

## The Competitiveness of the Hungarian SMEs after the EU Accession

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*Abstract: Despite the popularity of competition there are a very limited number of studies dealing with the firm level competition in Hungary especially in the small business sector. In order to accomplish the examination of the competitiveness of Hungarian SMEs, I created a conceptual model that fit to the small business setup as well as to the available data set. The model contains 19 individual variables and six pillars. A stratified representative sample of 695 is used to calculate the competitiveness point of the individual firm. The calculation is unique in the sense that it incorporates the weak points, called bottlenecks in terms of the six pillars. The competition points collerate significantly with the selected three measures of competitiveness, increase of sales, employment and export. The cluster analysis shows high differences amongst the five groups of businesses.*

*Key words: competitiveness, SME*

*JEL codes: M30*

### 1 Introduction

The basic aim of this article is to analyze the factors competitiveness of the Hungarian SMEs. Building on the previous literature I present a conceptual model of competitiveness that is adjusted to fit to the small business framework (Chapter 3). Chapter 4 includes the description of the data set and describes the empirical methodology followed by the analysis of the results (Chapter 5). Correlation coefficients are applied to show the connection between the competition points and the different measures of competition. Finally the paper concludes.

## 2 Literature Survey

While competitiveness is one of today's "buzzword" widely used amongst politicians, media or professionals, the concept of competitiveness is relatively new. Starting from Michael Porter's novel approach in the 1980s, there has been many followers (Chaudhuri and Ray 1997, Chikán and Czakó 2009, Török 1999). Moving away from the traditional Ricardo idea of comparative advantages, Porter's diamond model aims to explain the competitive advantages of the nations (Porter 1990). The competitive position of a nation depends on the factor endowments, demand conditions, the support of related industries, and the firms' strategy, structure and rivalry, argues Porter. These four factors together affect other four components that determine the competitive position of the nation. The four components are the availability of skills and resources, the information that firms use how to apply these skills and resources, the goal of the businesses and the pressure of the firms to renew, innovate or invest. In addition, the government can also play a role by effective industry and antitrust policies, stimulating demand and specialized factor creation.

A development of the original Porter diamond model is the competitiveness index reported yearly by the World Economic Forum (WEF). Porter and Schwab define (2008) competitiveness as the mix of institutions, policies and factors that influence the level of productivity of a country. The index identifies twelve pillars, and the significance of these factors (pillars) varies over the different phases of development. Basic institutions, infrastructure, macroeconomic stability, health and primary education are important for low developed factor driven economies, higher education and training, goods and labor markets efficiency, sophisticated financial markets, technological readiness, market size are vital for efficiency driven economies, while business sophistication and innovation are the key elements of innovation driven countries.

Although the national competitiveness refers to the ability to compete globally, others focus more on the determinants of local competitiveness (Lengyel 2000, Rugman and Verbeke 2001). The importance of clusters in local competitiveness is also acknowledged by Porter (Porter 1998). An elegant amendment of the Porter model in regional development is provided by the pyramid model of Lengyel (2006). Despite numerous improvements there are serious doubts about the proper interpretation of competitiveness in regional levels. Nobel laureate Paul Krugman claims that competitiveness is empirically unfounded, the concept of international competition is wrong and consequently national economic policy focusing on competitiveness can be harmful (Krugman 2001). In the light of Krugman, Budd and Hirmis (2004) argue that regional competitiveness is based on the combined competitive advantage of firms and the comparative advantage of a regional economy. Examining the determinants of innovative behavior Sternberg and Arndt (2001) finds that internal firm specific characteristics dominate over region-specific or other external forces, reinforcing the importance of individual firm level behavior in general.

Another advancement of Porter's theory is the five forces model of industrial competitiveness. The degree of rivalry, the treats of substitutes, the power of buyers and suppliers, and the treats of entry shape the industry (Porter 1998). The firm can position itself in terms of two basic strengths that are cost advantages and unique products. By understanding the industry trends leading managers can formulate efficient strategy to gain competitive advantage over other businesses. Low production costs and consequently lower than competitor prices is the core of the cost leadership strategy. Differentiation means that the firm offers unique products/services to its costumers and charges a higher price for it. The central element of the differentiation strategy is product innovation. If the firm applies either the cost leadership or the differentiation to a narrow market segment then we talk about the focus strategy. Maintaining customer loyalty by tailor-made products/services or sustaining the lower pressure of local competition are the central tenet of the focus strategy.

Over years there have been many new developments in the field of competition. Chaudhuri and Ray (1997) summary article provides a two-dimensional classification: one is at the level of analysis (nation, industry, and firm) and the other is the types of used variables. Out of these possible approaches I focus on the firm level investigation. While there are different theories, frameworks and models of firm level competitiveness exists (Ambastha and Momaya 2004), I rely mainly on the well-known resource based view (RBV).

According to the RBV theory, to sustain competitive advantage, the firm has to have unique resources. Barney (1991) list four characteristics of this unique resources: (1) valuable basically means that the resource should be effective and efficient, (2) rarity takes into account the specificity of the resource, (3) imperfect in-imitable refers to the difficulty to reproduce the resource, and (4) substitutability involves the availability of alternative resource. A resource, that can be interpreted as asset, competency, organizational processes, information, knowledge or capability is considered to be unique if it is valuable, rare, difficult to imitate and has no close substitute. Moreover, distinctive resources lead to sustained competitiveness and superior returns (Rugman and Verbeke 2002). Whilst the RBV literature list a several factors of competitiveness the knowledge-based view of the firm identifies knowledge as the single most significant resource of the firm because it is relatively rare, difficulty to imitate, and socially complex (Grant 1996).

Besides the identification of the factors of competitiveness it is equally important to combine together the elements. The configuration theory, originated by Dennis Miller, argues that the elements of a system cannot fully be understood in isolation, so the investigation of the system as a whole is inevitable (Miller 1986). While it is easy to copy a single element, the competitive advantage lies "...in the power of the orchestrating theme and the degree of complementarity it engenders among the elements" (Miller and Whitney 1999, p. 13). Miller describes three potential application of the configuration concept, typologies, taxonomies and

organizations (Miller 1996). From our perspective, the third approach is the most relevant when configuration is interpreted as a quality or property that varies among organizations. In this case configuration is the “degree to which an organization’s elements are orchestrated and connected by a single theme” (Miller, 1996).

While the national and regional level competitiveness is well researched there is a lack of firm level investigation in Hungary. The most significant series of researches about the competitiveness of Hungarian medium and large firms has been done by the Chikán Attila led research group at Budapest Corvinus University. Over fifteen years and three series of questionnaires and interviews the research group could identify the changes in the competitiveness of the Hungarian businesses. By 1995-96 Hungarian firms adapted the most important element of the competitive market economy. The competitiveness of domestic businesses had improved over the 1995-2000 time period: the quality improvement of leadership, management techniques, human resources, financial performance contributed to increased efficiency and financial performance. At the same time Hungarian businesses lagged behind foreign firms in the areas of marketing, innovation, production, logistic and information management.

The results of the latest 2004-2006 survey are contradictory. On the one hand, the performance of the Hungarian businesses was in close relation to the most important factors of competitiveness (strategy, HRM, adaption capability, information management, etc.), but on the other hand, the differentiation of the Hungarian business sector continued. While large foreign owned firms can compete globally, there is a relative lag in innovation, information management, production-organization management, HRM techniques, amongst others (Chikán and Czakó 2009). It also worth noting that due to the negative changes in the macroeconomic environment Hungary has been continuously falling in the Global Competitiveness Index in the 2004-2008 time period. Alarming sign, that we are only ahead of Romania and Bulgaria in the European Union rank of GCI competitiveness (Porter and Schwab 2008).

There have been other sporadic, small sample researches focusing on the competitiveness of the Hungarian SMEs. Kadozca (2006) identified a few management and organizational methods that affected positively the competitiveness of the Hungarian SMEs. It came as a surprise that family businesses proved to be more successful than non-family counterparts. Márkus et al (2008) focused on two things: first, identifying the factors of competitiveness, and, second, providing a useful analytical framework for analyzing competitiveness in a small business framework. While the statistical-econometric methodology proved to be useful to group/cluster the businesses, the small number of the variables and the sample of only 100 did not make possible to evaluate the competitiveness of Hungarian SMEs.

### 3 The Conceptual Model

My basic aim is to investigate the competitiveness of Hungarian SMEs. Therefore, I rely mainly on firm level investigations in building the conceptual model. Embedded mainly in the RBV literature, I define firm level competitiveness as competencies in available physical and human resources/capabilities, networking and innovational processes that allow a firm to compete effectively with other firms and serve costumers with valued goods/services. Inside resources, capabilities, and processes together form the basic competencies of the businesses that should be fit to the costumers' need (demand conditions) and to the competitive pressure of the firms within the industry as well as the treat of substitutes (supply conditions). While the external, institutional factors of competition can be important I pay attention on the internal factors. The basic reason of this approach is the lack of proper regional variables, at least presently.

While there is an agreement amongst leading scholars that basically firms and not nations and regions compete (Porter 1990), most competitiveness concepts model firm competitive behavior within the framework of national or local environment (Nelson 1992). This approach assumes that the macroeconomic or industry specific characteristics, institutions, and policies affect the performance of the firms in a given geographical entity, industry, cluster region or nation. The application of regional, national and aggregated firm data is also typical in this top-down approach. Whereas this methodology can be useful to institutional development, it does not help us to understand the behavior of an individual firm or the varieties of different firm characteristics in the same industry. This approach misses not only a vital microeconomic, firm level aspect of competitiveness but also has the tendency to view aggregate variables in an inappropriate way (see Krugman 2001 critique).

Since most competitiveness theories and empirical studies focus on large firms the model should reflect that small businesses are not scaled down version of large firms but they differ in organizations, style of management and the way of competition (Man et al 2002). For example, out of Porter's three strategic choices of cost leadership, differentiation and focus, only the last is appropriate to small business (Porter 1998). Analyzing the WWW offered new opportunities Tetteh and Burn (2001) claims that small firms have to apply entirely different strategies and management techniques than large firms. Leadership and management differences in the small business - large firm setup are reinforced by Gray and Mabey (2005). Despite increasing globalization, small firms compete mainly in the local, domestic markets. SMEs frequently face the lack of proper inside resources that is particularly vital in terms of the human resources and innovation (Bridge et al 2003, Storey 1994). As a consequence networking, outside collaboration, co-operation as well as efficient inside knowledge-sharing methodology are the core of effective competition of the SMEs (Dyer and Singh 1998).

The following problem is how to identify the relevant factors of competitiveness. While the strategic management and the RBV literature lists several individual factors appropriate to competitiveness (see. e.g. Grant 1991, Man et al 2002, Peteraf 1993, Ray et al 2004) I can apply only a limited number of these factors due to limitations in the questionnaire. The conceptual model is presented in Figure 1.

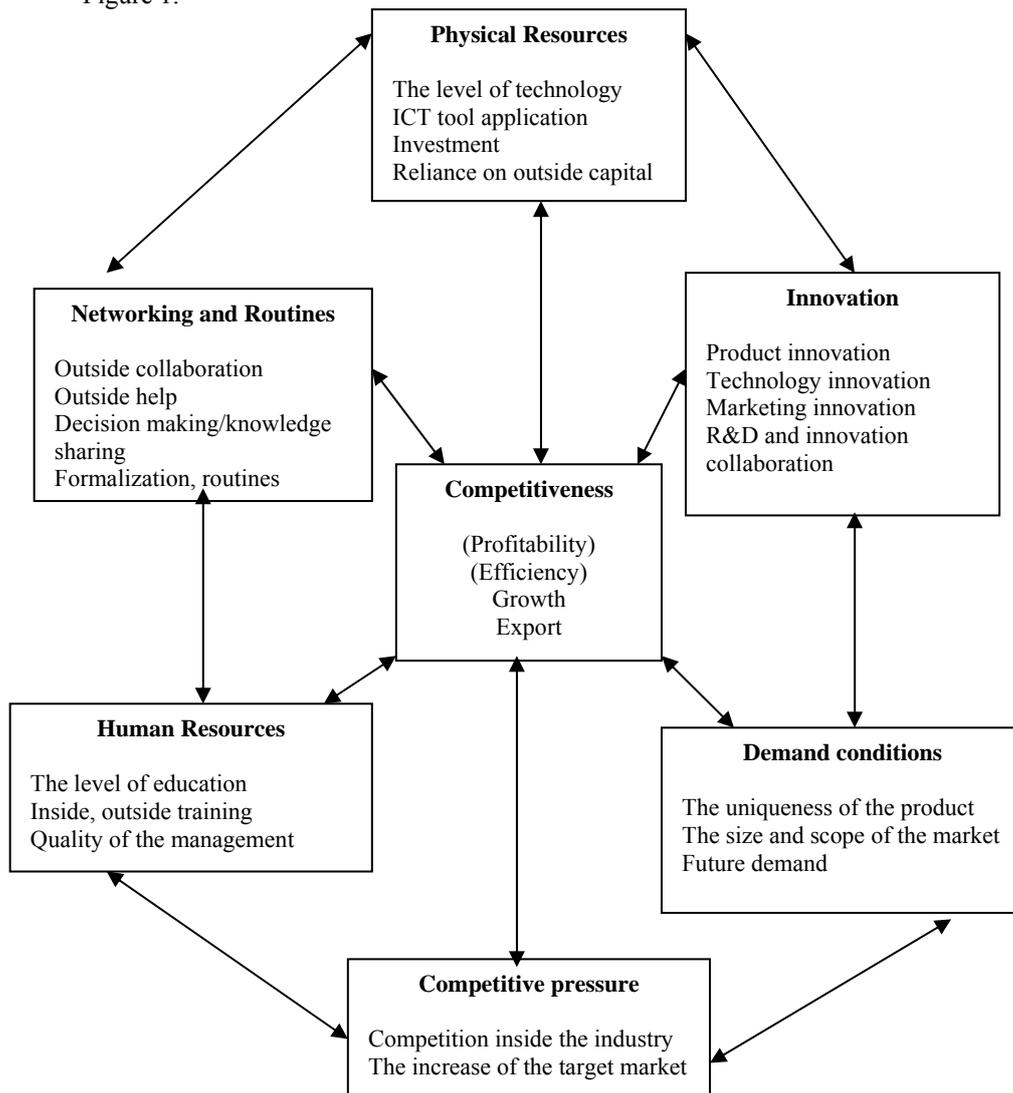


Figure 1  
The conceptual model of SME competitiveness

According to Figure 1, out of six pillars four ones constitute the core competencies of the businesses, physical and human resources or capabilities on the one hand, innovation and networking/routine processes on the other hand. Core competencies provide the possibility to be competitive, however, competencies should be adjusted to the other two pillars, to costumers (demand conditions) and to competitors. Competitiveness can be measured basically by relative performances of profitability and efficiency. Other measures such as growth and export are also frequently applied success criteria of competitiveness. Since I do not have profitability or efficiency data (bracketed terms), the level of competitiveness can be quantified by growth and export willingness.

The interaction and the fit of the six pillars are vital. Similar to other competitiveness models, this one is also relies on the benchmarking view. The benchmark businesses are those that possess high level of technology, various information communication tools (ICT), heavily invest and willing to involve outside capital if it is necessary, have highly educated and frequently trained human resources as well as competent management, innovate products, technology and marketing, have R&D capacity or continuously collaborate in innovation, co-operates, frequently build on outside resources, have sophisticated multi-party decision making and knowledge dissemination system, has low level of rivalry, increasing markets, unique product, and high demand from wide range of geographical area within the country.

## 4 Data Description and Methodology

A data set of 700 serves to examine empirically the competitiveness of the Hungarian SMEs. The aim of the data collection was to examine the basic factors of competitiveness and growth in the Hungarian SME sector. Besides collecting the basic data, the survey included nine blocks and 53 question groups covering all major functional fields of the business from strategy through innovation, knowledge management, HRM, finance, risk management, and marketing. The examined time period is 2004-2007. For this present analysis I applied 24 question groups including 109 questions altogether. While the survey included several types of questions, in this study we apply mainly those that had only two alternatives to select Yes/no. The “do not know” answers were considered as “no”. In the cases of question groups, 4-6 point Likert scale variables were created. The number of created variables, reflecting to Figure 1 is 23, altogether.

The survey was conducted in April-June 2008 by a professional vendor company named Szociográf Market and Survey Research Co. After an initial telephone call for approval a face-to-face interview was carried out with one of the owners who were part of the top management in the case when the firm had with less than 20 employees, and one of the top executives – not necessary having ownership in the business - in the case of larger firms.

The initial sample is based on OPTEN company database that includes all the present and former businesses registered in the Business Registry<sup>1</sup>. The aim was to collect a total sample size of 700. Firms were randomly selected but the vendor company paid attention to regional size and industry representativeness. The size distribution of the sample as compared to the total number of businesses reported by the Hungarian Statistical Office (HSO) is presented in Table 1. We also show the response rates in different categories.

Table 1

The distribution of the sample based on the number of employees in 2007 as compared to the total number of the same size businesses in 2006

	Total number/ percent of businesses in 2006*		Initial Sample		Final Sample		Response rate (%)
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
2-9 empl.	193 092	84,5	963	58,3	373	53,7	38,6
10-49 empl.	29 388	12,9	538	32,6	230	33,1	42,9
50-249 empl.	5 010	2,2	127	7,7	75	10,8	59,1
Over 250 empl	924	0,4	25	1,5	17	2,4	38
Total	228 490	100,0	1628	100	695	100,0	41,4

\*Based on the report of HSO (2008)

Since the response rate was lower than expected we increased the number of firms ending at asking for survey participation 1628 firm altogether. Finally there were 702 businesses having at least two employees participated and completed the questionnaire in the survey. After cancelling the inappropriate businesses because of missing data or inconsistent answers, the sample size for further analysis reduces to 678 small businesses and 17 large firms resulting a 42% response rate. In order to avoid having a large number from the smallest sized businesses stratification was applied.

The following problem is how to combine together the variables in the firm level? There are several possibilities from factor analysis, cluster analysis to simple methodology such as addition and just calculating the average values. Here, we apply a three step method.

*1. The calculation of the pillar values* In the cases of the variables constituting a particular pillar I assume that there is a partial substitutability amongst the variables, therefore after normalization we simply calculate the averages of the variables to receive the values of each of the six pillars.

<sup>1</sup> More information about it can be found in the following OPTEN website: <http://www.opten.hu/ismerteto/cegtar-translation-en.html>

2. *The calculation of the penalty for bottleneck (PFB) points from the six pillars*  
The following problem is how to combine together the six pillars. By doing it I apply a new methodology developed by Acs and Szerb (2009), called the penalty for bottleneck (PFB).

This notion of bottleneck is important for strategy purposes. The conceptual model suggests that physical resource, human resources, innovation, networking, supply and demand conditions interact; if they are out of balance, competitiveness is inhibited. The six pillars are adjusted in a way that takes this notion of balance into account. The value of each pillar is penalized by linking it to the score of the pillar with the weakest performance in that firm. This simulates the notion of a bottleneck; if the weakest pillar were improved, the overall competitiveness would show a significant improvement.

Technically, the bottleneck is achieved for each pillar by adding one plus the natural logarithm of the difference between that pillar's firm score and the score for the weakest pillar for that firm to the score for the weakest pillar for that firm. Thus improving the score of the weakest pillar will have a greater effect on the competitiveness than improving the score of stronger pillar. For example, assume the normalized score of a particular pillar in a firm is 0.60, and the lowest value of the pillar is 0.40. The difference is 0.20. The natural logarithm of 1.2 is equal to 0.18. Therefore the final adjusted value of the pillar is  $0.40 + 0.18 = 0.58$ . Larger differences between the pillar values implies higher penalty

The PBF methodology is consistent with the Miller configuration theory emphasizing the combined interplay of the pillars.

3. *The calculation of the overall competitiveness point of the individual firms*  
The overall competitiveness point of an individual firm is simply the sum of the six PFB adjusted pillar values.

## 5 The Analysis – Initial Results

First, the calculated competitiveness points for each business are examined in relation to the competitiveness performance measures and to some basic characteristics of the business.

Table 2

*The correlation values of the competitiveness points and the measures/characteristics of the business*

	1	2	3	4	5	6	7	8
Calculated								
1 competition point	1,00	<b>0,19</b>	-0,02	<b>0,43</b>	<b>0,39</b>	<b>0,27</b>	<b>0,34</b>	<b>0,10</b>
2 Increase of real sales 2004-2007		1,00	-0,01	<b>0,10</b>	<b>0,21</b>	0,03	<b>0,16</b>	<b>-0,07</b>

	Increase of employment						
3	2004-2007	1,00	0,01	0,00	-0,06	<b>0,06</b>	-0,01
	Planned increase of sales in five						
4	years		1,00	<b>0,50</b>	<b>0,13</b>	<b>0,11</b>	<u>-0,06</u>
	Planned increase of employment in						
5	five years			1,00	<b>0,20</b>	<b>0,25</b>	0,03
	Percentage of						
6	export				1,00	<b>0,21</b>	<b>0,10</b>
	The size of the						
7	business					1,00	<b>0,17</b>
	Age of the						
8	business						1,00

***Bold: Significant at P=0,01 level***

*Underlined: Significant at P=0,05 level*

According to Table 2, the competitiveness points are significantly correlated to the basis measures of competitiveness except one, that is the increase of the employment in the 2004-2007 time period. The highest correlation coefficient can be found between the planned increase of sales and the competitiveness points, followed by the planned increase of sales and the percentage of export. The actual growth rate of sales shows only a lower level of correlation with competitiveness implying that present competitiveness is a better predictor of future than actual sales. Size, as can be expected, is also positively related to competitiveness, hence, larger businesses are more competitive. In a smaller extent, the same is true for the age: Older businesses are more competitive. The reason behind this latest finding is probably the learning effect, older business are more experienced than younger firms.

In the following I am analyzing the basic competition strategy of firms in terms of the six pillars with cluster analysis technique. In order to do that the original normalized – not PFB adjusted – values are used. The calculated competition points and the other three measures of competitive performances (planned increase of sales, employment and percentage of export) are also reported. Table 3 reports the results.

Table 3  
The cluster of the firms in terms of the six pillars of competitiveness

Cluster	1	2	3	4	5	Mean
Number of cases	159	101	185	182	68	
Percentage of the businesses	22,9	14,5	26,6	26,2	9,8	
Supply condition	0,422	0,380	0,263	0,467	0,549	0,398
Demand conditions	0,627	0,316	0,178	0,192	0,712	0,357

Physical resources	0,354	0,387	0,246	0,349	0,521	0,345
Human resources	0,313	0,332	0,220	0,363	0,421	0,315
Innovation	0,027	0,540	0,018	0,016	0,705	0,163
Networking and inside routines	0,435	0,437	0,227	0,592	0,589	0,436
Competition point value	1,779	2,157	1,002	1,626	3,229	1,729
Planned increase of sales	2,778	3,043	2,036	2,738	3,833	2,722
Planned increase of employment	1,835	1,833	1,144	1,916	2,667	1,763
Percentage of export in sales	1,943	1,950	1,330	1,648	2,250	1,734

Table 3 prevails huge differences in the SME sector. Competition points range from 1 to 3,23 average from the lowest to the highest values. The individual competition points range from 0,38 to 4,32. Since the highest value is 6, even the business reaches just only 72% of the potential possibilities.

Out of the five clusters, the 68 cluster 5 firms perform the best in all the six pillars but one case: Cluster 4 businesses are marginally better in networking. As a consequence, not only the competition points but all the competition measures – planned sales increase, planned employment increase and export – are the highest in this group. On the average, the competitive performance of these businesses seems to be balanced. Based on the competition point values, cluster 2 businesses perform second. Medium level mean values in all six pillars show that balanced performances can lead to good competitiveness. Cluster 1 businesses' performance is about average. While the demand conditions are good, and competition is moderate, these firms possess average physical and human resources. Moreover, networking and inside routines are also close to the average, but the low level of innovation can undermine future competitiveness. One of the weakest points of cluster 4 businesses is the low level of demand, either the narrow regional focus or the shrinking market. Another weakness of cluster 4 businesses is the inadequate level of innovation that cannot be counterbalanced even by excellent networking. Cluster 3 businesses, that constitute almost 27% of all firms in the sample, seem to be the absolute losers in the competition race. Their performance is the worst in every category, so they have to make improvements in all six pillars if they want to remain in the market.

### Summary and conclusion

In this paper I presented a potential way to examine the competitiveness of the small businesses. Since most firm level competitiveness models aim to investigate large, mainly international firms, I created a new conceptual model that fit to small business setup. However, the availability of the variables limits the empirical application of the model. The conceptual model contains 23 individual variables and six pillars. The resource based theory and Michael Porter's theory of

competitiveness served as a basis to construct the six pillar model of competitiveness. While it would have been more appropriate, environmental, regional or country level data are left out of analyses because of proper data limitation.

A stratified representative sample of 695 Hungarian businesses served as a basis of empirical investigation. The calculation of the competition points is unique in the sense that it incorporates the weak points, called bottlenecks in terms of the six pillars. The competition points correlate significantly with the selected three measures of competitiveness, increase of sales, employment and export. The cluster analysis shows high differences amongst the five groups of businesses.

In general there are huge differences in competitiveness in the Hungarian SME sector. The competitiveness points of the individual firms range from 0,38 to 4,32 implying the even the best firm is just reaches only 72% of the potential points. The average value is 1,73, about 29% of the maximum available value of 6. The results reinforce that innovation is the weakest point on the average in the examined businesses. It has been already well-known, unfortunately, I am not able to provide useful policies how to improve it. While it has not been done, the methodology is proper to provide tailor-made policy-strategy recommendation to individual firms by showing their weak and strong points.

I would like to pay the attention that this paper contains initial results, and it is necessary to test it a more rigorous way. There are several potential limitations. For example, the further examination between the competition points and the regional settlement is proved to inadequate showing contradictory results. Moreover, external, regional and other individual variables should be incorporated in the model.

### **Acknowledgement**

The financial support of this research has been provided by OTKA Research Foundation, theme number NK 69283, thanks for it

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