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The Factors of Growth of Small Family Businesses: A Robust Estimation of the Behavioral Consistency in the Panel Data Models

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Abstract:

The paper quantifies the role of factors associated with the growth (or decline) of micro and small businesses in European economies. The growth is related to employment and value added in enterprises as well as to ten institutional variables. We test the data for consistency of behavioural patterns in various countries and gradually remove outlying observations, quite a unique a pproach in the panel data analysis, that can lead to erroneous conclusions when using the classical estimators. In the first part of this paper we outline a highly robust method of estimation based on fixed effects and least trimmed squares (LTS). In its second part we apply this method on the panel data of 28 countries in 2002-2008 testing for the hypothesis that micro and small businesses in Europe use different strategies for their growth. We run a series of econometric tests where we regress employment and total net production in micro and small businesses on three economic factors: gross capital returns, labour cost gaps in small relative to large enterprises and the GDP per capita. In addition, we also test the role of 10 institutional factors in the growth of familty businesses.

Keywords: Family business, robust estimator, LTS, fixed effects

JEL: C01, C23, C51, C82, F21, F40

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1 Introduction

As the recent world financial and economic crisis undermined the confidence in the economic leadership of large corporations, self-enforcing efficient markets and uninterrupted high growth, so there has been rising worldwide a renewed interest in the performance of small and family businesses that for many researchers and politicians present a crucial vehicle for rising both the employment and the competition in the world economies. This research is a follow-up to the analysis of Benáček and Michalíková, 2010, where we assessed the role of economic and institutional factors on the rise and decline of family businesses and applied them on the analysis of data on micro and small businesses in 28 countries of Europe by means of panel data for 2002–2008. We discovered that unique data on micro and small businesses in so many varied countries did not represent a homogenous pattern of behaviour in firms that differ not only in sizes but also in institutional setups that also change in time. Thus mixing together of firms subject to different incentives could potentially lead to behavioural patterns that are not compatible and, in extreme cases, it can strike a bias in estimating the factors of decision making and policies leading to high employment and output growth. In this research we have tested the potential for such a heterogeneity in the behaviour of small family businesses in various countries that could be even reflected in separating the original panel data into two subpopulations that are not compatible in their reaction to entrepreneurial stimuli. Hence, we have concentrated in our analysis on the techniques of robust estimation.

Although the methods of robust regressions have been applied throughout the last 50 years and many researchers were aware of the problem of outlying observations, which can completely damage the quality of estimators, little literature is existing on the use of robust estimations of the parameters in panel data models. This is one of our innovations in this research. The other innovation deals with the design and testing of economic motives on the supply-side and institutional barriers to the growth of family businesses.

In this paper, we apply a robust version of the classical within-group estimators on data of two groups of family businesses. In section 2 we present and describe this approach. Instead of centering the separate time series for each country by mean (and then estimating this centered data by simple ordinary least squares) we transform the data by the subtraction of country-specific median, which is more robust. Then, instead of OLS, a robust estimator is applied on centered data. Among all possibilities we choose least

trimmed squares, which are based on the minimization of h smallest residuals.

To test the properties of this approach practically, we decided to apply this method on economic data relating to family businesses grouped by enterprise size. In section 3 we describe the role of family businesses in present economies and we work out theoretical vantage points for assessing the factors associated with the growth (or decline) of micro and small businesses in Europe.

In section 4 both these theoretical considerations (robust method for panel data and incentives of family businesses) are merged together. We apply robust version of the within-group estimator on data for 28 European countries in 2002–2008 and we test how employment and net production in family businesses depend on two relative indicators representing benefits and costs: on the measure of gross capital returns per value added and the relative gap between labour costs in small (or micro) and large enterprises. Additional explanatory variables include the GDP per capita and ten institutional variables. Besides the economic interpretation of results, we focus on the properties of estimators and how the estimated parameters vary as the number of deleted outliers increases. Section 5 summarizes our findings.

2 Robust Estimation of Panel Data Models

2.1 Robust Estimators – an Overview

Classical methods of estimation rely heavily on assumptions, which are often not met in practice. Unfortunately, it often happens that some values of variables fall far away from the other observations in the sample. These differing values might be the result of reporting errors, different methodologies used by the reporters or idiosyncraticy in the behaviour of observed agents. The risk of incidence of all these disturbances is quite high in panel data where the time and the geographic discontinuity may lead to data inconsistency. In robust statistics the assumption is that the major part of the data follows a certain specific distribution F, while a certain small percentage of the data takes values unlikely to come from that distribution. Observations of this second case are termed *outliers*. Often they occur by errors and omissions in the collection of data. However, outliers can be also generated when the reporters mix together two or more subpopulations of data that represent agents whose behavior is mutually inconsistent. For example, it can be the case

when the analysts presume that micro businesses (such as self-employed) and businesses up to 50 employees follow identical strategies for their growth in all countries, irrespective of the changing institutional arrangements.

Both inconsistencies in observations are our main concern. In contrast to medium or large enterprises that have systematic accounting and whose annual balances are subject to external audits, small family businesses are subject to specific circumstances that increase the uncertainty and inconsistency of their reported data. Firstly, their accountancy need not be always led by professionals and thus more open to errors and omissions. Then their true production, employment and costs can be rigged due to much easier tax evasion. Thirdly, the reporting to statistical offices is not regular, relying on random (often non-representative) samples and the feedback on its accuracy is also limited, differing by the countries. Last but not least, our study is comparative across many countries and the behaviour of businesses among countries is not homogenous. There are cultural idiosynchracies in objectives or traditions in running small businesses, as well as there are different institutions guiding the incentives of small entrepreneurs and workers. Thus we are convinced that a comparative analysis of the behaviour of family businesses across countries and time is open to so many contingencies and behavioural inconsistencies that a robust technique of their estimation is a necessary and adequate approach in order to avoid the trap of data bias.

Since the robust estimation has not been a standard technique of analysis in this kind of panel data we will describe first our approach to data processing where the central issue rests in "outliers". There are several types of outliers in the cross-sectional regression analysis according to Rousseeuw and Leroy (1987). Contamination in the error term (so called *vertical outliers*) are observations outlying in the y-dimension that affects the estimation of both the intercept and the slope while the effect on the latter is milder. Contamination in the explanatory variables (called *bad leverage points*) affect severely the coefficients. The third type of outliers are called *good leverage points* that lie far from the values of other explanatory variables but are located close to the regression line. Their influence on the estimation of the intercept and other coefficients is marginal. In this work it comes particularly into question to consider the *block concentrated outliers* that are characteristic for situations in which most of the outlying observations are concentrated in a limited number of time series that belong to different countries.

The naive belief in the unimpeachability of statistical observations may end up in conclusions where outliers inflicted a series of blows to standard least squares analyses. Not only that some coefficients are false but many variables virtually lose significance. To solve this problem, we construct special regression diagnostics computed from the data with the purpose of locating the points of qualitative break-even, after which some outliers can be removed or corrected, followed by least squares analysis on the remaining data. Some of these methods can work well in the case when there is only a random outlier. However, it is more difficult to diagnose outliers that pollute systematically the data set. Then the approach of robust regression comes into question (Rousseeuw and Leroy, 1987).

The term *robust estimator* means the estimator that is not strongly affected by outliers. It means that the main aim is to fit a regression to the dominant inter-relations in the data and then discover the outliers for future treatment. As a measure of robustness we can consider the existence of the breakdown point of estimators. Generally spoken, the breakdown point of an estimator is defined as the smallest fraction of outlying observation that can cause a breakdown of the estimator. The seminal technique of their estimation is described in Rousseeuw and Leroy (1987).

Most of robust statistical estimators can be grouped into one of three following categories: generalized M-estimates that follow from maximum-likelihood arguments and are usually the most relevant class for model-fitting – that is for the estimation of parameters. The problem of this estimator is in the low breakdown point equal to *1/p*, where p is the dimension of model (Marona and Yohai, 1981). R-estimates are estimates based on rank tests: this estimator involves the ranking of residuals and the ranks are used to calculate weights. L-estimates involve a linear combination of order statistics and are most applicable to estimations of central value and central tendency, though they can occasionally be applied to some problems with the estimation of parameters. An L-estimator with high breakdown point is for example the least median of squares (LMS, Rousseeuw, 1984) – the first really applicable 50% breakdown point estimator. This method involves finding the beta coefficients that minimize the median squared residual. Since LMS is only $\sqrt[3]{n}$-consistent, it is not asymptotically normal and not easy to evaluate, we will focus on the second applicable 50% breakdown point estimator – the least trimmed squares (LTS, Rousseeuw, 1983).

2.2 Robust Within-Group Estimator in the Context of Our Model

Robust methods date back to the history of statistics and the first basis for a theory of robust estimation was formed in 1960's. Huber (1964) introduced a flexible class of M-estimators and Hampel (1968, 1971, 1974) designed the approach based on the influence function. On the other hand, still few literature is available on robust techniques applied to econometrics (Zaman et al. 2001, Bramati and Croux, 2004). Many statistician believe that outliers can be identified simply by eye by using graphs. However, tt is difficult to diagnose outliers by eye, especially in the case of panel data, because large panels of countries, firms or other agents may contain atypical observations or gross errors subject to a multitude of exogenous variables. Unfortunately, the econometrics are limited by a scant number of literature describing robust methods for panel data. In this paper we will attempt at contributing to these techniques by focusing on the simple fixed effects panel data model of small businesses. We will try to find a robust alternative to the Within-Group estimator[1], which can be affected by the presence of outlying observations. The breakdown point is the measure of robustness and the least trimmed squares is the estimator with high breakdown point. Thus we will describe high breakdown point estimator for the fixed effects panel data model based on LTS as an estimation procedure which is less sensitive to the presence of aberrant observations.

We consider the following form of the fixed effects linear panel data model:

$$y_{it} = \alpha_i + x_{it}^{'}\beta + \varepsilon_{it} \qquad \text{i} = 1, \ldots, N \qquad t = 1, \ldots, T \tag{1}$$

where i denotes the cross-section dimension (number of countries) and t denotes the time-series dimension (number of years). x_{it} is a column vector of explanatory variables with dimension $K \times 1$ while β is a $K \times 1$ vector of regression parameters. α_i denotes the unobservable time-invariant individual fixed effects and ε_{it} denotes the error terms or disturbance terms, uncorrelated through time and through cross-sections.

The classical Within-Group estimators for fixed effect panel data models is based on centering within every time-series:

[1]Since our panel contain all countries of interenst, the fixed effects model is more appropriate than a random effects models for our dataset.

$$\hat{y}_{it} = y_{it} - \frac{1}{T}\sum_{t=1}^{T} y_{it}$$
$$\hat{x}_{it} = x_{it} - \frac{1}{T}\sum_{t=1}^{T} x_{it}$$

and then the basic form of the fixed effects panel data models, described in (1), can be expressed as:

$$\hat{y}_{it} = \hat{x}_{it}^{'}\beta + \hat{\epsilon}_{it} \qquad \mathrm{i} = 1, \ldots, N \qquad t = 1, \ldots, T$$

and the fixed effects α_i have disappeared from the model by the centering operation. Then we can regress $\hat{y}_{it}$ on $\hat{x}_{it}$ by OLS and we will get Within-Group estimator denoted by $\hat{\beta}_{WG}$. Of course, fixed effects parameters can be estimated as well (Baltagi, 1998). Centering has a crucial advantage, because it reduces the number of parameters enormously.

So, the idea underlying Within-Group estimator is to center the series when applying the within transformation. In order to get a *robust* version of this estimator we have to center the time series (in both the dependent and the explanatory variables) *robustly* and then a robust regression will be applied to the centered data. The difference in these two approaches is that the time-series must be centered by removing the median instead of mean because the mean is largely distorted by outliers since the median is known to be min-max robust (Huber, 1981). We will get:

$$\tilde{y}_{it} = y_{it} - med_t(y_{it})$$
$$\tilde{x}_{it}^{(j)} = x_{it}^{(j)} - med_t(x_{it}^{(j)})$$

where $1 \leq i \leq N$, $1 \leq t \leq T$ and $1 \leq j \leq K$. $x_{it}^{(j)}$ denotes the j-th explanatory variable measured at time t in the i-th time-series. Number of parameters is reduced as in the case of demeaning. It implies that computation time for robust regression algorithm remains feasible (Bramati and Croux, 2004). So we can run a robust estimator (and regress $\tilde{y}_{it}$ on $\tilde{x}_{it}$ to identify the outliers). For this purpose we will apply the LTS estimator on centered data. LTS estimator is defined as $\hat{\beta}^{LTS}$ which minimizes the sum of the smallest h squared residuals:

$$\hat{\beta}_{LTS} = arg\min_{\beta} \sum_{k=1}^{h} [(\tilde{y}_k - \tilde{x}_k'\beta)^2]_i,$$

where

$$[(\tilde{y}_k - \tilde{x}_k'\beta)^2]_1 \leq [(\tilde{y}_k - \tilde{x}_k'\beta)^2]_2 \leq \ldots [(\tilde{y}_k - \tilde{x}_k'\beta)^2]_i \leq \ldots \leq [(\tilde{y}_k - \tilde{x}_k'\beta)^2]_{NT}$$

are the ordered squared residuals (Rousseeuw, 1983)). The value $1 \leq h \leq NT$ is a trimming value. As mentioned before, this estimator has a breakdown point attaining 50%. Moreover, for $h = [NT/2] + [(K+1)/2]$ the LTS reaches the maximal possible value for the breakdown point. However, in practice it appears that we do not need maximal breakdown point and we can select h larger. A default choice can be $h = [3NT/4]$ or $h = [4NT/5]$, making it possible to cope with up to 25% of outliers (or 20%, respectively) or we can select h sufficiently small to reach an acceptable coefficient of determination of the model. The LTS estimator in its basic version is regression, scale and affine equivariant (Bramati and Croux, 2004). Under rather general condition it is $\sqrt{n}$-consistent and asymptoticaly normal (Rousseeuw and Leroy, 1987 or Víšek, 1996). However, in our version the estimator $\hat{\beta}_{LTS}$ is scale equivariant only due to the nonlinearity of the centering transformation by the median (Bramati and Croux, 2004). Although the extreme requirements of the method on both the memory and the speed of computers gave the reason why these methods were not much used in the past, at present it is usually not difficult to evaluate this estimator thanks to new speed-improving computer technology.

Fixed effects parameters can be easily computed as follows:

$$\hat{\alpha}_i = med_t(y_{it} - x_{it}'\hat{\beta}_{LTS}) \qquad \text{i} = 1, \ldots, N.$$

Of course we take into account only included observations.

Our technique can by used in different ways. We can use it directly: centering the data by median, using least trimmed squares and discovering the outliers. Then we can work with the rest of the data and regress dependent variable on other regressors (Verardi and Wagner, 2010; Benáček and Víšek, 1999; Benáček and Víšek, 2000). However, we can employ it also in a different way by using outliers only as a diagnostic tool to recognize a

"suspicious" behaviour of some agent. In other words, we can drop out whole groups of agents (firms, countries, etc.) where most of the observations are earmarked as outliers and work with the rest of observations (Michalíková and Galeotti, 2010). In this paper we will apply this method directly. It means that we will identify the outliers in centered model, separate them and then use the LTS on the rest of data.

Finally we will focus on the question what we expect from our new method. Firstly, this technique makes it possible to recognize outliers, which are not able to be detected by eye or by the help of traditional regression diagnostics. Once we have separated the observations (considered to be outliers), we can monitor if this subpopulation of data is subject to certain systemic regularity. For example, we may be primarily interested if some group of countries does not behave in an idiosynchratic way. These findings can serve to drawing conclusions about specific behavioural patterns in analysed agents. Secondly, we may be watching if the removal of outliers brings some improvement in the estimated regression model. For example, we may monitor the decrease in the residual sum of squares, the increase in the coefficient of determination and thus and improvement in the quality of the basic model. Furthermore we may monitor the stability of estimated regression coefficients in the case of increasing h. Last but not least, we are interested if p-values of estimated regressors are improving as the outliers are dropped out from the model.

3 The Factors of Growth of Family Businesses

3.1 Family Business and Small and Medium-sized Enterprises

Until the 1930s family businesses were the dominant forms of capital ownership throughout Europe. Because a half of our analysed countries are post-Communist countries, we must be aware of their specifics. Shaken by the Great Crisis, the rise of Communism, the Second World War, and the post-war waves of nationalization and government interventions, these businesses in a large part of Central Europe declined in importance as the attention of policy-makers hinged on corporations. An important break occurred in the early 1990s with the fall of the Communist empire.

Family-led entrepreneurship was supposed to get a new boost as the pro-market forces triumphed. This was an error in judgement: since the 1990s, incumbent and emerging

large-scale capitalism throughout the world has received a special spur from the globalisation. Authentic small-scale family business were often squeezed out of the space for rapid development by surviving, former state-owned enterprises, which were converted to corporations that were owned formally by thousands of petty stock-owners and a thin class of insiders with dominant stakes (Benáček, 2006). The post-communist countries in Europe were obsessed with the privatisation of inefficient state monopolies, thus establishing recourse to a new primitive accumulation of capital that did not relinquish the resources of labour and capital so necessary for the rise of family business. The parallel opening-up of globalisation offered new windows of opportunity to large enterprises dominated by managers. In the late 1990s the floodgates to expansionary monetary policy opened up and government debt grew. In parallel, entrepreneurship in the majority of advanced capitalist countries, led by large financial institutions, turned either to assets whose prices could rise in a vicious circle of supply and demand or to an alignment with public administrators where achieving social efficiency was an objective that could be sacrificed, which was a similar move like in the post-Communist countries. This was a very different style of management compared to small businesses.

Both bubbles finally burst, which drove the economies in both developed and post-Communist countries into a lasting recession. It ended in another unexpected event: fiscal rescue packages of an unparalleled size, a credit crunch, liquidity trapped in savings and bureaucratic interventions, which handed over the initiative in entrepreneurship in many large enterprises to governments. Governments became the crucial agents for sustaining aggregate spending. Rising taxes, as a consequence of interventions, discriminated against small family business and the middle-classes. The natural expansionary drive in post-Communist small and medium-sized enterprises (SME)[2]) that was apparent in the 1992–2006 period (Benáček and Zemplinerová, 1995) was also influenced by the government policies that were biased in favour of large businesses, thus checking the SME' profit rates.

[2]In order not to confuse the reader, we will use the following acronymes in this paper: SME – small and medium-sized enterprises that include firms from 1 up to 250 employees. There are two categories of SME that we will test empirically: micro businesses (MB, with 1 through 9 employees) and small businesses (SB, with 10 through 50 employees). We will also talk about "family businesses" (FB) that relate to a consolidated set of micro and small businesses (firms). It is merely for practical reasons since the union of MB and SB does not have an easily recognised common name and a lot of our statements relates to both groups of enterprises.

The is one current problem in all advanced economies: all are faced with the need to revive authentic entrepreneurship in the form of family businesses and to provide incentives for innovative growth and investment in place of government expenditures that became, due to world financial crisis, the most relied-on driver of aggregate demand. In another words, the expectation is that the turnaround in the present recession should come from an increase in domestic aggregate spending and employment in SME dominated by family businesses, which in almost every country have been the main source of employment and job creation, but not the engine of spending dynamics. The main objective in this paper is to address the question: which economic and institutional factors are associated with the development and growth of family businesses?

3.2 Economic and Institutional Factors of Development of Small Family Businesses

A firm is said to be family-business if a member of one or more families is its controlling owner, implying a managerial commitment toward the business' overall performance. It includes also the case of ownership by shares when the family controls at least 20% of voting rights and that 20% is the highest percentage compared with other aligned shareholders. The main strength of a family business is the direct accountability and enforcement of property rights, without recourse to moral hazard and asset stripping. It also results in high wage flexibility and effective personal commitment to the wellbeing of the firm. Other advantages are higher ability of family businesses to withstand economic shocks, the commitment to high investment by relying on own savings and to net job creation. In this paper we will use micro and small businesses as proxies of small family businesses. The choice of MB and SB as proxies thus kills two birds with one stone: a) it helps operationalise the basic subject of this study with a very high degree of overlapping; b) it offers a name for the union of MB and SB that does not have an easily recognised common name when a lot of our statements relates to common finding related to both groups of enterprises. At the same time it keeps large family businesses aside because they differ in their managerial operation from MB and SB, which was also not our concern.

It was generally believed that even though SME could provide the majority of jobs, their role in the progress of economies was just of subsidiary importance (Schumpeter, 1942). For long, there dominated a presumption that employment in small businesses was

negatively related to the GDP per capita, causing a bias toward larger enterprises (Lucas, 1978; Acs et al., 1994). We think that these presumptions should be re-considered because they are not consistent with empirical observations. Very similar arguments were used by central planners whose bias towards centralization and monopolization and opposition to entrepreneurship were paramount.

Acs and Audretsch (1988) reached the conclusion that innovations were negatively related to concentration and that innovation increased with the R&D expenditures at a less than proportional rate. Symeonidis (1996) concluded his extensive survey of empirical literature on the alleged advantages of large over small firms with the finding that 'literature survey suggests that there seems to be little empirical support for the view that large firm size or high concentration are factors generally conducive to a higher level of innovative activity' (p. 33). The outbreak of the world financial and economic crisis in 2008 brought a new wave of attention to the facts refuting the validity of the so-called Schumpeterian hypothesis about the demise of small entrepreneurship (Schumpeter, 1942: 134–143).

Micro and small businesses (i.e. MB and SB) cover 98.7% of all EU enterprises. In addition, approximately 50% of MB in the EU are formed by self-employed. Thus, only a negligible number of family businesses (FB) rank in the categories of medium-sized or large firms. Therefore, for a high behavioural correlation between a union of MB with SB and the FB, in the rest of this study we shall use micro and small businesses as a proxy category for family businesses. We will thus distinguish between two types of FB: those ranging in size from self-employed individuals to enterprises with 10 employees (i.e. MB) and enterprises with 10 to 50 employees (i.e. SB). It is necessary to note that we will work with the non-financial private sector only, so we will analyze an incomplete part of national economies in Europe. For example, our employment statistics (including medium-sized and large firms) represent 61% of all employment in the EU-27 in 2008.

Our objectives in this research will have to be closely linked to examining how FB could contribute to Europe's economic revival and what factors determined their development in the recent past. The macroeconomic conditions for fast growth are associated with two strategies: external and internal. Export-led growth is the most typical and the most successful type of development. The external growth strategy was the main engine of prosperity in the post-war democratic Europe and Japan. Later this strategy was adopted in such successful countries like the NICs of South-East Asia, Ireland and

post-Communist China, and in nearly all other transition countries. The internal growth strategy, bearing signs of autarchy, was the crackerjack of the Communist economies, where high taxation and intensive government spending concentrated on local industries catering to local markets. The internal strategy of development under central command brought them neither growth nor prosperity, even though its main success was in securing extremely high employment rates. With respect to how the two mentioned strategies relate to private businesses, export-led growth is the driver of expansion in large enterprises, because they are significantly more export-oriented than SME. For example, Eurobarometer (2009) reports that only 8% of all SME were engaged in exports and their income from exports made up less than 5% of their turnover. On the other hand, the majority of large enterprises were engaged in exports and their income formed 20% of the turnover. Generally speaking, SME can be important subcontractors for exports, but their role in direct exports is subsidiary. In contrast, SME are at the core of domestic aggregate demand in the non-traded sectors that generate most of the GDP. Breaking away from the present sluggish aggregate demand and credit crunch in nearly all European countries depends on finding a self-sustained replacement for the present reliance on government fiscal and monetary injections into private resources and intermediation. The revival of corporations and their exports, shielded by the dismal Schumpeterian hypothesis, is an important but not a sufficient strategy. It is necessary to find a new class of innovatory agents, close to economic grassroots, whose activities would be conducive to a break-through in growth and employment, similarly as it happened in China. We presume that European FB are largely destined for this kind of a mission. A successful model of development leading out of recession can be thus outlined as follows: internationally open large enterprises, which are also the bearers of domestic comparative advantages, provide domestic economies with their primary impetus for strong growth via a revival in international trading. As a secondary repercussion, their outsourcing and consumer spending is then transformed by means of a multiplier into the performance of non-traded sectors, which are represented primarily by FB. In order to adjust to rising aggregate demand, all enterprises have to invest – which initiates a tertiary boost to growth. Thus, the success in development is characterized by an interaction of large plus medium and family businesses, all of which play a specific role in the process. In all of them the decisive engine are entrepreneurs that are able to make up for both the emerging market and government failures.

The world economic crisis slashed the EU exports of goods and services from previous annual growth rates close to 6% to a mere 1.6% in 2008 and a decline of -14% in 2009 (Eurostat, 2010). This severely damaged the trust in the growth leadership of large businesses. Government deficit spending compensated partially for the missing exports, but there was no other segment of the economy available to fill the looming gap in both aggregate demand and efficiency. With the exception of Poland, nowhere was the private sector able to act as an agent of sustained growth. Nevertheless, SME have saved many European economies from drastic falls in employment. The expected mild economic recovery of the GDP growth of 1.6% in EU-27 in EU-27 in 2011, driven mainly by exports, will require that a complementary resource be started up to substitute for the fading and inefficient government deficit spending. We predict that such a resource to be in the revival of authentic entrepreneurship that used to be represented by FB. That revival should actually be traced back to 1948–1965, when internally driven development in FB was still dominant and had not yet been crowded out by globalised businesses.

We will analyze in this paper which factors helped SME in micro and small categories achieve growth in the past. We will measure the growth of MB and SB by their employment figures or, alternatively, by their net output. In our view, the expanding FB will have to take over some of the resources relinquished by large businesses that were not able to use them efficiently.

3.3 The Factors Favourable or Adverse to Family Business Development

Blau (1987) found in his empirical study that the self-employed, numerically the largest group amongFB, grew in importance since the 1970s. Later research into SME development concentrated mainly on the differences in the self-employment rates among countries or regions. It drew on cross-sectional techniques of estimation that helped explain the differences in employment accrued in time as a result of local specificities, such as different structures in national factor requirements (and endowments), GDP per capita and a series of country-specific institutional factors. Torrini (2005) estimated that the intensity of self-employment depended inversely on the local capital/labour ratio and public sector size. The factors enhancing the self-employment were the low tax and social security wedge, the rising income per capita, high unemployment rates, product market regulation, labour market protection, low fiscal discipline and perceived corruption.

SB development looks then to be the result of market distortions and like the second-best solution to problems of inefficient public administration, it became a heaven for entrepreneurs with tainted managerial capacities. Explaining SB as the outcome of a suboptimal market structure does not in our view seem persuasive, even though the cited factors might play a role. We will try to test a hypothesis that the development of SB could have deeper microeconomic foundations. We traced them to wage and profit structures, and to the competition with large enterprises, which pressed 'fringe competitors' to respond with strategies idiosyncratic to smallness that allowed them to withstand the competitive race. The following theoretical assumptions will be used as guidelines for hypotheses in our empirical tests[3]:

a) General benchmarks for the analysis of efficiency and growth are derived from production functions with labor and capital serving as factors. By applying the cost-benefit principles on factor allocations, entrepreneurs consider their Pareto-efficient outcomes subject to various scopes of activities. Their outcomes have direct repercussions on the growth of output and employment.

b) The objective function of entrepreneurs is profit maximization. Even though entrepreneurs maximize net profits for making their decisions about production, the maximization of gross capital returns per value added (KR/VA), where capital K is defined by reducing total labor compensation (W) from the net income of enterprises (VA)[4], is still a plausible criterion because it represents a social efficiency of capital allocated among businesses of various scales.

c) We could set up a hypothesis that countries with higher KR/VA in any group of FB could also see the stronger development of FB. If the space for $K = VA - W$ increases (e.g. as a result of innovation or lower transaction costs), it will induce the entrepreneurs to expand their employment in order to bolster the sales and net output. This will result in an increase of labor income W and a raise in the wage rates per labor W/L. Nevertheless, is such a behavioral hypothesis valid for both employment and net production in reality? A very high KR/VA may also imply a shortage of capital (undercapitalization and/or too expensive capital). Then high capital returns could act as an impediment to FB growth,

[3]A more detailed theoretical explanation of these theoretical undeprinnings can be found in Benáček and Michalíková, 2010.

[4]Net income (i.e. the value added) of enterprises is defined as difference between sales S and material inputs M.

i.e. KR/VA could be negatively related to growth in employment.

d) FB development is not autonomous in isolation within their own SME categories because what also matters is an FB's relative performance vis-a-vis large businesses (LB). Small FB compete with LB for limited nationally available economic resources. Assuming the prices of products and capital for FB are exogenously given, the competition lies in costs and relative productivities. We can describe two specific 'imperfections' of the factor markets in FB: the access to capital is more expensive for FB than for LB. This is in fact a normal arrangement that reflects higher transaction costs of FB in their access to money market. Therefore FB must compensate for this defficiency by reducing some other costs. This will fall on lower wages in FB, which is their second specificity.

e) Thus the cost competition between FB and LB will depend on how well FB are able to depress wages, thus creating a wage gap relative to LB in order to gain a cost advantage once the prices of products are given. We will test whether (lower) wages per worker in FB related to (higher) wages per worker in LB are associated with higher growth in FB. Thus we can raise a hypothesis for empirical testing of FB development assuming that L_{FB} is a negative function of relative wage rates $(W_{FB}/L_{FB})/(W_{LB}/L_{LB})$. It is an outcome of an assumption that LB and FB differ in their micro-technologies, which are driven by different relative factor prices, i.e. different ratios of wage rates per capital rental rates. Thus the isoquants in FB tend to be capital-saving while in LB are labor-saving that at the end makes the former net job creators.

f) Another hypothesis about the determining factors of growth in FB that we will test concerns the degree of general economic development represented by GDP per capita. We could then verify whether rising prosperity is a factor that enhances or retards the development of FB.

g) Contemporary economics stresses the importance of institutions, as administrative bodiesdefining the 'rules of the game' or incentives whose purpose is to reduce uncertainties and transaction costs in business interaction (Stiglitz, 1998). National institutions are important factors that may have both positive and negative impacts on businesses of different sizes. They can be associated with excessive regulation, barriers to trading freely on markets, volatile currency, high taxes, public spending rigged by corruption, inflexible labor market, and more. The analysis by Torrini (2005) confirmed that the development of MB closely depends on the institutional setup but such a dependence is

country-specific. Thus three economic indicators related to internal rates of gross capital returns (R_{FB}/Y_{FB}), relative wages rates $(W_{FB}/L_{FB})/(W_{LB}/L_{LB})$, and GDP per capita, plus ten institutional indicators are selected as causal factors related to the growth of FB, i.e. the MB and SB.

4 Results of Econometric Tests

4.1 The Review of Variables and Models for Empirical Testing

In this chapter we will test empirically the extent to which the growth in FB in 28 European countries was influenced during 2002–2008 by described three economic factors and by the risks or benefits associated with ten country-specific and time-specific socio-political institutions. Our estimations will search for common behavioural characteristics of sub-panels of countries and their observations in a sequence of time. Our data cover the non-financial business economy. Sources of the data are: Small Business Act Factsheets (Eurostat and DG Enterprises and Industry); GDP statistics of the World Bank; Database on the Economic Freedoms (The Heritage Foundation). The robust version of the fixed effect panel data model will be used for the estimation of coefficients.

Our dependent variables are computed from aggregated data of production statistics for MB, SB and LB, representing the indicators of FB growth in observed countries related to FB employment and the FB value of net output (i.e. the value added). We assume that the smaller is the business, the more labour-intensive is its production and the lower is its net productivity per worker.

Dependent variables

- L_{it}^{FB}: Employment in $FB = \{MB, SB\}$ quantified by the number of workers in country i and year t.
- VA_{it}^{FB}: The value of net output (i.e. the value added) in MB or SB in country i and year t.

Economic explanatory variables

- $KR_{it}^{FB}/VA_{it}^{FB}$: Gross capital returns in analyzed businesses per value added

- $LC_{it}^{FB}/LC_{it}^{LB}$: Relative rates of full labour costs ($LC = W/L$), i.e. total labour compensation per worker in FB divided by similar compensation in LB
- GDP_{it}/PC_{it}: GDP per capita in purchasing power parity.

Institutional explanatory variables

- $Regul_{it}$: Business freedom (regulation) index
- $Trade_{it}$: Trade freedom (trade barriers) index
- $Monet_{it}$: Monetary freedom (inflation and price control) index
- $Govern_{it}$: Freedom from government (public spending) index
- $Fiscal_{it}$: Fiscal freedom (taxation) index
- $PropR_{it}$: Property rights index
- $Invest_{it}$: Investment freedom (capital controls) index
- $Financ_{it}$: Financial freedom (private banking security) index
- $Corrupt_{it}$: Freedom from corruption (perception) index
- $Labour_{it}$: Labour freedom index

Remark: Institutional variables are the proxies of economic "freedoms" ranging in their values $\langle 0, 100 \rangle$. The higher the percentage index the more liberal and pro-market is the local institutional arrangement.

The selection of 28 countries of Europe is highly representative, covering nearly all of the EU and potential accession countries (see Table 5 in Attachment). The estimation will point to potential factors and their effects on augmenting or diminishing the SME roles in European economies.

The first two explanatory variables are relevant for decision-making in enterprises. Gross capital returns are closely related to profits and profits form the basis for investments into physical capital and R&D. High profits also motivate FB owners to increase the scope of their production and gain in scale economies, which should imply growth. Reasons for having a high share of gross capital returns on the value added can be: a) Increasing labour productivity without compensating workers at a proportionally higher wage rate – that

would imply high profits; b) Decreasing the marginal product of labour by overstaffing, which is reflected in disproportionally lower average wages in the enterprise. That would imply a high cost of capital that burdens the firm; c) Hiring and paying labour outside official contracts, which slashes the total labour costs.

As a result of the existence of wage gap, FB are pressed by the very nature of their businesses to move between all three strategies, which brings an outcome that gross capital returns per value added are higher in MB than in SB and higher in SB than in LB. Because of different reasons that drive KR/VA upward we cannot be sure whether this variable is related to FB growth negatively or positively.

The second variable LC^{FB}/LC^{LB} tests the relevance of low (reported) wages and of the gap in FB wage rates trailing behind LB. We can expect to observe a wide range of cross-country differences in that relationship. What matters is whether higher labour cost gap in FB is a driver or a retarder of FB growth. Once again we cannot be sure a priory about the nature of its sign.

The third variable points to a general trend in development. Our only macroeconomic indicator is substantiated on theoretical grounds elaborated by Lucas (1978), and followed by Acs et al. (1994) and Torrini (2005). In our case this variable proxies the purchasing power, instead of a supply-side variable representing the capital endowments. Then we should expect its sign to be positive.

The remaining ten institutional variables are relevant for government policy-making. The central idea behind the choice of institutional variables is that institutions as man-conceived factors can have a two-pronged impact on businesses: as public goods or as public bads. The departure from largely macroeconomic to microeconomic explanatory variables representing incentives or policy instruments, became recently a standard tool of econometric analysis (Blau 1987; Robson and Wren 1999; Davis and Henrekson 1999). All our institutional variables are based on their perceived qualities of allowing for market and entrepreneurial freedom, once the coefficient is positive. Even though we can assume that more liberal economies grow faster, some studies of SME revealed, very small businesses are not related to all indicators of free market economy in a positive way (Torrini, 2005).

Now we will present the results of our robust regression analyses. The test consist of four models related to micro and small enterprises, whose specifications are as follows:

$$L_{it}^{micro} = \alpha_1(KR/VA)_{it}^{micro} + \alpha_2(LC_{it}^{micro}/LC_{it}^{large}) + \alpha_3 GDP_{it}/PC_{it} + \alpha_x(INSTIT_{it}^{var}x) + \varepsilon_{it}$$

$$L_{it}^{small} = \beta_1(KR/VA)_{it}^{small} + \beta_2(LC_{it}^{small}/LC_{it}^{large}) + \beta_3 GDP_{it}/PC_{it} + \beta_x(INSTIT_{it}^{var}x) + \varepsilon_{it}$$

$$VA_{it}^{micro} = \gamma_1(KR/VA)_{it}^{micro} + \gamma_2(LC_{it}^{micro}/LC_{it}^{large}) + \gamma_3 GDP_{it}/PC_{it} + \gamma_x(INSTIT_{it}^{var}x) + \varepsilon_{it}$$

$$VA_{it}^{small} = \delta_1(KR/VA)_{it}^{small} + \delta_2(LC_{it}^{small}/LC_{it}^{large}) + \delta_3 GDP_{it}/PC_{it} + \delta_x(INSTIT_{it}^{var}x) + \varepsilon_{it}$$

where $i = 1, \ldots, 28$ are countries, $t = 2002, \ldots, 2008$ are the observed years, $x = \{4, 5, \ldots, 13\}$ indicates the respective number of institutional variable 4 through 13.

4.2 Comments on the Econometric Results

As it was already mentioned, our panel data will be estimated with our own robust version of fixed effects. Since our data contains almost all European countries, it can be presumed that fixed effects are a suitable technique of estimation. In Tables 1 and 2 we report the results of four regressions, which are specified above. In each regression we included three economic explanatory variables plus some relevant institutional explanatory variables. These variables were chosen according to the level of significance in individual models. The non-significant institutional variables were dropped from the model. In the first column for each regression we report results of fixed effects model, which was estimated from the data centered by median. In the following columns, we report results of Least Trimmed Squares regression, applied on the data centered by median, with regard to different choice of h.

In our analytical tasks we are firstly interested in the technical improvement of models after the outliers were removed. We focus especially on the extent how the quality of estimation progressed (e.g. how the residual sum of squares decreased and the coefficient of determination increased). We also monitor the stability of estimated coefficients – whether the sign of parameters has changed with increasing h. Also p-values of coefficients may be interesting – are the results more significant with decreasing h? Last but not least, we focus on eliminated outliers – what is their origin and is there any common property among them?

With regard to the results of our estimation in Tables 1 and 2, our first general observation is that parameters are mostly significant. In all four cases, the coefficient of determination (R-squared) has been increasing and thus quality of model improved. In

Model	1				2			
Dependent variables	L_{it}^{micro}				L_{it}^{small}			
h%	–	95%	85%	75%	–	95%	85%	75%
Economic								
KR/VA_{it}^{micro}	-0.080*	-0.329***	-0.210***	0.009				
	(0.043)	(0.053)	(0.047)	(0.017)				
KR/VA_{it}^{small}					-0.164***	-0.157***	-0.166***	-0.005
					(0.021)	(0.015)	(0.010)	(0.051)
$LC_{it}^{micro/large}$	-0.346***	-0.398***	-0.318***	-0.157***				
	(0.062)	(0.051)	(0.039)	(0.025)				
$LC_{it}^{small/large}$					-0.330***	-0.167**	-0.016***	0.016
					(0.091)	(0.074)	(0.054)	(0.049)
GDP/PC_{it}	0.509***	0.419***	0.405***	0.377***	0.541***	0.496***	0.407***	0.423***
	(0.039)	(0.029)	(0.021)	(0.018)	(0.035)	(0.026)	(0.003)	(0.017)
Institutional								
MONET	0.003**	0.0003	-0.001*	-0.003***				
	(0.001)	(0.001)	(0.0008)	(0.001)				
FINANC	0.001**	0.002***	0.0006**	0.0004**	0.001**	0.001**	0.001**	0.001
	(0.0007)	(0.0005)	(0.0003)	(0.002)	(0.0007))	(0.0004)	(0 0003)	(0.001)
LABOUR					-0.001	-0.001	-0.002**	-0.001***
					(0.001)	(0.0009)	(0.0006)	(0.0004)
No of obs.	196	187	167	147	196	187	167	147
adj. R^2	0.525	0.603	0.700	0.772	0.634	0.748	0.751	0.837

Table 1: Robust fixed effects regressions – models 1 and 2. Notes: The value for *h%* denotes how many observations were included into data set. * significant at 10%; ** significant at 5 %; *** significant at 1 %. Standard errors are in brackets. Fixed effects are not reported. Variance inflation factor does not suggest any problems with collinearity in regressions. Dependent variables and GDP per capita are in logarithms.

Model	3				4			
Dependent variables	VA_{it}^{micro}				VA_{it}^{small}			
h%	–	95%	85%	75%	–	95%	85%	75%
Economic								
KR/VA_{it}^{micro}	0.301***	0.299***	0.277***	0.503***				
	(0.072)	(0.064)	(0.044)	(0.073)				
KR/VA_{it}^{small}					-0.105***	0.052	0.456***	0.452***
					(0.032)	(0.148)	(0.128)	(0.098)
$LC_{it}^{micro/large}$	0.448***	0.376***	0.388***	0.575***				
	(0.103)	(0.087)	(0.061)	(0.063)				
$LC_{it}^{small/large}$					0.631***	0.408***	0.410***	0.478***
					(0.138)	(0.129)	(0.108)	(0.083)
GDP/PC_{it}	1.736***	1.552***	1.404***	1.528***	1.737***	1.576***	1.507***	1.386***
	(0.067)	(0.060)	(0.045)	(0.036)	(0.054)	(0.045)	(0.038)	(0.033)
Institutional								
MONET	0.004**	-0.001	-0.002	-0.003**				
	(0.002)	(0.002)	(0.002)	(0.001)				
CORRUPT	0.005***	0.003**	0.001	0.001				
	(0.001)	(0.001)	(0.001)	(0.001)				
GOVERNMENT					0.002*	0.002**	0.001	-0.0001
					(0.001)	(0.001)	(0.001)	(0.001)
INVEST					0.001	0.001	0.0003	0.0007**
					(0.001)	(0.005)	(0.0007)	(0.0003)
Number of obs.	196	187	167	147	196	187	167	147
adj. R^2	0.823	0.825	0.880	0.938	0.866	0.877	0.909	0.934

Table 2: Robust fixed effects regressions – models 1 and 2. Notes: The value for *h%* denotes how many observations were included into data set. * significant at 10%; ** significant at 5 %; *** significant at 1 %. Standard errors are in brackets. Fixed effects are not reported. Variance inflation factor does not suggest any problems with collinearity in regressions. Dependent variables and GDP per capita are in logarithms.

the case of first two models the R-squared moves around 52% (63%, respectively). This is not a result satisfying enough. Nevertheless, with deleting 5% and 15% of observations in the model for L^{micro} the R-squared shoots up markedly. In the case of model 2 for L^{small} the R-squared increases even more and gets over the value of 74% after deleting mere 10 observations (which corresponds to 5% of the data). It means that in the core of our model 70% of its variability is explained. In the case of models 3 and 4 the results are even better. After deleting their 25% of observations (which corresponds to 30 observations out of 196) R-squared moves over 93%.

The convergence of all models testifies that there exists a dominant pattern of behaviour among the European FB that offers a valuable description of their mechanism of growth. Lets turn our attention to individual models in more detail. We are interested if the estimated coefficients are significantly modified with increasing h. We can see that it is not always the case. If we focus on the signs of parameters, only in one case – in that of the coefficient of KR/VA in model 4 – the sign is instable. Such a counter-intuitive reversal in sign could be, hypothetically, a result of multicolinearity, but variance inflation factor (VIF)[5] refuted that possibility. Therefore, we can infer that among small businesses there was a small (but highly influential) subpopulation of agents, whose output responded to capital returns in an inverse direction than the majority of firms, which is a paradox. In the rest of regressions the values of estimated parameters differ with decreasing h only slightly and the majority of coefficients seem to be stable (relative to the threshold of tolerance).

As we have already mentioned, parameters in models are mostly significant, namely in the initial models where all observations are included. In four models we use altogether 11 different variables. All three economic variables prove their clear dominance. The role of institutional factors seems to be only subsidiary, which is an unexpected finding of high importance. It signals that small family businesses are deeply dependent on the market performance and policies are not so important in changing their strategic behaviour.

Only four out of the total of 13 selected explanatory variables have problems with complete insignificance. All of them belong to institutional factors. On the other hand, we are fully satisfied with the significance of variables in the case of economic explanatory

[5]Variance inflation factor (VIF) is common way for detecting multicollinearity. VIF is computed from the covariance matrix of parameter estimates (O'Brien, 2007).

variables. Exceptions are in model 2 for SB where deleting 25% of observations destroys the significance of two economic variables and in model 1 for MB where after deleting 25% of observations the variable KR/VA becomes insignificant. It seems that our data in models of employment are not strictly homogeneous. Remaining economic variables in models 1 and 2 are highly significant.

Variables *KR/VA* and LC have negative signs in models 1 and 2. This implies that job creation in small FB is conjoined with low pretentions to both capital returns and wage requirements. Reversing the argument, high wages and high capital yield requirements are impediments to higher employment in FB. It is obvious that an intensive mechanisation crowds out workers similarly like rising wages. Thus saving on machines and prudent wage policy are traditional recipes for the high employment in FB. There is also an important proviso to be added: a sustained or even widening gap in labour costs relative to large enterprises combined with lower capital endowments is a knife-edge enterprise strategy for gaining competitiveness in the short term that calls for low costs and prudence in expenditures on the one hand. On the other hand, too much of both endangers the quality of investments and the availability of skilled workers that cut on productivity growth in the long term. Our results reveal a possibility for a paradox of development: measures for a high employment growth can be in conflict with high output growth. A crucial information is added by the third economic variable: rising GDP per capita enhances the employment in both types of FB. We can see that FB were the leading drivers of job creation throughout Europe during the observed period.

What concerns the institutional variables, their importance was found much weaker when compared to economic variables. The conditions for job expansion in micro business are also in the prudent monetary policy (that sustains low inflation) and in the existence of efficient financial services. A similar conclusion can be drawn about an easy access to financial intermediaton in model 2 for small businesses. On the other hand, high labour market flexibility is not compatible with employment growth in the majority ofSB.

The three most powerful findings occurred in models 3 and 4 explaining the mechanism of growth in net production in MB and SB. Firstly, our models point to the existence of a trade-off between employment and output expansion because the signs for the first two economic variables reversed from negative to positive. Secondly, the coefficients for GDP per capita increased approximately three-fold in their value, pointing to a high elasticity

Table 3: Comparation of outliers. The number denotes how many years in a given country have been dropped for selected h%.

	Model 1			Model 2			Model 3			Model 4		
h%	95	85	75	95	85	75	95	85	75	95	85	75
Albania	2	5	6	1	5	6	1	3	3	2	2	3
Bulgaria				1	2	4				2	3	5
Croatia	1	2	2		3	3		4	5	1	1	2
Cyprus						1			5			
Czech Rep.		4	5			2						1
Denmark			1					1	3			
Estonia		1	3	1	1	2		1	1		1	2
Finland											4	4
Germany								1	2			2
Greece				2	6	6			1		3	6
Hungary			2									1
Ireland			2	3	3	3		3	5			
Italy						1						
Latvia		3	5			2		3	4	1	2	3
Lithuania			1								1	3
Malta						1						
Netherlands	1	1	4		3	3					1	2
Norway						1	4	4	7		2	2
Poland						1					2	2
Portugal	2	3	3		1	3			2			
Romania	2	3	3		2	4	3	5	5	3	5	6
Slovakia	1	4	4	1	2	2	1	4	4		2	4
Slovenia			3			2						
Spain		1	2			1			1			
Sweeden		1	2		1	1			1			
UK		1	1									1

Table 4: Comparision of some countries with maximum and minimum number of outliers. The number in brackets denotes how many years in a given country have been dropped in all four models (1–4) together for selected h% in columns I, II and III. Column IV denotes countries with maximum number of outliers in all four models and all three choices of h. Column V denotes countries with minimum number of outliers in all four models and all three choices of h.

	I h%=95	II h%=85	III h%=75	IV maximum for all h%	V minimum for all h%
1	Romania (8)	Albania (15)	Albania (18)	Romania (41)	Italy (1)
2	Albania (6)	Romania (15)	Romania (18)	Albania (39)	Malta (1)
3	Norway (4)	Slovakia (12)	Latvia (14)	Slovakia (29)	UK (2)
4	Bulgaria (3)	Croatia (10)	Slovakia (14)	Croatia (24)	Hungary (3)
5	Ireland (3)	Greece (9)	Greece (13)	Greece (24)	Germany (5)
6	Slovakia (3)	Latvia (8)	Croatia (12)	Latvia (23)	Poland (5)

of FB output growth to aggregate demand. Thirdly, the results in Table 2 imply that value added VA is more sensitive to low labour costs LC (and with it to labour efficiency) than to high capital returns (capital efficiency). Therefore, by consolitating these results, we can draw an implication that increasing aggregate demand is driving production (and therefore probably also the profits) in FB more than its employment. Thus the natural market forces keep the FB biased more towards the net output than to the net employment growth. A social preference to reverse this bias (especially in times of crises with rising unemployment) implies the need for policy measures that would give the price of labour relative to the price of capital a higher cost advantage. In contrast to that, policies offering the FB an easier access to capital will not boost the job creation.

The growth in net output in FB is underpinned by high gross capital gains per value added, which should be complemented in the medium-run with upward wage concessions (i.e. the pay-rises), thus forming a virtual circle of investments, output growth, high returns and rising wages. High GDP per capita is a crucial catalyst for such development accompanied by low corruption in the case of model 3. The constraints on monetary policy are not compatible with output growth in the 75% of micro business. Our last model deals

with output growth in SB and the role of three economic factors is similar to the previous case. However, institutional variables are not significant with the single exception of high government spending. Thus corruption or financial intermediaton are not found to be a significant factor of FB development.

Finally we will focus on observations which have been dropped out from the model. Table 3 and Table 4 compare some outliers excluded from estimation by LTS. There are six countries that are generating the majority of outliers: Albania, Croatia, Greece, Latvia, Romania and Slovakia. Excepting Greece they belong to countries of emerging post-communist Europe that in the past had problems with macroeconomic stability and the EU accession. Let us look more closely at their most apparent similarities that relate toFB. These countries differ by their high growth of employment. Thus the job creation in FB during 2002–2008 was in these emerging countries faster compared to other countries. Such a growth can be explained by their lagging in FB development prior to 2002. In the case of value added this growth was even more significant. Revealed heterogeneity in data can be caused by a different method of measurement of economic or institutional variables, or by a very different pattern of behavioural patterns of FB in mentioned countries.

5 Conclusions

In this paper we have analyzed the factors that were instrumental for a growth in two types of small firms in 28 European countries. It was revealed that growth related to employment and to net production was conditioned by very different internal incentives. As we have found, schemes (or incentives) targeting high employment can be in conflict with schemes concentrated on the growth in value added.

We have also tested the stability of behavioural patterns in FB throughout Europe. For that purpose we applied a robust methodology for fixed effect panel data models which allowed us to estimate a model where data were contaminated by outliers. Thus we were able to separate a "hard core" of firms grouped by countries from firms subject to different behavioural pattern. The robust method was based on two steps: firstly we had to center the data by median (which is more robust than mean), secondly we applied the Least Trimmed Squares technique with high breakdown point as a robust method of estimation on the centered data.

In the third section we described the potential role of family businesses in European economies recovering from the financial crisis that forced them to restructure both their internal mechanisms of decision-making, and the organisation of industries and public finance. We concentrated on the specificities in the management of micro and small businesses. Several general characteristics related to growth and competitiveness were incorporated in our tests. Family businesses play an irreplaceable role in the provision of employment in national economies. They are the decisive net creators of new jobs and the main absorbers of unemployment – an objective that has been rising on importance recently. Family businesses have lower wages (at least lower reported wages) than in the rest of the national economy. Finally businesses have higher gross capital returns per unit of capital than do large businesses, which is a reflection of their more difficult access to financial capital that is burdened with higher transaction costs.

Based on data for 28 European countries in 2002–2008 we ran a series of econometric tests in which we analysed how two groups of businesses with up to 50 employees evolved over time by quantifying their growth in employment and net production. We regressed these two alternative indicators of development to a measure of gross capital returns per a unit of value added (as a proxy for profitability, investment and capital intensity) and to the relative gap between labour costs (wages) in small and large enterprises (as a proxy for cost advantages in order to gain competitiveness). In addition, we tested the role of GDP per capita in the development of family businesses and the significance of several institutional variables that represented government policies relevant for the viability of small entrepreneurship.

In our econometric analyses we used a robust fixed effect estimator. Our tests concluded with a finding that our three economic explanatory variables were highly statistically significant. With rising h (the number of deleted observations) results have been generally improving as the residual sum of squares was decreasing, the coefficients of determination were rising and the explanatory power of the model was gaining in strength. In the majority of cases the significance of explanatory variables after deleting outliers was improving, pointing to a high degree of homogeneity in the behaviour of European firms.

We can conclude from the results of four regressions that job creation in micro and small family businesses depends on a low pretention on capital returns. But narrowing the gap in labour costs in family businesses relative to large corporations is negatively

correlated with employment. In sharp contrast to that both these economic variables are positively connected with the value added in micro and small business. The higher are the gross capital gains per value added and the higher are the relative labour costs in FB, the higher is their growth in net production.

Rising GDP per capita enhances both the employment and the value added in FB, even though the impact on the net output is markedly more intensive. We have also discovered that some less developed post-communist countries (particularly Albania, Romania, Croatia, Latvia and Slovakia) were subject to highly different behaviour of family businesses related to growth than the core of European family businesses which was represented by Germany, United Kingdom, Italy, Denmark and Spain, joined also by Hungary, Poland, Lithuania and Slovenia. In all our sample of countries institutional factors play a marginal role only. Policies for the enhancement of employment in family businesses include low inflation and efficient banking and financial intermediation. On the other hand, corruption is detrimental to the growth in output in the sector of micro firms.

As a final point for discussion, our results imply that after all, hard economic fundamentals (factor costs, labour efficiency and the aggregate demand) are much more important for the development of small family businesses than soft institutional factors. This is in sharp contrast to the performance of large businesses, whose activities are found to be strongly influenced by policies and vertical transfers at the level of public administration, as was observed by Alfaro et al. (2008) or Benacek et al., 2011. Therefore we can presume that the development of small businesses is handicapped vis-a-vis the corporate sector in countries where the government is active in exercising various policies of development and where the conditions for market competition, contestability and low transaction costs are infringed by market power and/or government capture. Therefore, lower exposure of entrepreneurs to industrial policies and to government "favours", and less of government hyper-activity in fiscal transfers, constitute an environment that supports the growth of family businesses. However, once there is a social demand for policies supporting the creation of new jobs, the choice of policies should target the measures decreasing the transaction costs of family businesses for hiring labour and the costs of labour in general.

References

[1] Acs, Z.J. and Audretsch, D.B. Innovation in Large and Small Firms: An Empirical Analysis. *Amer. Economic Review*, 78:678–690, 1988.

[2] Acs, Z.J., Audretsch, D.B. and Evans, D. Why Does the Self-Employment Rate Vary Across Countries and over Time? *London, CEPR, Discussion paper*, 871, 1994.

[3] Alfaro, L., Kelemli-Ozcan, S. and Volosovych, V. Why doesn't capital flow from rich to poor countries? An empirical investigation. *The Review of Economics and Statistics*, 90(2):347–368, 2008.

[4] Baltagi, B.H. *Econometric Analysis of Panel Data*. Wiley, 1998.

[5] Benáček, V. The Rise of Grand Entrepreneurs in the Czech Republic and Their Contest for Capitalism. *Czech Sociological Review*, 42(6):1151–1170, 2006.

[6] Benáček, V. and Víšek, J. Á. The Determinants of FDI Flows into Czech Manufacturing Industries: Theoretical Background for an Empirical Study. *WIFO Seminar, Vienna*, 1999.

[7] Benáček, V. and Víšek, J. Á. Přímé zahraniční investice v české ekonomice: praxe, teorie a aplikace. *Politická Ekonomie*, 1:7–24, 2000.

[8] Benáček, V. and Zemplinerová, A. Problems and Environment of Small Businesses in the Czech Republic. *Journal of Small Business Economics*, 7(6):437–450, 1995.

[9] Benáček, V., Lenihan, H., Andreosso-O'Callaghan, B. and Kan, D. Political risk and foreign direct investment: How do they get along in various European countries? *Working Papers, University of Limerick*, 2011.

[10] Benáček,V. and Michalíková, E. In: J. Večerník (edit.) Individuals and Households in the Czech Republic and in Countries of Central Europe. *Prague, SoÚ Academy of Sciences of the Czech Republic*, 2010.

[11] Blau, D. A Time Series Analysis of Self Employment in the United States. *Journal of Political Economy*, 95:445–467, 1987.

[12] Bramati, M. C. and Croux, C. Robust estimators for the fixed effects panel data model. *Econometrics Journal*, 10:1–19, 2004.

[13] Davis, S. and Henrekson, M. Explanining National Differences in the Size and Industry Distribution of Employment. *Small Business Economics*, 12(1):59–83, 1999.

[14] Eurobarometer. Observatory of european sme. *Brussels, Eurobarometer Flash no. 196*, 2009.

[15] Eurostat. Databases of the gdp and external trade statistics. *Luxembourg.*

[16] Hampel, F. R. *Contributions to the Theory of Robust Estimation. Ph.D.thesis.* Diploma thesis, University of California, Berkeley, 1968.

[17] Hampel, F. R. A General Qualitative Definition of Robustness. *Ann. Math. Stat.*, 42:1887–1986, 1971.

[18] Hampel, F. R. The Influence Curve and its Role in Robust Estimation. *J. Am. Statist. Assoc.*, 69:383–393, 1974.

[19] Huber, P. J. Robust Estimation of a Location Parameter. *Ann. Math. Stat.*, 35:73–101, 1964.

[20] Huber, P. J. *Robust Statistics.* John Wiley, New York, 1981.

[21] Lucas, R. E. On the Size Distribution of Business Firms. *The Bell Journal of Economics*, 9(2):508–523, 1978.

[22] Maronna, R. A. and Yohai, V. J. The Breakdown Point of Simultaneous General M-estimates of Regression and Scale. *Journal of American Statistic Association*, 86(415):699–704, 1981.

[23] Michalíková, E. and Galeotti, E. Determinants of FDI in Czech Manufacturing Industries between 2000-2007. *South Eeast European Journal of Economics and Business*, 5(2):21–32, November 2010.

[24] O'Brien, R. O. A caution regarding rules of thumb for variance inflation factors. *EQuantity and Quality*, 41:673–690, 2007.

[25] Robson, M. and Wren, C. Marginal and Average Tax Rates and the Incentive for Self-Employment. *Southern Ec. Journal*, 65(4):757–773, 1999.

[26] Rousseeuw, P. Multivariate Estimation With High Breakdown Point. *Paper presented at Fourth Pannonian Symposium on Mathematical Statistics and Probablity, Bad Tatzmannsdort, Austria*, September 1983.

[27] Rousseeuw, P. Least Median of Squares Regression. *J. Am. Stat. Assoc.*, 79:871–880, 1984.

[28] Rousseeuw, P. and Leroy, A. *Robust Regression and Outlier Detection*. Wiley, 1987.

[29] Schumpeter, J. A. *Capitalism, Socialism, and Democracy*. New York: Harper and Brothers (Harper Colophon edition, 1976), 1942.

[30] Stiglitz, J. Distinguished Lecture on Economics in Government: The private Uses of Public Interests: Incentives and Institutions. *Journal of Economic Perspectives*, 12(2):3–22, 19968.

[31] Symeonidis, G. Innovation, Firm Size and Market Structure: Schumpetarian Hypotheses and Some New Themes. *Paris, OECD Economics Working Papers*, 161, 1996.

[32] Torrini, R. Cross-country Differences in Self-employment Rates: the Role of Institutions. *Labour Economics*, 12(5):661–683, 2005.

[33] Verardi, V. and Wagner, J. Robust Estimation of Linear Fixed Effects Panel Data Models with an Application to the Exporter Productivity Premium. *Working Paper Series in Economics University of Lüneburg*, (168), April 2010.

[34] Víšek, J. Á. On High Breakdown Point Estimation. *Computational Statistics*, 11:137–146, 1996.

[35] Zaman, A., Rousseeuw, P. J. and Orhan, M. Econometric applications of high-breakdown robust regression techniques. *Economics Letters*, 71:1–8, 2001.

Attachment

Table 5: List of countries included in the analysis

ALL	Advanced Europe-14 + Emerging Europe-14
Advanced Europe-14	Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom
Emerging Europe-14	Albania, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia

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