

# The Examination of the Competitiveness in the Hungarian SME Sector: A Firm Level Analysis

**László Szerb, József Ulbert**

Faculty of Business and Economics, University of Pécs  
Rákóczi út 80, 7622 Pécs, Hungary  
e-mail: szerb@ktk.pte.hu, ulbert@ktk.pte.hu

---

*Abstract: While the research on competition has been increasing in popularity amongst scholars, there is a lack of studies focusing on the firm level competition especially in Hungary. Even less is known about the competitiveness of the smaller size businesses. The newly created conceptual model is configured to fit to the small business setup as well as to the available data set. The model contains 19 individual variables and seven pillars. The methodology is unique in the sense that it incorporates the weak points, called bottlenecks over the seven pillars of competitiveness. The individual level competitiveness points are calculated for each of the 695 businesses. The competition points collerate significantly with the selected three measures of competitiveness, increase of sales, employment and export. The cluster analysis prevails high differences amongst the seven groups of businesses.*

*Keywords: competitiveness, SME*

---

## 1 Introduction

The basic aim of this article is to identify and analyze the factors of competitiveness in the case of Hungarian small and medium size enterprises (SMEs). While the competitiveness literature includes a large number of articles and books there is still a lack of papers focusing on a firm level analysis and small business. Even less is known about the competitiveness of the Hungarian small businesses. Therefore a comprehensive, theoretically based, empirically tested analysis of the Hungarian SMEs could provide valuable insight about the problems Hungarian smaller size businesses face.

The paper structures the following way. Chapter 2 gives a snapshot about the competitiveness literature. We argue that most followers of Michael E. Porter use the top-down approach emphasizing the role of institutions, clusters or industry and pay less attention to the bottom-up methodology, and the inside, firm level factors of competitiveness. Since small firms are not a scaled-down version of

large businesses, most traditional models provide an inadequate tool to analyze the competitiveness of smaller business units. Building on previous resource based view literature we 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. Chapter 6 provides the application of the results. The cluster analysis technique serves to identify dominant competitive strategies over the factors of competitiveness and the performance of the businesses. 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. Moving away from the traditional Ricardo idea of comparative advantages, Porter's diamond model aims to explain the competitive advantages of the nations [1]. 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.

Since Michael Porter's novel approach, there have been many followers [2] [3] [4]. A development of the original Porter diamond model resulted the competitiveness index reported yearly by the World Economic Forum (WEF). Porter and Schwab [5] define 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 of a country to compete globally, others focus more on the determinants of local competitiveness [6] [7].

The importance of clusters in local competitiveness is also acknowledged by Porter [8]. An elegant amendment of the Porter model in regional development is provided by the pyramid model of Lengyel [9]. Despite numerous improvements there are serious doubts about the proper interpretation of competitiveness in regional levels. Recent 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 [10]. In the light of Krugman, Budd and Hirmis [11] 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 [12] 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 [8] 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 are 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 costumers loyalty by tailor-made products/services or sustaining the lower pressure of local competition are the central tenets of the focus strategy.

Over years there have been many new developments in the field of competition. Chaudhuri and Ray [2] 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 we focus on the firm level investigation.

Of course, the Porter's view is not the only way to examine the competitiveness of the businesses [13]. Besides traditional theories such as the structure-conduct performance (SPC) the competency theories provides a useful alternative to Porter. The competency theories include the resource-based theory, the dynamic capabilities theory, and the knowledge-based theory. A common characteristic of these theories that they give a decisive importance "to the firm's internal rather than to its external conditions for understanding its competitive market position" [14, p. 13]. In the following we rely mainly on the well-known resource based view (RBV) out of the competence theories.

According to the RBV theory, to sustain competitive advantage, the firm has to have unique resources. Barney [15] 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 [7]. Whilst the RBV literature lists 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 [16].

Besides the identification of the factors of competitiveness it is equally important to combine together the elements [17]. 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 [18]. 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" [19 p. 13]. Miller describes three potential application of the configuration such as concepts, typologies, taxonomies and organizations [20]. From our perspective, the third approach is the most relevant when configuration is interpreted as a quality or property that varies among organizations.

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 [3]. 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 [5].

There have been other sporadic, small sample researches focusing on the competitiveness of the Hungarian SMEs. Kadocsa [21] identified a few management and organizational methods that affected positively the competitiveness of the Hungarian SMEs. It came as a surprise that family businesses are proved to be more successful than non-family counterparts. Márkus et al [22] 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**

Our basic aim is to investigate the competitiveness of Hungarian SMEs. Therefore, we rely mainly on firm level investigations to build the conceptual model. Embedded mainly in the RBV literature, we define firm level competitiveness as competencies in available physical and human resources/capabilities, networking, innovational, and administrative routine 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 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) [23].

While there is an agreement amongst leading scholars that basically firms and not nations and regions compete [1] most competitiveness concepts model firm competitive behavior within the framework of national or local environment [24]. 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 missies 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's critique [10]). As a consequence we consider the bottom-up approach as a more

useful way to understand the differences in firm level competitiveness. Although, the external, institutional factors of competition can be important this model incorporates only internal factors, that is a potential caveat. However, the individual performance of a particular business can also contain the mediated effects of institutions that lessens the magnitude of a mistake.

Since most competitiveness theories and empirical studies focus on large firms the conceptual 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 [25]. For example, out of Porter's three strategic choices of cost leadership, differentiation and focus, only the last is appropriate to small business [8]. Analyzing the WWW offered new opportunities Tetteh and Burn [26] 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 [27]. Despite increasing globalization, small firms compete mainly in the local, domestic markets or market niches. SMEs frequently face the lack of proper inside resources that makes essential to develop human resources and innovation [28], [29]. As a consequence networking, outside collaboration, co-operation as well as efficient inside knowledge-sharing methodology are the core of effective competition of the smaller sized businesses [30], [31].

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. [32], [25], [33], [34]) we can apply only a few number of these factors due to limitations in the research. The suggested conceptual model is presented in Figure 1.

According to Figure 1, out of the seven pillars, five ones constitute the core competencies of the businesses, physical and human resources or capabilities on the one hand, innovation, networking and administrative 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 (supply conditions). 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 we do not have profitability or efficiency data (bracketed terms), we can quantify the level of competitiveness by growth and export willingness.

The interaction and the fit of the seven pillars are vital. Similar to other competitiveness models, this one 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 relies on outside debt and 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 builds 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.

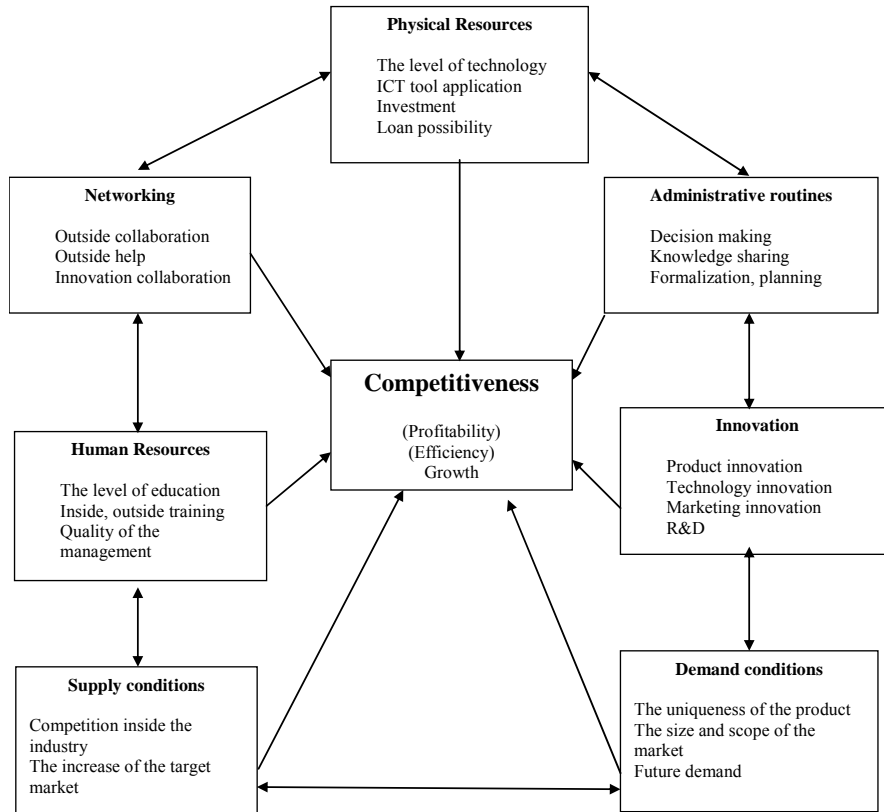


Figure 1

The conceptual model of SME competitiveness

## 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 we 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 in the sub-sample of firms having at least two employees. 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

Number of employees	Total number/ percent of businesses in 2006*		Initial Sample		Final Sample		Response rate (%)
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
2-9	193 092	84,5	963	58,3	373	53,7	38,6
10-49	29 388	12,9	538	32,6	230	33,1	42,9
50-249	5 010	2,2	127	7,7	75	10,8	59,1
Over 250	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 reduced to 678 small businesses and 17 large firms. The overall response rate was

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



41.4%. 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. Regression techniques are improper because of the strong correlation between the different factors of competitiveness, i.e. multicollinearity. Here, we apply a three step method, called the penalty for bottleneck.

1 The calculation of the pillar values In the cases of the variables constituting a particular pillar we 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 seven pillars.

2 The calculation of the penalty for bottleneck (PFB) points from the seven pillars: The following problem is how to combine together pillars. In the sense of Miller (1996) we consider the complementarity of these pillars. Therefore the combined effect of these factors is the key to the overall level of competitiveness. In order to calculate the joined influence we apply a new methodology developed by Acs and Szerb [35] and 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, administrative routines, supply and demand conditions interact; if they are out of balance, competitiveness is inhibited. The seven 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 considerable 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 Basic Results

First, we examine the calculated competitiveness points for each business in relation to the competitiveness performance measures and to some basic demographic characteristics of the business. Both the normalized and the PFB adjusted pillar correlation values are reported (Table 2). The simple average competition points perform slightly, but insignificantly better than the PFB adjusted values if we compare and evaluate the connection between competitiveness points and performances based on the correlation coefficients. The question is logical: Why should we prefer the application of the PFB adjusted way of calculation? The reasoning refers to another important policy question: How to improve the competitiveness of the business? Since the PFB adjustment considers the weakest link in the pillars, the enhancement of that particular pillar has a positive effect on all the other pillar values. Therefore the enhancement of the bottleneck is vital to improve the whole competitiveness of the businesses.

The highest correlation coefficient can be found between the planned increase of sales and the competitiveness points, followed by the planned increase of employment and the percentage of export. The actual growth rate of sales shows only a lower level of correlation with competitiveness, sometimes neither the sign nor the significance of the correlation is proper. This implies that present competitiveness is a better predictor of future than recent growth of sales. All seven pillars correlate positively with all the measures of competitiveness, and only the human resource is insignificant out of them. Taking into account the weakest link – i.e. adjusting for bottleneck - the human resource pillar becomes significant. Altogether, human resources explain the expected growth of the business and export only weakly. This finding is consistent with other human resource studies showing a moderate development of HR strategies in the Hungarian SME sector [36]. Supply conditions (competitive pressure) and innovation processes show the highest correlation with competitiveness performance measures.

Size, as can be expected, is also positively related to competitiveness (coefficient = 0,37), hence, larger businesses are more competitive. In a smaller extent, the same is true for the age: Older businesses are more competitive (coefficient =0,10). The reason behind this latest finding is probably the learning effect, older business are more experienced than younger firms. Moreover, we have no information about the ventures that went out of business over the examined time period.

Table 2

The correlation values of the competitiveness points and the measures/characteristics of the business, normalized and PFB adjusted values

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Planned sales increase	<b>0,52</b>	<b>0,35</b>	<b>0,20</b>	<b>0,29</b>	0,07	<b>0,32</b>	<b>0,25</b>	<b>0,27</b>	<b>0,38</b>	<b>0,25</b>	<b>0,32</b>	<b>0,12</b>	<b>0,32</b>	<b>0,28</b>	<b>0,31</b>	<b>0,42</b>
2 Planned employment increase	1,00	<b>0,37</b>	<b>0,23</b>	<b>0,23</b>	0,06	<b>0,19</b>	<b>0,30</b>	<b>0,24</b>	<b>0,40</b>	<b>0,27</b>	<b>0,26</b>	<b>0,10</b>	<b>0,20</b>	<b>0,30</b>	<b>0,27</b>	<b>0,39</b>
3 Supply condition, normalized		1,00	<b>0,21</b>	<b>0,16</b>	<b>0,10</b>	<b>0,17</b>	<b>0,23</b>	<b>0,17</b>	<b>0,98</b>	<b>0,24</b>	<b>0,20</b>	<b>0,13</b>	<b>0,18</b>	<b>0,25</b>	<b>0,21</b>	<b>0,47</b>
4 Demand conditions, normalized			1,00	<b>0,25</b>	0,04	<b>0,28</b>	<b>0,21</b>	<b>0,21</b>	<b>0,23</b>	<b>0,98</b>	<b>0,28</b>	<b>0,07</b>	<b>0,28</b>	<b>0,23</b>	<b>0,24</b>	<b>0,47</b>
5 Physical resources, normalized				1,00	<b>0,19</b>	<b>0,44</b>	<b>0,31</b>	<b>0,44</b>	<b>0,21</b>	<b>0,32</b>	<b>0,98</b>	<b>0,25</b>	<b>0,44</b>	<b>0,35</b>	<b>0,48</b>	<b>0,63</b>
6 Human resources, normalized					1,00	<b>0,17</b>	<b>0,13</b>	<b>0,17</b>	<b>0,13</b>	<u>0,08</u>	<b>0,22</b>	<b>0,99</b>	<b>0,18</b>	<b>0,15</b>	<b>0,20</b>	<b>0,42</b>
7 Innovation, normalized values						1,00	<b>0,46</b>	<b>0,30</b>	<b>0,29</b>	<b>0,44</b>	<b>0,56</b>	<b>0,28</b>	<b>1,00</b>	<b>0,53</b>	<b>0,43</b>	<b>0,77</b>
8 Networking, normalized values							1,00	<b>0,29</b>	<b>0,29</b>	<b>0,30</b>	<b>0,37</b>	<b>0,20</b>	<b>0,47</b>	<b>0,99</b>	<b>0,36</b>	<b>0,67</b>
9 Administrative routines, norm.								1,00	<b>0,20</b>	<b>0,26</b>	<b>0,45</b>	<b>0,21</b>	<b>0,31</b>	<b>0,31</b>	<b>0,98</b>	<b>0,59</b>
10 Supply condition, PFB adjusted									1,00	<b>0,29</b>	<b>0,27</b>	<b>0,18</b>	<b>0,31</b>	<b>0,32</b>	<b>0,26</b>	<b>0,57</b>
11 Demand conditions, PFB adjusted										1,00	<b>0,38</b>	<b>0,14</b>	<b>0,44</b>	<b>0,33</b>	<b>0,32</b>	<b>0,60</b>
12 Physical resources, PFB adjusted											1,00	<b>0,29</b>	<b>0,57</b>	<b>0,42</b>	<b>0,53</b>	<b>0,73</b>
13 Human resources, PFB adjusted												1,00	<b>0,29</b>	<b>0,23</b>	<b>0,26</b>	<b>0,51</b>
14 Innovation, PFB adjusted													1,00	<b>0,54</b>	<b>0,45</b>	<b>0,79</b>
15 Networking, PFB adjusted														1,00	<b>0,40</b>	<b>0,73</b>
16 Inside routines, PFB															1,00	<b>0,70</b>
17 Calculated competition point PFB																1,00

**Bold: Significant at P=0,01 level, Underlined: Significant at P=0,05 level**

Table 3

The correlation coefficient between the individual (subjective) view about competitiveness and the seven normalized, non-adjusted values of the seven pillars

Individual view about competitiveness	Competition points	Supply condition	Demand conditions	Physical resources	Human resources	Innovation	Networking	Admin.routines
Unique products	<b>0,41</b>	<b>0,34</b>	<b>0,33</b>	<b>0,22</b>	<b>0,13</b>	<b>0,25</b>	<b>0,27</b>	<b>0,22</b>
Advanced technology	<b>0,42</b>	<b>0,31</b>	<b>0,27</b>	<b>0,21</b>	<b>0,21</b>	<b>0,23</b>	<b>0,34</b>	<b>0,22</b>
Advanced ICT tool	<b>0,33</b>	<b>0,24</b>	<b>0,15</b>	<b>0,13</b>	<b>0,21</b>	<b>0,14</b>	<b>0,35</b>	<b>0,16</b>
Continuous innovation	<b>0,38</b>	<b>0,24</b>	<b>0,23</b>	<b>0,19</b>	<b>0,17</b>	<b>0,18</b>	<b>0,35</b>	<b>0,23</b>
Low cost product	<b>0,14</b>	<b>0,11</b>	0,02	<u>0,08</u>	0,03	<u>0,09</u>	<b>0,15</b>	0,05
Individual marketing	<b>0,24</b>	<b>0,16</b>	<b>0,10</b>	<b>0,13</b>	<b>0,18</b>	<b>0,09</b>	<b>0,23</b>	<b>0,15</b>
Quick response to costumers demand	<b>0,26</b>	0,06	<b>0,14</b>	<b>0,22</b>	<b>0,22</b>	<b>0,19</b>	0,07	<b>0,18</b>
Outstanding product management	<b>0,36</b>	<b>0,20</b>	<b>0,18</b>	<b>0,26</b>	<b>0,17</b>	<b>0,17</b>	<b>0,30</b>	<b>0,25</b>
Outstanding leadership	<b>0,30</b>	<b>0,17</b>	<b>0,14</b>	<b>0,21</b>	<b>0,21</b>	<b>0,10</b>	<b>0,19</b>	<b>0,26</b>
Outstanding HR	<b>0,28</b>	<b>0,19</b>	<u>0,09</u>	<b>0,22</b>	<b>0,18</b>	<b>0,13</b>	<b>0,18</b>	<b>0,18</b>
Outstanding location	<b>0,22</b>	<u>0,08</u>	0,05	<b>0,16</b>	<b>0,11</b>	<b>0,11</b>	<b>0,20</b>	<b>0,14</b>
Strategic partners	<b>0,30</b>	<b>0,18</b>	<b>0,14</b>	<b>0,21</b>	<b>0,11</b>	<b>0,17</b>	<b>0,27</b>	<b>0,18</b>
Outstanding subcontractors	<b>0,32</b>	<b>0,16</b>	<b>0,12</b>	<b>0,32</b>	<b>0,11</b>	<b>0,22</b>	<b>0,16</b>	<b>0,24</b>

**Bold: Significant at P=0,01 level**Underlined: Significant at P=0,05 level

We have asked the businesses to provide an individual (subjective) view about their competitive advantages of their businesses. In all thirteen categories the respondents were asked to point whether the particular item is not their competitive advantage (value 1), only moderately competitive (value 2) or strongly competitive (value 3) factor. The correlation matrix between the individual (subjective) view about competitive advantages and the actual findings about the value of the seven pillars is provided in Table 3.

According to Table 3, most of the connection between the subjective and the actual variables of competition is moderately strong but highly significant. The correlation in every category is the highest in terms of the competition points, expressing the importance of the combined competitiveness of the business. While the subjective and the actual categories of competitiveness are not exactly the same, it can be expected that the correlation is higher between the similar categories. For example unique products should highly correlate to demand, supply conditions and innovation, or outstanding HR with human resources. This expectation is only partially valid, according to table 3. It worth noting that the correlation coefficients between networking and the subjective measures of competitiveness are relatively high implying that the capabilities to use outside resources is a vital aspect of small business competitiveness.

## **6 The Application of the Model and the Relevance of the Results**

In this chapter we provide a further practical application of our model and the results. The calculation of the competitiveness points makes possible to rank the businesses. Since these points contain condensed and reduced information about the competitiveness of the individual business they can be considered as having limited value for particular strategy improvement. Therefore the analysis should base upon not the single point value but on the seven pillar values of the businesses. Moreover, the normalized values rather than the PFB adjusted values offer a more appropriate method for the analysis because they refer to the original situation of the business.

*Cluster analysis* In the following we analyze the basic competition strategies of the firms in terms of the seven pillars with cluster analysis technique. The combination of the pillars provides an inside view about the components of the dominant competitive strategies of the businesses. The three measures of competitive performances (planned increase of sales, employment and percentage of export) are also included as explanatory variables of cluster membership. At the same time, competition point, the size of the business and the age of the business

values are also calculated and reported, however, they are not part of the cluster analysis. Table 4 reports the results.

Table 4  
The cluster of the firms in terms of the seven pillars of competitiveness

Clusters	1	2	3	4	5	6	7	Aver.
Planned sales increase	0,256	0,146	0,441	0,522	0,227	0,258	0,558	0,287
Planned employment increase	0,262	0,161	0,271	0,466	0,174	0,235	0,646	0,252
Percentage of sales exported	0,077	0,040	0,177	0,074	0,064	0,840	0,902	0,183
Supply conditions	0,454	0,274	0,513	0,577	0,318	0,398	0,543	0,398
Demand conditions	0,434	0,370	0,638	0,551	0,438	0,515	0,631	0,471
Physical resources	0,296	0,244	0,526	0,390	0,379	0,401	0,522	0,354
Human resources	0,316	0,202	0,416	0,317	0,430	0,273	0,385	0,315
Innovation	0,071	0,019	0,563	0,054	0,054	0,096	0,412	0,119
Networking	0,552	0,112	0,513	0,277	0,224	0,273	0,686	0,298
Administrative routines	0,397	0,251	0,638	0,552	0,563	0,482	0,691	0,464
Competition points	2,140	1,271	3,469	2,235	1,999	2,057	3,491	2,071
Size	2,396	1,874	3,215	2,735	2,814	3,016	3,870	2,637
Age	2,571	2,358	2,708	2,265	2,400	2,547	2,609	2,483
Number of businesses	91	151	65	68	140	64	23	602
Percentage of businesses	15,12	25,08	10,80	11,30	23,26	10,63	3,82	

Table 4 prevails huge differences in the SME sector. Average competition points of the clusters range from 1,27 to 3,49 from the lowest to the highest values. The individual competition points range from 0,61 to 4,84. Since the highest value is 7, even the best business reaches just only 69% of the potential competitiveness.

Out of the seven clusters, the 23, cluster 7 firms perform the best. Out of the seven pillars they rank first in two, and second in other four pillars. Their relatively weak point is the human resources. The average competitiveness point is 3,49, the highest of all seven group with relatively well balanced performances over the seven pillars. 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. These businesses are the largest, the oldest and export the most in all seven clusters. These firms definitely compete in the international markets. The main problem is their minimal number: only 3,82% of the total businesses belong to this category.

Based on the competition point values, 65 businesses belonging to cluster 3 perform second. Excellent demand conditions, good physical resources, high innovation and well balanced performance in all seven pillars. Their competitive performance is a little below to that of the first group. While they plan to increase considerably the sales, the planned increase of employment is barely above the average. The exporting activity of the businesses is low, so they produce and compete mainly in the domestic market.

68 businesses belong to cluster 4, with 2,235 average competition points, slightly above the overall average. The performance of these businesses in terms of expected sales and employment growth seem to be better than the previous group despite their lower points of competitiveness. The individual analysis of the seven pillar values demonstrates considerable differences. The only thing where cluster 4 businesses are better than cluster 3 businesses, out of the seven pillars, is the supply conditions meaning that they sell relatively unique products/services in a not too high competitive environment. However, the low level of innovation activity does not reflect to this uniqueness. Maybe the excellent supply position is the result of a previous innovation activity. Examining the other demographic characteristics, these businesses are the youngest and their size is about average. Another alternative explanation about the good performance is the well positioned start-up strategy that has had longer lasting effect on the performance of the business.

91, smaller than average, businesses belong to Cluster 1 that ranks number four in terms of the competition points. Their strong point is the excellent networking, but innovation is out of any acceptable range. While supply conditions are relatively good, demand conditions are not favorable implying that they should improve, increase their customer base. The planned increase of sales and employment is about average.

Cluster 6 businesses overall performance in terms of planned increase of sales and employment and competitiveness points are very similar to the previous cluster 1 businesses. The most important difference is in internationalization: While cluster 1 businesses produce almost exclusively to domestic markets, cluster 6 businesses show high exporting activity. The comparison of the seven pillar points suggests an unbalanced performance: Over than average demand conditions, physical resources and administrative routines, about average supply and networking activity, and below average innovation and human resources.

The competitiveness of Cluster 5 businesses is slightly below the average so are their expected sales and employment growth. Low exporting, relatively bad supply and demand conditions characterize these ventures. The level of human resources is excellent, physical resources and administrative routines are over the average, but networking and mainly innovation are below the average, providing an uneven level of the seven pillars of competitiveness.

Cluster 2 businesses, the largest group with 151 businesses, 25% of the sample, is at the bottom of competitiveness with very low, 1,271 points. They seem to be the absolute losers in the competition race. Harsh competition, inadequate demand, low physical and human resources without proper administrative routines innovation or networking all contribute to the low competitiveness points. Their performance is the worst in every category, so they have to make improvements in all seven pillars if they want to be alive in the market. Regarding the future growth of sales and employment they expect decline or a very low increase, at best. In addition, these ventures are the smallest; this may explain their limited competitiveness position.

### **Summary and Conclusion**

In this paper we 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, we created a new conceptual model that fit better to small business setup. The conceptual model contains 23 individual variables and seven pillars. The resource based theory and Michael Porter's theory of competitiveness served as a basis to construct the seven pillar model of competitiveness. A potential drawback is that this conceptual model still prefers larger size businesses and lacks to incorporate institutional factors. The incorporation of sectoral differences would also be useful. Since most small firms do not have any administrative routines sell only in a narrow niche markets and have very low innovation capabilities, it can be expected that most micro businesses would have a low level of competitiveness. Moreover, the availability of the variables limits the empirical application of the model.

A stratified representative sample of 695 Hungarian businesses provided the basis of the 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 seven pillars. Competition points collerate significantly with the selected three measures of competitiveness, planned increase of sales, employment and export. In addition, the calculated points of the seven pillars correlate significantly with the subjective view points of competitiveness reported by the entrepreneurs.

The competitiveness points of the individual firms range from 0,61 to 4,84 implying the even the best firm is just reaches only 69% of the potential points. The average value is 2,07, about 30% of the maximum available value of 7. The results reinforce that innovation is the weakest point on the average in the examined businesses followed by networking and human resources. The cluster analysis shows high differences amongst the seven groups of businesses in terms of competitiveness in the Hungarian SME sector. Moreover, the clusters represent the dominant competitive strategies of the Hungarian SMEs. While the top group constitutes only 3,82% of the businesses around 25% of the ventures have an average of 1,27 competitiveness points, that represent only 18% of the potential seven points. The performance of the clusters over the seven pillars of



competitiveness is generally unbalanced. Even the best group lacks the proper level of human resources. Only two groups, 12,7% of the whole sample considers innovation as a major part of their competitiveness.

A further potential application of the model is to provide tailor-made strategy suggestions to individual businesses by improving the weakest link.

### **Acknowledgement**

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

### **References**

- [1] Porter, M. E. (1990) *The Competitive Advantage of Nations*, New York: The Free Press, 1990
- [2] Chaudhuri, S., S. Ray (1997) *The Competitiveness Conundrum: Literature Review and Reflections* Economic and Political Weekly, 1997 Vol. 32, No. 48, pp. 83-91
- [3] Chikán, A., Czakó Á. (2009) *Versenyben a világgal*, Akadémiai Kiadó Budapest
- [4] Török Á. (1999) *Verseny a versenyképességért?* MEH, Budapest
- [5] Porter, M. E., K. Schwab (2008) *The Global Competitiveness Report 2008-2009*, World Economic Forum Geneva Switzerland
- [6] Lengyel I. (2000) *A regionális versenyképességről*, Közgazdasági Szemle, Vol. XLVII December pp. 962-987
- [7] Rugman, A. M., A. Verbeke (2001) *Location, Competitiveness, and the Multinational Enterprise*, in: Rugman, A. M., T. L. Brewer (eds) *The Oxford Handbook of International Business*, Oxford University press, Oxford, pp. 146-180
- [8] Porter M. E. (1998) *On competition*; Boston: Harvard Business School
- [9] Lengyel I. (2006) *A regionális versenyképesség értelmezése és piramismodellje*, *Területi Statisztika*, 2. pp. 148-166
- [10] Krugman P. (1994) *Competitiveness: A Dangerous Obsession*; *Foreign Affairs*; Vol. 73, Issue 2., pp.
- [11] Budd L., A. Hirmis (2004) *Conceptual Framework for Regional Competitiveness*, *Regional Studies*, Vol. 38, Issue 9, pp. 1015-1028
- [12] Sternberg, R., O. Arndt (2001) *The Firm or the Region: What Determines the Innovation Behavior of European Firms?* *Economic Geography*, Vol. 77, No. 4 (Oct., 2001), pp. 364-382

- [13] Ambastha, A., K. Momaya (2004) Competitiveness of firms: Review of theory, frameworks and models, Singapore Management Review, Vol. 26, No. 1; First half 2004, pP. 45-61
- [14] Foss, N. J. C. Knudsen (1996) Towards a Competence Theory of the Firm, Routledge, 1996
- [15] Barney, J. (1991) Firm Resources and Sustained Competitive Advantage, Journal of Management, Vol. 17, No. 1, pp. 99-120
- [16] Grant, R. M (1991) Toward the Resource-based Theory of Competitive Advantage: Implications for Strategy Formulation, California Management Review Spring; 33, 3, pp. 114-135
- [17] Dess, G. G., S. Newport, A. A. Rasheed (1993) Configuration Research in Strategic Management: Key Issues and Suggestions, Journal of Management Vol. 19, Issue 4, pp. 775-796
- [18] Miller, D. (1986) 'Configurations of Strategy and Structure: Towards a Synthesis', Strategic Management Journal. 7: pp. 233-249
- [19] Miller, D, J. O. Whitney (1999) Beyond Strategy: Configuration as a Pillar of Competitive Advantage Business Horizons May-June, pp. 5-17
- [20] Miller, D (1996) Configurations Revisited, Strategic Management Journal, Vol. 17, Issue 7, pp. 505-512
- [21] Kadocsa, Gy. (2006) Research of Competitiveness Factors of SME, Acta Polytechnica Hungarica, Vol. 3, No. 4, pp. 71-84
- [22] Márkus G., Potó Zs., Zsibó Zs., Soó J., Schmuck R., Duczon A. (2008) A mikroszintű regionális versenyképesség mérése; Vállalkozás és innováció, Vol. 2, Is. 1, pp. 30-53
- [23] Szerb, L. (2009) The Competitiveness of the Hungarian SMEs after the EU Accession, 7<sup>th</sup> International Conference on Management Enterprise and Benchmarking, June 5-6, 2008, Budapest, Proceedings pp. 129-144
- [24] Nelson, R. (1992) Recent Writing on Competitiveness: Boxing the Compass, California Management Review, 34(2) 127-137
- [25] Man, T. W. Y, T. Lau, K. F Chan (2002) The Competitiveness of Small and Medium Enterprises A Conceptualization with Focus on Entrepreneurial Competencies, Journal of Business Venturing, Vol. 17, pp. 123-142
- [26] Tetteh, E., J. Burn (2001) Global Strategies for SME-Business: Applying the SMALL Framework Logistics Information Management, Volume 14, Issue 1/2, pp. 171-180
- [27] Gray, C., C. Mabey (2005) Management Development: Key Differences between Small and Large Businesses in Europe, International Small Business Journal, Vol. 23, No. 5, 467-485 (2005)

- 
- [28] Bridge S., K. O'Neill, S. Cromie (2003) *Understanding Enterprise, Entrepreneurship, and Small Business* 2<sup>nd</sup> Edition Palgrave Macmillan
- [29] Storey, D. (1994) *Understanding the Small Business Sector*, Routledge, London
- [30] Dyer, J. H., H. Singh (1998) *The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage*, *The Academy of Management Review*, Vol. 23, No. 4. pp. 660-679
- [31] Hakansson, H., Snehota, I. (1989) *No Business is an Island: The Network Concept of Business Strategy*, *Scandinavian Journal of Management*, Vol. 5, pp. 187-200
- [32] Grant, R. M. (1996) *Toward a Knowledge-based Theory of the Firm*,” *Strategic Management Journal* Vol. 17, Winter Special Issue, pp. 109-122
- [33] Peteraf, M. A. (1993) *The Cornerstones of Competitive Advantage: A Resource-based View*, *Strategic Management Journal*; Mar 1993; 14, 3; pp. 173-191
- [34] Ray, G.; Barney, J. B.; Muhanna, W. (2004) *Capabilities, Business Processes, and Competitive Advantage: Choosing the Dependent Variable in Empirical Studies*, *Strategic Management Journal* 25: 23-37
- [35] Ács, Z. J., L. Szerb (2009) *The Global Entrepreneurship Index (GEINDEX)*, Jena Economic Research Papers 2009-028, [http://zs.thulb.uni-jena.de/servlets/MCRFileNodeServlet/jportal\\_derivate\\_00169881/wp\\_2009\\_028.pdf?hosts=](http://zs.thulb.uni-jena.de/servlets/MCRFileNodeServlet/jportal_derivate_00169881/wp_2009_028.pdf?hosts=)
- [36] Richbell, S., Szerb L., Vitai Zs. (2009) *HRM in the Hungarian SME Sector*, Forthcoming in *Employee Relations*