of age). The first survey has been carried out in the second quarter of 2008 on a sample of 1003 respondents, while the second survey has been fielded in the second quarter of 2012 on a sample of 1009 respondents. The two surveys were weighted to represent accurately the gender and age distribution of the Hungarian population.

The survey measured two distinct types of hidden employment: unreported employment and employment masked as contract with a subcontractor. To measure unreported employment the survey asked respondents whether they had work during the two years preceding the survey where the totality or part of their salary was unreported to tax authorities and paid directly to their pocket. To measure “masked” employment another question asked respondents whether they were employed or could have been employed by an employer but earned the whole or part of their pay as a subcontractor (i.e. fake invoicing). In the analysis of motivations we also define an overall measure of participation in informal work, which comprises those who were involved in one of the two forms of hidden employment. The following Figure shows percentages of the sample involved in some form of informal work in the different samples.

Figure 1. Percentage of active aged in different forms of hidden employment during the 2 years preceding the survey (%)



The percentage of those involved in unreported employment is around 15% in both surveys, while the percentage of those who have been working in employment masked as subcontracting declined substantially from 14% to 6% from 2008 to 2012. In the case of this second type of hidden employment there was a minor change in the question wording in the 2012 survey. It is difficult to assess the importance of the change in question wording on the frequency of masked employment. In the following analysis we will most often perform estimations on the pooled sample to avoid difficulties in interpreting changes.

The two surveys contained carefully designed questions to analyse motivations behind the decision to participate in informal work. As outlined in the previous section, hypotheses about motivations can be divided in three broad groups: rationality, tax morale and the exchange value hypothesis. In the following we outline how the role of these motivations were measured in the surveys.

Variables belonging to the rationality theory of motivations are estimated probability of detection, estimated fine in case of detection and risk aversion. To elicit estimates of detection probability, respondents were asked the following question:

“Assume that you haven’t paid taxes after all of your incomes. On response sheet X., you can see a scale ranging from 0 to 100, where 0 means that there are absolutely no chances of being caught, while 100 means that the tax fraud will surely be detected and you will be fined. How likely do you think that you will be caught?”

The question on estimated fines was the following:

“If someone purportedly hides incomes from the tax authority with a tax liability of 100 000HUF, how large a fine will he have to pay (over the 100 000HUF taxes) if detected?”

Categorical measures of detection probability and estimated fine of were derived on the basis of these survey questions. Risk aversion was measured with the following questions (only included in the 2012 survey):

“Imagine that you had 200 000 HUF (on the top of what you normally spend for everyday living) and you have lost half of it (100 000 HUF) in gambling, and you receive an offer of another gamble in which there is 50% chance to win 100 000 HUF (and recover your loss) and 50% chance to loose the remaining 100 000 HUF. Would you:

- a) decline to participate*
- b) take up the gamble*
- c) be indifferent?*

And what if you were offered a gamble with 66% chances of winning 100 000HUF and 33% chances of loosing 100 000HUF? Would you:

- a) decline to participate*
- b) take up the gamble*
- c) be indifferent?”*

Based on these questions we created a risk aversion scale ranging from -2 (strongly risk averse) to +2 (strongly risk lover), where 0 is risk neutral, which was finally recoded to a 3-point scale.

The measurement of tax morale was based on the following survey question:

“If the probability of getting caught in case of tax evasion was zero, how likely is that you would cheat on your taxes?”

- 1) very likely*
- 2) rather likely*
- 3) rather unlikely*
- 4) absolutely unlikely”*

Hypotheses B2, B3 and B4 involve factors that are related to tax morale: public sector integrity, trust in institutions, trust in the legal system. We measured these concepts with the following composite scales.

Perception of corruption (public sector integrity)=political influence on courts³+corruption in police⁴+corruption among state officials⁵+changes in corruption among state officials⁶+need to bribe officials⁷.

Trust in institutions=police provides protection⁸+police is reliable⁹+justice is reliable¹⁰

Trust in legal framework=obedience to law¹¹+importance of traditions¹²+unavoidability of punishment¹³+success and breach of law¹⁴

These scales were finally transformed to 3-point scales. The last concept to measure was satisfaction with public services, use in the test of hypothesis C1. This is also measured by a composite scale, which was finally also transformed to a 3-point scale:

Satisfaction with public institutions=public services¹⁵+law enforcement¹⁶.

³ Agreement with the statement "Court decisions often depend on political influence on judges". (5-point scale)

⁴ Agreement with the statement: "There are honest policemen, but most policemen are corrupt." (5-point scale).

⁵ „According to your opinion how widespread is corruption among state officials in Hungary?" (4-point scale)

⁶ „What do you think, how did the number of corrupt state officials change during the past 3 years?" (3-point scale)

⁷ „Do you think that there are cases, when state officials need to be bribed in order to get something settled?" (3-point scale)

⁸ Agreement with the statement: "Police protects honest people from the dishonest." (5-point scale)

⁹ Agreement with the statement: "The police is powerless against gangsters, one cannot count on the police." (5-point scale)

¹⁰ Agreement with the statement: "Nowadays, too many people escape justice." (5-point scale)

¹¹ Agreement with the statement: "Only good laws should be obeyed." (5-point scale)

¹² Agreement with the statement: "Tradition is more important than law." (5-point scale)

¹³ Agreement with the statement: "One cannot escape punishment for crimes committed." (5-point scale)

¹⁴ Agreement with the statement: "People need to violate some rules if they wish to be successful." (5-point scale)

¹⁵ „How satisfied are you with the way public services (health care, education, police, courts) function in Hungary?" (5-point scale)

¹⁶ „How satisfied are you with the enforcement of laws in Hungary?" (5-point scale)

4. Results

4.1 Identification of hidden employee types

In line with the above theoretical expectations, clustering of tax evaders was carried out using socio-economic characteristics and tax evasion technology:

- Number of months working in the last 12 months;
- Current labour market status: employee, entrepreneur, unemployed, or inactive;
- Highest level of education completed: primary school, vocational school, secondary school, university; and
- Tax evasion technology: cash in hand, or fake invoicing.

Because the survey question on fake invoicing was less reliable in the 2012 wave, we first carried out clustering of the 2008 data and then assigned 2012 respondents to the 2008 cluster centres. Clustering of 2008 data took place in two steps: first, tax evaders were clustered; second, similar non-tax evaders were identified using socio-economic variables only. We used spss statistical programme for carrying out the clustering procedures (two-step clustering for using count and continuous data simultaneously, log-likelihood distance measure) (Bacher, Wenzig, & Vogler, 2004; Schendera, 2010).

Two clusters emerged as statistically reliable encompassing tax evaders according to our theoretical expectations as well as non-tax evaders similar in socio-economic background (Table 1Table 1), goodness of fit measures can be found in Appendix A.

These clusters partially confirm our hypotheses: first, the poverty escape-type is as expected primarily receiving cash in hand, low income, high incidence of unemployment and inactivity, and lower education while hidden income represents the largest part of income earned. Second, the better-off entrepreneur type has only been partially identified according to expectations, hence we had to re-baptise it to better-off fake entrepreneurship-type. This is because this group is predominantly formed of employees who use fake invoices of a company run by someone else. According to expectations this type relies on fake invoicing much more heavily¹⁷, has a higher income, lower incidence of unemployment and inactivity, and higher education. The 'moonlighting' character referred to in the literature (e.g. Pfau-Effinger, 2009) is not characteristic as hidden income amounts to more than 50% of total income for about two-thirds of this type.

¹⁷ Clusters of 2008 data only are much more distinct in terms of tax evasion technology. Somewhat less clear-cut results may come from the different wording of fake invoicing question in the 2012 questionnaire.

Table 1. Descriptive statistics of the two identified clusters, 2008 and 2012

Type	N	Cash in hand in the last 2 years		Fake invoicing in the last 2 years		Cash in hand or fake invoicing in the last 2 years		Average family per capita income	Average number of months spent in employment in the last 12 months
		Resp.	Yes	No	Yes	No	Yes	No	HUF
poverty escape	623	119	504	37	586	141	479	47939	1.0
better-off fake entrepreneurship	1293	176	1117	155	1133	300	984	80093	11.7
Type	Highest level of education completed				Current labour market status				Proportion of those with hidden income more than 50% of total income, only tax evaders
	primary school	vocational school	secondary school	University	Employee	Entrepreneur	Unemployed	inactive	
poverty escape	231	145	200	53	82	4	136	407	85%
better-off fake entrepreneurship	194	396	466	242	1106	119	33	39	68%

Source: *rg_lak_2008* and *rg_lak_2012*

4.2 Motivations to engage in hidden employment

In this section we study determinants of hidden employment in Hungary. We use binary logit models to study the role of different explanatory variables in line with our hypotheses according to the following equations (stata 11.0 was used for performing the analyses):

$$\Pr(INFEMP_i = 1) = \frac{1}{1 + e^{-Z_i}} \quad (1)$$

$$Z_i = \beta_0 + \beta_{2i}RC_i + \beta_{3i}TM_i + \beta_{3k}EV_{ik} + \beta_{1j}X_{ij} + \varepsilon_i \quad (2)$$

Where the dependent variable (*INFEMP*) equals 1, if the individual participated in hidden employment during the 2 years preceding the survey and 0 otherwise. *RC* stands for variables related to rational calculation or external coercion, *TM* are variables relate to tax morale or intrinsic motivation, *EV* are variables related to the exchange value of taxpaying hypothesis, *Xs* are socio-demographic control variables and *βs* are coefficients to be estimated.

Logit models are non-linear multivariate statistical models, and as such estimated coefficients are not as easily interpreted as in the case of linear regression models. Estimated coefficients in OLS models are readily interpreted as partial derivatives, which show the effect of a unit change in a given explanatory variable holding all other explanatory variables constant. In non-linear models the effects of an explanatory variable varies with the level of other explanatory variables. One way to summarise the effect of given variable is to calculate the average of the effects at all combinations of other explanatory variables that can be found in the sample. The following tables contain average marginal effects, which thus show the average in the sample of the effects of a unit change in the given explanatory variable on the probability of individuals participating in undeclared work. We restrict our sample to economically active individuals, because we are not primarily interested in labour supply, but in the probability of individuals engaging in hidden employment among those willing to work. More precisely we have excluded from our sample not only those who are currently inactive, but also those who haven't worked at all during the preceding year.

4.2.1 Estimates based on the whole sample

Table 2 shows results of our benchmark estimates of determinants of undeclared work on the pooled sample of the economically inactive (2008 and 2012, both types of hidden employment). All models control for socio-demographic variables, coefficient estimates of these are shown in Appendix B. Model 1 estimates the effect of variables related to the rational model of tax evasion, namely the probability of being caught and the amount of fine to be paid in case of detection of tax evasion. Both variables enter in categorical form to the regression to allow for non-linearities and they reflect the respondents' subjective assessment rather than objective figures. We can see that conforming to our hypothesis A1, people who estimate higher chance of being detected in case of tax evasion are less likely to engage in hidden employment. Those who estimate the probability of being caught in the range of 50-98% are 7.7 points less likely to be in hidden employment, compared to those estimating low (0-49%) probability of detection. Those who think that practically all tax evaders get caught are 10 points less likely to work informally. Those who were unable to quantify their estimate of the probability of detection and have missing values on this variable are also less likely to participate in undeclared work.

Table 2. Determinants of undeclared work on the pooled sample of the economically inactive, average marginal effects (Dep var.: participated in some form of undeclared work in the past 2 years)

	Model 1	Model2	Model3	Model4	Model5
Probability of detection	Ref.cat	Ref.cat			Ref.cat
0-49%					
Probability of detection	-0.0547	-0.00801			-0.0474
50%	(-1.48)	(-0.14)			(-1.28)
Probability of detection	-0.0773*	-0.0412			-0.0545
51-98%	(-2.26)	(-0.90)			(-1.58)
Probability of detection	-0.0998**	-0.0456			-0.0598
99-100%	(-2.81)	(-0.90)			(-1.62)
Probability of detection	-0.127**	-0.106*			-0.107**
missing	(-3.23)	(-2.02)			(-2.60)
Fine for cheating taxes	Ref.cat	Ref.cat			Ref.cat
0-50 000 HUF					
Fine for cheating taxes	0.125**	0.103			0.123**
50-100 000 HUF	(2.81)	(1.64)			(2.74)
Fine for cheating taxes	0.0289	0.111*			0.0396
100-200 000 HUF	(0.77)	(1.99)			(1.02)
Fine for cheating taxes	0.108**	0.124*			0.106**
200-500 000 HUF	(2.69)	(2.45)			(2.59)
Fine for cheating taxes	0.0521	0.0834			0.0361
500 000- HUF	(1.06)	(1.16)			(0.75)
Fine for cheating taxes	0.0546	0.0616			0.0501
missing	(1.67)	(1.50)			(1.49)
Strongly risk averse		Ref.cat			
		(.)			
Risk-neutral, weakly		-0.0411			
risk lover		(-1.22)			
Strongly risk lover		0.0882			
		(1.89)			
Has been unemployed	0.126***	0.162***			0.110***
since started working	(5.63)	(5.09)			(4.67)
He would likely cheat			Ref.cat		Ref.cat
on taxes			(.)		(.)
Rather unlikely that			-0.0897**		-0.0859**
he would cheat			(-3.01)		(-2.86)
Absolutely unlikely			-0.125***		-0.119***
that he would cheat			(-4.33)		(-4.01)
Unsatisfied with				Ref.cat	Ref.cat
public services				(.)	(.)
Satisfied with public				0.00317	-0.00321
services				(0.13)	(-0.13)
Strongly satisfied				-0.0195	-0.0179
with public services				(-0.64)	(-0.58)
Year 2012	-0.0897***		-0.0949***	-0.0932***	-0.0910***
	(-4.03)		(-4.23)	(-4.16)	(-3.93)
Control variables	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.0784	0.1026	0.0789	0.0648	0.0896
N	1529	709	1430	1487	1393

Our results on the effect of fines to be paid in case of detection are not easily interpreted, as the effect seems to be non-linear, and is positive rather than negative. The probability of being in hidden employment first increases as the estimated fine is increased from the lowest level, while those who estimate intermediate amounts of fine are not statistically different from those estimating very low levels of fine. Such controversy is in line with many empirical test of this hypothesis (Kirchler et al., 2010). To sum up, our hypothesis A2 regarding the effect of fines were not supported by the data. Nevertheless, a possible explanation for this is that respondents couldn't make much sense of monetary values of a fine, in their everyday practice, the impact of a fine is different in nature for them (in Hungary employees are not liable for tax evasion, the whole fine falls on the employer). When the size and impact of the fine was enquired in qualitative terms such as "I would lose my job because my company would go bankrupt" or "my net wage would decrease cause my employer would have to hide less of my wage", higher estimated fine was associated with lower tax evasion (detailed results can be obtained from authors).

In Model 2 we add our variable on risk aversion, which restricts the sample to data from year 2012. In line with the theoretical prediction in hypothesis A3, the results show that individuals who are strongly risk lovers are more willing to participate in informal work as compared to people showing strong risk aversion. The effect size is 8.8 points, but it is only significant at the 10% level.

Our fourth hypothesis states that fear from unemployment and negative income expectations also increase the likelihood of participation in undeclared work. We assume past experiences of unemployment associated with the likelihood of becoming unemployed in the future, and test this hypothesis with the inclusion of unemployment experience in our regressions. Results show that the experience of unemployment is a significant predictor of the probability that an individual participates in informal work. Those who have experiences of unemployment are 12.6 points more likely to participate in undeclared work according to Model 1. Thus our analysis confirms hypothesis A4.

Model 3 looks at the effect of tax morale on participation in undeclared work. Conforming to our B1 hypothesis, those with a stronger tax morale are significantly less likely to participate in the informal economy. Those who are unlikely to cheat on taxes are 9 points less likely to participate in informal work, while those who are absolutely unlikely to cheat on taxes even when the chances of getting caught were zero are 12.5 points less probable to be involved in undeclared work.

In Table 3 we present our results on the effect of factors that are supposed to affect tax evasion via their effect on tax morale. According to our hypotheses B2-B4, higher perceived public sector integrity, trust in public institutions and trust in the legal framework are positively related to tax morale and thus lead to a lower probability of tax evasion. According to Model 1 in Table 3, perception of corruption is significantly related to participation in informal work. Those who perceive middle level of corruption have a 7 points higher probability of being involved in undeclared work, while those perceiving a high level of corruption are 12.6 points more likely to work informally. According to Model 2 trust in institutions is negatively related to participation in undeclared work. Those with high trust in institutions are 6.6 points less likely to work informally compared to those having low level of trust in institutions. The variable of trust in the legal system on the other hand is not significantly related to informal work, although the sign of the variable is negative in accordance with our theoretical prediction. Model 4 in Table 3 includes all three groups

of variables together with socio-demographic controls. Results are qualitatively similar as in previous models, although the effect of trust in institutions appears weaker than in Model 2. To summarise, these results are in accordance with hypotheses B2 and B3 but not B4.

The “exchange value of tax-paying” theory asserts that tax evasion would be less likely if individuals perceive to benefit from public services (hypothesis C1). Our results do not seem to support this hypothesis. In Model 4 of Table 2 regression estimates show weak and insignificant effects of satisfaction with public services on the probability of informal work.

In Model 5 of Table 2 variables related to rational calculation or external coercion, tax morale or internal motivation and the exchange value of tax-paying hypothesis are all included together with socio-demographic controls. Results of this model are qualitatively similar to those found earlier, although the effect of detection probability is weaker when all explanatory variables are introduced together.

Appendix B summarises the effects of socio-demographic control variables in regression models of Table 2. Results show that men are 6-9 points more likely to be involved in undeclared work than women. Participation in informal work is less frequent among older individuals, as the likelihood of participation declines with age. Ageing by ten years corresponds to a 3-4 points decline in the probability of participation in informal work. Coefficient signs suggest that Budapest is more affected by informal work than other settlements in the country, although the effects are weak and only seldom significantly different from zero. Participation in informal work is less frequent among the more educated. Those with upper secondary education and tertiary education are 7-12 points less likely to participate in informal work compared those with only primary education. According to results in Models 1 to 5, family income is not related to participation in informal work.

Table 3. Determinants of undeclared work on the pooled sample of the economically inactive, average marginal effects (dep var: participated in some form of undeclared work in the past 2 years)

	Model1	Model2	Model3	Model4
Low level of corruption perceived	Ref.cat			Ref.cat
Middle level of corruption perceived	0.0690 (1.94)			0.0397 (1.01)
High level of corruption perceived	0.126** (3.16)			0.0989* (2.19)
Weak trust in institutions		Ref.cat		Ref.cat
Middle level trust in institutions		-0.00207 (-0.08)		0.0338 (1.06)
High trust in institutions		-0.0659* (-2.42)		-0.0303 (-0.90)
Low trust in legal system			Ref.cat	Ref.cat
Middle level trust in legal system			0.00877 (0.23)	0.0211 (0.50)
High level trust in legal system			-0.0481 (-1.12)	-0.0361 (-0.71)
Control variables	Yes	Yes	Yes	Yes
Pseudo R2	0.0879	0.0808	0.0822	0.0909
N	1176	1468	1455	1138

4.2.2 Estimates based on subsamples

To examine the role of different motivations in the two subsamples, we performed similar regression analyses as before. Because of limited sample size, we simplify the models and include only probability of detection and tax morale as crucial explanatory variables. We also restricted the set of control variables and included only gender, age and settlement type in these regressions, since other controls also entered into the definition of subsamples.

Table 4. Determinants of undeclared work among the *better-off fake entrepreneurship-type*, average marginal effects (dep. Var.: participated in some form of undeclared work in the past 2 years), 2008 sample

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
<i>Probability of detection:</i>					
0-19%	Ref.cat	Ref.cat			Ref.cat
20-49%	-0.184*	-0.222**			-0.230**
	(-2.16)	(-2.63)			(-2.71)
50%	-0.0736	-0.0892			-0.0791
	(-0.87)	(-1.05)			(-0.92)
51-79%	-0.117	-0.120			-0.0790
	(-1.19)	(-1.20)			(-0.75)
80-97%	-0.213*	-0.224**			-0.210*
	(-2.57)	(-2.65)			(-2.44)
98-100%	-0.171*	-0.194*			-0.166*
	(-2.16)	(-2.41)			(-2.03)
Missing	-0.168*	-0.196*			-0.186*
	(-1.96)	(-2.29)			(-2.15)
<i>Tax morale</i>					
He would likely cheat on taxes			Ref.cat	Ref.cat	Ref.cat
Rather unlikely that he would cheat			-0.0286	-0.0261	-0.00652
			(-0.59)	(-0.55)	(-0.14)
Absolutely unlikely that he would cheat			-0.0217	-0.00766	0.00526
			(-0.47)	(-0.17)	(0.12)
Control variables	No	Yes	No	Yes	Yes
Pseudo R ²	0.02	0.045	0.001	0.021	0.045
N	596	596	557	557	557

Table 4 shows results for the better-off fake entrepreneurship-type subsample and Table 5 shows results for the poverty escape-type subsample. Results for the better-off fake entrepreneurship-type subsample show that the probability of detection has a significant effect on the probability of informal work. Those estimating a low probability of detection are more likely to participate in hidden employment than those who estimate high probability of detection (over 80%). The effect is not linear however: people in the middle ranges of estimated probability of detection do not seem to be different from those estimating low detection probabilities. Results show no significant effect of tax morale on the likelihood of engaging in informal work.

In the case of the poverty escape subsample the pattern seems to be different. The estimated probability of detection does not seem to have an effect on the decision to participate in informal work, albeit those who were not able to estimate detection probability are less likely to engage in hidden work. On the other hand tax morale seems to have a stronger effect. In the model without control variables those who are absolutely unlikely to cheat on taxes even if detection probability was zero are 23.4 points less probable to be involved in informal work, which is a significant effect. The effect weakens and becomes insignificant when control variables are added to the model, but the effect size remains non-negligible.

Table 5. Determinants of undeclared work among the *poverty escape-type*, average marginal effects (dep var: have participated in some form of undeclared work in the past 2 years), pooled sample

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
<i>Probability of detection:</i>					
0-19%	Ref.cat	Ref.cat			Ref.cat
20-49%	0.0769 (0.57)	0.0422 (0.31)			-0.0251 (-0.17)
50%	-0.106 (-0.81)	-0.113 (-0.86)			-0.108 (-0.82)
51-79%	-0.175 (-1.10)	-0.161 (-1.03)			-0.277 (-1.72)
80-97%	0.00566 (0.04)	0.0216 (0.16)			0.0112 (0.08)
98-100%	-0.139 (-1.03)	-0.116 (-0.84)			-0.122 (-0.88)
Missing	-0.318* (-2.22)	-0.319* (-2.22)			-0.316* (-2.12)
<i>Tax morale</i>					
He would likely cheat on taxes			Ref.cat	Ref.cat	Ref.cat
Rather unlikely that he would cheat			0.0913 (1.06)	0.111 (1.30)	0.100 (1.16)
Absolutely unlikely that he would cheat			-0.234** (-2.79)	-0.162 (-1.88)	-0.147 (-1.70)
Control variables	No	Yes	No	Yes	Yes
Pseudo R ²	0.041	0.084	0.048	0.099	0.137
N	191	191	181	181	181

5. Conclusions

The analysis confirmed that it is possible to identify distinct types of tax evaders in line with the literature using statistical techniques which engage in hidden employment for characteristically different reasons. The poverty escape type is by and large characterised according to expectations: poor on the periphery of the labour market while the better-off fake entrepreneurship-type is considerably different from what has been seen in many other contexts. It is made up of employees who use the enterprises of other people to exploit fake invoices in order to avoid the much higher taxes on labour than on capital. Furthermore, this type typically engages in hidden employment not as an additional income source rather as main income. These suggest that the specificities of the Hungarian context (e.g. high relative tax burden of labour, low frequency of auditing invoices-related payments) may create a yet unexplored version of tax evasion.

These two groups engage in hidden employment for different reasons too. First, the better-off fake entrepreneurship-type seems to be largely driven by rational calculation or external coercion while the poverty escape type is mainly driven by intrinsic motivations or tax morale. The first result underlines that engaging in tax evasion results from a decision of weighing the costs and benefits of such action to those who belong to the better-off fake entrepreneurship-type. However, engaging in tax evasion may not be a rationally reached conclusion to the members of the poverty escape group as they are likely to be dominated by their employer and desperate to get a job. Under this interpretation the weak effect of intrinsic motivation or tax morale may be attributed to reverse causality that is ex-post rationalisation of a decision (Wenzel, 2005).

While this research is very preliminary and could unearth causal relationships only to a limited degree, it already offers a few policy suggestions. First, if hidden employment concerns characteristically different groups of people then a one size fits all strategy is likely to backfire. Second, deterrence and modifications to the cost-benefit factors such as more flexible labour laws may work well for the better-off segment of hidden labour market; while this strategy is only likely to increase misery of those at the periphery of the labour market struggling for survival. Third, creating stable employment opportunities, education, and decreasing tax burden of the low paid may work better for the poverty escape type of hidden workers while potentially leave most of the better-off tax evaders less affected.

Further research should provide more evidence on the divergent motivations of hidden employment types and investigate our preliminary findings on causal relationships.

Bibliography

- Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, 1(3-4), 323–338.
- Alm, J. (1988). Compliance Costs and Tax Avoidance: Tax Evasion Decision. *Public Finance Quarterly*, 16(1), 31–66.
- Bacher, J., Wenzig, K., & Vogler, M. (2004). *SPSS Twostep cluster – A first evaluation*. Nuernberg, Germany.
- Braithwaite, V., & Wenzel, M. (2008). Integrating explanations of tax evasion and avoidance. In A. Lewis (Ed.), *The Cambridge Handbook of Psychology and Economic Behaviour* (pp. 304–331). Cambridge, UK: Cambridge University Press.
- Elffers, H., Robben, H. S. J., & Hessing, D. J. (1991). Under-Reporting Income: Who is the Best Judge-- Tax-Payer or Tax Inspector? *Journal of the Royal Statistical Society*, 154(1), 125–127.
- Elffers, H., Weigel, R. H., & Hessing, D. J. (1987). The Consequences of Different Strategies for Measuring Tax Evasion Behavior. *Journal of Economic Psychology*, 8, 311–337.
- Fazekas, M., Medgyesi, M., & Tóth, I. J. (2010). Az informális munkavégzést meghatározó tényezők Magyarországon. *MKE Éves Konferenciája*. Budapest: Magyar Közgazdaságtudományi Egyesület.
- Feige, E. L. (1990). Defining and estimating underground and informal economies: The new institutional economics approach. *World Development*, 18(7), 989–1002.
- Feige, E. L., & Cebula, R. (2011). America's unreported economy: measuring the size, growth and determinants of income tax evasion in the U.S. Munich.
- Feld, L. P., & Frey, B. S. (2002). Trust breeds trust: How taxpayers are treated. *Economics of Governance*, 3(2), 87–99. doi:10.1007/s101010100032
- Feld, L. P., & Frey, B. S. (2007). Tax Compliance as the Result of a Psychological Tax Contract: The Role of Incentives and Responsive Regulation. *Law Policy*, 29(1), 102–120. doi:10.1111/j.1467-9930.2007.00248.x
- Fischer, C. M., Wartick, M., & Mark, M. (1992). Detection probability and taxpayer compliance: a review of literature. *Journal of Accounting Literature*, 11, 1–46.
- Kirchler, E., Hoelzl, E., & Wahl, I. (2008). Enforced versus voluntary tax compliance: the “slippery slope” framework. *Journal of Economic Psychology*, 29(2), 210–225.
- Kirchler, E., Muehlbacher, S., Kastlunger, S., & Wahl, I. (2010). Why pay taxes? A review of tax compliance decisions. In J. Alm, J. Martinez-Vazquez, & B. Torgler (Eds.), *Developing Alternative Frameworks for Explaining Tax Compliance* (pp. 15–32). New York: Routledge.
- Lago-Peñas, I., & Lago-Peñas, S. (2010). The determinants of tax morale in comparative perspective: Evidence from European countries. *European Journal of Political Economy*, 26(4), 441–453.

- Marcelli, E., Williams, C. C., & Joassart, P. (Eds.). (2010). *Informal Work in Developed Nations*. New York: Routledge.
- OECD. (2005). *OECD Employment Outlook*. Paris: OECD.
- Perry, G. E., Maloney, W. F., Arias, O. S., Fajnzylber, P., Mason, A. D., & Saavedra-Chanduvi, J. (2007). *Informality: exit and exclusion*. Washington, DC: World Bank.
- Pfau-Effinger, B. (2009). Varieties of Undeclared Work in European Societies. *British Journal of Industrial Relations*, 47(1), 79–99. doi:10.1111/j.1467-8543.2008.00711.x
- Pfau-Effinger, B., Flaquer, L., & Jensen, P. H. (Eds.). (2009). *Formal and Informal Work*. New York: Routledge.
- Portes, A., & Haller, W. (2005). The Informal Economy. In N. J. Smelser & R. Swedberg (Eds.), *The Handbook of Economic Sociology* (2nd ed., pp. 403–428). Princeton, NJ: Princeton University Press.
- Schendera, C. (2010). *Clusteranalyse mit SPSS*. München: Oldenburg.
- Schnellenbach, J. (2010). Vertical and horizontal reciprocity in a theory of taxpayer compliance. In J. Alm, J. Martinez-Vazquez, & B. Torgler (Eds.), *Developing Alternative Frameworks for Explaining Tax Compliance* (pp. 56–73). New York: Routledge.
- Semjén, A., Tóth, I. J., & Fazekas, M. (2009). Az egyszerűsített vállalkozói adó (eva) tapasztalatai vállalkozói interjúk alapján. In A. Semjén & I. J. Tóth (Eds.), *Rejtett gazdaság. Be nem jelentett foglalkoztatás és jövedelemelvitkolás - kormányzati lépések és a gazdasági szereplők válaszai* (pp. 131–149). Budapest: MTA Közgazdaságtudományi Intézet.
- Semjén, A., Tóth, I. J., Fazekas, M., & Makó, Á. (2009). Alkalmi munkavállalói könyves foglalkoztatás munkaadói és munkavállalói interjúk és egy kérdőíves munkavállalói felmérés tükrében. In A. Semjén & I. J. Tóth (Eds.), *Rejtett gazdaság. Be nem jelentett foglalkoztatás és jövedelemelvitkolás - kormányzati lépések és a gazdasági szereplők válaszai* (pp. 150–183). Budapest: MTA Közgazdaságtudományi Intézet.
- Slemrod, J., & Yitzhaki, S. (2002). Tax Avoidance, Evasion, and Administration. In A. Auerbach & M. Feldstein (Eds.), *Handbook of Public Economics, Volume 3* (pp. 1425–1465). Elsevier Science.
- Srinivasan, T. N. (1973). Tax evasion: A model. *Journal of Public Economics*, 2(4), 339–346.
- Torgler, B. (2007). *Tax Compliance and Tax Morale A Theoretical and Empirical Analysis*. Cheltenham, UK: Edward Elgar.
- Torgler, B. (2011). *Tax Morale and Compliance Review of Evidence and Case Studies for Europe*. Washington, DC.
- Wenzel, M. (2005). Motivation or rationalisation? Causal relations between ethics, norms and tax compliance. *Journal of Economic Psychology*, 26(4), 491–508.
- Williams, C. C. (2004). *Cash-in-hand work: the underground sector and the hidden economy of favours*. New York: Palgrave Macmillan.

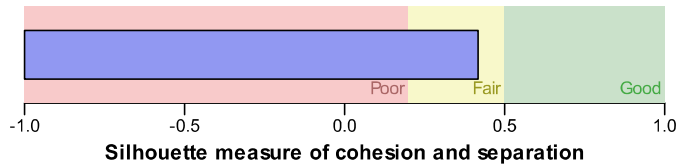
- Williams, C. C. (2009a). Tackling undeclared work in Europe: lessons from a 27-nation survey. *Policy Studies, 30*(2), 143–162. doi:10.1080/01442870902723667
- Williams, C. C. (2009b). *The Hidden Enterprise Culture*. Cheltenham, UK: Edward Elgar.
- Williams, C. C., & Nadin, S. (2010). Entrepreneurship and the Informal Economy: An Overview. *Journal of Developmental Entrepreneurship, 15*(4), 361–378.
- Williams, C. C., & Windebank, J. (2005). Refiguring the nature of undeclared work. *European Societies, 7*(1), 81 — 102.

Appendix A. Clustering of 2008 data: goodness of fit

Model Summary

Algorithm	TwoStep
Input Features	6
Clusters	2

Cluster Quality



Auto-Clustering

Number of Clusters	Schwarz's Bayesian Criterion (BIC)	BIC Change ^a	Ratio of BIC Changes ^b	Ratio of Distance Measures ^c
1	2425.163			
2	1916.083	-509.080	1.000	2.916
3	1784.685	-131.398	.258	1.315
4	1700.560	-84.125	.165	1.006
5	1617.402	-83.158	.163	1.311
6	1569.598	-47.805	.094	1.321
7	1549.376	-20.222	.040	1.002
8	1529.317	-20.059	.039	1.166
9	1521.482	-7.835	.015	1.257
10	1528.698	7.216	-.014	1.071

a. The changes are from the previous number of clusters in the table.

b. The ratios of changes are relative to the change for the two cluster solution.

c. The ratios of distance measures are based on the current number of clusters against the previous number of clusters.

Appendix B. Effects of socio-demographic control variables in models of Table 2

	Model 1	Model 2	Model 3	Model 4	Model 5
Men	0.0637** (2.85)	0.0868** (2.85)	0.0722** (3.16)	0.0617** (2.72)	0.0700** (3.01)
Age (years)	-0.00354*** (-3.56)	-0.00227 (-1.63)	-0.00295** (-2.90)	-0.00428*** (-4.22)	-0.00287** (-2.75)
Budapest	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Large cities	-0.0550 (-1.48)	-0.0197 (-0.39)	-0.0821* (-2.15)	-0.0512 (-1.35)	-0.0818* (-2.11)
Other towns	-0.0578 (-1.70)	0.0137 (0.29)	-0.0568 (-1.63)	-0.0581 (-1.70)	-0.0613 (-1.73)
Small settlements	-0.0321 (-0.91)	0.0104 (0.22)	-0.0404 (-1.11)	-0.0385 (-1.07)	-0.0454 (-1.23)
Primary schooling	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Vocational schooling	-0.0705* (-2.07)	-0.0306 (-0.69)	-0.0604 (-1.74)	-0.0834* (-2.38)	-0.0766* (-2.14)
Upper secondary	-0.118*** (-3.44)	-0.0708 (-1.61)	-0.101** (-2.90)	-0.117*** (-3.33)	-0.120*** (-3.34)
Tertiary	-0.126** (-3.13)	-0.120* (-2.35)	-0.0864* (-2.05)	-0.118** (-2.83)	-0.111** (-2.59)
Family income lower third	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Family income middle third	-0.0585* (-2.02)	-0.0290 (-0.74)	-0.0501 (-1.69)	-0.0464 (-1.59)	-0.0530 (-1.76)
Family income upper third	-0.0249 (-0.72)	0.0265 (0.58)	-0.0296 (-0.85)	-0.00361 (-0.10)	-0.0369 (-1.04)
Family income missing	-0.0360 (-0.98)	-0.0616 (-1.17)	-0.0418 (-1.12)	-0.0296 (-0.80)	-0.0299 (-0.76)