

Flat tax system and heterogeneity of self-employment

Flat tax system

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Abstract

Purpose – This paper aims to investigate the effect of the flat tax system on self-employment by necessity and by opportunity. Specifically, the paper examines whether individuals decide to switch from wage-employment to self-employment by necessity or by opportunity when government imposes a flat tax system.

Design/methodology/approach – To analyze the association of a flat tax system with occupational choice this paper uses both multinomial and ordinary logit models. In the multi-nominal logit model, this study separates dependent variables into three categories: wage employee, self-employed by necessity and self-employed by opportunity. In the second step of analyzes using the ordinary logit model, this paper studies only self-employed individuals by distinguishing them according to their preferences.

Findings – The results suggest that, in countries with the imposed flat tax system, the probability of being self-employed by necessity is low, while the probability of being self-employed by opportunity is high. Moreover, better economic growth in the country also elevates the chances of individuals to be self-employed by opportunity.

Originality/value – Out novel contribution is documenting that flat tax system in transition countries increases the number of individuals self-employed by opportunity compared to self-employed by necessity.

Keywords Transition countries, Self-employment by opportunity, Flat tax system, Self-employment by necessity

Paper type Research paper

1. Introduction

Over the past two decades, a number of studies have focused on tax policy and its impact on entrepreneurship and innovation, risk tolerance and appetite of entrepreneurs and corruption in countries. Taxation policy has been one of the key drivers of entrepreneurial activity, which, in turn, is an essential driving force of the economy; growth and productivity performance heavily rely on the entrepreneurial capacity of the country (Wong *et al.*, 2005) [1].

However, business activities are many times disturbed by, surprisingly, decisions of policymakers which are not very smart and reasonable. In particular, fiscal policymakers, using the tax as the main tool, have the power to significantly boost entrepreneurial activities by introducing lower marginal tax rates (Bruce and Mohsin, 2006). Otherwise, keeping the marginal tax rates high may lead to the bigger size of the informal sector in the economy (Block, 2016). In addition, in his study of entrepreneurship trends in Switzerland, Block (2016) concluded that a complex tax structure may reduce the entry rate of entrepreneurship in the country.

Besides high marginal tax rates and complex tax structures, progressivity or flatness of tax rates may also have a significant impact on entrepreneurial incentives, though this topic



remains controversial lately. A micro-study of US households (Gentry and Hubbard, 2000), a macro-study of European countries (Baliamoune-Lutz and Garello, 2013) and a separate study of OECD countries (Baliamoune-Lutz, 2014) revealed that tax progressivity restricts the number of nascent entrepreneurs, while other studies of certain individual countries (e.g. Switzerland by Bacher and Brulhart, 2012; Block, 2016; and Canada by Ferede, 2011) showed the opposite case.

A flat tax system, in which the flat tax rate is mostly lower than the upper limit of progressive tax rates, has several advantages over a progressive tax system. First, the introduction of flat tax rates makes employment more attractive to middle- and high-income individuals, leading to increased labor supply in the economy. Then, second, many of the flat tax systems introduce much more simplified tax schedules with much lower administrative and compliance costs for all individuals, leading to the elimination of bureaucracy (Peichl, 2014). Considering all these advantages, it is certainly worth studying how the number of new entrepreneurs (i.e. self-employed individuals) changes in countries where the flat tax system exists. In this respect, we develop hypotheses as such that we can study how self-employment changes with the existing flat tax systems in transition countries.

Scholars such as Amit and Muller (1995) and Block and Koellinger (2009) have identified a number of reasons why individuals prefer switching from salaried employment to starting their own businesses. This leads to an understanding that individuals prefer to be self-employed mainly because either they cannot find wage-employment and have to run their own businesses (self-employment by necessity) or they discover promising business opportunities and willingly start entrepreneurial activities (self-employment by opportunity). Therefore, it is critical to study these two types of self-employment separately due to the heterogeneous motives of these individuals. In developed economies, self-employment is motivated by innovative business ideas, pursuing a passion and, eventually, promising wealth-building potential. These individuals are always satisfied and exhibit a much higher commitment to their current form of employment (Baluku *et al.*, 2020). While, in transition economies, the noticeable share of self-employment is motivated by the so-called “no other choice” decisions, as individuals cannot find jobs with sufficient pay to survive. To better understand this phenomenon in numbers, we recommend reviewing the number of self-employed individuals as a percentage of total employment provided by the World Bank (2020) for selected countries with a flat tax regime in 2010 (Appendix). For example, Azerbaijan, GA and Albania (68.06%, 58.81% and 56.70%, respectively) make the top three compared to developed countries such as Germany, Great Britain or Sweden (11.57%, 13.99% and 10.95%, respectively). Indeed, the numbers of self-employment as a percentage of the labor force in transition countries are distinctively bigger compared to developed countries. Based on these statistics, some might wrongly conclude that developed countries are not doing well in promoting self-employment, though, in fact, those countries represent a few of the best business conditions in the world. Therefore, it is critical to study the flat tax system with each type of self-employment separately in transition countries.

Based on a comprehensive review of the related literature, we identify that most of the papers either study the impact of the marginal tax rates, their complexities and progressivity or flatness on the level of newly formed entrepreneurship or investigate the motives of self-employment and their impact on the overall economic growth of an individual or grouped countries. The two aspects of those papers, in particular, the flatness of tax rates and self-employment by necessity or by opportunity, are not discussed together, though many papers have concluded that extended research should be carried out in those

areas. Besides, most of the studies are conducted for well-established economies and very few studies are carried out in transition economies.

In this paper, we aim to study the relationship between the flat tax system and each type of self-employment separately for transition countries. We use ordinary and multi-level logit models to estimate the association. To address the potential omitted variable bias, we include aggregate and individual level control variables. Using Life In Transition Survey (LITS 2), which includes 34 transition countries, allowed us to have a sufficient number of representatives for both necessity- and opportunity-type self-employment. The main advantage of the survey is the existence of relevant information that can separate self-employment by necessity from self-employment by opportunity. Besides, as the representative countries of the survey recently started switching from a centralized to a market-based economy, our study will be of a valuable contribution to their policy implications.

In the following section, we review existing studies on entrepreneurship and self-employment by opportunity and self-employment by necessity in transition economies, followed by the introduction of established hypotheses. In section 3, we describe our data and chosen statistical models followed by key results of our analyzes. Finally, after a thorough discussion of the results, we conclude our paper by providing policy implications and directions for future research.

2. Literature review

To understand the systemic issues in the corporate tax world, scholars have developed various tax evaluation models to analyze the success of existing and nascent entrepreneurs. In one of the early papers written by Gentry and Hubbard, the convexity issue of tax rates and their negative impact on the probability of new entrants was raised (2000). Although they proved the negative statistically significant relationship between the convex shape of tax and entrepreneurial entries in specific income levels [2], they recommended further steps to test, in detail, the efficiency consequences of tax influences on newborn entrepreneurs. Even taking the education status as a proxy for potential innovation, which is needed to be proved to show the innovation and tax relationship, tax convexity was found to, still, discourage individuals from switching to self-employment with all available education background (Gentry and Hubbard, 2005). Besides, a study in Sweden showed highly-educated individuals being sensitive to high tax rates compared to less-educated individuals (Hansson, 2010).

On the other hand, interestingly, some findings showed that the effect of tax can be concave, too (Da Rin *et al.*, 2009). Da Rin *et al.* (2009) established the fact that not always does the tax reduction affect the entry rates, in fact, there is a certain threshold of income above which the shape of tax does not matter while entering the business world. From this conclusion, another hypothesis, which takes into account different income levels of households, can be developed using microdata. Indeed, wealthy households are less likely to be employed by someone, as, financially, they have good opportunities to start their own businesses. Regardless of the tax system the government uses, i.e. progressive or flat, financially stable households have high chances to be self-employed, while high marginal tax rates along with complex tax schedules reduce the number of newborn firms in the economy (Hanson, 2010). Peichl (2014) supported the latter case stating that flat tax systems help simplify the tax structure, while progressive tax systems may lead to a more complex tax structure. Block (2016) also supported this finding adding that a complex tax system reduces entrepreneurship entry rates.

In addition, to maintain the efficiency of reduced corporate income tax rates, [Da Rin \(2009\)](#) argued that country may need a better institutional infrastructure to prevent any “tax sheltering” [3] activities, which may grow significantly due to high corporate tax rates along with complicated tax system the governments impose ([Gentry and Hubbard, 2005](#)). Hence, scholars suggested introducing new tax reforms to promote the number of nascent businesses in all income levels by simplifying the tax systems.

Nevertheless, confusion still exists in regard to whether or not the tax progressivity encourages more individuals to become self-employed. Prior to tax reforms, individuals usually think that tax progressivity promotes the birth rate of new firms due to the so-called “insurance effect” [4] ([Bacher and Brulhart, 2012](#)). On the other hand, to have an efficient insurance effect, one needs, at least, adequate and not complicated taxes imposed by the government; otherwise, the firm birth rate may be depressed, as it is already proved earlier. Tax progressivity may distress the newly established businesses from the high-income level, while it may promote the existing businesses and new businesses from the low-income level. This surely contradicts some of the papers at first glance; however, one needs to establish the key differences in models used in different papers. Those, who proved that a progressive tax system increases the number of nascent firms, count on the risk-averse behavior of households who perceive it as an insurance mechanism ([Lee and Gordon, 2005](#)). Others, who proved the hypothesis that progressivity reduces the number of newborn businesses, consider very tight profit opportunities available for nascent entrepreneurship, hence, they developed the model as such different income levels generate different outcomes eventually ([Balioune-Lutz and Garelo, 2013](#)). Therefore, one can conclude, so far, that if a progressive tax system discourages individuals from entering the business sector, then a flat tax system should boost the rate of birth of nascent entrepreneurs.

In recent years, most of the papers attempt to define self-employment as a heterogeneous variable. [Block and Koellinger \(2009\)](#) surveyed 1,547 nascent entrepreneurs in Germany to study why a certain group of entrepreneurs does not enjoy their entrepreneurial activities, while other groups of individuals are happy with their decisions. Their findings show that those who are not satisfied with their choices, did not choose to be self-employed willingly, i.e. they have to become entrepreneurs because they could not find a job with a sufficient salary. On the other hand, individuals, who see entrepreneurial opportunities in the economy, are indeed satisfied with their choices, which consequently leads to higher creativity and success in the business world ([Block and Koellinger, 2009](#)). [Baluku et al. \(2020\)](#) supported this idea by stating that individuals are more satisfied with their decisions of becoming self-employed compared to less satisfied individuals who are forced to be self-employed. Besides, the more satisfied the individuals are with their decisions, the higher the commitment is to their current form of employment ([Baluku et al., 2020](#)). [Amit and Muller \(1995\)](#) too defined entrepreneurs differently depending on whether they make a decision by necessity or by opportunity. Findings showed that “pull” entrepreneurs, who are attracted by new business ideas, tend to be more successful compared to “push” entrepreneurs, who are pushed to being self-employed. [Isaga et al. \(2015\)](#) also argued that pull factors are more important than push factors to start successful entrepreneurship and maintain sustainable growth, which later contributes value to the economy.

The decision of being employed or self-employed surely depends on many factors such as gender, age, literacy, social network and marital status, as well as other demographics that can easily drive either decision ([Colombier and Masclat, 2007](#); [Hansson, 2010](#); [Velamuri, 2011](#); [Aleksandrova et al., 2019](#)). For example, as observed in those papers, the probability of being older, male and married is higher for self-employed individuals compared to wage-employed individuals. If an individual has direct or indirect experience in running a

business or believes that he or she has the necessary skills and knowledge to run a business, that individual will most likely open his or her own business (Aleksandrova *et al.*, 2019). Besides these variables may have a different association with individual decisions choosing either self-employment by necessity or self-employment by opportunity (Ahunov and Yusupov, 2017; Block and Koellinger, 2009; Castellano and Punzo, 2013; Amit and Muller, 1995). Self-employed-by-opportunity individuals are, on average, wealthier and healthier than self-employed-by-necessity individuals (Ahunov and Yusupov, 2017; Amit and Muller, 1995; Castellano and Punzo, 2013). Furthermore, Ahunov and Yusupov (2017) examined if risk tolerance drives the choice of being self-employed by necessity and/or by opportunity. They concluded that the majority of individuals with high-risk intolerance are better off with being employed by someone and high-risk tolerant individuals prefer being self-employed to salaried-employment; in fact, self-employed-by-opportunity individuals are observed to be the most risk-tolerant of all.

Therefore, it is important to distinguish opportunity-type self-employment from necessity-type self-employment when we study the effect of the flat tax system on entrepreneurship. A flat tax system not only motivates individuals to be self-employed because of high after-tax income and a simplified tax system but it also creates more job opportunities that necessity-type self-employed individuals can switch to Peichl (2014). Considering all the above evidence, we develop two hypotheses:

- H1. Flat tax system reduces self-employment by necessity in transition economies;
- H2. Flat tax system increases self-employment by opportunity in transition economies.

3. Methodology and data

The paper uses the LITS 2 [5] conducted by European Bank for Reconstruction and Development (EBRD) in 2010. One of the benefits of using this particular survey is that it includes household responses from mainly transition countries with the same characteristics such as centralized economy, no room for independent major business enterprises and presence of recent economic changes (Ahunov and Yusupov, 2017). The survey additionally comprises respondents from developed countries, namely, Germany, Great Britain, France, Italy and Sweden for the interest of comparison. A list of the countries in the survey with relevant statistics can be found in Appendix, Table 1. Our aim is to study the sensitivity of heterogeneous self-employment to a certain tax environment using LITS 2, which includes a sufficient number of representatives for both necessity- and opportunity-type self-employment. Thus, we restrict our sample to wage employees and self-employed individuals, excluding unemployed ones and farmers. In our robustness test analyzes, five developed countries were dropped due to the following reasons: entrepreneurial capacity of these countries is relatively more developed; hence, in those countries, the number of entrepreneurial entries is not as highly sensitive as it is expected in other transition countries of the sample.

We categorize respondents to wage employees and self-employed individuals based on their occupations as our dependent variable. Further, similar to Ahunov and Yusupov (2017), we separate the self-employed individuals into two groups: self-employed by necessity and self-employed by opportunity and it is done so by using the following hypothetical occupation choice question: "Suppose you were working and could choose between different kinds of jobs. Which of the following would you personally choose?" with options of self-employed and employee in several sectors. If an individual is self-employed at the time of the survey but prefers being an employee in a certain sector if he or she could

Variable	Description	Source
Dependent variable		
Self-employment rate	Share of self-employed individuals in total employment in 2010	World Bank data
Occupation choice	Main occupation of the respondent: Wage employee (respondents who work for wages) Self-employed by necessity (individuals who are self-employed but prefer to be a wage employee) Self-employed by opportunity (individuals who are and prefer to be self-employed over wage employee) Self-employed with the employee (self-employed who hires individuals outside of their households) Self-employed without employee (self-employed who does not hire individuals outside of their households)	LITS 2
Main interest independent variable		
Flat tax system	Dummy variable; tax system of the country in 2010 0 = progressive tax system, 1 = flat tax system	Peichl (2014)
Country macro variable		
GDP	Gross domestic product of the country measured in dollars in 2010	World Bank data
Demographic factors:		
Gender	Dummy variable; 0 = male; 1 = female	LITS 2
Age	Age of the respondents in groups: 18-24, 25-34, 35-44, 45-54, 55-64 and 65+	LITS 2
Health status	Self-described health status of the respondent: very good, good, medium, bad and very bad	LITS 2
Willingness to take risk	Self-described respondent's willingness to take risk scale ranging from no willingness at all (1) to very much willingness (10)	LITS 2
Wealth status	Self-described wealth status of the respondent scale ranging from the poorest (1) to the richest (10)	LITS 2
Mother education	Education of respondent's mother -measured in years	LITS 2
Marital status	Dummy variable; marital status of the respondent: 1 = married, 0 = otherwise	LITS 2
Education	Highest level of education respondent completed: No education, primary education, secondary education, post-secondary education, higher education	LITS 2

Table 1.
Description of the variables

choose, we classify him or her as self-employed by necessity. If both actual and hypothetical occupations of the respondent are self-employed, we classify him or her as self-employed by opportunity. Moreover, we differentiate self-employed with employees from self-employed without employees by coding 1, if he or she hires outside of his or her household or otherwise 0. Hiring employees may reflect the expansion of the business and self-employed individuals already creating job opportunities for others. Additionally, we use aggregate data on self-employed as a percentage of total employment in 2010 to estimate the basic macro-level association between aggregate self-employment and the flat tax system in these countries.

Our key independent variable – flat tax system – is measured as a dummy variable, which we define countries with flat tax systems as 1 and countries with progressive tax rates as 0. The information on whether the chosen countries had a flat or progressive tax system in 2010 is taken from previous research done by [Peichl \(2014\)](#).

Previous literature demonstrated the importance of demographic characteristics in the decision of choosing occupational choice (Hansson, 2010; Amit and Muller, 1995; Velamuri, 2011). Ahunov and Yusupov (2017) also presented that many demographic factors of self-employed-by-necessity individuals are noticeably different from self-employed-by-opportunity individuals. Thus, we include these factors in our estimations to address potential omitted variable bias. Table 1 presents a description of the used variables in our analyzes and the sources where they are collected from.

Our empirical model, which estimates the association between the flat tax system and occupational choice, can be formulated in the following form in general:

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \varepsilon_i$$

where Y_i is as a self-employment rate and X_i s are tax system and log gross domestic product (GDP) of the country i in our OLS regression estimation. Further Y_i is measured as a binary variable that equals 0, if respondent i is wage employee and 1, if self-employed. As our dependent variable is dummy, we use an ordinary logit model and include a set of demographic factors of respondents to control omitted variable bias. These two models provide a basic association between a flat tax system and occupational choice on the macro and individual level assuming self-employment as a homogenous group.

Further, we move to the main part of our analyzes by classifying respondents' occupations into 3 categories:

- wage employees, self-employed by necessity and self-employed by opportunity; and
- wage employees, self-employed with employee and self-employed without employee.

In these estimations, we use a multilevel logit model, as our Y_i is a categorical variable with three distinct categories. Wage employee is a base category and two different types of self-employed individuals are compared to wage employees. Once more, the log GDP of the country to control aggregate differences between countries and demographic characteristics of the respondents are included in the model.

Finally, we removed wage employees from the model and, by using the ordinary logit model, we compared self-employed-by-necessity individuals to self-employed-by-opportunity individuals and self-employed-without-employee individuals to self-employed-with-employee individuals. We estimate the models with and without demographic factors to understand the sensitivity of the association between flat tax and self-employment to included control set. The chosen models are applied quite often previously including, Colombier and Masclat (2007), Yueh (2009), Velamuri (2011), Castellano and Punzo (2013) and Patrick *et al.* (2016) to study determining factors of self-employment.

The following Table 2 presents the descriptive statistics of the variables used in our analyzes. According to Table 2, Panel A, most of the individuals are wage employees constituting 85% of the sample and among self-employed individuals, self-employed by opportunity and self-employed without employees are slightly more than their counterparts. On an aggregate level, the share of self-employed in total employment constitutes, on average, 24.07% varying from the lowest 4.13% in Belarus to the highest 68.06% in Azerbaijan. This statistic was unavailable for Kosovo. Table 2, Panel B shows macro statistics of countries used in the analyzes. Around half of the respondents in the sample are from countries with flat tax systems. Table 2, Panel C presents the demographic characteristics of our sample. In total, 54% of respondents are female and 61% are married. The majority part of the sample has secondary education followed by individuals with

	<i>n</i>	Mean/%	SD	Min	Max
<i>Panel A: Occupation choice</i>					
Occupational choice (<i>n</i> = 18,296):					
Wage employee	15,600	85.26			
Self-employed by necessity	1,119	6.12			
Self-employed by opportunity	1,577	8.62			
Self-employed with employee	1,470	6.53			
Self-employed without employee	1,193	8.05			
Self-employment rate as a % total employment	17,995	24.07	15.73	4.13	68.06
<i>Panel B: Country macro factors</i>					
GDP in bln. US dollars					
	18,296	541.18	937.67	4.14	3,417.09
Tax system of the country (<i>n</i> = 18,296)					
Progressive tax system	8,680	47.44			
Flat tax system	9,616	52.56			
<i>Panel C: Demographic characteristics</i>					
Gender (<i>n</i> = 18,296)					
Male	8,414	45.99			
Female	9,882	54.01			
Age (<i>n</i> = 18,284):					
18–24	1,886	10.32			
25–34	4,612	25.22			
35–44	4,823	26.38			
45–54	4,256	23.28			
55–64	2,235	12.22			
65+	472	2.58			
<i>Health status (n = 18,214):</i>					
Very good	3,346	18.37			
Good	8,603	47.23			
Medium	5,396	29.63			
Bad	772	4.24			
Very bad	97	0.53			
Willingness to take risk (self-described), %	17,877	5.16	2.47	1	10
<i>Marital status (n = 18,178):</i>					
Married	11,132	61.24			
Otherwise	7,046	38.76			
Wealthy(self-described), %	18,011	4.70	1.63	1	10
Mother's education	14,693	9.64	3.86	0	20
<i>Education (n = 18,295):</i>					
No education	160	0.87			
Primary education	640	3.50			
Secondary education	8,462	46.25			
Post-secondary education	3,661	20.01			
Higher-education	5,372	29.36			
Observations	18,296				

Table 2.
Descriptive statistics

higher education levels. Mothers of the respondents have, on average, around 10 years of education. The level of risk tolerance, on average, appears to be 5.16 out of the 10-unit subscale and 66% of the sample considers themselves in a good or very good health condition. Previous literature demonstrated the importance of demographic characteristics in the decision of choosing occupational choice (Hansson, 2010; Amit and Muller, 1995; Velamuri, 2011). Thus, we include these factors in our estimations to address the potential omitted variable bias.

4. Results

Table 3 presents estimation analyzes of the flat tax system with occupational choices. Model 1 shows OLS regression coefficients of the flat tax system on the share of self-employment in the labor force in 2010 among 34 LITS surveyed countries [6]: Having a flat tax system in a country is associated with a 9.21% decrease of self-employed share in labor force controlling for country aggregate GDP level. Model 2 presents the odds ratio of logit regression estimation between the flat tax system and occupational choice assessing self-employed as a homogenous group. The estimated odd ratio of the flat tax system is less than one, which implies that the probability of being self-employed over being a wage employee is negatively associated with the flat tax system in the country. Further in multinomial logit estimations presented in Model 3 and 4, self-employed individuals are differentiated by necessity versus by opportunity and without employee versus with employee categories, respectively. By default, the wage employee is in the reference category in both models. The model coefficients are defined as relative risk ratios that show the chances of being self-employed either by necessity or by opportunity over the chances of being a wage employee. Along with micro-characteristics of individuals, the proxy variable for the economic potential of countries, GDP is also controlled in our models. When there is a flat tax system in the country, the number of both self-employed by necessity individuals and self-employed without employees tended to decrease at the conventional significance level, as the coefficients are less than one. Although we find a positive association of a flat tax system with self-employed by opportunity and self-employed with the employee, the coefficient does not appear to be statistically significant for self-employed by opportunity. Thus, the observed negative association between the flat tax system and self-employment in Model 1 and 2 should be mostly due to a decrease in self-employed-by-necessity individuals.

Furthermore, statistically significant odds ratio and relative risk ratios of willingness to take risk indicate that being more risk-tolerant is associated with a higher probability of being self-employed, particularly, by opportunity. Furthermore, men have a higher probability of becoming self-employed regardless of types compared to women. The model output also represents the evidence that being married increases the chances of individuals to become self-employed both by necessity and by opportunity. However, both mother's education and individual's higher education reduce the chances of being self-employed for any reason. This can be explained by the fact that higher education and parental good social network allow them to find good wage-employment opportunities with a stable environment in transition countries. There is one more finding of high importance related to low-income and high-income transition economies. High-income individuals have higher chances to become self-employed by opportunity, while low-income individuals have higher chances to become self-employed by necessity over salaried-employment. In relatively poorer economies, most of the individuals were pushed to become self-employed due to lack of wage-employment choices, while in relatively higher-income economies, individuals were pulled to become self-employed due to better opportunities.

4.1 Regression estimation among self-employed individuals

Table 4 presents the odds ratios of logit regression estimation among self-employed individuals. Self-employed by necessity and self-employed without employee is reference categories by default. To test for robustness, we estimate the model with and without control variables and also by estimating among only transition economies [7]. According to adjusted odds ratios in the full data set model, the probability of being self-employed by opportunity over by necessity is 1.43 times higher; and the probability of being self-employed with an employee over without employee is 1.68 times higher in those countries

Table 3.
Correlation
coefficients for all
model variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Wage employee	1.00													
2 Self-employed by necessity	-0.61 ^{***}	1.00												
3 Self-employed by opportunity	-0.74 ^{***}	-0.08 ^{***}	1.00											
4 Self-employed with employee	-0.64 ^{***}	0.33 ^{***}	0.53 ^{***}	1.00										
5 Self-employed without employee	-0.72 ^{***}	0.50 ^{***}	0.48 ^{***}	-0.08 ^{***}	1.00									
6 GDP	0.04 ^{***}	-0.07 ^{***}	0.01 ^{***}	0.01 ^{***}	-0.06 ^{***}	1.00								
7 Flat tax	0.04 ^{***}	-0.02 ^{***}	-0.03 ^{***}	-0.00 ^{***}	-0.05 ^{***}	-0.37 ^{***}	1.00							
8 Willingness to take a risk (self-described)	-0.11 ^{***}	0.03 ^{***}	0.12 ^{***}	0.11 ^{***}	0.05 ^{***}	-0.03 ^{***}	-0.01 ^{***}	1.00						
9 Wealthy (self-described)	-0.04 ^{***}	-0.04 ^{***}	0.09 ^{***}	0.07 ^{***}	-0.01 ^{***}	0.08 ^{***}	-0.09 ^{***}	0.16 ^{***}	1.00					
10 Married	-0.07 ^{***}	0.04 ^{***}	0.05 ^{***}	0.05 ^{***}	0.05 ^{***}	-0.08 ^{***}	-0.00 ^{***}	-0.05 ^{***}	0.07 ^{***}	1.00				
11 Female	0.10 ^{***}	-0.06 ^{***}	-0.08 ^{***}	-0.06 ^{***}	-0.07 ^{***}	0.01 ^{***}	0.08 ^{***}	-0.13 ^{***}	-0.03 ^{***}	-0.07 ^{***}	1.00			
12 Age	-0.02 ^{***}	0.00 ^{***}	0.02 ^{***}	0.01 ^{***}	0.02 ^{***}	0.07 ^{***}	-0.04 ^{***}	-0.16 ^{***}	-0.06 ^{***}	0.19 ^{***}	0.02 ^{***}	1.00		
13 Mother's education	0.06 ^{***}	-0.05 ^{***}	-0.03 ^{***}	-0.01 ^{***}	-0.06 ^{***}	-0.00 ^{***}	0.11 ^{***}	0.12 ^{***}	0.13 ^{***}	-0.12 ^{***}	0.05 ^{***}	-0.31 ^{***}	1.00	
14 Education	0.07 ^{***}	-0.07 ^{***}	-0.04 ^{***}	-0.01 ^{***}	-0.09 ^{***}	-0.03 ^{***}	0.12 ^{***}	0.06 ^{***}	0.12 ^{***}	-0.02 [*]	0.08 ^{***}	-0.01 ^{***}	0.25 ^{***}	1.00
15 Good or very good health	-0.02 ^{***}	-0.01 [*]	0.04 ^{***}	0.02 [*]	0.01 [*]	0.09 ^{***}	-0.15 ^{***}	0.14 ^{***}	0.22 ^{***}	-0.02 [*]	-0.10 ^{***}	-0.23 ^{***}	0.14 ^{***}	0.01 [*]

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.00$

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>		<u>Model 4</u>	
	Self-employment rate	Self-employed (SE)	SE by necessity	SE by opportunity	SE without employee	SE with employee
Flat tax	-9.21* (0.09)	0.86*** (0.00)	0.72*** (0.00)	1.01 (0.85)	0.69*** (0.00)	1.14* (0.08)
lnGDP	-4.48*** (0.00)	0.89*** (0.00)	0.77*** (0.00)	0.98 (0.13)	0.82*** (0.00)	0.97 (0.14)
Willingness to take the risk (self-described)		1.15*** (0.00)	1.09*** (0.00)	1.20*** (0.00)	1.10*** (0.00)	1.23*** (0.00)
Good or very good health (self-described)		1.03 (0.65)	0.92 (0.29)	1.12 (0.12)	1.11 (0.14)	0.94 (0.44)
Female		0.65*** (0.00)	0.64*** (0.00)	0.67*** (0.00)	0.66*** (0.00)	0.64*** (0.00)
Age: (reference: 18–24 years)						
25–34 years		1.00 (0.97)	0.90 (0.45)	1.10 (0.46)	1.00 (0.99)	0.98 (0.88)
35–44 years		1.24** (0.02)	0.98 (0.89)	1.51*** (0.00)	1.21 (0.12)	1.29* (0.07)
45–54 years		1.17 (0.13)	0.88 (0.36)	1.45*** (0.01)	1.16 (0.27)	1.20 (0.20)
55–64 years		1.08 (0.50)	0.84 (0.28)	1.32* (0.07)	1.12 (0.45)	1.05 (0.77)
65+ years		1.95*** (0.00)	1.60** (0.04)	2.27*** (0.00)	2.27*** (0.00)	1.53* (0.09)
Wealthy		1.06*** (0.00)	0.92*** (0.00)	1.16*** (0.00)	1.00 (0.85)	1.14*** (0.00)
Married		1.43*** (0.00)	1.50*** (0.00)	1.37*** (0.00)	1.34*** (0.00)	1.52*** (0.00)
Mother's education		0.97*** (0.00)	0.97*** (0.01)	0.97*** (0.00)	0.97*** (0.00)	0.98** (0.02)
Education: (reference: No education)						
Primary education		0.72 (0.20)	0.65 (0.23)	0.78 (0.45)	0.74 (0.33)	0.74 (0.46)
Secondary education		0.65* (0.06)	0.59* (0.10)	0.71 (0.26)	0.66 (0.14)	0.72 (0.37)
Post-secondary education		0.49*** (0.00)	0.44** (0.01)	0.54** (0.05)	0.38*** (0.00)	0.72 (0.37)
Higher-education		0.40*** (0.00)	0.32*** (0.00)	0.47** (0.01)	0.34*** (0.00)	0.55 (0.10)
Observations	34	14,179		14,179		14,158
Adjusted/Pseudo R ²	0.203	0.06		0.06		0.06

Table 4.

Flat tax system and occupation choice

Sources: LITS 2. Author estimation; Model 1 – OLS beta coefficient; Model 2 – Logit regression odds ratio; Model 3, 4 – Multilevel logit relative risk ratios; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

where the government introduced flat tax system. These findings do not change significantly when we tested the model with control variables. When it is estimated among only transition economies, the association between them becomes slightly stronger. Furthermore, the higher GDP of the country is associated with a higher probability of being self-employed by opportunity, as countries with better economic growth have higher chances to increase their entrepreneurial capacities to boost consumption, investment and savings in the economy. Talking about other controllable variables, we find that higher risk tolerance drives the probability of being self-employed by opportunity higher. Moreover, the healthier and wealthier the individuals are, the higher the chances are for them to become self-employed by opportunity. However, the remaining controllable variables such as gender, marital status, age, duration of education of individuals' mothers and higher education, cannot define self-employment by opportunity (Table 5).

5. Discussion

It is very important to note that all past papers, including [Lee and Gordon \(2005\)](#) and [Balioune-Lutz and Garello \(2013\)](#) and that studied the impact of the tax system on entrepreneurship, have one similar, as well as an inherent assumption: they used the self-employment as a homogeneous variable. However, self-employed individuals may have different purposes, i.e. there can be different motivations behind their decisions to become self-employed. Assuming two self-employed individuals, one may be seeking better income through self-employment as he or she has zero chance to be employed for a good salary, while another individual may make a choice by opportunity, meaning this particular individual may willingly launch his or her entrepreneurial activities. Indeed, our study showed that when we measure self-employment as one homogeneous group or aggregate variable, a negative association of the flat tax system is estimated. After distinguishing the self-employment into two groups, we learn that the observed negative association is specifically due to a decrease in necessity-type self-employment. In fact, we estimate a positive association between a flat tax system and opportunity-type self-employment.

We confirmed our hypothesis that a flat tax system reduces self-employment by necessity, which should be related to improved labor market conditions in the economy. When a flat tax system is introduced, the number of wage-employment opportunities increases ([Peichl, 2014](#)) and those who are working as self-employed for survival reasons find proper salaried employment to switch to. Another important reason can be a change in their own motives. An individual, who becomes self-employed due to no other option, may later realize that self-employment can, indeed, bring huge returns to him or her: marginal tax cost does not increase along with business growth.

Furthermore, we confirmed that a flat tax system increases self-employed-by-opportunity individuals. Considering the fact that a flat tax system implies a relatively lower marginal tax rate to relatively higher income thresholds and less complicated tax schedule, individuals start willingly enter self-employment and be motivated to enhance their businesses ([Peichl, 2014](#); [Block, 2016](#)). The introduction of the flat tax system is beneficial to both middle- and high-income individuals, as well as self-employed ones, however, the present value of future returns from wage-employment will always be substantially lower than future returns from entrepreneurial activities, assuming that self-employed individuals are always motivated to take complete advantage of the flat tax system. In other words, self-employed individuals start to expand their businesses by, for example, hiring more individuals, in an unconstrained environment, while wage-employed individuals will be constrained with salaries that are usually fixed to a certain extent. Indeed, our findings show that the probability of being self-employed with an employee over

Flat tax system

	Full data set				Data set without developed economies			
	Self-employed with opportunity		Self-employed with employee		Self-employed with opportunity		Self-employed with employee	
	Basic model	With controls	Basic model	With controls	Basic model	With controls	Basic model	With controls
Flat tax	1.35 ^{***} (0.00)	1.43 ^{***} (0.00)	1.78 ^{***} (0.00)	1.68 ^{***} (0.00)	1.38 ^{***} (0.00)	1.44 ^{***} (0.00)	1.88 ^{***} (0.00)	1.71 ^{***} (0.00)
lnGDP	1.28 ^{***} (0.00)	1.24 ^{***} (0.00)	1.20 ^{***} (0.00)	1.17 ^{***} (0.00)	1.26 ^{***} (0.00)	1.25 ^{***} (0.00)	1.14 ^{***} (0.00)	1.12 ^{***} (0.00)
Willingness to take risk (self-described)		1.07 ^{***}		1.09 ^{***}		1.07 ^{***}		1.08 ^{***}
Good or very good health (self-described)		1.26 ^{**} (0.03)		0.84 (0.11)		1.23 [*] (0.06)		0.86 (0.18)
Female		1.01 (0.91)		0.93 (0.45)		1.01 (0.95)		0.85 (0.13)
Age: (reference: 18–24 years)								
25–34 years		1.13 (0.51)		0.95 (0.76)		1.09 (0.62)		0.93 (0.72)
35–44 years		1.38 [*] (0.08)		0.97 (0.87)		1.32 (0.13)		1.02 (0.91)
45–54 years		1.34 (0.12)		0.89 (0.54)		1.30 (0.17)		0.94 (0.74)
55–64 years		1.23 (0.34)		0.80 (0.31)		1.25 (0.32)		0.87 (0.53)
65+ years		1.13 (0.68)		0.60 [*] (0.10)		0.81 (0.55)		0.64 (0.21)
Wealthy (self-described)		1.25 ^{***} (0.00)		1.14 ^{**} (0.00)		1.27 ^{***} (0.00)		1.11 ^{***} (0.00)
Married		0.98 (0.88)		1.20 [*] (0.09)		1.00 (0.99)		1.19 (0.15)
Mother's education		0.99 (0.41)		1.01 (0.67)		0.98 (0.14)		1.02 [*] (0.09)
Education: (reference: No education)								
Primary education		0.84 (0.70)		0.79 (0.63)		0.90 (0.84)		0.81 (0.69)
Secondary education		1.01 (0.98)		0.94 (0.88)		1.09 (0.85)		0.82 (0.68)
Post-secondary education		1.04 (0.93)		1.66 (0.26)		1.13 (0.80)		1.69 (0.30)
Higher-education		1.22 (0.64)		1.35 (0.50)		1.31 (0.56)		1.28 (0.62)
Observations	2,696	2,089	2,663	2,068	2,326	1,776	2,300	1,761
Pseudo R^2	0.04	0.07	0.03	0.06	0.02	0.06	0.02	0.06

Table 5.
Regression among self-employed individuals

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Sources: LITS 2. Author estimation; Logit regression odds ratio

without employee is higher in those countries where government introduces a flat tax system, which reflects the self-employed individuals expanding their activities. Additionally, this system promotes entrepreneurial activities in all sectors by introducing much more simplified tax schedules with much lower administrative and compliance costs (Peichl, 2014).

Our contribution to literature, by studying the association of flat tax system and self-employment by necessity and/or by opportunity, is enhanced by our chosen focus of transition countries, where a significant share of self-employed individuals is survival-type. These countries used to have a centralized economy and, finally, the governments of those countries have been working on switching to a market-based economy. They are in such a phase, wherein both types of self-employment are met quite frequently, thus, it is critical for transitional economies to use appropriate tax policies to promote entrepreneurial activities and increase particularly opportunity-type self-employment. As evidence shows, opportunity-type self-employment helps boost sustainable economic growth, increase the number of jobs created by businesses and alleviate the poverty in the country, while necessity-type self-employment might signal the absence of enough job vacancies in the labor market (Edoho, 2016).

In summary, our findings show that introducing a flat tax system in transition countries will be beneficial to develop and sustain the entrepreneurial capacity of the economies. High self-employment sometimes signifies that the economy does not have enough good-salaried-job opportunities, i.e. strong and competitive labor market; hence, individuals are pushed to become self-employed as there is no other choice rather than being unemployed for a considerable time period. If the government wants to boost the entrepreneurial capacity of the economy, they should not want to have more individuals be self-employed by necessity, but rather they should want them to be self-employed by opportunity. Because the latter group of individuals is job creators and they will most likely boost the economy further with their innovative business ideas.

6. Conclusion

While reviewing the literature, we identified that many scholars, who studied the impact of marginal tax rates, their structure and progressivity or flatness on entrepreneurship, did not distinguish the necessity-type self-employment from opportunity-type self-employment. We aim to explain the relationship between the flat tax system and each type of self-employment separately using LITS 2 survey conducted among transition countries in 2010.

In general, by using the ordinary and multilevel logit models, our estimates show that a flat tax system is positively associated with self-employment by opportunity and negatively associated with self-employment by necessity. Initially estimated the negative association between the flat tax system and total self-employment is further found to be driven by a particularly decrease in self-employment by necessity-individuals. Our binary logit regression estimation shows that the probability of being self-employed by opportunity over being self-employed by necessity and the probability of being self-employed with an employee over being self-employed without employee are higher in countries where governments introduced flat tax systems. Thus, our study confirms that having a flat tax system in the economy boosts entrepreneurial activities overall, in particular, by increasing opportunity-type self-employment.

In fact, the government would not want entrepreneurs to be working as if they have no other choice due to the possible poor labor market. To have sustainable economic growth, the individuals who enter the business world need to have a desire to establish a new business and increase the production capacity of the economy. Those who start their

businesses simply to survive financially will most likely have zero motivation to grow their businesses, i.e. they will be focusing more on short-term profits rather than focusing on long-term potential growth. For that reason, the government needs to differentiate the group of individuals who really want to contribute to economic growth with their innovative business ideas in the long-run from the group of individuals who enter the business world temporarily to survive. From a tax perspective, to increase the number of entrepreneurs by opportunity, the government needs to introduce a flat tax system, as our model proves that using a flat tax system leads to higher opportunity-type self-employment in the country. A flat tax system helps reduce the tax planning cost and improve transparency, which is very critical in transition countries, as these kinds of reforms may have a huge impact in the developing stage of the economy. As we observe a strong negative association between a flat tax system and necessity-type self-employment, our findings are crucial for particularly low- and lower-middle-income countries, where the share of necessity-type self-employment is significantly high. To maintain long-term self-employment in those countries, governments should develop an appropriate tax policy system. While in developed economies, self-employment is mostly derived from opportunity-type self-employment and the administrative cost of opening and running the business is low and transparent.

Our research can be extended in various dimensions:

- the exact rate of tax for transition countries is not included but rather measured as a dummy variable; or
- the duration of how long the country has been using the flat tax system is not considered due to a limited number of countries in the sample.

The above-mentioned issues could be solved or the accuracy of the model could be improved by including many countries, however, to the best of our knowledge, a challenge to distinguish self-employment into two types for all countries will still remain. Furthermore, we cannot claim if the flat tax system is advantageous due to relatively lower tax rates or a less complicated system with less bureaucracy. If the latter case is the reason, governments could still keep a progressive tax system, but needs to find ways to ease the process of establishing and running the business by reducing administrative and bureaucratic costs.

Notes

1. A study in Czech Republic, for example, confirms that economic growth in terms of GDP per capita has been positive for the given increasing number of newly established companies and partnerships (Dvoulety, 2017).
2. This measure of convexity only accounts for differences in marginal tax rates at the specific income levels associated with successful and unsuccessful entry. It ignores convexity associated with changes in the marginal tax rate between these two income levels (which is relevant when the distribution of outcomes is continuous) (p. 286, Gentry and Hubbard, 2000).
3. “Tax sheltering” activities include tax evasion and tax avoidance and these activities are positively correlated with corporate tax rates in countries (Gentry and Hubbard, 2005).
4. It is one of the three dimensions of corporate income taxes, namely, the “level effect,” “insurance effect” and tax complexity. “Insurance effect” relates to the implications of progressivity of corporate tax rates (Bacher and Brulhart, 2012).
5. We cannot use the other 2 waves (i.e. LITS 1 and LITS 3) of this survey as the question that allows to distinguish self-employment by opportunity from self-employment by necessity is given only in this wave (LITS 2).

6. Kosovo is excluded in OLS estimation. No data was available on self-employment percentage in labor force in 2010.
7. Respondents from Germany, Great Britain, France, Italy and Sweden are dropped in a data set without developed economies.

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	Self-employment rate, %	Flat tax	Wage employee	Self-employed by necessity	Self-employed by opportunity	Total
Albania	56.70	1	325	50	114	489
Armenia	43.14	0	252	48	25	325
Azerbaijan	68.06	0	276	60	15	351
Belarus	4.13	1	656	9	25	690
Bosnia	26.56	1	310	17	16	343
Bulgaria	12.57	1	411	13	43	467
Croatia	21.84	0	421	15	15	451
Czech Republic	17.73	1	610	32	74	716
Estonia	8.54	1	451	13	22	486
France	11.49	0	538	7	32	577
Georgia	58.81	1	196	59	20	275
Germany	11.57	0	570	12	71	653
Great Britain	13.99	0	641	29	86	756
Hungary	12.32	0	409	17	38	464
Italy	25.28	0	460	30	63	553
Kazakhstan	32.99	1	512	14	43	569
Kosovo	–	0	248	34	19	301
Kyrgyzstan	36.90	1	249	68	63	380
Latvia	11.49	1	516	11	20	547
Lithuania	10.88	1	422	16	10	448
Macedonia	28.50	1	337	26	31	394
Moldova	29.28	0	376	14	19	409
Mongolia	57.30	1	328	92	64	484
Montenegro	16.86	1	424	25	28	477
Poland	22.98	0	637	15	80	732
Romania	35.17	1	389	23	19	431
Russia	6.76	1	871	22	42	935
Serbia	32.44	0	544	64	52	660
Slovakia	15.97	1	626	19	55	700
Slovenia	17.26	0	473	20	29	522
Sweden	10.95	0	586	7	33	626
Tajikistan	45.85	0	181	55	63	299
Turkey	39.10	0	208	35	73	316
Ukraine	18.91	1	692	35	58	785
Uzbekistan	46.30	0	455	113	117	685
Total			15,600	1,119	1,577	18,296

Table A1.
Country statistics
used in the analyzes

Sources: Self-employment rate is as a percentage of the total labor force in 2010 taken from World bank data; flat tax system is taken from [Peichl \(2014\)](#); last 4 columns show the number of respondents in each occupation groups in the LITS 2

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