Determinants of entrepreneurship in Latvia and Baltic countries in general: an empirical approach

Gonçalo Rodrigues Brás

Stockholm School of Economics in Riga,
Strēlnieku iela 4a, Riga LV 1010, Latvia
Email: goncalo.nr.bras@gmail.com

Abstract: Within the framework of North's institutional theory (1990, 2005), the aim of this study is to analyse the impact of economic and institutional factors (formal and informal) on entrepreneurship in both Latvia and the Baltic countries as a whole in the post-Soviet era. Based on international entrepreneurship topic, a multiple regression approach was used with data from 1996 to 2014 with a time-series model (Latvia), a panel data model and a dynamic panel data model (Baltic countries). The empirical findings for the Baltic countries suggest that a lower level of corruption, fewer constraints on capital investment, higher investment expenditure, a higher level of financial development, fewer trade barriers, lower inflationary pressure and less governmental price regulation tend to increase entrepreneurial activity. Despite some unexpected results related to fiscal freedom and property rights, the findings provide economic policy-makers with important information about the main determinants of entrepreneurial activity in the Baltics.

Keywords: entrepreneurship; Latvia; Baltic countries; time-series model; panel-data model.

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Biographical notes: Gonçalo Rodrigues Brás is a Portuguese economist who has been working as a lecturer or as a visiting researcher in several European Universities and Polytechnic Institutes for the last 13 years.

1 Introduction

Despite the lack of academic consensus on entrepreneurship as a concept (Martin et al., 2010), there is strong evidence of the positive correlation between entrepreneurship and economic growth, which is confirmed by about two thirds of all empirical studies (van Praag and Versloot, 2007; Braunerhjelm, 2008). As such, it is interesting to examine the determinants of entrepreneurial activity in countries like Latvia, Lithuania and Estonia, which have enjoyed robust and sustainable economic growth over the last

20 years. This dynamic context is used herein to compare the determinants of entrepreneurship in the Baltic countries as a whole with those specifically of Latvia; not only because this study was conducted from Riga but also because in the last available report of Global Entrepreneurship Monitor (GEM) on which were represented those three economies (2013), Latvia shows a higher total early-stage entrepreneurial activity (Amorós and Bosma, 2014). This fills a gap in the literature, which hitherto has focused predominantly on entrepreneurship at the company level (Stel et al., 2005).

While it would also be interesting to compare the determinants of entrepreneurship before and after European Union (EU) enlargement to the Baltics in 2004, this initial aim was hampered due to the short time period since EU membership. We therefore examine the determinants of entrepreneurship in the Baltic countries regardless of EU membership, focusing above all on identifying institutional and macroeconomic variables that help explain entrepreneurial activity in the Baltics so as to establish a pattern. Our purpose is not only to decode institutional and economic drivers of entrepreneurship but also to identify which ones are irrelevant to the development of entrepreneurial activity in Latvia and in the Baltic countries as a whole. Although it is not yet clear that higher entrepreneurial activity leads to economic growth, by identifying the most significant determinants of entrepreneurship, we draw attention to ways of furthering economic development in the Baltics. Within the framework of North's institutional theory, this exploratory research aims to unveil the institutional (and economic) determinants of entrepreneurial activity in Latvia specifically and in the Baltic countries as a whole using a time-series model (Latvia) and a panel data model (Baltic countries). This approach is consistent with the international entrepreneurship concept defined by McDougall and Oviatt (2000, p.903), whose study encompasses two topics: (a) research on 'innovative, proactive and risk-seeking behaviour that crosses national borders and is intended to create value and organizations' and (b) research 'comparing domestic entrepreneurial behavior in multiple countries'. Moreover, this study has the modest ambition to contribute to the evolution argued by Coviello et al. (2014) that has been made to consolidate international entrepreneurship as a credible field of research.

The paper is structured in the following five sections: literature review, the Baltic context, methodology, results and discussion/conclusions. The literature review describes the state of the art of the concept of entrepreneurship and its determinants. The section on the Baltic context provides an overview of the economic developments in the post-Soviet era of the Baltic countries and identifies structural reforms that could have influenced entrepreneurial activity in this region. The methodological section explains the research design, variable measures, data analysis and research procedures. The next section presents our results without making any subjective interpretation. The final section analyses the results in light of the literature review and sets out the main findings and conclusions, before addressing some limitations and implications for the future.

2 Literature review

Entrepreneurship is considered one of the most intriguing concepts in economics (Baumol, 1968) and is seen as multidimensional (Audretsch et al., 2007). However, it gathers little academic consensus (Martin et al., 2010; Berglann et al., 2011) precisely because it is so transversal, heterogeneous and subjective (Davidsson, 2006).

Although linked to different areas such as economics, psychology, management and sociology, several concepts of entrepreneurship have emerged. But rather than highlighting the different concepts of entrepreneurship in each area, we should be aware of the contextual environment that influences entrepreneurial activity.

Bruyat and Julien (2001, p.165) argue that one of the major interests of entrepreneurship studies is 'the dialogic between individual and new value creation, within an ongoing process and within an environment that has specific characteristics'; this underlines the importance of contextual factors to enhancing entrepreneurship. In fact, given the interaction between the environment and individuals in the entrepreneurial process (Davidsson and Wiklund, 2007), we can assume that cultural, economic or market factors may enhance or inhibit entrepreneurial activity (Busenitz et al., 2003). So can these factors be managed and controlled to foster entrepreneurial activity? Defined as a set of policies focused on the individual or potential entrepreneur (at the pre-startup, startup and early post-startup phases), entrepreneurship policy is directed to firm formation and can stimulate entrepreneurship (Lundstrom and Stevenson, 2005). 'In Europe entrepreneurship has emerged as an important focus of public policy in efforts to promote growth and generate employment' (Hölzl, 2010, p.188), and as such it is particularly relevant to understand the key factors for the setting up of new firms and fostering entrepreneurship and how public policy contributes to this (Lerner, 2010). It is therefore necessary to identify the drivers of entrepreneurship in order to determine the most suitable entrepreneurship policy to adopt, and to be aware of the vast number of explanatory variables used to explain it. Indeed, Verheul et al. (2002) suggest the eclectic theory of entrepreneurship to obtain a fuller understanding given its different levels of analysis (country, company or individual) and multidisciplinary nature, as well as the heterogeneity of its determinants.

Far from proposing an alternative to the eclectic theory of entrepreneurship, we draw attention to some basic assumptions about the relationships between entrepreneurship and economic and institutional variables.

First of all, on the economic front, the different levels of entrepreneurial activity in countries worldwide cannot be dissociated from the development stage of their economies (Freytag and Thurik, 2007), by which appear to be crucial to the explanation of entrepreneurial activity (Carree et al., 2007; Wennekers et al., 2008). In this vein, some authors confirm the inverse relationship between GDP *per capita* and entrepreneurial activity (Stel et al., 2005), while others described a convex relationship between entrepreneurship and GDP *per capita* (Acs et al., 1994; Wennekers and Thurik, 1999). Despite these conclusions, Wennekers et al. (2005) argue that it is the nature of entrepreneurship (driven by necessity or opportunity) that defines the positive or negative relation between entrepreneurial activity and GDP *per capita*. In the Global Entrepreneurship Monitor report in 2002, Reynolds et al. (2002) note that opportunity entrepreneurship involves entrepreneurs who start a business to take advantage of a real market opportunity, while necessity entrepreneurship is driven by unemployment or dissatisfaction with previous jobs. According to Wennekers et al. (2005), while necessity entrepreneurship reveals a negative relation with GDP *per capita*, that of opportunity entrepreneurship is positive. In fact, 'broadly new ventures founded by opportunity entrepreneurs are considered to have much stronger positive long-run effects on the economy in terms of employment, innovation and growth than startups initiated by

necessity entrepreneurs' (Kariv, 2011, p.8). Moreover, the ratio between opportunity and necessity entrepreneurship is higher in economies with higher *per capita* income (Wennekers et al., 2005).

As argued by Jack and Anderson (2002), the development of entrepreneurship depends from an embedded socio-economic process. Furthermore, beyond the socio-economic context, expectations are one of the most important components in decision models theory, particularly in entrepreneurial ecosystem (Townsend et al., 2010) and entrepreneurs as agents of change, in a Schumpeterian sense, could even anticipate economic booms (Baumol, 2002).

From a resource-based perspective, resources play a critical role in the development of an entrepreneurial venture (Desa and Basu, 2013) and the nature and amount of investment can be vital. It is argued by Audretsch et al. (2006) that stronger investment (in new knowledge and ideas) promotes a higher degree of entrepreneurship. Similarly, Kirzner (1979) defends that several investment mechanisms can be used to stimulate entrepreneurship. In fact, investments can produce a more fertile environment for the search of entrepreneurial opportunities (Holcombe, 1998; Harper, 2002).

From the labour market perspective, the relationship between unemployment and entrepreneurial activity seems to be ambiguous (Baptista and Preto, 2007). While on the one hand rising unemployment may stimulate the creation of new businesses (Reynolds et al., 1995), on the other unemployment could negatively constrain entrepreneurial activity (Audretsch et al., 2006). A number of empirical studies have shown that the unemployed are much more likely to start a new business than those who have a job (Andersson and Wadensjo, 2007; von Greiff, 2009; Røed and Skogstrøm, 2014), thus confirming that the unemployed are pushed into self-employment by economic adversity. This 'refugee effect' of economic adversity helps define necessity entrepreneurship (Thurik et al., 2008).

However, entrepreneurial activity can be explained not only by economic factors like income, investment level and even variables related to a country's labour market, but also by the role institutions play in the country's level of development. Indeed, within the framework of institutional theory (North, 1990, 2005), the role of institutions has been forming a fundamental reference for entrepreneurship study (Bjørnskov and Foss, 2008; Veciana and Urbano, 2008; Salimath and Cullen, 2010; Álvarez and Urbano, 2011; Díaz-Casero et al., 2012).

According to North (1990, 2005), institutions comprise the set of formal and informal rules that influence the behaviour of economic agents and should be distinguished from institutions (formal rules) and organisations (informal rules). Metaphorically, we can say that institutions are the rules of the game (set of political and legal rules, economic rules and contractual procedures) and that organisations are the players (owners of ideas, beliefs, attitudes and personal values).

On the one hand, informal institutions have an impact on entrepreneurial activity through their governance (McMillan and Woodruff, 2002), but on the other hand, the more formal their role is, the more negatively it influences entrepreneurial activity (Gnyawali and Fogel, 1994; Begley et al., 2005), since the excess regulation that is often associated with bureaucracy is a clear constraint in this field.

It is essential to test the institutional role to understand the logic of economic growth. Human and physical capital should not be seen as the only inputs in the production process; the institutional environment is critical to encourage entrepreneurship as well as to attract human and physical capital (Holcombe, 1998). Several studies confirm the

relationship between certain institutional factors; for example, the economic freedom indicators published by The Heritage Foundation, and entrepreneurship measured by the total entrepreneurial activity (TEA) (Bjørnskov and Foss, 2008; McMullen et al., 2008; Díaz-Casero et al., 2012).

This difficult task is enlarged by the fact that our analysis focuses the three Baltic countries in light of multidisciplinary nature of international entrepreneurship, which implies a deeper knowledge about the Baltic context itself.

3 The Baltic context

The shift to a free-market economy over the last 25 years has significantly changed the political, social, cultural and economic context of the Baltic countries and this has impacted entrepreneurial activity.

Since 1991, the socialisation of investment has been replaced by structural reforms (liberalisation and privatisation) aimed at improving the business environment, promoting private initiative and fostering entrepreneurial activity. Despite differences between the three countries, their reforms have some common traits: large-scale privatisation, banking reforms and infrastructure.

As argued by Erixon (2010, p.48), 'Liberalising reforms were pushed on all fronts. Prices and markets were liberalised. A new monetary order, centred upon a currency board arrangement, was established'. This gradual process in the Baltics began with the liberalisation of unilateral trade (within each country), followed by the liberalisation of bilateral and regional trade (among the Baltic states and between Baltics and other European countries) and then by the regulation of regional and multilateral trade (EU accession). Meanwhile, fiscal incentives were implemented to create favourable conditions for investors and attract foreign capital, thereby fostering entrepreneurial activity. In short, liberal reforms created an appropriate economic ecosystem to boost the privatisation processes in the Baltic economies.

Throughout the 1990s, the Baltic countries undertook banking reforms aimed at market-based interest rates and exchange rates. Banking system liquidity was assured and institutional underpinnings were provided for the design and implementation of macroeconomic stabilisation and structural reform programmes (Knight, 1997). Despite these reforms, some banking problems emerged. In 1992, some Estonian banks faced serious liquidity problems, and internal governance difficulties at the Social Bank (Estonia's second largest bank) triggered a solvency problem in 1994 that led to bankruptcy in 1995 (International Monetary Fund, 1996). Estonian banks were not alone however, and Latvia (Bank Baltija) and Lithuania (Innovation Bank and Litimpeks Bank) also dealt with bank insolvencies in the mid-1990s. The following decade proved challenging for the Baltic banking sector, not only because of the 2007–2008 financial crisis but above all due to the Baltic states housing bubble; according to Eurostat, the official house price index increased more than 100%, compared to average 11.8% growth in the euro area in the same period. Banks almost stopped lending in 2008–2009, and this may have constrained investment and entrepreneurial activity in these countries. In fact, the financial crisis of 2007–2008 in conjunction with the above-mentioned housing bubble led to the start of a deep economic recession in 2008; according to Servaas et al. (2010, p.6), 'the economic contraction was initially stronger in Estonia and Latvia, reaching year-on-year rates of about –10% in the fourth quarter of 2008, but it got into

full swing by 2009 in all three countries'. Nevertheless, according to the World Bank Data, economic growth in the Baltics over the last 20 years has greatly exceeded (on average, 3.7% per year) that of the Euro Zone (on average, 1.5% per year) and the EU (on average, 1.7% per year).

Whereas many countries in the European Union have had unbalanced public accounts, the Baltics' public finance has remained solid over the years; with the exception of the post-crisis years, the annual budget balance has registered low deficits (Latvia, Lithuania and Estonia)/low surpluses (Estonia) and controlled debt in all three countries.

Indeed, Baltic countries have made a huge effort over the years to improve the business environment and competitiveness through structural reforms and the transition to a free-market economy. Moreover, in 2016, the Doing Business report (for 189 economies) shows that they have a competitive regulatory environment for starting and operating local firms (Estonia ranked in 16th place, Lithuania ranked in 20th place and Latvia ranked in 22nd place). Considering Latvia as our domestic nation (from where this study was conducted) and comparing our analysis to the Baltic countries as a whole, our approach fits perfectly to international entrepreneurship process defined initially by McDougall (1989), in which the author compared international and domestic new ventures. Besides that, as international entrepreneurship focuses on entrepreneurial aspects of doing business across borders (Zander et al., 2015), it would be relevant to study those aspects.

4 Methodology

4.1 Goals and research design

Given that 'exploratory and descriptive studies, for example, do not test hypotheses' (Rubin and Babbie, 2010, p.166), the exploratory nature of this research leads us to define objectives rather than to establish and confirm specific hypotheses. Our aim is to contribute to the understanding of entrepreneurial activity at the country level, with the following four main objectives:

1 To understand the impact of economic freedom indicators on entrepreneurial activity in Latvia and the Baltics in general.

2 To test if GDP per capita has any relationship with entrepreneurial activity in Latvia and the Baltics in general.

3 To confirm the relationship between the unemployment rate and entrepreneurial activity in Latvia and the Baltics in general.

4 To understand the importance of investment for entrepreneurial activity in Latvia and the Baltics in general.

To optimise the chosen models, the backward mode of estimation was adopted, starting with the complete set of explanatory variables and eliminating sequentially the variables with no statistical significance after performing an *F*-test on the joint significance of the population parameters. This resulted in a parsimonious model that includes the significant explanatory variables of entrepreneurial activity.

4.2 Measures of entrepreneurship

Given the multidisciplinary nature of entrepreneurship, a number of variables can be used for its measurement. TEA is one such measure but as it is only available in GEM publications for Latvia and the Baltic countries generally for a few years, it was decided to search for an alternative. Entrepreneurship is typically measured as the new-firm startup rate (Henderson and Thisse, 2004), namely new companies (annually) as a proportion of all enterprises in each country; it is a dynamic measure (Low, 2009) and is used in studies such as Acs and Armington (2004). It was decided to use this measurement, which involved collecting harmonised data on all Baltic companies. This was obtained from the Orbis database, which contains data from firms' mandatory reports.

4.3 Explanatory variables

Several explanatory variables from the Heritage Foundation's Economic Freedom Index were chosen to explain entrepreneurship due to its complexity, diversity and dynamic nature (Bruyat and Julien, 2001). The Heritage Foundation defines the following institutional variables:

- *Property rights*: The property rights index captures the country's legal framework that allows individuals to freely accumulate private property. The higher the property rights index (0–100 points), the higher the level of legislation protecting private property.
- *Freedom from corruption*: Freedom from corruption index is directly reproduced from Transparency International's Corruption Perceptions Index (CPI), which measures the level of perceived corruption. The higher the freedom from corruption index (0–100 points), the lower the level of corruption.
- *Fiscal freedom*: The fiscal freedom component reflects both marginal tax rates (individual and corporate income) and the overall level of taxation (direct and indirect) as a percentage of GDP. The higher the fiscal freedom index (0–100 points), the lower the tax burden.
- *(Absence of) Government spending*: The level of government expenditure as a percentage of GDP reflects the space for private initiative in economies. As this scale is inverted, the higher the value of this index (0–100 points), the lower the government expenditure (and the higher the private domain in economies).
- *Business freedom*: Business freedom is an overall indicator of the efficiency of government regulation in business. It is related to the ease of starting, operating or closing a business. The higher the index value (0–100 points), the lower the government regulation and legal constraints.
- *Labour freedom*: The labour freedom index reflects the legal and regulatory framework of a country's labour market. The higher the index value (0–100 points), the higher the labour market flexibility.

- *Monetary freedom*: Monetary freedom index represents the absence of market distortions through the inflation rate and price controls. The score for the monetary freedom component depends on two factors: (a) the weighted average of the inflation rate for the most recent 3 years and (b) price controls: the higher the index value (0–100 points), the lower the pressure on the currency (inflation) and the lower the extent of price controls.
- *Trade freedom*: The trade freedom index reflects the extent of barriers (tariff and non-tariff) that influences international trade (imports and exports) of goods and services. The higher the index value (0–100 points), the lower the tariff and non-tariff barriers.
- *Investment freedom*: Investment freedom represents the absence of investment restrictions. The higher the index value (0–100 points), the lower the investment restrictions.
- *Financial freedom*: Financial freedom measures the banking efficiency and the independence of the banking sector from government actions (constraints, interferences or control). The higher the index value (0–100 points), the higher the banking efficiency and autonomy.

A linear and positive relationship is expected between these institutional variables and entrepreneurial activity in Latvia and the Baltic countries in general. Additionally, in order to find the relationship between entrepreneurial activity and the macroeconomic environment at the country level, we added three macroeconomic variables[1]:

1 GDP per capita (current prices) in the case of Latvia and GDP per capita based on purchasing-power-parity (PPP) for the Baltic countries in general – variables retrieved from IMF

2 Unemployment rate – variable retrieved from IMF

3 Total investment (% GDP) – variable retrieved from IMF

A linear and positive relationship is expected between GDP per capita, total investment (% GDP) and unemployment, and the entrepreneurial activity rate in Latvia and the Baltic countries in general.

4.4 Models

Owing to the evident non-stationarity of the time-series components (Phillips and Moon, 2000), the first differences in all variables of the model were lagged to avoid 'spurious regression' results (Granger and Newbold, 1974).

Time-series model for Latvia – Model 1:

$$\begin{aligned} Entrep\_act_t - Entrep\_act_{t-1} = b_0 + \sum_{j=1}^{10} b_j (ec\_freedom_{j,t} - ec\_freedom_{j,t-1}) \\ + b_{11}(GDPpc_t - GDPpc_{t-1}) \\ + b_{12}(Unempl\_rate_t - Unempl\_rate_{t-1}) \\ + b_{13}(Total\_invest_t - Total\_invest_{t-1}) + u_t - u_{t-1} \end{aligned}$$

As non-stationarity receives virtually no attention in traditional panel regression analysis (Phillips and Moon, 2000), first differences were removed. Additionally, natural logarithms were applied to the variables in the panel data model in order to eliminate heteroscedasticity. This procedure is in line with some theoretical approaches (Gujarati, 1988) that predict that a log-log model may reduce heteroscedasticity better than a linear model.

Panel data model for Baltic countries – Model 2 (Fixed-effects):

$$\ln Entrep\_act_{it} = \ln b_0 + \sum_{j=1}^{10} b_j (\ln ec\_freedom_{j,it}) + b_{11} \ln GDPppppc_{it} + b_{12} \ln Unempl\_rate_{it} + b_{13} \ln Total\_invest_{it} + u_{it}$$

Owing to the potential short-term rigidity of the variables, it may be appropriate to estimate dynamic models to capture the adjustment mechanism (Greene, 2003). Arellano and Bond (1991) propose a dynamic model that respects the orthogonality between the lagged dependent variable and the error term for the formation of instrumental variables and previous estimation by GMM (Generalised Method of Moments). However, given our small sample (three countries over 19 years), the Least Square Dummy Variable (LSDV) estimator seems to be the better choice despite some inconsistency (Judson and Owen, 1999) because its variance is smaller than instrumental variable (IV) estimator and GMM. Furthermore, Kiviet (1995) uses higher order asymptotic expansion techniques to approximate the small sample bias of the LSDV estimator, as this makes dynamic balanced models asymptotically consistent. In our case, the number of observations is very small (three countries) and we have a dynamic unbalanced panel; we therefore followed the approach suggested by Bruno (2005b), the results of which strongly support the bias-corrected LSDV estimator. Based on the bias approximations derived from Bruno (2005a), the Stata code XTLSDVC was used implementing LSDVC estimators for dynamic unbalanced panel-data models with a small *N* and strictly exogenous covariates.

Model 3 was tested with this estimation in order to understand the relative impact of each of the independent variables in entrepreneurial activity.

$$\ln Entrep\_act_{it} = \alpha_{it} \ln b_0 + (1-\alpha_{it}) \ln Entrep\_act_{it-1} + \sum_{j=1}^{10} \alpha_{it} b_j (\ln ec\_freedom_{j,it}) + \alpha_{it} b_{11} \ln GDPppppc_{it} + \alpha_{it} b_{12} \ln Unempl\_rate_{it} + \alpha_{it} b_{13} \ln Total\_invest_{it} + u_{it}$$

At the same time, a first-difference transformation was operated on the dependent variable, Model 4, to prevent a negative speed of adjustment ($1-\alpha > 1$), in other words where the Arellano-Bond estimator exhibits substantial downward bias when the coefficient on the lagged dependent variable is close to unity, as suggested by Blundell and Bond (1998).

$$\ln Entrep\_act_{it} - \ln Entrep\_act_{it-1} = \alpha_{it} \ln b_0 + (1-\alpha_{it})(\ln Entrep\_act_{it-1} - \ln Entrep\_act_{it-2}) + \sum_{j=1}^{10} \alpha_{it} b_j (\ln ec\_freedom_{j,it}) + \alpha_{it} b_{11} \ln GDPppppc_{it} + \alpha_{it} b_{12} \ln Unempl\_rate_{it} + \alpha_{it} b_{13} \ln Total\_invest_{it} + u_{it}$$

The listed models assume independence of the error terms, identical distribution (normal), average zero (conditional) and the assumption of constant variance hypothesis.

Here:

Entrep_act represents entrepreneurial activity (in Latvia or in the Baltic countries)

Ec_freedom represents each one of the ten variables of the Index of Economic Freedom (J=1,2 ...10)

GDP pc is the Growth Domestic Product per capita

GDPppp pc is the Growth Domestic Product per capita based on purchasing power parity

Unempl_rate is the unemployment rate

Total_invest is the Total Investment as a percentage of GDP

(i) is the country and (t) is the year

4.5 Procedures

4.5.1 Time-series model

The multicolinearity within the explanatory variables was tested by examining tolerance and the Variance Inflation Factor (VIF). All explanatory variables showed a VIF < 10 (d_freedomfromcorruption = 2.885; d_fiscalfreedom = 1.218; d_governmentspending = 1.254; d_financialfreedom = 3.383; d_TotalinvestmentGDP = 1.450).

The homoscedasticity condition was verified by White's test (1980), with a *p*-value = *P*(Chi-square(10) > 9.443305) = 0.490611, which allows us to accept the null hypothesis of homoscedasticity.

The autocorrelation between the error terms was checked by LM statistic, which showed a *p*-value = $P(F_{(1,11)} > 1.0211\text{e-}005) = 0.998$. Hence, there is no statistical evidence to reject the null hypothesis, which leads us to conclude that there is no serial correlation, or autocorrelation, between the error terms.

Regarding the model specification, the Reset Test from Ramsey (1969) was used to test the general *specification* for the linear regression model. With a *p*-value = $P(F_{(2,10)} > 2.44393) = 0.137$, there is statistical significance to accept the null hypothesis (correct specification); we can therefore conclude that the time-series model was correctly specified.

A structural break was established in 2004 to confirm the structural stability of the model. A Chow (1960) test was performed to verify whether parameters (slopes and the intercept) of one group are different from those of the other group (after the structural break). With a *p*-value of 0.2259, there is statistical significance to accept the null hypothesis of stability, that is, to confirm the model's structural stability.

The endogeneity hypothesis of the explanatory variables was tested for the hypothetical use of instrumental variables (IV). As we shall see, the outgoing model is the base for the following models. Hence, Durbin-Wu-Hausman Test (Durbin, 1954; Wu, 1973; Hausman, 1978) was used to ensure the centricity and efficiency of the OLS estimator:

$$H = \left[\hat{b}_{IV} - \hat{b}_{OLS}\right]' \left[Var(\hat{b}_{IV}) - Var(\hat{b}_{OLS})\right]^{-1} \left[\hat{b}_{IV} - \hat{b}_{OLS}\right] \sim x_k^2$$

Using Durbin-Wu-Hausman Test, with a 5% significance level, it is concluded that all explanatory variables are exogenous since they have a *p*-value > 0.05.[2] In addition, as all the instruments used (one-period-lagged variables) are weak with an *F*-statistic of <10, the OLS estimator is more adequate than IV estimators.

The time-series model has none of the typical problems (multicolinearity, heteroscedasticity, errors autocorrelation, specification errors, structural instability or endogeneity bias), and we can therefore conclude that the OLS estimator is blue (best linear unbiased estimator) and the performed regression results are valid and reliable.

4.5.2 Panel data model

According to Hsiao (2007), the panel data model allows a more accurate inference of the data and a greater ability to capture the complexity of human behaviour than cross-section or time-series models, and the simplification of computing and inference statistics.

Although the OLS estimator (Pooled Model) has been tested and, considering the random heterogeneity of countries through the GLS estimator (Random Effects Model), the final option involves the adoption of LSDV estimator (Least Squares Dummy Variables), using a Fixed Effects Model, the theoretical framework of this option aims to capture the heterogeneity of countries in the constant part of the equation due to differences that remain the same over time; it is justified with the presentation of the following tests: *F*-statistic, Breusch-Pagan and Hausman (Table 1).

Table 1 Selection of the appropriate estimator

Test	*P-value*	*Hypothesis*	*Conclusion*
$F_{(2,49)} = 1101.65$	1.86421e-041	H_0: 'Pooled' (OLS) H_A: Fixed effects (LSDV)	Rejection of pooled model in favour of the fixed effects model
Breusch-Pagan LM = 320.673	1.03365e-071	H_0: 'Pooled' (OLS) H_A: Random effects (GLS)	Rejection of pooled model in favour of the random effects model
Hausman	Insufficient degrees of freedom	H_0: Random effects (GLS) H_A: Fixed effects (LSDV)	

Source: Own elaboration

The endogeneity hypothesis of the explanatory variables was then tested for the potential use of instrumental variables (IV). As we shall see, the outgoing model is the base for the following models. The Durbin-Wu-Hausman test was therefore used to ensure the centricity and efficiency of the estimators:

$$H = \left[\hat{b}_{IV} - \hat{b}_{OLS}\right]' \left[Var(\hat{b}_{IV}) - Var(\hat{b}_{OLS})\right]^{-1} \left[\hat{b}_{IV} - \hat{b}_{OLS}\right] \sim x_k^2$$

Using Durbin-Wu-Hausman test, with a 5% significance level, it is concluded that all explanatory variables are exogenous since they have a *p*-value > 0.05.[3]

5 Results

5.1 Descriptive statistics

Appendix A (Latvia) and Appendix B (Baltic countries) provide descriptive statistics of dependent and explanatory variables. In order to describe the basic features of the data, some commonly used measures were explored: mean, median, minimum, maximum, standard deviation, coefficient of variation (CV), skewness, kurtosis, 5% percentile, 95% percentile, interquartile range and missing observations.

When analysing the two appendices in relation to the measures of central tendency and of variability or dispersion, we should note the different nature of variables: (a) the dependent variable (ratio), (b) economic freedom variables (discrete numerical variable), (c) GDP per capita (continuous numerical variable), (4) unemployment (rate) and (5) total investment as a percentage of GDP (rate).

In short, according to the reference values defined by Kline (2011) – | Sk | > 3 (severe asymmetry) or values | Ku | > 10 (severe kurtosis) and | Ku | > 20 (very severe kurtosis), the variables did not show severe violation of normal distribution. These values can be found in Appendix A and Appendix B.

5.2 Inferential statistics

Under the previously specified econometric models, the following tables present estimation results for Latvia (Table 2) and for Baltic countries as a whole (Tables 3 and 4).

Table 2 Estimation results, OLS (Latvia)

Explanatory variables and constant	*Model 1 (time series)*
Constant	0.798 (**) *P-value* = 0.0162
d_freedomfromcorruption	0.225 (**) *P-value* = 0.0192
d_fiscalfreedom	–0.479 (*) *P-value* = 0.075
d_governmentspending	–0.070 (*) *P-value* = 0.076
d_financialfreedom	0.279 (***) *P-value* = 0.007
d_TotalinvestmentGDP	–0.229 (**) *P-value* = 0.011
GDP pc	–
GDP pc²	–
Statistic robustness	
R^2	0.642
F-stat	F(5,12) = 4.308 *P-value* = 0.018

Table 2 Estimation results, OLS (Latvia) (continued)

Explanatory variables and constant	*Model 1 (time series)*
Heteroscedasticity (White's test)	$\chi^2_{(10)} = 9.443$ *P-value* = 0.491
Instability (Chow test)	F(6, 6) = 1.435 *P-value* = 0.336
Specification (Reset test)	F(2, 10) = 2.444 *P-value* = 0.137

Source: Own elaboration

Using the coefficients from Table 2, each additional point of increase in freedom from corruption and financial freedom indexes is associated with a 0.225 and 0.279 percentage point increase respectively in the entrepreneurial activity rate per year. In other words, despite the inelastic relationship among the variables, less corruption, financial development and banking efficiency lead to a higher entrepreneurial activity rate in Latvia.

Unexpectedly, a one point increase in fiscal freedom and (freedom from) government spending indexes or of one percentage point in total investment (% of GDP) would result in a drop of between 0.07 and 0.479 in the entrepreneurial activity rate.

The five independent variables explain 64.2% of the entrepreneurial activity in Latvia during the period 1997 to 2014.

Table 3 Estimation results, fixed-effects model (Baltic countries)

Explanatory variables and constant	*Model 2: log-log Fixed effects model (LSDV)*
Constant	6.603 (**) *P-value* = 0.0047
ln property_rights	−1.528 (***) *P-value* = 0.0008
ln freedomfromcorruption	0.774 (***) *P-value* = 0.0010
ln fiscalfreedom	−3.214 (***) *P-value*< 0.0001
ln investmentfreedom	2.098 (***) *P-value*< 0.0001
ln TotalinvestmentGDP	0.319 (**) *P-value* = 0.035
GDP pc	–
GDP pc²	–
Statistic robustness	
$LSDVR^2$	0.993
LSDV F	$F_{(7,46)} = 882.95$ *P-value* = 8.51e-47
Heteroscedasticity (Wald test)	$\chi^2_{(3)} = 0.162$ *P-value* = 0.983

Source: Own elaboration

Based on these regression results for the Baltic countries (Table 3), a 1% increase in freedom from the corruption and investment freedom indexes and in total investment (% GDP) is associated with a 0.774%, 2.098% or 0.319% increase respectively in the entrepreneurial activity rate. In other words, less corruption, fewer regulatory restrictions for investment and higher total investment led to more entrepreneurial activity during 1997 to 2014 in the Baltic countries. Moreover, we can conclude from these three variables that investment freedom is the only variable that reveals partial elasticity. Additionally and unexpectedly, fiscal freedom and property rights indexes showed a negative, and partially elastic, relationship with the entrepreneurial activity rate.

Table 4 Estimation results, dynamic models (Baltic countries)

Explanatory variables and constant:	*Model 3 – dependent variable* $\ln entrep_{act_{it}}$	*Model 4 – dependent variable* $\Delta \ln entrep_{act_{it}}$
$\ln entrep_{act_{it-1}}$	0.910 (***) *P-value*< 0.0001	–
$\Delta \ln entrep_{act_{it-1}}$	–	0.229 (*) *P-value* = 0.075
ln fiscal freedom	–	–1.096 (*) *P-value* = 0.086
ln property_rights	–0.699 (**) *P-value* = 0.022	–
ln GDP ppp per capita	–	–
ln GDP ppp per capita²	–	–
ln financial freedom	–	0.350 (*) *P-value* = 0.055
ln trade freedom	–	2.268 (**) *P-value* = 0.019
ln monetary freedom	0.487 (***) *P-value* <0.0001	0.510 (**) *P-value* = 0.040
Statistic robustness (one step results)		
Test for AR(1) errors	*z* = –1.493 *P-value* = 0.1354	*z* = –2.98 *P-value* = 0.0029
Test for AR(2) errors	*z* = –0.580 *P-value* = 0.5619	*z* = –0.31 *P-value* = 0.7553

Source: Own elaboration

As we can see, the results for Model 3 show the lagged dependent variable to be closer to unity, which means that Arellano-Bond estimator exhibits a substantial downward bias. For these dynamic models, we therefore focus our analysis specifically on the fourth model results. Overall, the results show a negative (and unexpected) relationship between fiscal freedom and entrepreneurial activity and a positive (and expected) relationship between this variable and economic freedom variables (financial freedom, trade freedom and monetary freedom). In other words, an increase in the level of financial development, fewer trade barriers, less pressure on the currency (inflation) and fewer price controls (as well as a greater corporate tax burden) led to a higher level of entrepreneurial activity in the Baltic countries.

The adjustment coefficient of the partial adjustment (δ) process is: 1–0.229 = 0.771. This means that 0.771 of the difference between optimal and actual entrepreneurial activity is eliminated in 1 year, which reveals that the adjustment of entrepreneurial activity is relatively fast.

According to the long-run propensity to entrepreneurial activity, dividing the short-run propensity by δ, we can conclude that in the long-run:

- a 1% increase in the fiscal freedom index is associated with a short-run decrease of 1.422 percentage points (1.096/0.771), or 1.096 percentage points in the entrepreneurial activity rate.
- a 1% increase in the financial freedom index is associated with a short-run increase of 0.454 percentage points (0.350/0.771), or 0.350 percentage points in the entrepreneurial activity rate.
- a 1% increase in the trade freedom index is associated with a short-run increase of 2.942 percentage points (2.268/0.771), or 2.268 percentage points in the entrepreneurial activity rate.
- a 1% increase in the monetary freedom index is associated with a short-run increase of 0.661 percentage points (0.510/0.771), or 0.510 percentage points in the entrepreneurial activity rate.

Hence, we can write the long-run equation as:

$$\Delta \ln Entrep\_act_{it} = -1.422 \ln fiscal\_freedom + 0.454 \ln financial\_freedom + 2.942 \ln trade\_freedom + 0.661 \ln monetary\_freedom$$

6 Discussion and conclusions

For Latvia, the main findings show that less corruption, greater financial development and banking efficiency lead to a higher entrepreneurial activity rate. In line with the conclusions of Avnimelech et al. (2014), the results for Latvia show that corruption could be a barrier to its entrepreneurial activity. Furthermore, as argued by Bianchi (2012) for developing and developed countries, financial development also favours an increase in entrepreneurial activity in Latvia.

In addition, there was a negative correlation between the total investment rate (% of GDP) and entrepreneurship, which means that investment (public and private) leads to a lower entrepreneurial activity rate. Although this effect is unexpected and despite including public investment, it is argued by Audretsch et al. (2006) that it may be explained by the fact that investment by incumbent firms can be considered a substitute for entrepreneurial opportunities. It might be important to understand the composition of total investment in Latvia, particularly the private investment and a deeper knowledge about green-field investment and brown-field investment.

Another unexpected result suggests that in Latvia the higher the fiscal freedom (which implies a lower tax burden), the lower the entrepreneurial activity rate; that is, higher taxation levels lead to a higher entrepreneurial activity rate. As assumed by Hansson (2008, p.18) ‘the intuition behind this result is that the incentives to be self-employed are greater when taxes are high as the self-employed can avoid taxation more easily than employees’.

Finally, it was concluded that the greater the (freedom of) government spending (which means lower government expenditure), the lower the entrepreneurial activity rate in Latvia. Unexpectedly, the data suggest that lower government spending reduces the entrepreneurial activity in Latvia, rather than leveraging it by giving space to private initiative (Bjørnskov and Foss, 2008). This is consistent with the crowding-in hypothesis, in which the State's role could be viewed as an economic catalyst (Miller and Holmes, 2012). That is, government spending could be inclusive and complementary to private investment and therefore useful to boost entrepreneurial activities in Latvia.

From a static point of view, the fixed effects model performed for the Baltic countries show that a lower level of corruption, measured by freedom from corruption, encourages entrepreneurial activity, as found in Russia by Aidis et al. (2008).

Moreover, the investment freedom variable has the strongest positive impact on entrepreneurial activity in the Baltic countries. This shows that the regulatory restrictions that are typically imposed on investment could strongly discourage entrepreneurship, that is, 'the more constraints are imposed on investment, the lower the level of entrepreneurial activity' (Díaz-Casero et al., 2012, p.1691). In other words, fewer regulatory restrictions to investment could leverage (remembering the partial elasticity of investment freedom) entrepreneurial activity in the Baltic countries.

The results also show total investment has a positive effect on entrepreneurial activity. As expected, and in contrast to the time-series model for Latvia in which we deduce that major investments were made by established companies, the positive sign between total investment and entrepreneurial activity for the Baltic countries leads us to conclude that investments were made by new entrant firms in the market. This conclusion is in line with the fact that investments can produce a more fertile environment to search for entrepreneurial opportunities (Holcombe, 1998) and partially confirms the findings of Audretsch et al. (2006) that stronger investment (in new knowledge and ideas) should also lead to a higher degree of entrepreneurship.

Unexpectedly, although property rights are a corner stone for the promotion of entrepreneurial activity (Tyson et al., 1994), we found a negative relationship between property rights and entrepreneurial activity. This contrasts with the findings of Nyström (2008) for 23 OECD countries between 1972 and 2002.

However, given that property rights are not relevant when explaining necessity driven entrepreneurship (McMullen et al., 2008), and that in some contexts they are negatively related with entrepreneurship by necessity (Díaz-Casero et al., 2012), we can conclude that the relationship found does not necessarily contradict the academic trend. To justify this negative relationship, Díaz-Casero et al. (2012) state that extensive employment opportunities may discourage entrepreneurial activity. Furthermore, for the Baltic countries it may be explained by the fact that property rights have little influence in the decision to start a new micro-enterprise or self-employment and they may also be substituted by informal arrangements and social networks (Estrin et al., 2009). Another hypothesis is that the population in the Baltic countries have unequal property rights and, as Sonin (2003) argues in relation to Russia, this leads to a bad economic equilibrium, with low growth rates, high income inequality and widespread rent-seeking.

The results for the dynamic model show that entrepreneurial activity made a fairly rapid adjustment in the Baltic countries, which shows these economies have a short-run regeneration capacity. Moreover, in comparison with the previous estimations, these results lead us to new findings for the Baltic countries related to the positive relationship between entrepreneurial activity and financial freedom, trade freedom and monetary freedom.

The results for the Baltics show that the greater the financial development and banking efficiency, the higher the entrepreneurial activity rate. Similar to the findings of Bianchi (2012) and by Llussá (2009) for developing and developed countries, financial development in the Baltics favours increased entrepreneurial activity. This indicates that it is important for the economy to have a wider range of financing instruments and corroborates the results of Gnyawali and Fogel (1994) and van Gelderen et al. (2005), namely that better access to credit has a positive influence on stimulating new businesses.

From a dynamic point of view, another financial factor (monetary freedom) is found to have a positive impact on the entrepreneurial activity in Baltic countries. Greater monetary freedom is achieved by higher price stability, lower inflationary pressure and fewer government price regulations. These conditions are crucial to reduce risk and uncertainty in the markets and therefore foster new entrepreneurial activities. This is in line with the conclusions of Porter and Schwab (2009) who consider inflation a threat to entrepreneurial activity. McMullen et al. (2008) also found monetary freedom to have a positive impact on TEA in relation to necessity driven entrepreneurship, using a sample of 37 countries and the GEM 2002 data. These authors pointed out that when monetary policy restricts economic freedom, it is likely to be negatively associated with entrepreneurial activity as individuals choose less uncertain income-generating alternatives.

Trade freedom is another factor with a significant and positive weight on the entrepreneurial activity in the Baltics from a dynamic perspective. This can be explained by some structural efforts made in this domain in the Baltics; notably, in 1994 a free trade agreement was signed within the Baltic Area and between the Baltics and the European Community which permitted to promote the liberalisation of regional and bilateral trade. Similarly, Kuckertz et al. (2016, p.1289) refer to the positive effect of trade freedom on entrepreneurial activity as it 'creates competitive pressure, which stimulates innovation and hence opportunity-driven-entrepreneurship'. Furthermore, in relation to the effect of interventionist policies on entrepreneurial activity generally, Klein (2012) claims that trade barriers do not benefit the entrepreneurial system as a whole.

In contrast to findings in a wide range of countries (Koellinger and Thurik, 2012; Klapper et al., 2015), a positive relationship was not found between GDPppp *per capita* and entrepreneurial activity in Latvia or in the Baltic States. Moreover, unlike a number of empirical studies (Andersson and Wadensjo, 2007; von Greiff, 2009; Røed and Skogstrøm, 2014), the expected positive impact of the unemployment rate on entrepreneurial activity of the Baltic countries was not confirmed. A two equation Vector Auto Regression (VAR) model is strongly recommended to confirm whether or not there is a relationship between unemployment and entrepreneurial activity.

Overall, the negative relationship between entrepreneurial activity and fiscal freedom is an unexpected finding that is common to all estimations performed, that is in Latvia and in the Baltic countries as a whole. What are the possible causes for increased entrepreneurial activity in higher tax burden periods? Further qualitative research is required to shed light on this negative, and unexpected, relationship in the Baltics. Notwithstanding this surprising result, the overall findings inform economic policy-makers of the main determinants of entrepreneurial activity, not only in Latvia but also in the Baltics as a whole. Throughout the comparison results between locations, 'the discovery, enactment, evaluation and exploitation of opportunities – across national borders – to create future goods and services', defined by McDougall and Oviatt (2005,

p.7) as international entrepreneurship will enable to improve policies and also to contribute to establish a proper entrepreneurial ecosystem in the region.

As for the limitations of this study, the data of the Index of Economic Freedom from Heritage Foundation are only available from 1995 and the samples are therefore very small; this is the case of the time-series model in particularly in which observations per parameter to estimate are far from ideal. However, as the purpose of this paper is to study the determinants of entrepreneurial activity in the Baltics in the post-Soviet era (and capture potential effects of post EU enlargement), it would clearly be difficult to work with large samples. Furthermore, additional qualitative research would complement this quantitative analysis and probably would have guided us to a deeper knowledge of entrepreneurial activity in the Baltic countries, particularly about the unexpected relationships between some variables as stated before.

Despite the extensive use of the measure of entrepreneurial activity (new firms as a percentage of total registered firms), it is a clear limitation of this study. Obviously, not all new firms are truly entrepreneurial but this measure is not only consistent with the World Bank approach to measure entrepreneurship, but is also known as the most dynamic measure of entrepreneurship (Low, 2009) and is used by various authors (Acs and Armington, 2004; Henderson and Thisse, 2004).

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Notes

1 GDP and unemployment were cumulatively tested as explanatory variables of entrepreneurial activity in VAR models, see Koellinger and Thurik (2012).

2 *d_freedomfromcorruption (p-value* = 0.299); d_fiscalfreedom (*p-value* = 0.1253); *d_governmentspending*(*p*-value = 0.1253); *d_financialfreedom* (*p*-value = 0.1712); *d_TotalinvestmentGDP (p-value* = 0.28889).

3 *p-value* ***Property rights*** = 0.274663; *p-value* ***Freedom from corruption*** = 0.0963124; *p-value Fiscal freedom* = 0.283554; *p-value Investment freedom* = 0.124017; *p-value Total investment* = 0.23536.

Appendix A (Latvia): Summary statistics, using the observations 1996–2014

Variable	*Mean*	*Median*	*Minimum*	*Maximum*
Birth rate firms	0.112389	0.112034	0.0714587	0.176134
Property rights	50.7895	50.0000	50.0000	55.0000
Freedom from corruption	39.1895	40.0000	27.0000	50.0000
Fiscal freedom	80.8105	82.3000	75.5000	84.6000
Government spending	55.2632	56.2000	43.8000	65.3000
Business freedom	73.3105	72.8000	70.0000	85.0000
Monetary freedom	74.5526	78.3000	41.1000	85.8000
Trade freedom	81.0000	81.0000	55.0000	87.8000
Investment freedom	71.8421	70.0000	50.0000	85.0000
Financial freedom	63.1579	70.0000	50.0000	70.0000
GDP per capita	6497.92	6037.08	1893.28	11781.8
Unemployment rate	12.836	13.090	6.0530	20.711
Total investment GDP	27.6696	26.0360	19.2190	41.6480
Variable	*SD*	*CV*	*Skewness*	*Ex. kurtosis*
Birth rate firms	(0.0282765)	0.251594	0.619987	–0.251342
Property rights	(1.87317)	0.0368811	1.87639	1.52083
Freedom from corruption	(7.24752)	0.184935	–0.0751503	–1.20210
Fiscal freedom	(3.23572)	0.0400408	–0.299312	–1.61664
Government spending	(5.29614)	0.0958350	–0.278591	–0.187091
Business freedom	(4.34165)	0.0592227	1.45590	1.45223
Monetary freedom	(11.0204)	0.147820	–1.61157	2.58288
Trade freedom	(8.25449)	0.101907	–2.02744	3.73285
Investment freedom	(7.30497)	0.101681	–0.886150	2.67240
Financial freedom	(9.45905)	0.149768	–0.664697	–1.48923
GDP per capita	(3614.51)	0.556257	0.125406	–1.60629
Unemployment rate	(3.9586)	0.30840	0.055016	–0.62015
Total investment GDP	(6.54158)	0.236418	0.707034	–0.508919
Variable	*5%*	*95%*	*IQ range*	*Missing obs.*
Birth rate firms	0.0714587	0.176134	0.0364375	0
Property rights	50.0000	55.0000	0.00000	0
Freedom from corruption	27.0000	50.0000	11.0000	0
Fiscal freedom	75.5000	84.6000	6.10000	0
Government spending	43.8000	65.3000	7.50000	0
Business freedom	70.0000	85.0000	5.00000	0
Monetary freedom	41.1000	85.8000	12.1000	0
Trade freedom	55.0000	87.8000	6.80000	0

Appendix A (Latvia): Summary statistics, using the observations 1996–2014 (continued)

Variable	*Mean*	*Median*	*Minimum*	*Maximum*
Investment freedom	50.0000	85.0000	10.0000	0
Financial freedom	50.0000	70.0000	20.0000	0
GDP per capita	1893.28	11781.8	7334.94	0
Unemployment rate	6.0530	20.711	4.7300	0
Total investment GDP	19.2190	41.6480	10.6440	0

Appendix B (Baltic countries): Summary statistics, using the observations 1:01–3:19 (missing values were skipped)

Variable	*Mean*	*Median*	*Minimum*	*Maximum*
Birth rate firms	0.130866	0.115077	0.0514641	0.373440
Property rights	59.9123	50.0000	50.0000	90.0000
Freedom from corruption	47.5211	48.0000	27.0000	70.0000
Fiscal freedom	80.5035	80.7000	70.5000	93.6000
Government spending	57.8965	58.0000	25.0000	73.0000
Business freedom	77.2579	75.9000	70.0000	85.7000
Monetary freedom	73.9544	78.5000	12.9000	90.4000
Trade freedom	82.7298	84.8000	55.0000	87.8000
Investment freedom	77.7193	75.0000	50.0000	90.0000
Financial freedom	70.7018	70.0000	30.0000	90.0000
GDP ppp per capita	17059.1	17892.8	6373.25	27954.8
Unemployment rate	11.6566	11.8140	4.25500	20.7110
Total investment GDP	26.7240	26.0360	12.6100	41.6480
Variable	*SD*	*CV*	*Skewness*	*Ex. kurtosis*
Birth rate firms	(0.0620605)	0.474231	2.00618	4.57483
Property rights	(13.1098)	0.218817	1.04472	–0.188818
Freedom from corruption	(12.0233)	0.253010	0.104008	–0.887029
Fiscal freedom	(5.49896)	0.0683071	0.0979403	–0.168640
Government spending	(8.49327)	0.146698	–1.07614	2.74635
Business freedom	(6.28501)	0.0813511	0.0524799	–1.65433
Monetary freedom	(15.9014)	0.215017	–2.23648	5.25398
Trade freedom	(6.12638)	0.0740528	–2.51685	7.45032
Investment freedom	(10.3970)	0.133777	–0.303043	–0.342777
Financial freedom	(14.3750)	0.203319	–0.596682	–0.308995
GDP ppp per capita	(6191.23)	0.362927	–0.0413193	–1.25749
Unemployment rate	(3.87309)	0.332267	0.0159125	–0.608454
Total investment GDP	(6.42732)	0.240507	0.371660	–0.496166

Appendix B (Baltic countries): Summary statistics, using the observations 1:01–3:19 (missing values were skipped) (continued)

Variable	*5%*	*95%*	*IQ range*	*Missing obs.*
Birth rate firms	0.0710295	0.302351	0.0637510	0
Property rights	50.0000	90.0000	20.0000	0
Freedom from corruption	30.0000	67.3000	18.5000	0
Fiscal freedom	70.9700	92.8100	7.05000	0
Government spending	41.4100	70.8700	9.40000	0
Business freedom	70.0000	85.2100	14.6500	0
Monetary freedom	31.4300	90.1000	12.7000	0
Trade freedom	65.0000	87.8000	5.80000	0
Investment freedom	68.0000	90.0000	20.0000	0
Financial freedom	50.0000	90.0000	15.0000	0
GDP ppp per capita	7605.47	26821.0	11641.2	3
Unemployment rate	5.23925	18.0285	5.54975	3
Total investment GDP	18.3180	39.3335	9.91000	0