The examination of the factors of growth in the Hungarian small- and medium size business sector*

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Despite increasing interest, it is still a lack of rigorous model building and econometric method application in the area of small business growth in Hungary. This paper constructs an integrated conceptual model of growth. The model incorporates four major categories of variables such as personal demographic, personal behavioural, business demographic and business behavioural variables. To test the empirical validity of the model, different measures of growth, including employment, sales, equity and composite factors, are used in five empirical models. The stepwise regression method is proved to be a proper tool to identify the significant factors of business growth. However, the different dependent variables of growth are mainly influenced by different independent factors. Most observed outcomes corresponding to previous empirical results and the alterations can be explained by the limited market economy experience and the transitional nature of Hungary. Business behavioural factors of investment, technology development, exports, organizational change and strategic orientation are found to be the major determinants of business growth. Personal behavioural features like ownership experience in other businesses as well as business size, age, legal form, the number of founders and foreign owners are significant but less important determinants of growth.

KEYWORDS: Enterprise statistics.

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Despite considerable statistical and interpretation problems, the performance and the future prospect of a country is most frequently measured and judged by economic growth, unemployment and inflation. Out of these measures, probably the examination of growth has received the widest interest among economic scholars. After *Solow* [1956] and *Lucas* [1988], *Romer's* [1990] so-called endogenous model has became the major theoretical framework in examining economic growth since the late 1990s. Besides that all of these macro models mention the importance of the underlying economy – Lucas builds on that – both the theory and the empirics lack to demonstrate and prove the connection between macro and micro economy, or in other words between macroeconomic and firm level growth.

The examination of firm level growth raises several difficulties. A major problem emerges during the aggregation of firm data, when we loose important information about the personal performance, characteristics and behaviour of the individual businesses that are associated with the growth of a business. For example, just recent researches have presented evidences that only a tiny portion of the young and small businesses, called gazelles, are responsible for most the creation of new employment in an economy (*Birch* [1987], *Autio* [2005], *Parker–Storey–Witteloostuijn* [2005]). Aggregation also hides the dynamics behind growth, i.e. even in the most prosperous sector there are stagnating and disappearing firms, or, on the contrary, in the cases of declining segments, some firms still grow. To understand the reason of this different performance specific, firm level data collection and examination are required.

Since the second half of the 1990s, a new wave of research has emerged aiming to investigate small business growth (*Davidsson* [2003], *Davidsson–Wiklund* [1999], *Delmar–Davidsson–Gartner* [2003], *Davidsson–Achtenhagen–Naldi* [2005], *Reid* [1993], *Storey* [1994], *Wiklund–Stepherd* [2004], *Weinzimmer–Nystrom–Freeman* [1998]). Instead of rigorous modelling, these researchers have focused on empirical testing. The mentioned authors identified and explained several factors of growth. Moreover, they presented evidences about the problems associated with the different measures of growth. A major shortcoming of these researches is the reliance on business registry data that does not make possible to analyze important behavioural characteristics of business growth. These caveats call for specific firm based data collection as well.

Besides numerous publications in the area of business growth, Hungarian researchers have been focused more on studying large, mainly foreign-owned businesses that determined and lead macroeconomic growth in Hungary since the mid 1990s (*Szerb–Ulbert* [2002]). However, it is no doubt that the interest toward small businesses have been increasing.

Regarding the growth of the newly established businesses and their effect on employment are analyzed by the Global Entrepreneurship Monitor (GEM) studies

where mainly the connection among individual demographic characteristics, entrepreneurial traits and growth are in the spotlight (*Ács et al.* [2002], *Szerb et al.* [2004], *Szerb* [2005]). The investigation of the growth potential of the newly established and of privatized businesses is the main issue of *Laki* [1998], [2001].

In a comprehensive empirical study, *Czakó et al*. [1995] analyzed the small business sector in the early years of transition. The authors distinguished six groups of small businesses according to the several features like business versus household orientation, full time or part-time focus, and demographic characteristics. They also noted that most recently founded businesses did not fulfil the classical definition of entrepreneurship.

The limited growth capacity of the small businesses is also recognized by *Jávor–Rozgonyi* [1995] and *Laky* [1998]. By studying the efficiency of the Hungarian business sector, *Halpern* and *Kőrösi* [2001] observe the relative backwardness of the smaller size businesses as well as the improved performance of the corporate sector in the second half of the 1990s. Another notable study is *Major* [2002], which analyzed the performance of the Hungarian small and medium sized enterprises (SME) and recognized the efficiency problems not only in the micro but also in the medium size businesses sector.

The influential factors and the consequences of growth have been less frequently investigated with the exception of the financial (capital) problems. *Kuczi* and *Makó* [2000] pointed out how important the effect of social capital can be on business growth. The employment of micro businesses is the main topic of *Vajda* [1999].

The structure and the structural change of the domestic small business sector have been examined probably by the most researchers.

Notable papers can be found from this field including *Kőhegyi* [1998], *Mészáros–Pitti* [2003], and *Román* [2002], [2005]. Recently, *Kőhegyi* [2001] has provided the most comprehensive study on firm growth by presenting the regional, sectoral, financial features and differences of the growing and shrinking businesses in the 1996–1999 time period. However, Kőhegyi could not analyze the behavioural factors of firm growth. *Szirmai* [2002] has probably the only one that deals with the limited number of the fastest growing Hungarian businesses, the gazelles. By relying on the life-cycle model, *Salamonné* [2006] presented evidences about the development phases of Hungarian businesses. Based on a sample of 50 carefully selected small businesses she suggested a minor modification of the original life-cycle model to fit to the local conditions and the transitional nature of the Hungarian economy.

Despite considerable domestic theoretical and empirical development in the area of small businesses, there is still a lack of rigorous modelling and the application of econometric methods in Hungary.[1] Therefore the aim of this paper is twofold. First, we would like to build a conceptual model of small business growth that is different from the popular life-cycle models, recently used in the Hungarian literature (see

[1] In this area of research only *Halpern–Kőrösi* [2003] and *Major* [2002] applied econometric technique. However both of these studies focus on efficiency rather than growth.

Szirmai [2002], *Salamonné* [2006]). Second, to test the validity of the conceptual model we intent to rely on econometric regression methods. By relying on a unique, but non-representative individual small business data set, we aspire to identify the most important determinants of business growth and evaluate the sometimes contradictory results.

In the following part of the paper we built a conceptual model of business growth that contains four major groups of influential factors of growth. The theory building is followed by the description of the data set and the methodology. The expected outcomes and the regression results are evaluated in the third section. Section four contains the discussion of the overall findings.

1. The conceptual model of firm growth

There is probably one thing in which the different authors and experts agree: examining growth and its influential factors on firm level is a difficult and multidimensional issue. Over years, more or less researchers have found that besides demographic features, certain behavioural factors, like clear growth strategy orientation, product and process innovation, the application of specific financing resources like angel money, entrepreneurial skills as risk taking, opportunity recognition, managerial knowledge and expertise have significant influence on firm growth (*Acs* [1996], *Baumol* [2002], *Dodgson–Rothwell* [1995], *Kirzner* [1979], *Moran–Ghoshal* [1996], *Porter* [1985], *Reid* [1993], *Storey* [1994], *Wennekers–Thurik* [1999]).

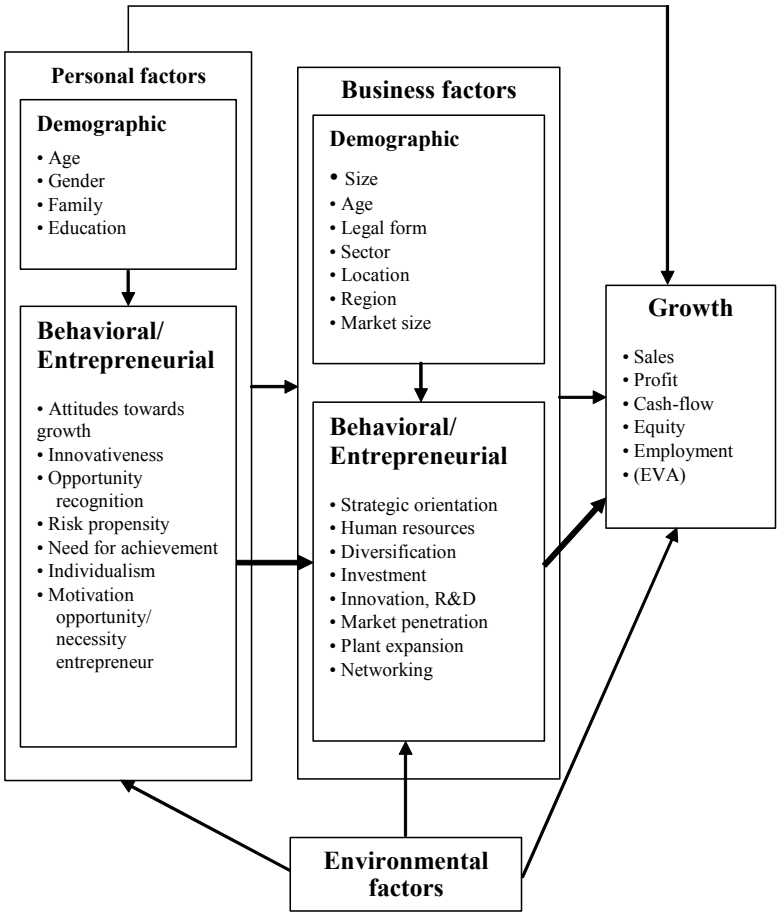
In a comprehensive conceptual framework model, Figure 1 shows the influential factors of business growth.

Figure 1 groups the prominent elements of firm growth in three major categories as personal, business and environmental factors. While the importance of the environment is acknowledged, we are focusing on the personal and business factors.

Both of these categories consist of two other subcategories, one is a demographic that includes basically given features, and the other is behavioural that is associated with learnt characteristics.

Both personal and business demographic characteristics can have an effect on behavioural factors. The existence of different measures of growth is also incorporated in the model. According to the model, personal factors influence business characteristics that determine business growth. At the same time, personal factors can directly influence growth. However, as noted by the bold arrow, the major direction of the impact on growth is assumed to derive from the behavioural features.

Figure 1. The conceptual model of firm growth



We also label the behavioural factors as entrepreneurial, highlighting that there is a direct connection between entrepreneurship and growth. This relationship is particularly salient because it provides both the theoretical and the practical application of the concept of entrepreneurship in cases of already existing business (*Davidsson–Achtenhagen–Naldi* [2005]). The connection between economic growth, new employment and entrepreneurship are important issues of *Wennekers–Thurik* [1999] and *Acs et al.* [2003]. Some authors, including *Sexton* [1997] claim, that "growth is the very essence of entrepreneurship" (*Sexton* [1997] p. 97. also cited by *Davidsson–Achtenhagen–Naldi* [2005] p. 4.).[2] Despite *Davidsson's* [2003] argument

[2] Just examining journal papers and leading textbooks between 1988 and 1992, *Morris et al.* [1994] found 77 definitions. *Wennekers* and *Thurik* [1999] claim that "entrepreneurship is an ill-defined, at best multidimensional, concept" (p. 29.).

that we have the necessary blocks to build a strong paradigm for entrepreneurship research, the full and generally agreed definition of entrepreneurship is still missing (*Gartner* [1990], *Wennekers–Thurik* [1999], *Shane–Venkatamaran* [2000]).

However, it is agreed that entrepreneurship includes two, many times interrelated factors, traits and behaviour. Several researchers separate entrepreneurial and managerial roles, where entrepreneurial style is associated with specific traits like high risk taking propensity (*Knight* [1990]), need for achievement (*McClelland* [1961]), creativity and innovativeness (*Schumpeter* [1934]). The recognition and pursuit or exploitation of opportunity is considered to be the heart of entrepreneurship by *Kirzner* [1979], *Timmons* [1999], *Venkataraman* [1997] and *Shane–Venkataraman* [2000]. These features are shown on Figure 1. Longer or shorter lists of other entrepreneurial traits can be found in many publications including *Herbert–Link* [1989], *Timmons* [1999], *Chell et al*. [1991] or *Hisrisch et al*. [2005]. Personal-demographic traits include gender, age, education, and family background have been widely investigated and connected to business growth. According to recent GEM research results, a typical entrepreneur is middle aged (35-45 year old) male, with higher education degree, and having an entrepreneur in the family or knowing an entrepreneur personally. In terms of these features, Hungarian entrepreneurs do not differ from their colleagues from abroad (*Ács et al* [2002], *Szerb* [2005]).

Entrepreneurial businesses are characterized by distinct behaviour including processes, sets of actions, and functions. Several aspects of strategic orientation, like strategy formulation in general (*Stevenson–Roberts–Grousbeck* [1989], *Sadler-Smith et al*. [2003]), development of human and intellectual capital (*Becker et al.* [1997], *Glancey* [1998], *Ucbasaran–Westhead–Wright* [2005]), diversification (*Berger–Ofek* [1995]), networking (*Holm– Erikson* [1999], *Tsai–Ghoshal* [1998], *Wedin* [2003]) and investment propensity (*Iyigun–Owen* [1997]) are examined and associated with ultimate growth. Following *Schumpeter's* [1934] famous notion about the creation of something new, many researchers have identified innovation as the distinctive attribute of entrepreneurship and therefore a source of growth (*Drucker* [1985], *Dodgson–Rothwell* [1995], *Baumol* [2002], *Teece* [1998]). Out of the firm demographic characteristics, the examination of firm size, age and growth has received the widest interest. According to *Jovanivic* [1982] *Evans* [1987], and *Hall* [1987] smaller and younger firm grow at a faster rate than older and larger businesses, denying Gibrat's law. The examination of the legal form, business sector, location, region, and market size can be found mainly in empirical studies (e.g. *Davidsson et al.* [2000], *Reid* [1993], *Storey* [1994]). All of these factors are present on Figure 1.

While the measurement of macroeconomic growth is relatively well developed it cannot be said about firm level growth. In order to arrive at a balanced view at diverse determinants and measures of growth, multiple indicators are required. Different indicators result in very different outcomes. The correlations between different growth measures are generally weak (*Weinzimmer–Nystrom–Freeman*

[1998]). Useful empirical applications of the growth concept are provided by *Davidsson–Wiklund* [1999], *Davidsson et al.* [2002], *Delma–Davidsson–Gartner* [2003], *Davidsson–Achthagen–Naldi* [2005], *Wiklund–Stepherd* [2004]), who highlight the multidimensional characteristics of growth. Following the Swedish researchers and other well recognized empirically oriented studies (*Reid* [1993], *Storey* [1994], *Weinzimmer–Nystrom–Freeman* [1998]), we intent to apply three measures of growth as changes in sales, employment and own capital. We demonstrate that applying or favouring only a single growth factor may be misleading. It should be noted that neglecting of opportunity costs, liquidity premium and compensation of risk weakens the application of this approach (*Ventakamaran* [1997], *Shane–Venkataraman* [2000]). However, our data set does not make possible to apply some other measures like economic value added (EVA). Moving to the following section, an additional comment should be added. The mentioned model does not contain all the factors; probably any category can be expanded. However, we focus on the entrepreneurship related features; therefore, factors that are associated with the firms' behaviour, such as pricing, marketing, and finance, are only implicitly included in the model.

2. Data description, variables and methodological considerations

Our data set consists of 320 individual small and medium size business that had at least two years of operation (were established before 1st. January 2002). First, it should be emphasized that this research was experimental; therefore it lacked the representativeness of the data set. Originally, the questionnaire aimed to collect small firm growth data, but some individual characteristics were also recorded. Respondents were the main owners of the businesses and also had a position in the leadership: in most cases they were the executive managers. Data were collected between March 2004 and March 2005, and the harmonization of the data set and the collection of the missing data took place in November 2004 and May 2005. The basic characteristics of the sample and the applied (significant) variables can be found in Tables 1 and 2.

Out of several possible growth measures, we use employment, sales, and own equity data.[3] Both sales and equity data are in real terms. We do acknowledge the availability of a large number of growth measures as described in many studies (*Davidsson* [2005], *Davidsson–Wiklund* [1999], *Delmar–Davidsson–Gartner* [2003], *Weinzimmer–Nystrom–Freeman* [1998], *Wiklund–Stepherd* [2005]).[4]

[3] Own equity includes the subscribed capital, the annual profit and the reserved profit from previous years.

[4] Probably many experts, readers miss the growth of profit from the growth measures, however we had a lot of missing data that would have decreased the sample size. Moreover, it is well-known that most data are not really correct in the case of small businesses, but we think that the unreliability of profit data is the most prevailed.

Table 1

Sample description

Characteristics	Size category based on number of employees in 2002						
	0–1	2–5	6–9	10–19	20–49	50–249	Sum/average
Number of firms	66	102	35	49	44	24	320
Age of firm in 2004 (year)	7	8.2	9.7	10	11.2	11.8	9.1
Male ownership (percent)	56	57	69	80	82	67	66
Age of entrepreneur in 2004 (year)	43	45	46	49	49	51	46
Opportunity orientation (percent)	35	27	46	29	30	8,3	30
Independent existence orientation (percent)	42	53	57	65	39	25	49
Necessity orientation (percent)	40	52	54	55	52	71	52
Other business start-up (percent)	29	41	42	55	41	21	39
Number of founders	2	2.4	2.8	3.4	4.6	6.7	3.1
Family business (percent)	64	61	40	47	36	25	51
Foreign owners (percent)	4.5	5	5.7	6.1	4.5	8.3	5.3
Number of employees in 2002	0,8	3	7.2	13.8	31	102	16.1
Net sales in 2002 (million HUF)	5	42	91	246	383	882	183
Own capital in 2002 (million HUF)	1.7	7	24	34	104	376	56.5
Plant expansion 1998–2004 (percent)	9	13	11	24	20	17	15
Change of ownership 1998–2004 (percent)	23	14	9	39	25	17	21
Organizational change 1998–2004 (percent)	3	5	17	24	23	25	13
New product introduction 1998-2004 (percent)	14	8	11	33	23	33	17
New technology introduction 1998-2004 (percent)	14	16	20	31	27	46	22
New investment 1998-2004 (percent)	47	61	54	71	89	67	63
Has a business plan (percent)	56	60	74	61	55	58	60

Table 2

The list of applied significant variables

Variable	Use	Type	Description
Growth measures			
EMPCREG	D	Continuous	Change of employment between 1998–2004 or from start-up to 2004, the slope of regression
SALESCHREG	D	Continuous	Change of real sales between 1998–2004 or from start-up to 2004, the slope of regression
CAPITCHREG	D	Continuous	Change of real own equity between 1998–2004 or from start-up to 2004, the slope of regression
CLUSTERREG3	D	Continuous	Cluster of employment, of real sales and of real own equity changes calculated from regression slopes
CLUSTERREG2	D	Continuous	Cluster of employment, and of real sales changes calculated from regression slopes
Personal demographic			
AGEENTR	I	Categorical	The age of entrepreneur, 1: 18–35 year age, 2: 36–45 year age, 3: 46–55 year age, 4: 56 and up age
AGEENTRSQ	I	Categorical	The square of the AGEENTR
Personal behavioral			
STARTEXP	I	Categorical	The entrepreneur has participated in other start-up: 0: no start-up experience, 1: start-up experience 2: start-up+ ownership experience
Business demographic			
SIZE	I	Categorical	The size of business based on the number of employees in 2002. 1: 0–1 employees, 2: 2–5 employees, 3: 6–9 employees, 4: 10–19 employees, 5: 20–49 employees, 6: 50–249 employees
AGEBUS	I	Categorical	Age of business. 1: 1–3 year, 2: 4–6 year, 3: 7–9 year, 4: 10–12 year, 5: 12–14 year, 6: 15 and up year
LEGFORM	I	Categorical	The legal form of the business. 1: sole proprietorship, 2: unlimited liability, 3: limited liability
FOUNDER	I	Categorical	Number of founders in categories: 1: 1 founder 2: 2 founders, 3: 3–5 founders, 4: 6 or more founders
FORIGNOWN	I	Dummy	Foreign ownership: 0: no foreign ownership, 1: foreign ownership
Business behaviour			
INVEST	I.	Dummy	Investment in the business between 1998–2002, 0: no investment 1: investment
EXPORT	I	Dummy	Export of sales in 2004: 0: no export, 1: export
INNOVTECH	I	Dummy	New technology introduction between 1998–2004, 0: no technology innovation 1: technology innovation
STRATORIENT	I	Dummy	Strategic orientation of the business, 0: no business plan, written strategy: 1: written business plan, strategy 2: written business plan and strategy

Note. I: Independent variable, D: dependent variable.

Following *Weinzimmer–Nystrom–Freeman* [1998], we use the regression based measure of growth where the slope of the regression curve over the examined time period serves to identify the rate of growth.[5] A second measure of growth was calculated by the factor analysis technique where employment, real sales and real equity growth rates constituted one factor, and employment and real sales growth rates (as the two most important growth measures) constituted another factor.[6] The examined time period ranges from 1998 to 2004, or if the firm was established after 1998, then from the first year of start-up to 2004.

As it happens frequently in experimental data collection, not all the necessary factors described on Figure 1 are available. Of the individual factors, most entrepreneurial traits are missing except the opportunity/necessity variable. Moreover, all the business characteristics data are available except the human resource and networking variables. However, there is an important limitation of the model testing: the small sample size does not make possible to apply simultaneous equation system in order to identify the major influential factors of growth originated from personal features then affecting business characteristics as it is implied by Figure 1. Therefore, we are testing the effect of personal and of business factors within the framework of one model. Since the instrumental variable method of two stage least squares (2SLS) is also proved to produce inconclusive results, we selected the stepwise regression technique.

A stepwise regression procedure is able to find the best predictors of the dependent variables. The forward method starts with the most significant variable and adds the most statistically significant term (the lowest p-value) at each step, until there are no more significant variables left. The backward method begins with including all of the variables, then the independent variable with the smallest partial correlation with the dependent variable is removed first if it meets with the selection criteria. Here, the ten percent F value is chosen as a selection criterion. In the following, the same method is applied, and the removal of the variables continues until all the independent variables are significant with the dependent variable. Since it is not guaranteed that the stepwise regression provides the best results, both the forward and the backward methods are tried and the best results are reported.[7] The results are provided by the SPSS Version 11 statistical program package. Data points with missing values were omitted from the analysis.

By the application of the stepwise regression procedure, we could select only the significant determinants of growth, therefore the relative importance of personal demographic, personal behavioural, business demographic and business entrepreneurial should be tested. We assume that, in general, business factors would be more important determinants of growth than personal features. Moreover, we believe that business entrepreneurial characteristics would be even more significant

[5] We also used other relative and absolute growth rates; however, the results were about the same.
[6] Note, that the application of absolute instead of relative measures gives partially different results.
[7] For details regarding the stpewise regression method see *Mundruczó* [1981] or *Rappai* [2001].

than business demographic attributes. As a supplement, the correlation coefficients will serve to support the idea about the connections between the personal and the business characteristics. In the way of result evaluation we should also consider those Hungarian specialties that basically derive from the limited market economy experience of domestic entrepreneurs and businesses. Though, it is mostly agreed that Hungary, along with other similar countries like the Czech Republic, Poland and Slovenia, have successfully laid down the foundations of the market system, entrepreneurs and businessmen make their decision according to market rules and price signals (*Transtion economies* [2002], *The first ten years* [2002], *Szerb–Ulbert* [2002]). Therefore we do not expect too much different influential factors of the growth of Hungarian businesses as compared to other matured market economy enterprises.

3. Model testing: expectations and results

In the following, the five stepwise regression results are reported in Table 3. Note that we included only those variables that proved to be significant at most at ten percent.

According to the *F* test, all regressions are significant. However, the explanatory powers are not too high: the adjusted R^2 are below 0.15. There was no need to test for potential multicollinearity, since the stepwise regression method excluded this possibility. Moreover, the Glejser test did not imply heteroscedasticity problems. As it has been expected, the five different growth variables are affected by different independent variables underlying the notion about the application of various growth measures. Relatively, the growth measures that contain sales provide the worst results. During the evaluation, if one independent variable has not been proven to be significant at least two times, then we consider the effect of variable as not important (not robust).

Table 4, containing the correlation coefficients among the applied variables serves as an addition instrument to our analysis.

During our evaluation we would like to compare our outcomes whith the expectations based on the literature as well as on other empirical results.

Table 3

Stepwise regression analysis results of the influential factors of growth indicators

	Employment growth		Sales growth		Own capital growth		Cluster three factors		Cluster two factors	
	Coefficient	Significant	Coefficient	Significant	Coefficient	Significant	Coefficient	Significant	Coefficient	Significant
Constant	–0.934		0.514		–11.74		0.367	**	0.121	
Personal demographic										
Age of entrepreneur	1.759	*			7.313	***				
Age of entrepreneur sq.	–0.387	**			–1.994	*				
Personal behavioural										
Other business experience			12.771	**	–3.079	*			0.158	**
Business demographic										
Size			6.664	**			0.100	**	0.091	**
Business age	–0.341	***	–6.097	**	1.672	*	–0.115	***	–0.126	***
Legal form	0.765	***								
Number of founders.	–0.976	***					–0.214	***	–0.193	***
Foreign ownership	–1.873	**			15.717	***	–0.499	**		
Business behaviour										
Organization change					11.367	***				
Investment	0.312	***			2.780	***	0.072	**	0.074	**
Export			44.096	***			0.318	*	0.366	**
Technology innovation	1.096	**					0.240	*	0.305	**
Strategic orientation	0.400	*							0.136	**
Number of cases	313		313		286		286		313	
Adjusted R^2/*Wilks' Lambda*	0.137		0.106		0.144		0.109		0.133	
F-test	6.519	***	8.791	***	8.056	***	5.983	***	6.990	***

Note.* report a significance level of 10 percent, ** of 5 percent, and *** of 1 percent.

Table 4

Pearson correlation coefficients between growth, personal and business characteristics

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	EMPCREG	1.00																												
2	SALESCHREG	**0.50**	1.00																											
3	CAPITCHREG	0.04	0.02	1.00																										
4	CLUSTERREG3	**0.88**	**0.88**	*0.10*	1.00																									
5	CLUSTERREG2	**0.87**	**0.87**	0.04	1.00	1.00																								
6	AGEENTR	*-0.09*	0.02	-0.05	-0.06	-0.04	1.00																							
7	AGEENTRSQ	***-0.11***	0.02	-0.07	-0.07	-0.05	**0.98**	1.00																						
8	GENDER	0.06	0.04	-0.07	0.07	0.06	0.07	0.08	1.00																					
9	FAMILY	0.07	-0.02	-0.07	0.05	0.03	**-0.14**	**-0.14**	**-0.11**	1.00																				
10	OPPORTUNITY	0.01	0.06	0.02	0.05	0.04	-0.02	-0.03	0.02	***-0.12***	1.00																			
11	NECESSITY	0.01	0.02	0.02	-0.01	0.02	0.01	0.01	-0.08	0.06	-0.30	1.00																		
12	INDEPENDENT	0.02	0.00	-0.04	0.01	0.01	-0.06	-0.05	0.03	*0.11*	0.02	**-0.16**	1.00																	
13	STARTEXP	0.08	**0.14**	-0.06	0.08	***0.13***	-0.03	-0.03	0.05	0.01	0.08	***-0.11***	0.06	1.00																
14	SIZE	*0.10*	**0.19**	**0.22**	**0.16**	**0.17**	**0.24**	**0.22**	**0.18**	**-0.24**	**0.12**	-0.09	-0.05	0.07	1.00															
15	AGEBUS	***-0.11***	-0.05	**0.16**	-0.08	*-0.09*	**0.31**	**0.30**	0.03	-0.08	0.05	-0.01	0.00	0.00	**0.40**	1.00														
16	LEGFORM	*0.09*	***0.13***	0.02	*0.11*	***0.13***	**0.25**	**0.24**	**0.24**	**-0.29**	***0.13***	**-0.14**	0.04	**0.15**	**0.43**	**0.17**	1.00													
17	FOUNDER	**-0.14**	0.00	0.04	*-0.11*	-0.08	**0.25**	**0.25**	**0.13**	**-0.50**	**0.14**	-0.05	-0.09	0.00	**0.37**	**0.18**	**0.52**	1.00												
18	FORIGNOWN	***-0.11***	0.07	**0.14**	*-0.10*	-0.02	0.04	0.04	0.02	**-0.24**	***0.12***	-0.06	**-0.15**	0.08	0.03	-0.04	0.08	0.03	1.00											
19	DIVERSIF	*-0.10*	-0.04	-0.01	***-0.13***	-0.08	***0.13***	***0.11***	-0.03	0.00	0.00	-0.06	-0.02	0.06	0.06	***0.14***	**0.16**	*0.10*	*0.10*	1.00										
20	INVEST	**0.17**	**0.16**	**0.30**	**0.18**	**0.19**	0.08	0.07	**0.16**	**-0.24**	***0.11***	-0.07	0.02	0.05	**0.52**	**0.26**	**0.33**	**0.25**	0.05	0.02	1.00									
21	INNOVPROD	**0.14**	0.03	0.05	***0.12***	*0.10*	0.02	0.02	**0.21**	0.06	-0.05	0.00	*0.09*	0.01	**0.20**	**0.22**	0.06	0.00	-0.04	-0.07	**0.21**	1.00								
22	INNOVTECH	**0.18**	***0.13***	0.01	**0.16**	**0.18**	0.03	0.03	*0.09*	-0.01	0.00	0.03	0.00	0.04	**0.21**	0.08	**0.15**	0.05	-0.02	*-0.10*	**0.20**	**0.29**	1.00							
23	LEGFORMCH	0.00	-0.01	-0.05	-0.01	-0.01	-0.03	-0.03	0.05	0.07	0.06	-0.03	-0.04	0.04	**0.00**	*0.10*	0.14	***0.04***	-0.06	-0.02	0.05	0.07	0.08	1.00						
24	OWNERCH	-0.03	0.08	0.08	-0.01	0.03	0.02	0.02	*0.11*	**-0.19**	-0.03	-0.08	0.03	***0.13***	*0.07*	*0.09*	0.19	0.19	*0.09*	***0.04***	*0.09*	*0.07*	**-0.01**	*0.09*	1.00					
25	ORGCH	***0.13***	**0.15**	**0.21**	***0.12***	**0.16**	-0.02	0.00	**0.14**	-0.04	0.01	-0.07	0.08	**0.15**	**0.26**	***0.11***	***0.13***	*0.10*	0.08	-0.01	**0.22**	**0.19**	**0.23**	-0.01	**0.20**	1.00				
26	PLANTEXP	**0.22**	***0.12***	*0.10*	**0.23**	**0.20**	-0.01	-0.02	0.03	0.07	***0.13***	0.01	0.06	0.00	0.09	-0.01	0.06	0.02	-0.05	0.01	0.07	0.07	*0.09*	-0.08	-0.03	*0.10*	1.00			
27	GEOGREXP	0.08	***0.12***	0.04	0.08	*0.11*	0.01	-0.01	0.08	-0.06	0.02	-0.01	0.01	0.09	**0.17**	-0.03	***0.13***	*0.09*	0.08	-0.02	**0.20**	0.08	***0.11***	-0.03	0.09	**0.17**	***0.11***	1.00		
28	EXPORT	*0.09*	**0.27**	0.08	**0.18**	**0.21**	0.07	0.07	**0.14**	-0.08	0.02	-0.04	0.03	0.01	**0.33**	0.07	**0.18**	*0.09*	*0.10*	***-0.12***	**0.25**	**0.15**	**0.14**	-0.06	0.09	**0.21**	0.06	**0.27**	1.00	
29	STRATORIENT	0.07	0.07	0.04	0.08	0.08	-0.03	0.00	0.03	-0.05	-0.02	0.02	0.03	-0.07	0.03	0.04	*0.09*	0.09	-0.06	-0.04	-0.02	0.08	0.00	-0.01	0.00	0.04	0.04	-0.06	0.05	1.00

Note. Bold numbers mean a significance level of 1 percent, bold and italic of 5 percent, and italic of 10 percent.

3.1. The effect of personal demographic factors

Out of the *personal demographic* variables, the effects of age and gender on business growth have been the most widely examined. One the one hand, a younger age of the entrepreneur may imply higher risk aversion and a stronger attitude towards growth as compared to older entrepreneurs. On the other hand, as the entrepreneur gets older, he/she is learning more and more about business growth and has more and more managerial experience, implying a positive impact of age on growth. Following *Storey* [1994] we consider not only the linear but also the quadratic effect of age.

Our finding show mixed results. The parameters of the age and the square of the age of the entrepreneur seem to support the quadratic effect of age on growth in the cases of employment and own capital growth. Therefore the business of a middle age person who possesses enough resources and experiences on the one hand and has a young spirit to drive achievement on the other hand, grows more than younger or older person's firm. This age effect is not significant in terms of sales growth. Based on Table 4, young entrepreneurs' business grows faster, so the sign of the parameter is such as expected, but the overall effect is insignificant. In the cases of the composite growth measures neither the age nor the square of age is significant.

Gender is also a frequently examined factor of growth. In general, female entrepreneurs are believed to be more "growth averse" than males. However, as found in several empirical studies after controlling for demographic characteristics and for industry, the differences between male and female businesses disappear (*Carter–Williams–Reynolds* [1997], *Chell–Baines* [1998], *Davidsson–Achtenhagen–Naldi* [2005], *Johnsen–McMahon* [2005], *Du Rietz–Henrekson* [2000], *Storey* [1994]). Since we found gender to be insignificant, our result support the idea that gender is not an important demographic determinant of growth.

Some studies have found that family owned businesses are more averse in hiring new employees and this averseness limits the growth of these types of businesses (*Ward* [1997], *Cromie et al*. [1999]). However, recent studies find no differences between family and non-family owned business growth orientation (*Bogaert et al* [1999], *Malinen–Stenholm* [2004]). Since we found that the growth in family and non-family businesses do not differ from each other; therefore, we reject the notion about the importance of family ownership. The correlation coefficients also show mixed sign and a very weak correlation between family orientation and growth.

3.2. The effect of personal behavioural factors

The opportunity/necessity motives of business establishment on growth and survival are amongst the most frequently analyzed connections. In general, opportunity oriented business owners are better prepared, more skilled, and have a stronger desire to grow than necessity driven entrepreneurs who start the business mostly because of unemployment or the fear of it (*Autio* [2005], *Reynolds et al.* [2001], *Reynolds–*

Bygrave–Autio [2004], *Storey* [1994]). However, this may not be true in Hungary where entrepreneurs, independent of start-up motivation, had no previous market experience, proper business skills or education. This is particularly true for businesses started in the early 1990s. According to our findings, neither opportunity nor necessity motives seem to be significant factors of growth. The correlation coefficients present generally surprising results: both opportunity and necessity business establishment motives have a weak but positive influence on growth. This can be seen as a Hungarian special feature resulting from the transition to market economy.

Experience in managing other businesses or prior ownership can decrease the probability of failure (*Storey* [1994]). We also expect that multiple business owners possess more of the managerial skills required for successful business growth. This expectation is supported by our outcome in the sales and the two factor cluster cases. A surprise is that experience negatively influence the growth of own capital, however, the level of significance is marginal only at 10 percent. For this phenomenon we could not find a reasonable explanation.

3.3. The effect of business demographic factors

Denying Gibrat's law, most empirical studies found that business size is not a stochastic determinant of growth: smaller businesses grow at a faster rate (*Davidsson et al.* [2000], *Dunne–Roberts–Samuelson* [1988], *Evans* [1987], *Hall* [1987], *Storey* [1994]). A popular interpretation of this finding is that smaller firms grow more quickly in order to achieve the minimum efficient size (*Jovanovic* [1982]). A few empirical studies have found that larger businesses grow faster (*Glancey* [1998], *Storey* [1994]). However, these authors did not provide a clear justification for this phenomenon. Since Hungarian business growth in the smaller size sector is considered to be constrained it may happen that size has a positive influence on it (*Laky* [1998], *Kőhegyi* [2001], *Szerb–Ulbert* [2002]). Based on our finding, i.e. the size of the business positively influence growth, this later argument seems to be supported.

The examination of the effect of age on business growth is similarly interpreted as in the case of the age of the entrepreneur: younger businesses are expected to grow faster than old firms. Our findings support this statement except in the case of own capital. The implication of this outcome is that younger Hungarian businesses face serious capital limitations therefore in the early years of growth they select a non-capital intensive growth path. Note, that out of the business demographic characteristics, age seems to be the most important explanatory variable.

The legal form, especially the difference between limited and unlimited liability forms, can make a difference in terms of growth. More rapid growth rates are experienced in the case of limited liability businesses as compared to partnerships or sole proprietorship legal forms (*Davidsson et al.* [2000], *Storey* [1994]). The correlation coefficients of our data set imply a positive but weak relationship between growth and the legal form of business. According to the stepwise regression

result, establishing a limited liability form of business is associated with more rapid employment growth rates, but the overall effect is negligible.

The number and the composition of business owners can also be an important determinant of growth. Since the business requires different managerial skills it is expected that firms with more numerous owners can grow faster (*Storey* [1994]). By surprise, our result is the opposite what most other studies found, but fits well to our common knowledge about Hungarian ownership problems. So, there is a potential counterbalancing effect: if the number of owners is increasing then the potential disagreement about business strategy and growth can be higher, implying a negative growth rate effect. The effect is the strongest in the case of employment growth, but highly significant also in the cases of composite growth measures. The composition of the owners can also be an important influential growth factor. In this regard, the presence of foreign owners who posses more relevant market experience and managerial skills than Hungarian ones is particularly vital. It is expected that foreign owners bring fresh blood to the business and therefore these businesses grow at a faster rate. Surprisingly, we found that the presence of foreign owners has a negative significant effect on employment growth and positive significant effect on the growth of own capital. The overall effect of foreign ownership in the case of composite growth rate is negative.

3.4. The effect of business behavioural factors

Among *business behavioural* factors, the degree of diversification has not been empirically researched. More diversified businesses are less exposed to industry specific changes and, according to the portfolio theory, can expect a smoother growth rate with less frequent sudden changes. However, increased diversification can lead to the lost of strategy focus. Since small businesses posses less resources than larger firms, the inefficient use of the limited resources can negatively influence growth rates. As it shown in Table 3, diversification alone seems to negatively influence growth rates, but according to the stepwise regression results, the strength of this effect seems be insignificant. The impact of investment on business growth is probably the most straightforward effect. It is expected that investment positively affects business growth, and this statement is supported by our regression results. The coefficient of investment is insignificant only in the case of sales growth. In general, investment propensity seems to be the most important behavioural influential factor of growth.

In general, any kind of innovation is expected to positively influence business growth (*Brouwer–Kleinkleht–Reijen* [1993], *Roper* [1997], *Storey* [1994]). However, innovation activity in the Hungarian small business sector is generally weak. Most small firms introduce only marginally new products or technology (*Török–Papanek* [2005], *Inzelt* [2003], *Inzelt–Szerb* [2006], *Pakucs–Papanek* [2003]). The new products are marginal improvements in existing products and are mainly introduced

at the declining stage of the life-cycle of existing products. They are barely enough to maintain competitive position (*Inzelt–Szerb* [2006]) and not sufficient to induce substantial growth. Therefore, the effect of innovation effort on Hungarian business growth is insignificant. Our findings present mixed evidences: based on Table 4, both product and process (technology) innovations positively and significantly influence any kinds of growth measures. However, the stepwise regression outcome implies that product innovation is less important, insignificant factor of growth while technology innovation is vital for employment growth as well as when growth is measured as a composite factor.

A change of ownership, legal form or organization structure in the business can bring new owners, new expertise, and new impulsion. Moreover, all of these changes can be considered as innovation in the sense of *Schumpeter* [1934]. Therefore it is expected to have a positive influence on growth. However, our results imply a modest, non-significant influence of these factors expect organizational change that has a positive influence on capital change. (See Table 3.) The expansion of a business can be interpreted in different ways. An increase of the number of plants or the acquisition of customers in different places is expected to influence business growth positively. Additionally, it is also anticipated that internationalized businesses exporting their product to foreign counties grow at a faster rate than businesses selling only in domestic markets (*Davidsson et al.* [2000], *Storey* [1994]). Stepwise regression results underline the initial expectation in terms of the export but not in the case of plant expansion. However, Table 4 shows strong, significant correlation among plant expansion and different growth measures. It seems that this significance disappeared due to cross-correlation among different independent variables. Exports are found to be the single most important factor of sales growth. A strong influence of exports are also noticed in the composite growth measure cases.

Planned business strategy can be vital for successful growth. If the business has a business plan or other written document on strategy, then it is expected to deal with growth problems more successfully than those businesses with no such plan. Moreover, written plans can be interpreted as a sign of growth orientation of the business owner/manager. According to our results, strategy formulation is only significant in the cases of two factor composite growth measures and employment change. However the level of significance, as well as the strength of influence, seem to be modest. Moreover, strategic orientation seems to have a limited influence on growth, according to Table 4. Overall, the results are ambiguous: out of 11, four behavioural features have proved to be significant in business growth, in at least two cases.

4. Interpretation of findings

While data limitations does not make possible to test our model fully, together with OLS regressions and Person's correlation methods, an overall picture of the growth factors emerges. It is clear, that different measures of growth are

influenced by different variables and different magnitudes, so it does matter what kind(s) of growth measures are applied. Our experience suggests on the use of not only one but more growth measures. An example for supporting this statement can be the comparison of capital change and of sales change: ownership experience in other business has a positive effect on sales growth but a negative one to own capital changes. A possible explanation is that business owners with multiple ownerships can spear their money amongst many firms. A more realistic explanation can be made in terms of foreign ownership. By surprise, foreign ownership has a negative effect on employment change but a positive one to own capital growth. Even before completing this study, we knew that foreign owned businesses were better capitalized, though recently we have evidences that foreign businesses are rather fire than hire new employees, therefore they prefer a capital intensive growth. Without multiple growth measures these phenomena would have been hidden.

In general, personal demographic characteristics seem to have the least influential direct effect on growth with one notable exception: the age of the owner. In this respect, a quadratic age effect on business growth is supported. It implies that a business with a median (average) aged entrepreneur (around 40) who has some business management experience, and a need for achievement has the highest rate of business growth. In older age, stability over growth is probably more appreciated. Neither being a female nor family ownership implies lower growth rates. However, there are high correlations between personal and business demographics factors. It means, that larger and older businesses are owned by older, most of the times male entrepreneurs. While family owned businesses do not grow slower than other type of firms, these ventures are generally smaller, have smaller number of owners and select the simpler unlimited liability sole proprietorship or general partnership legal forms.

Business demographic factors are found to be important determinants of growth. Out of this, size is definitely the most significant feature of a business growth. Larger businesses are older, operate in limited liability forms, and have multiple owners. Moreover, larger firms invest and export more, renew their products and technology (innovate) more frequently, attract more customers from different geographic location and change their inside organizational structure more often than smaller businesses do. Since most developing countries empirical studies found negative relationship between firm size and growth, this outcome may reinforce that there is a growth problem in the Hungarian micro and small size business sector. Most empirical studies have found that smaller and younger businesses grow at a higher rate. In our analysis, the age effect is found to correspond to these previous results. There is only one exception: the growth of the capital is higher at larger businesses, reinforcing the limited capital raising capability of the young and risky businesses. In addition, younger firms invest and export less and renew their technology rarely. All of these findings correspond well to other empirical outcomes of the problems of young businesses.

The legal form of the business makes a difference in growth: limited liability firms grow faster than unlimited liability or sole proprietorship firms. The number of founders is another element where our outcome differs from other empirical results. It is believed that a larger number of owners have a positive influence on growth since the experience as well as the responsibility can be shared. However, if the number of owners is too high, then owners' conflicts and potential disagreements can demolish business growth. These businesses are established because of opportunity reasons with relatively large size, diversified product portfolio, and they invest more as compared to other businesses owned by less numerous members. At first, the negative effect of the number of founders on employment growth seems surprising. In the case of Hungary the large number of founders, who probably not just own but work at the business, could limit further employment. Potential disagreement amongst owners may cause frequent organizational changes and over time the number of owners decreases. A further possible reason of the limited growth is the lack of strategy focus.

Of the personal behavioural factors, opportunity or necessity start-up motives do not have an influence on business growth. This is different from other empirical studies, but it is consistent with the short history of the Hungarian market economy. In the transitional period, there is not much difference between opportunity and necessity entrepreneurs in terms of managerial experiences and attitudes so similar growth rates are not surprising. However, it is also prevailed that opportunity oriented businesses are larger, generally established in limited liability forms, have more founders, invest more and open new production plants more frequently than necessity oriented businesses.

Only one individual behavioural factor has proved to influence growth significantly. Previous or present business ownership and managerial experience in other business is an important individual factor in the cases of sales and capital growth. However, the negative sign of the parameter is unpredictable in the case of capital growth.

Overall, regardless of how growth is measured business behavioural variables are the most important factors of business growth. Investment, the introduction of new technology, exports, organizational changes and strategic orientation are found to be the major characteristics that influence growth. Out of these factors, investment, organizational changes and strategic orientation effects do not require further explanation, their impact is obvious. It is a surprise that product innovation is an insignificant factor of growth. This phenomenon can be explained by the late introduction of new products when the previous products are already in the declining stage of their life cycle or possibly it is the result of limited product improvements that are not valued by customers. Technology changes (innovation) influence growth rates positively, and this effect is significant in the cases of employment growth and of the two composite factors. The geographic expansion of sales is found to have an insignificant effect on growth rates unlike exports which is a major factor of sales growth.

5. Conclusion

Based mainly on entrepreneurship and small business growth literature, we constructed a conceptual model of growth applicable to small businesses in the first part of this paper. The influential factors of growth are grouped into four categories: *1*. personal demographic, *2*. personal behavioural, *3*. business demographic and *4*. business behavioural factors. After reviewing the potential application of the growth model in the Hungarian SME sector, we formulated our expectations about the factors of growth. We tested the model by relying on stepwise regression analysis and Pearson's correlation methods. For measuring growth, different factors are identified: the change in the number of employees, the change in real growth of sales, and the change in real growth of equity. In addition, two composite factors of growth are also incorporated in the model. Growth rates in each of the five cases were calculated as the slope of the regression over the examined time period. Out of the four major factors, business behavioural features are the most important while business demographic variables rank second. Personal characteristics show a limited influence on growth rates with the exception of the age of the business owner and the experience in other business start-ups. However, personal characteristics show high correlation with certain business demographic and behavioural variables, which calls for further research.

Examining growth on a micro level is a multidimensional problem focusing on either the measurement or the determinants of growth. An important aim of this study was to show an overall picture how to examine business growth according to a conceptual model and testing its validation by econometric method. This paper has probably raised some new questions while failed to answer all the old ones in a satisfying way. However, we are convinced that the analytical and conceptual methods developed to investigate advanced economy businesses have proved to be also applicable in the case of Hungary. Our results are sometimes contradictory which calls for further research. Since behavioural characteristics play the major role in explaining business growth, usual business registry data are insufficient and a careful and representative survey is necessary for further examination.

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