THE DETERMINANTS OF ENTREPRENEURSHIP IN LITHUANIA IN 2005-2016

Final research report

Enterprise Lithuania

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Šioje studijoje yra analizuojami veiksniai, lemiantys verslumo pokyčius Lietuvoje.

Ekonominėje literatūroje veiksniai, galintys daryti poveikį verslumo lygiui ir jo kaitai dažnai yra skirstomi į dvi grupes: į skatinamuosius ir ribojančiuosius. Tarp skatinamųjų svarbiausi yra tokie veiksniai kaip rinkos ekonominio augimo potencialas ir jos pelningumas. Tiek spartus augimas, tiek ir didėjantis pelningumas teigiamai veikia paskatas kurti verslą arba skatina jau veikiančius verslus toliau veikti rinkoje. Ribojantys veiksniai gali būti suskirstyti į rinkos ir institucinius veiksnius. Tarp ribojančių veiksnių svarbiausi yra didėjantis kapitalo intensyvumas, ribotas priėjimas prie išorinių finansavimo šaltinių ir didelės sąnaudos, patiriamos kuriant verslą. Verslumo kontekste kapitalo intensyvumas gali ir skatinti ir riboti verslo kūrimą, o didelės išlaidos, susijusios su verslo pradžia, dažnai daro neigiamą poveikį sprendimui steigti verslą. Ribotas priėjimas prie kreditų taip pat gali neigiamai veikti paskatas kurti verslą. Tarp institucinių, neigiamai verslumą veikiančių, veiksnių paminėtina mokestinė sistema, darbo rinkos reguliavimas, taip pat teisinės kliūtys, lėtinančios verslo kūrimą (pvz. licencijų ar leidimų išsiėmimas, verslo registravimo procedūros ir pan.). Ekonominėje literatūroje dar minimi ir tokie ribojantys rinkos veiksniai kaip eksporto ir importo intensyvumas, išlaidos reklamai, masto ekonomika, tačiau šie veiksniai, tikėtina, yra šiek tiek mažiau svarbūs nei veiksniai išvardinti aukščiau.

Empirinės literatūros, analizuojančius verslumo veiksnius nėra daug, o ir rezultatai skirtingoms šalims yra ganėtinai skirtingi. Paprastai yra randamas teigiamas sąryšis tarp verslumo kintamųjų ir rinkos augimo potencialo bei jos pelningumo, o ribojančių veiksnių poveikis verslumui skirtingose rinkose yra labai nevienodas.

Šioje studijoje daroma išvada, kad dauguma išvardintų veiksnių yra svarbūs verslumo lygiui Lietuvoje. Rinkos pelningumas dažnai yra svarbus veiksnys asmenims steigiantiems įmonę, o rinkos augimas - savarankiškai dirbantiems asmenims, tačiau pastarasis sąryšis yra silpnesnis. Tačiau, priimant sprendimą steigti verslą arba pasilikti rinkoje, yra svarbūs ir veiksniai atspindintys kliūtis. Kapitalo intensyvumo padidėjimas šalies ūkyje neigiamai veikia sprendimus veikti rinkoje kaip savarankiškai dirbantysis, tačiau daro teigiamą poveikį sprendimui steigti įmonę. Šioje studijoje daroma išvada, kad didėjant kapitalo intensyvumui ekonomikoje, yra patraukliau steigti įmonę, nei veikti rinkoje kaip savarankiškai dirbantysis. Vienas iš galimų paaiškinimų galėtų būti lengvesnis įmonių prieinamumas prie išorinių finansavimo šaltinių (kreditų); šios lėšos yra būtinos kapitalo prekėms įsigyti. Savarankiškai dirbantieji turi labai ribotą priėjimą prie kreditų, o dažnai jo ir visai neturi. Šioje studijoje daroma išvada, kad galimybė gauti kreditą yra svarbus veiksnys Lietuvos įmonėms. Darbo apmokestinimas ir išlaidos, susijusios su verslo pradžia, taip pat svarbūs faktoriai priimant sprendimus kurti verslą, tačiau tai yra svarbiau įmonėms nei savarankiškai dirbantiesiems asmenims. Galimas šių rezultatų paaiškinimas yra verslo įmonių lūkesčiai ateityje samdyti papildomą darbo jėgą, o išlaidos, susijusios su verslo steigimu paprastai yra didesnės įmonėms nei savarankiškai dirbantiesiems. Kaip ir daugumoje kitų studijų, kurios analizuoja verslumo veiksnius kitose šalyse, šioje studijoje nerandama įrodymų, kad darbo rinkos reguliavimas daro įtaką verslumo sprendimams. Dažnai mažiau svarbios Lietuvoje yra ir teisinės kliūtys, kurios lemia lėtesnį verslo kūrimą (laikas, reikalingas verslui pradėti; procedūrų, reikalingų verslui registruoti, skaičius ir pan.). Tai reiškia, kad pastarieji veiksniai turi mažesnę įtaką verslumo sprendimams nei gera ekonominė situacija, mokesčių sistema, veiklos pradžios išlaidos ir galimybė gauti kreditus.

1. INTRODUCTION

Entrepreneurship is a key factor for economic development in free-market economies. Existing businesses create production and working places and new businesses lead to improvement in efficiency and productivity. They increase competitiveness and reduce prices. They cause structural changes in the economy, generate innovations, create a higher variety of products, etc. Therefore, it is important to understand the determinants of entrepreneurship. Which factors make entrepreneurs decide whether to enter the market? What drives them to continue operating in the market? And do they enter the market as a legal entity or as self-employed? Both firms and the self-employed are important elements in the market from the perspective of competitiveness, efficient resource allocation and economic growth perspective. Decisions to enter the market or to continue operating in the market depends on the market structure and behavioural habits of entrepreneurs. These decisions are determined by incentives and barriers. The recent economic literature on the determinants of entrepreneurship emphasizing entry decisions and decisions to stay includes among others: Cala et al. (2015), Hajek et al. (2015), Nystrom (2007), Klapper et al. (2006), Klapper and Love (2010), Ozturk and Kilic (2012), Gunalp and Cilasun (2006), Naude (2009) and others. In general, research articles focus either on evaluating the determinants of entrepreneurship from a cross-country perspective or they focus on analysis of a single-country analysis, sometimes also evaluating cross-industrial differences.

Empirical research determines two types of indicators that affect decisions to enter the market or decisions to continue operating: incentives and barriers. The two most important variables depicting incentives for businesses are market growth and market profitability. The most important barriers analysed in the empirical literature emphasises market and legislative barriers. Typically, there is no straightforward separation between market and legislative barriers as legal regulations often create market barriers. Among market barriers, the most important indicators are market concentration, capital intensity and access to credit. Among legislative barriers, the most important indicators are the taxation system, the rigidity of employment, entry costs, entry procedures and product market regulations. It is also noteworthy that the research subject on the determinants of entrepreneurship in economic literature is very much based on empirical observations.

Previous empirical studies report different results on the determinants of entrepreneurship. Profitability of the economy and market growth are usually defined as important indicators for entrepreneurial decisions, but not always. Both variables are found to be of importance in empirical articles analysing Turkey, Argentina, Vietnam and South Africa. For Taiwan no evidence was found that these variables had an influence. Regarding entry barriers, results are even more mixed, although some common patterns could be identified. Access to credit or the banking system in general usually matters for entrepreneurial decisions, and so does capital intensity. Rigidity of employment is usually found to be insignificant in empirical research. Regarding other variables, as noted above, empirical research yields mixed results and it depends on the estimation method, the analysed country and the definition of the explanatory indicators (see Klapper and Love 2010, Klapper et al. 2006, Aghion et al. 2007, Naude 2009, Ozturk and Kilic 2012, Campos and Iotty 2005, Kaya and Ucdogruk 2002, Lay 2003, Gunalp and Cilasun 2006, Wang 2006, Cala et al. 2015, Hajek et al. 2015).

The purpose of this study is to analyse the determinants of entrepreneurship for Lithuania. Depending on data availability, it is evaluated which factors influence entrepreneurship activities in the Lithuanian

market. Entry decisions and decisions to continue operating of firms and the self-employed are evaluated. The methodology used in this study is derived from the studies mentioned above. These studies use econometric estimation techniques either for cross-country analysis or for cross-sector analysis for one country. Due to data constraints this study uses a quarterly data set with variables that show sufficient variation throughout time to capture changes in entrepreneurial activity in Lithuania.

2. THEORETICAL CONSIDERATIONS

In the theoretical and empirical literature on entrepreneurship, the decision to start a business is to a high extend associated with two factors: incentives to enter the market and barriers for entrance. The same reasoning is valid considering decisions to continue operating in the market. Incentives to enter the market or continue operating depend on two basic market characteristics: its growth potential and possibilities to earn profits. The higher the market growth and profit margins in a certain economy, the higher is the incentive to start a business (see for example Nystrom 2007). There are, however, factors considered as entry barriers. The main factors found in industrial organization theory and empirical research are defined as market and institutional barriers. Market barriers include economies of scale or market concentration, cost barriers, capital intensity, advertisement intensity, access to credit and some others. Institutional barriers mainly comprise the taxation system, product and labour market regulations and governance. In the empirical extensions on cross-country analysis different taxation and labour protection systems are considered. Political stability, government effectiveness, GDP per capita level and other indicators are also considered as important for entrepreneurial decisions (see for example Nystrom 2007, Klapper and Love 2010, Ozturk and Kilic 2012).

2.1 ENTRY INCENTIVES

As noted above, one of the most important determinants for entrepreneurial decisions is incentives to enter the market. Incentives to enter the market are to a high extend associated with basic market characteristics such as its growth potential and possibilities to earn profits. It is expected that higher growth potential and profitability of the market will attract entrepreneurs and will affect their decisions to start their entrepreneurial activities. The same reasoning is valid considering the decision to continue operating as a firm or as self-employed.

2.1.1 PROFITABILITY OF ECONOMY OR INDUSTRY

It is common to assume that potential entrants into business seek for profits. The higher the expected profits, the more attractive the market or industry for entrants and the stronger the willingness of entrepreneurs to operate in such a market.

The indicator that represents profitability might be reflected by the current or historical profit rate. Following previous empirical research, the most appropriate variable to measure profitability is defined by the gross profit margin, which is expressed as the ratio between gross profits and production value (see for instance *Nystrom 2007)* or as the ratio between nominal gross profits and nominal value-added. Alternatively, profitability is calculated as the ratio between the share of the difference of value-added and payments to workers and overall sales or with the difference between value-added and payroll as numerator and total output as denominator (see for instance *Gunalp and Cilasun 2006,*

Ozturk and Kilic 2012), but these variables more reflect capital-intensity of an economy or industry than its profitability. In general, there should be a positive relationship between profitability and attractiveness to enter. Profitability increases entries, i.e. the higher the expected profits, the higher is the entrance rate. The same argument is valid for entrepreneurs that already operate in the market. It is also important to note that profitability in an economy or industry is usually related to the cyclical position of an economy, though it also partly reflects the most profitable industries.

2.1.1 MARKET GROWTH PROSPECTS

In the same manner as profitability, expected market or industry growth rates are very important for entrance decisions. Strong market growth is closely related to increase in profits. Expected market growth affects entrants' expectations about the quantities that are going to be sold in the market and, in the sense that it signals the possible profitability of an industry. Growing demand in a market is also likely to lead to increasing prices if supply is limited and cannot be quickly adjusted to market needs. That could be the result of, for instance, limitations in production capacity. Growing demand and suppressed supply puts upward pressure on prices, which, in turn, leads to an increase in the profitability of an industry. Only demand growth is, thus, not a sufficient condition for new entries, an increase in prices is also necessary to increase the attractiveness for new entrants. All these factors imply that market growth rates and overall market conditions are a good indication for the flow of possible new entries *(Gunalp and Cilasun 2006, Ozturk and Kilic 2012, Nystrom 2007, Ilmakunnas and Topi 1999*).

In empirical research, the variable representing market growth prospects is usually measured by the current or past rate of growth of a market or industry, i.e. the annual growth of real output (or sales) in a market or industry under consideration. The other market growth measure could be calculated as the ratio of the difference between total industry income and output to total output *(Gunalp and Cilasun 2006, Ozturk and Kilic 2012, Nystrom 2007, Ilmakunnas and Topi 1999*). As is the case for measures of profitability market growth variables partially reflect the cyclical position of an economy or industry, but it also partially depicts the structural composition of an economy.

2.2 ENTRY BARRIERS: MARKET AND LEGISLATIVE BARRIERS

Apart from incentives, factors considered as entry barriers are also important for decisions to operate as entrepreneur. As noted above, such barriers, among others, include cost barriers, capital intensity, access to credit, the taxation system, product and labour market regulations and others. These factors are important for both new entrants as for entrepreneurs already operating in the market (see for example *Nystrom 2007, Klapper and Love 2010, Ozturk and Kilic 2012*).

2.2.1 CAPITAL INTENSITY

It might be difficult for new entrants to enter some specific market if that industry is characterised by a high capital-intensity. Entering such market requires high entrance costs and therefore, new entries to such markets could be discouraged. Business start-up costs in highly capitalized industries mainly consist of costs related to acquisition of tangible capital, such as machinery, dwellings and other fixed capital and often also investments into intangible capital such as patents, R&D and branding. A lack

of intangible assets could even be considered as a structural barrier to enter since their acquisition usually requires high investments.

Empirically it is usually proved that there exists a relationship between entrance rate and **capital intensity**, thereby implying that capital requirements could be a barrier for the decision to enter a market. In general, it is usually acknowledged that in capital-intensive industries new entrants without a sufficient stock of capital cannot compete with the firms already operating in the market and that has a dampening effect on overall entrance incentives (*Nystrom 2007, Gunalp and Cilasun 2006, Cala et al. 2015*). However, a negative impact of capital intensity on entrepreneurial decisions is not always clear. There is also empirical evidence that capital intensity might have a positive impact on decisions to continue operating and especially on entry decisions (see for instance *Lay 2003*). This argument is more relevant considering the form of entrepreneurship that is chosen to enter: as a firm or as self-employed. Credit constraints to obtain the necessary capital is usually more relevant for the self-employed.

Some empirical studies test the impact of **capital costs** on entry decisions while other studies use capital-intensity to test the impact of capital requirements on entrepreneurship (*Nystrom 2007, Gunalp and Cilasun 2006*). In empirical research capital-intensity is usually defined as the capital share in total output, calculated by substracting the share of labour income from total output. In the same way, tangible or intangible capital intensity could be assessed as a ratio between these assets and total production value (*Nystrom 2007*).

2.2.2 MARKET CONCENTRATION AND PRODUCT MARKET REGULATIONS

Market concentration is also an important issue in the consideration to enter a market, although this indicator is more important in cross-country or cross-industry analysis. Usually an entrepreneur that considers entering a market faces competition from firms that are already operating in that market. There is a possibility that existing firms are going to create behavioral barriers for new entrants. This is most likely to happen in highly concentrated industries. The higher the market concentration, the larger the barrier entrepreneurs might face trying to enter it. The channel through which such barriers could be created is usually related to the price channel. Existing firms could cooperate and keep prices down or create a situation of excess supply which (in a simple demand-and-supply framework) would also cause downward pressure on prices. Empirical studies also show that highly concentrated markets suffer from low entrance rates, but the relationship might be mutual since a low entry could simultaneously cause higher concentration in the market. It is also considered that high concentration might reflect the existence of economies of scale and therefore it can be difficult to differentiate between these two effects (*Nystrom 2007, Ozturk and Kilic 2012, Gunalp and Cilasun 2006*).

Usually the variable denoting market concentration is calculated as a Herfindahl index which is defined as the sum of the squared market shares for each firm in an industry or sector (*Nystrom 2007, Ozturk and Kilic 2012, Gunalp and Cilasun 2006*).

It is also possible to consider **product market regulations** as a barrier to enter the market, though it does not fully reflect the extent of market concentration. However, product market regulations might cause higher degrees of market concentration. In many markets entrepreneurs face product market regulations, but some markets or some industries are more liberal than others. Barriers to enter arise out of a necessity to obtain a number of certain authorizations, certificates and licenses that allows

operating in in the market. Therefore, a higher degree of product market regulations should negatively affect decisions to enter a market.

2.2.3 TAXATION

The taxation system obviously affects decisions to start an own business. In liberal markets with low tax rates it is easy and notcostly to start an own business or to continue operating in a market as a firm or as self-employed. On the other hand, high taxation of business might suppress incentives to operate as an entrepreneur and to consider a career as employee instead. High labour taxation might be a disincentive for entry decisions into labour-intensive activities. High labour taxation might also discourage business expansions, especially in labour-intensive industries which require labour force engagement. In this context, the **labour tax wedge**, i.e. the ratio between total labour taxes and total labour costs borne by the employer, is a good indicator of labour taxation and the overall taxation system in an economy (*Baliamoune-Lutz M. & Garello P., 2011*). **Profit tax rates** could be a supplementary indicator representing the overall taxation system in a country. It is also expected that higher corporate tax rates discourage new entries (*Klapper & Love, 2010*), though it could also suppress incentives to continue operating as entrepreneur in the long-run. In cross-country analysis corporate tax rates could serve as a proxy for the taxation system that business is facing (see for instance *Klapper & Love, 2010*). In single country analysis profit taxation could be represented by the ratio between budgetary income from profit taxation and the gross profit ratio. It is expected that higher labour and higher profit taxation is associated with a lower number of new entries and a smaller amount of businesses operating in the market.

2.2.4 ACCESS TO EXTERNAL FINANCING

Access to external financing could also be an important determinant to incentives to start an own business or to remain operating, especially in times of economic downturn when demand for products is weak. One of the most important sources of external financing is obviously credit that could be obtained from financial institutions, but some other sources could also be available. External funding makes it easier for entrepreneurs to start a business, especially in capital-intensive industries considering the high costs associated to acquisition of capital. Entry decisions and decisions to continue operating in a market could also be affected by overall possibilities to get funds from external financing sources so that an uninterrupted continuation of business activity is guaranteed. In the empirical literature that analyzes cross-country variations of the level of entrepreneurship, access to external financing is defined by the **overall financial sector development**, measured by domestic credit to the private sector as a percentage of GDP (see for instance *Klapper & Love, 2010*). It is also reasonable to define access to external financing by outstanding amount of credits to non-financial corporations as a percentage of GDP. It is predicted that greater financial development should be associated with higher entrepreneurship levels.

In some empirical articles the variable denoting the development of the financial sector is replaced with the **real interest rate** (see for instance *Gunalp and Cilasun, 2006*). The interest rate indicator, however, would reflect mainly incentives to borrow and would not account for supply side constraints from external funding institutions that businesses usually face.

2.2.5 EMPLOYMENT PROTECTION

The decision to run an own business depends also on the situation on the labour market or the degree of strictness of labour laws. **Employment protection** creates rigidities in the labour market and barriers for entrepreneurs to operate freely on the market. Indeed, less liberal labour laws are usually associated with higher costs to run businesses and could therefore be considered as an entrance barrier (see for instance *Bonnet et al. 2017*). More liberal labour laws increase the speed of filling vacancies and thereby makes it easier for entrepreneurs to hire the necessary labour force when needed. In the same manner, less strict labour protection implies that employers are not bound by conservative labour laws in firing processes and redundant labour force could be easily laid off. Although under liberal labour protection laws higher outflows from unemployment and higher inflows into unemployment might be observed simultaneously, entrepreneurial activities gain much from liberal labour market regulations. This accounts for the speed of hiring, layoff procedures and lower additional costs associated with employment contracts. Empirical research finds some evidence that stricter employment protection negatively influences entrepreneurial activity, although separate employment protection legislation elements could also be considered (see *Liebregts and Stam 2016, Young 2003, Klapper and Love 2010*). The strictness of employment protection is usually measured by an employment protection legislation (EPL) index. This indicator is widely used as a proxy for measuring the flexibility of the labour market.

Some researchers evaluated the effect of employment protection on the probability to become self-employed for immigrants, acknowledging that they are outsiders on the labour market because they are facing difficulties to become employed by other employers. Although there is no evidence found supporting this hypothesis, it is recognized that stricter employment protection might boost self-employment. The channel for such outcomes are lower turnover in the labour market due to strict employment protection, high unemployment rates for certain groups of the population and a less favorable standard of living. That might lead to the decision to become self-employed (*Ulceluse and Kahanec*, 2017).

2.2.6 OTHER ENTRY BARRIERS

Some other indicators are also important to evaluate the decision to enter the market as an entrepreneur. Particularly, the **time required to start a business** might capture legislative barriers that are important for the decision to start an own business and could be considered as a determinant of entrepreneurship. However, this indicator is important only for entry decisions, not for those entrepreneurs that are already operating in the market. It is expected that a longer time to start a business should negatively affect incentives to enter.

The other indicator, representing **costs to start a business,** captures startup costs of entry to the market. As is the case for the variable measuring the time required to start a business, start-up costs are only supposed to affect the decision to enter the market, not to continue operating on the market. Higher costs should be a disincentive for new entries.

The **number of procedures needed to register a business** also captures the extend at which legislative barriers are a burden for start-up procedures. It is expected that a high number of procedures should be a disincentive for new entries into the market (*Klapper and Love 2010).*

3. DATA AND ESTIMATION TECHNIQUES

3.1 DATA AND DATA SOURCES

This study applies econometric techniques to analyse the determinants of entrepreneurship in Lithuania. There are several indicators that are used as dependent variables in the estimations. In empirical research and in this study, such indicators as **entry density, business density and entry rate** serve as measurements of entrepreneurship (see for example *Cala et al. 2015*). To analyze entrepreneurship in Lithuania more extensive, different data sources have been combined. Time series usually cover the 2001Q1–2017Q2 period or shorter. The sample size for analysis depends on data availability. The choice of explanatory variables used in this study also heavily depends on data availability in national statistical sources.

First, **entry density** is used as dependent variable. This variable is calculated as the number of newly registered limited and unlimited liability legal entities (excluding self-employed) per 1000 inhabitants. The initial data (for legal entities) is taken from the Centre of Registers (Lithuania's business register) and Statistics Lithuania (for population data). Second, **business density** is calculated as the number of existing registered legal entities with limited and unlimited liability (excluding self-employed persons) per 1000 inhabitants. Data sources are the same as for entry density and covers the 2001Q1–2017Q2 period. An additional variable representing **business density** is also used as dependent variable in the estimations. In this variable the number of legal entities is replaced by the number of operating enterprises per 1000 inhabitants and quarterly data is interpolated from annual data using the cubic spline interpolation method. Initial data is available from the Statistics Lithuania database and covers the 2015Q4–2017Q2 period. Third, the **entry rate** is calculated as the ratio between the number of newly registered legal entities with limited and unlimited liability (excluding the self-employed) and the number of lagged registered businesses. Initial data is available from the Lithuanian business register database and covers the 2001Q1–2017Q2 period. All these series are available only at an aggregate level, not by separate sectors.

Similar variables are calculated for the self-employed. The **business density for the self-employed** variable is considered as a measurement of self-employed entrepreneurship. Quarterly data on the number of self-employed is available from the Eurostat database and covers the 2001Q1–2017Q2 period. Time series are available at an aggregate level and on sectorial level and are calculated per 1000 inhabitants.

Explanatory variables, representing entry incentives or incentives to continue operating on the market are market growth and profitability in that market. As noted in the theoretical part of this paper, **market growth** is measured as the annual growth of real output in the market or industry under consideration. Initial data for real GDP is available from the Statistics Lithuania database and covers the 2001Q–2017Q2 period. **Profitability** of the economy or industry is calculated as the ratio between gross profits and nominal value-added. Initial data for nominal value-added and gross profits is sourced from Statistics Lithuania and covers the 2005Q–2017Q2 period.

Capital intensity, as noted in the theoretical part, is calculated as the capital share in total output. This variable is obtained by subtracting the income labour share from total output. The income labour share is calculated as the ratio between nominal wages and nominal value-added. Initial data for

wages and value-added are available from Statistics Lithuania database and covers the 2001Q1-2017Q2 period for the whole economy and for separate sectors.

The **labour tax wedge**, as noted in the theoretical part, serves as a proxy for the taxation system. This variable is defined as the ratio between total labour taxes and total labour costs borne by the employer. In the Lithuanian tax system total labour taxation consists of a personal income tax, social security contributions paid by the employer and social security contributions paid by the employee. Total labour costs are defined as gross earnings (or bruto wage) plus social security contributions payed by the employer. The approximate labour tax wedge for Lithuania is calculated by combining data from the national accounts and general government budget income indicators. Series for total labour costs are available from the Statistics Lithuania database as a component of GDP by income approach. Direct taxes received by the general government are assumed to serve as a proxy for the personal income tax. Social contributions payed by employees and employers are calculated by combining data from the national accounts and general government income (from social contributions receivable data). Data is available for the 2001Q1–2017Q2 period and sourced from Statistics Lithuania.

In addition to the labour tax wedge, **profit taxation** is also used to determine the importance of taxation on entrepreneurship decisions. This variable is calculated as the ratio between profit tax paid and gross profits. Due to data availability, this variable is calculated only for the 2005Q1–2017Q2 period and therefore used only restrictively in alternative representations. Data for profit taxes is retrieved from State budget statistics, whereas gross profits are sourced from Statistics Lithuania. Both the labour tax wedge and profit taxation are calculated for the whole economy. Figures for separate sectors are not available.

Possibilities to acquire **credit** is an important determinant for starting entrepreneurs, but also highly relevant for continuation of businesses activities. Credits for non-financial corporations for the total economy and by separate sector are available from the Bank of Lithuania database for the 2001Q1–2017Q2 period. The variable used in the estimations is calculated as the ratio between outstanding credit for non-financial corporations in nominal terms and nominal value-added.

The variable measuring the **time required to start a business** in days, is calculated and available for the Lithuanian economy from the World Bank's Doing Business (2016) database. This indicator basically shows how many days are required to deal with governmental agencies to start an own business without extra payments. It is assumed that the number of days necessary to start a business is identical for all sectors of the Lithuanian economy. The Doing Business database comprises time series for Lithuania for the 2003-2016 period.

The **costs to start a business**, as a percentage of gross national income, is also calculated and available for Lithuania in the World Bank's Doing Business (2016) database. This variable is important only for new entrants and is assumed to be identical for all sectors of the Lithuanian economy. Series cover the 2003-2016 period.

The variable denoting **start-up procedures to register a business (number)**, is also taken from the World Bank's Doing Business (2016) database and covers the 2003-2016 period. It is assumed that the number of start-up procedures is similar for all sectors of the Lithuanian economy.

An **employment protection legislation** index is calculated by the Bank of Lithuania for 2003-2013 (see *Pesliakaite and Siaudvytis 2015*) and a prolonged series for 2014-2016 is calculated by Enterprise Lithuania. The method to measure the rigidity of the labour market is developed by the OECD.

Some measures are not available for Lithuania and therefore cannot be used in this study. There is not sufficient data available to construct a **market concentration** indicator and the OECD provides **product market regulation indexes** only for the separate years 2008 and 2013. These two indicators are therefore excluded from further analysis.

3.2 ESTIMATION TECHNIQUES AND MODEL

The baseline econometric model for single country analysis includes two potential incentive determinants of entrepreneurship along with variables that are considered as entry barriers. In this model no interdependence between indicators is considered because time series are short and indicators that could be possibly interacted appeared to be not significant in estimations. The empirically tested baseline model is intended to explain past entrepreneurial trends and is designed as following in dynamic form:

$$EN_t = \alpha + \beta_b EN_{t-1} + \sum_i \gamma_i X_t^i + \sum_i \chi_i Z_t^i + \varepsilon_t$$

where EN_t denotes entry density, entry rate or business density at time t, X_t^i stands for incentives to act as an entrepreneur and Z_t^i for barriers to enter or to continue operating in the market. There is also a lagged dependent variable included in the model. Regarding incentives, X_t^i includes market growth and profitability of the economy. Z_t^i stands for capital intensity, labour tax wedge, access to credit, costs to start a business, the number of procedures to start a business and time to start a business. Occasionally an alternative model where the labour tax wedge and legal barriers (number of procedures to start a business and time to start a business) are replaced with profit taxation and employment protection legislation is also estimated.

4. DATA AND ESTIMATION TECHNIQUES

4.1 RESULTS FOR FIRMS

In this study, one of the most important issues was to identify the determinants of entry for legal entities. It was also intended to analyse which factors affect decisions of firms to continue operating in the market. All equations are estimated with the Generalized Method of Moments (GMM) estimator to correct for potential endogeneity issues. The **entry density and entry rate** are regressed on variables representing incentives to enter and variables representing barriers. The variables representing incentives to enter are market growth and profitability and the variables representing barriers are capital intensity, the labour tax wedge, access to credit, costs to start a business, etc.

Table 1 reports the results of the estimations for legal entities (firms). In the case they are significant, all the independent variables are correctly signed. Column (1) relates to the model where the determinants of entry density are considered and column (2) to the model where the determinants of

the entry rate are identified. The latter model includes also the past exit rate as an additional explanatory variable. Columns (3) and (4) report results of entry density and entry rate where the labour tax wedge is replaced with the proxy for profit taxation, whereas the number of procedures to start a business and time to start a business are replaced with the employment protection legislation variable. Estimations with **business density** as dependent variable are not performed because data is not stationary, an important prerequisite for statistical inference on time series data. As noted in the theoretical part, business density was calculated as the number of existing registered legal entities with limited and unlimited liability (excluding self-employed) per 1000 inhabitants and as number of operating enterprises per 1000 inhabitants.

Table 1. Determinants for entry (legal entities and enterprises), single equations, 2005–2016

	Entry density (number of newly registered legal entities per 1000 inhabitants)	**Entry rate** (ratio between newly registered legal entities and total firms lagged one period**)**	**Entry density** (number of newly registered legal entities per 1000 inhabitants	**Entry rate** (ratio between newly registered legal entities and total firms lagged one period)
	Total economy	**Total economy**	**Total economy**	**Total economy**
	GMM	GMM	GMM	GMM
	(1)	(2)	(3)	(4)
Lagged dependent variable (-1)	0.37 (0.14)**	0.38 (0.17)**	0.47 (0.15)**	0.47 (0.15)**
Market growth	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.00 (0.01)
Profitability	0.08 (0.02)***	0.13 (0.04)***	0.07	0.07
Capital intensity	0.03 (0.01)***	0.05 (0.01)***	0.04	0.04
Labour tax wedge	–0.02 (0.01)*	–0.02 (0.01)*		
Profit taxation			0.00 (0.00)	0.00 (0.00)
Costs to start a business	–0.17	–0.23	–0.13	–0.21
Access to credit	0.01 (0.00)**	0.01 (0.00)**	0.01 (0.00)*	0.01
The number of procedures to start a business	0.02 (0.02)	0.07 (0.05)		
Time to start a business	0.00(0.00)	0.01 (0.01)		
Employment protection legislation			0.00 (0.11)	0.06 (0.11)
Past exit rate		0.20 (0.17)		0.00 (0.00)
Trend	no	no	yes	yes
Time dummy	no	no	yes	yes
Adjusted R-squared	0.89	0.83	0.87	0.77

Notes: *, **, *** statistically significant at the 10%, 5% and 1% levels respectively. All series are seasonally-adjusted, except for costs to start a business, EPL, time to start a business and the number of procedures to start business. Lagged variables in levels or ratios are used as instruments in estimations.

The positive and significant coefficients in the regressions suggest that the profitability in the economy matters for decisions to enter the market. No evidence is found in this study that market growth has an impact on the entry decision, from which can be concluded that it is profitability rather than market growth that affects entry decisions for firms.

Capital intensity affects decisions to act as entrepreneur in the market. The positive and significant sign in the regressions signal that an increase in capital intensity leads to the decisions to operate in the market as entrepreneur by establishing a legal entity. As noted in the theoretical part, this can be considered as a trade-off between the decision which form of entrepreneurship to choose: either to enter the market as a firm or choosing to be self-employed (see also part 4.2). Capital intensity is likely to influence decisions to act on the market as a firm, especially considering that availability of credit is also important for entry decisions. This is accounted for by a positive and significant coefficient of the

variable that serves as a proxy for access to external financing. The possibility to finance business activities by taking credit is of importance for new entrants. Labour taxation and costs to start a business negatively affect entrepreneurial decisions. This is accounted for by the negative and significant estimated coefficients. This implies that an increase in labour taxation and an increase in start-up costs lead to lower amounts of new entrances to the market. There is no evidence found in this study that profit taxation has the same effect on entrepreneurship as labour taxes, but this does not mean that taxation of profits does not matter for firms. It is more likely that firms perceive labour taxes of higher importance for business activity in Lithuania than profit taxation.

The variables denoting the number of procedures required to start a business or time to start a business appear not to be significant in the estimations. However, this does not mean that these issues are not important for new entrants into the market, but just suggests that other factors are more important for decisions to be active as entrepreneur. The same argument could be valid for the rigidity of employment. Even though the coefficient is not significant, it could mean that other indicators matter more for entrepreneurial decisions.

4.2 RESULTS FOR SELF-EMPLOYED

Similar estimation techniques are applied to analyse incentives and barriers to act in the Lithuanian market as self-employed. Depending on data availability, only **business density** is considered as a dependent variable in the estimations. Equations are also estimated with GMM to correct for possible endogeneity issues. Table 2 reports the results of the estimations. Column (1) depicts the model for the total economy and the columns (2), (3), (4) and (5) to models for separate sectors of the economy. The incentive variables used in the estimations are market growth and profitability. The variables representing barriers are capital intensity, costs to start a business, number of procedures to start a business, time to start a business and profit taxation. The latter variable is more used as a proxy for the overall taxation system of the Lithuanian economy, i.e. to test if taxes might matter for decisions to act as self-employed.

Table 2. Single equations for self-employed, 2005–2016

	Business density (self-employed per 1000 inhabitants)	**Business density** (self-employed per 1000 inhabitants)	**Business density** (self-employed per 1000 inhabitants)	**Business density** (self-employed per 1000 inhabitants)	**Business density** (self-employed per 1000 inhabitants)
	Total economy	**Agriculture**	**Manufacturing**	**Construction**	**Services**
	GMM	GMM	GMM	GMM	GMM
	(1)	(2)	(3)	(4)	(5)
Self-employed per 1000 population (-1)	0.61	0.58	0.85 (0.11)***	0.69 (0.18)***	0.47
Market growth	0.03	0.01 (0.00)*	0.01 (0.00)***	0.00 (0.00)	0.00 (0.01)
Profitability	– 0.28	–0.51(0.27)*	– 0.02 (0.02)	0.11 (0.03)***	0.01 (0.05)
Capital intensity	– 0.07	0.01 (0.01)	– 0.01 (0.01)**	0.00 (0.00)	– 0.02
Profit taxation	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Costs to start a business	–0.05	0.14 (0.10)	–0.04 (0.02)**	0.00 (0.01)	–0.08
Time to start a business	–0.03	–0.04	0.00 (0.00)	0.00 (0.00)	– 0.01
The number of procedures to start a business	0.05 (0.09)	0.07 (0.07)	–0.01 (0.01)	–0.03 (0.02)	0.01 (0.05)
Trend	no	no	no	no	no
Time dummy	yes	yes	yes	yes	yes

Adjusted R-squared	0.94	0.86	0.67	0.85	0.90

Notes: *, **, *** statistically significant at the 10%, 5% and 1% levels respectively. All series are seasonally-adjusted, except for costs to start a business, EPL, time to start a business and the number of procedures to start a business. Lagged variables in levels or ratios are used as instruments in estimations.

Results for the self-employed are quite different from the results for legal entities. Market growth affects decisions to enter. Profitability of the market in this context is less important as an incentive to enter the market as self-employed. In addition, contrary to firms, profitability of the market in the equations for the self-employed appear with an opposite sign (although not significant for the total economy). It most likely again indicates a trade-off between the decision to act as self-employed entrepreneur or to operate as a firm. The negative sign most likely signals that a decrease in profitability in the market makes entrepreneurs decide to change the form of business: from self-employed to firm, although this result is not easy to interpret economically. Capital intensity for self-employed also appears with an opposite sign than for firms, but these results are in line with theoretical expectations (see also part 4.1). An increase in capital-intensity leads to a decrease in the number of self-employed acting in the market. However, it makes businesses to switch the form of entrepreneurship from self-employment to firms. As noted above, this could happen due to easier access to credit for firms. Easier access to external financing sources allows firms to finance capital acquisition from credit.

Although taxation of profits is applicable in direct sense only for legal entities, this variable is still used in the estimations for the determinants of self-employed persons. The basic idea of using this variable is to see whether the overall taxation system matters for self-employed persons. As expected, the taxation variable appears to be not significant. The labour tax wedge as a barrier has not been tested, given that the self-employed operating in the Lithuanian market usually do not employ other workers. Access to credit is not considered either in the estimations for self-employed, because this form of entrepreneurship does not usually have access to external financing sources.

Different from the firms, the costs to start a business does not seem to matter much for the self-employed. One of the explanations for these results is that the estimations for self-employed are performed on the business density variable, i.e. entrepreneurs that are already acting on the market. This barrier might be more important for new entrants, not for entrepreneurs that already operate in the market. The other reason for such results could be low start-up costs for self-employed as compared to much higher costs to establish a firm. The time to start a business as self-employed might matter for this form of entrepreneurship. A longer time for the start-up procedure is a disincentive. The overall conclusion from this result is that legislative barriers are of much higher importance for entrepreneurs acting as self-employed than for the ones that consider establishing a legal entity.

There are some differences among sectors of the Lithuanian economy that are worth mentioning. More specifically, for the self-employed in manufacturing, market growth as well as capital intensity are much more important for entrepreneurial decisions than in other sectors of the economy. High start-up costs are also a disincentive in this sector and in services sectors as well. There is strong evidence that in the construction sector, the incentive to be active in the market is determined by an increase in profitability of construction services. In agriculture results are not very stable and are therefore not interpreted here.

5. CONCLUSION

The estimation results show that most indicators listed in the empirical literature are important for entrepreneurial decisions in Lithuania. Profitability often matters for entrepreneurs that enter the

Lithuanian market through the establishment of firms, while for the self-employed it is market growth that matters most. It needs to be noted that for the latter this relationship is weaker.

Barriers are also important for entry decisions. More specifically, an increase in capital intensity negatively affects decisions to act on the market as self-employed, but positively affects decisions to enter the market through a firm. The decision to act on the market as a legal entity or as self-employed is a trade-off that is influenced by changes in the capital intensity of the economy. A possible explanation for this finding might be caused by easier access to external financing sources for firms than for self-employed, since credit is often necessary to obtain capital goods. This study shows that access to credit is important for entrepreneurial firms.

Taxation and costs to start a business also matter for entry decisions, although only for decisions to enter the market as a firm, not as self-employed. A possible explanation for these results are future expectations of firms to hire additional labour force. Therefore, their decisions are affected by the taxation system in the economy. Start-up costs are also usually much higher for legal entities than for self-employed and are thus more important for Lithuanian firms. Rigidity of employment is found to be not important for entrepreneurial decisions, the effect of legislative barriers (time required to start a business and the number of procedures required to register a business) also turns out to be less important. This implies that employment protection and legal boundaries have less impact on decisions to act on the market as entrepreneur than incentives and other possible barriers such as the taxation system, start-up costs and access to credit.

This analysis has been an introductory study into the determinants of entrepreneurship in Lithuania. The results imply that further research is required in taxation, the importance of access to credit, other external financing sources and self-employment. The limits of research have already been reached using publicly available data sources and it is therefore recommended to make use of micro-data sets for Lithuania to increase the scope of the research into the determinants of entrepreneurship.

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