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## Factors considered in location of construction enterprises in the Małopolska region

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### Abstract

This paper focuses on the relationship between distribution of construction enterprises in the Małopolska Region and two location factors – intensity of entrepreneurship of the local population and the potential sales market. The authors analysed both factors on the basis of spatial variation of the factors: entrepreneurial activity of residence and cubage of buildings admitted to use. It was established that no straight dependence between these two aspects existed. Conclusions from the analysis form the basis for continuation of the research with the attempt to identify important factors which decide about location of construction enterprises.

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### 1. Introduction

These days, in the era of globalization, economic integration, technological and information challenges and a progressing impact of the new economy on the reality, operational paradigms of an enterprise are collapsing. There is a growing need of a change in the way of thinking and in strategic management of enterprises. Furthermore, a location of an enterprise emerges as one of significant sources of competitive advantage.

Decisions on choosing a good location of an enterprise are complex and involve an in-depth analysis of many factors. Typically, a decision on a spatial location of an enterprise brings long-term and often irrevocable

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consequences for its further operations. A specific geographical location determines access to manufacturing factors or to a sales market. In addition, this determinant defines an organisation's opportunity of operating in network structures, its access to public funding and more favourable fiscal solutions. In a longer run, any decision will be the background for other, subsequent decisions made (Rachwał, 2011; Stryjakiewicz, 2009; Rachwał & Wiedermann, 2008).

From a point of view of an entrepreneur, an employee as well as of the state or a local community, it is important to set a convenient business location. When the choice is right, it is reflected in production costs borne by the enterprises, employees' location but also in a harmonious spreading of a business over an area (which is governed by the state or a local community) (Perreur, 1992).

Actions aimed at determining the most optimum location of an enterprise may be carried out at any stage in the enterprise development. Analyses of potential locations are essential at the start-up phase, when a convenient location of an enterprise will contribute to its effective launch and further growth. Similarly, when continuation of a business in an area is no longer profitable, it is necessary to set a new location or to change the business; however, the latter solution is rarely applied (Fierla & Kuciński, 2001).

This article analyses factors influencing location of construction enterprises. The authors focused on two selected factors: entrepreneurial activity of residences and the potential sales market. While the first factor has not been broadly discussed in the available literature in the field, the latter was broadly described and considered one of the key factors in the theory and practice of locating enterprises (Greenhut, 1995, Fierla, 1998; Budner, 2004; Wieloński, 2004; Ponsard, 2011).

The main purpose of the article was to examine the significance of the potential sales market in entrepreneurs decisions making of enterprise location. The authors have also attempted to identify the prevalence of the relationship between entrepreneurial activity of the local population and the choice of a construction activity profile. The studies covered entities operating in Małopolska Region.

## **2. Evolution of the theory of location and differentiation of factors influencing location of enterprises**

Theory of location has been given the task of explaining and planning spatial organization of various types of businesses. The theory is rooted in concepts developed by A. Smith and D. Ricardo, who laid the foundation of the classical theory of economics. This scientific discipline continued to develop largely owing to German economists: including J.H. Thünen, W. Launhardt, A. Weber, A. Predahl, A. Lasch, Swedish economists: B. Ohlin, T. Palander, G. Myrdal and American economists: E.M. Hoover and W. Isard (Domański, 2011; Greenhut, 1995; Fujita, Thisse, 2002; Budner, 2004; Wieloński, 2004; Ponsard, 2011).

Launhard believed that an ideal location was a location which minimized total costs of transport per a production unit. On the other hand Weber, who continued Launhard's research, introduced the concept of a location factor and defined it as "one of a clearly emerging advantages which emerges in a business when the business is operating in a given area or place. The advantages should be understood as production cost savings. These advantages come from costs of production of specific goods in a point or area which are lower than production costs in any other point or area" (Budner, 2004). Weber distinguished three location-influencing factors: a transport factor, a labor factor and an agglomeration factor. Later on, the agglomeration benefits were analyzed in detail, largely in terms of their contribution to setting up business clusters. The research proved that that it was the geographic proximity that had a direct impact on creating clusters by facilitating creation of business relation and developing business networks (Krugman, 1991; McCann, 2001; Karlsson, Johansson & Strough, 2005). However, according to Lasch, a location of an enterprise may be determined by defining the resultant of two contradicting forces – maximized individual benefits and maximized number of business entities (Domański, 2011; Budner, 2004).

A. Predahl introduced a theory of substituting production factors. He believed that each point in the space is a specific allocation of production factors. As prices of production factors in space vary, a change in their location from one point to another requires substitution of various factors, depending on their relative process. The theory was expanded by W. Isard, who added a substitutive definition of investment into transport (Domański, 2011).

In consequence of continuous economic and social changes, the list of location-affecting factors is expanding. Soon, it was disclosed through analyses of factors and modifications of the first location theories, which assumed considerable simplification, that it was not possible to create an universal group of factors affecting the decision on

locating an enterprise. With time, new factors were being included into the research and specifically, factors that had not been considered so far and factors which emerged with the technological development and often accompanied new forms of business. According to the literature, factors related to the proximity of the raw material base, sales markets, access to real property, transport base and labor force (in terms of labor costs) are considered the traditional (classical) factors decisive for location of an enterprise since 1960. Nowadays, their impact is fairly large on some sectors but, on the other hand, quality factors have been growing in importance such as access to qualified labor force as well as broadly understood business climate in a region. The importance of factors attracting entrepreneurs is growing together with importance of factors appreciated by employees, in particular high class specialists, whose decisions regarding their place of living which is also their place of work are guided by a potentially high living standard or the opportunity to satisfy their higher needs i.e. the quality of life in the broad sense of the term. Some subjective aspects affecting selection of a location from the point of view of an entrepreneur are also frequently analyzed (the behavioral approach).

As emphasized in the introduction, currently the importance of economic progress-related factors involving technological and social progress is growing in the decision-making process of choosing location of enterprises. Many of the factors have emerged only upon introduction of new technologies, in particular IT technologies and development of new consumer and employees' needs. There is no doubt that the modern factors include: the quality of human and social capital, access to information, capital of knowledge and creativity, business services and attractions in the environment defined as natural environment, social climate and policies pursued by the local authorities (Domański, 2011).

Many interlinked location-related factors include a personal factor, whose role cannot be underestimated. Since 1950, the literature on location decisions of enterprises, has been mentioning a behavioral approach. The approach accounts both for the explicit spatial behaviors e.g. setting up a new industrial plant as well as implicit spatial behaviors such as change in the scale of the existing plant (Hamilton, 1978; Walmsley & Lewis, 1984).

### 3. Construction sector in Poland – introduction

The construction sector operates in many various field of economy. Following the criteria of the business activity (type of work), there are design studios, enterprises preparing construction sites, construction enterprises (builders) and finishing works delivering enterprises. However, according to the classification of the Main Statistical Office of the Republic of Poland and in terms of type of works, business, there is a group 01. erecting residential, industrial, office, service, hotel and public utility buildings and a group 02. classified to civil engineering (roads, yards, squares, bridge, tunnel, rail tracks, the utility network and water facilities construction). The variety of the construction business increases the commercial offer and facilitates flexible reactions to market changes.

Still, according to the functional division of the construction sector, which focuses on the purpose of a construction project/works (the type and purpose of facilities and buildings erected), the categories include: civil engineering, non-residential construction, residential construction (Table 1). As for the type of land as the main criterion, there is civil engineering and water engineering.

Table 1. Functional structure of the construction sector (The Małopolska Region, 2012)

Construction sector		
Engineering construction	Non-residential construction	Residential construction
Road and bridge construction (motorways, roads, streets, railroads, airport ways, bridges, fly bridges, tunnels, underground and overground passages)	Office buildings	Single family housing
Water construction	Commercial and service buildings	Two-apartment and apartment buildings
Construction complexes in industrial areas	Tourist accommodation and hotels	Collective housing buildings
The utilities (water mains, pipelines, sewage, gas pipes, telecom lines, energy lines)	Industrial buildings and warehouses	
Sport and recreation facilities and other facilities	Public utility and administrative buildings	

The construction sector is an important economic area of Poland, linked with other sectors. Consequently, it is particularly sensitive to market fluctuations. 2001–2011 GDP growth analysis shows that, in 2011, the sector was the most rapidly growing sector in Poland. According to the Main Statistical Office, its growth rate reached more than 11% (Table 2).

Table 2. GDP growth rate per economic sector (Construction Sector in Time and Space, 2011)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP											
Incl.:	101.2	101.4	103.9	105.3	103.6	106.2	106.8	105.1	101.6	103.9	104.3
Industry	99.9	99.8	108.7	110.9	103.5	109.9	110.0	106.0	101.3	109.4	106.3
Construction	97.0	92.5	97.2	101.1	106.6	112.5	109.4	105.8	111.6	106.4	111.8
Trade, car repairs	102.9	103.0	99.4	103.9	104.1	104.7	104.7	106.4	104.3	102.6	104.6
Transport and warehouse management	94.7	103.2	104.5	103.0	108.6	109.9	104.2	98.5	95.6	106.5	105.1

As show by the statistical information from the General Statistical Office, construction enterprises in Poland are usually small. From 1995 to 2009, construction enterprises employing up to 20 represented as much as 97-98% of all construction enterprises operating on the Polish market. In addition, there is a trend of deteriorating number of enterprises employing more than 100 employees. In 1995, they represented 0.9% of all construction enterprises compared to as little as 0.3% in 2009 (Table 3).

Table 3. The structure of the construction sector enterprises by number of employees (The Construction Sector in Time and Space, 2011)

Employees	1995	2000	2005	2009
1–19	118 242	202 830	158 366	222 293
20–49	2 209	3 046	2 458	3 842
50–99	930	1 161	833	1 091
100–499	953	933	558	700
500 and more	148	84	46	65
Total	122 482	208 054	162 261	227 991

Generally, employment in the construction sector is high and the number the employed in the construction sector to the total number of employed in Poland, 1995–2009, fluctuated from 8.8 and 9.0%. Similarly, when comparing the number of employees in the construction sector in Poland to the number of employees of the sector in other EU member states, one can see that Poland is one of the largest labour markets in the sector. Here, Poland comes 6<sup>th</sup> in the ranking after 5 largest EU states. However, the number of persons employed in the Polish construction sector per one enterprise is among the lowest in EU states, which evidences considerable dispersion of the sector.

#### 4. Varied distribution of construction enterprises in the Małopolska Region and entrepreneurial factors of its inhabitants and proximity to the sales market

According to the statistics, in 2011, in the Małopolska Region, 331 600 businesses were registered. This way, the region comes fourth among all the regions, which indicates very pro-entrepreneurial attitude of its residents. With that, a distinctive division of the Region into the western part, where its residents are very active – as demonstrated by high value of the entrepreneurial activity ratio for its residents (the number of enterprises per 1000 residents) and the eastern part, demonstrating much lower entrepreneurial activity of its residents, having lower values of the ratio (Fig. 1).

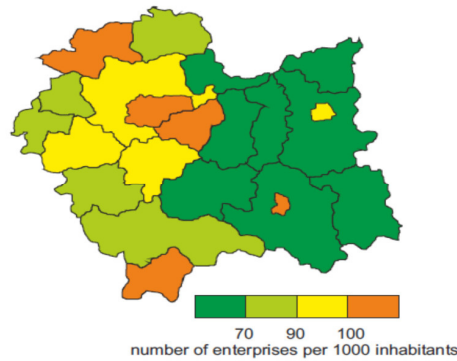


Fig. 1. Entrepreneurial activity of the Małopolska Region residents in 2011 year (prepared by authors)

44 400 enterprises operating in the construction sector represented as much as 13% of all the entities registered in the region. Analysing the structure of their size, one can see that micro enterprises prevail (94.8%) in the total number of construction sector enterprises in the Małopolska Region (Table 4).

Table 4. Construction enterprises in the Małopolska Region, 2011, by size (prepared by authors)

Size of the enterprise	Number of enterprises	Share in the total number of enterprises (%)
Micro	314 400	94.8
Small	14 400	4.3
Medium	2 400	0.7
Large	309	0.1

To identify conditions promoting location of construction sector enterprises in the Małopolska Region, the construction sector enterprises density ratio was calculated for the Region (the share of construction enterprises in the total number of enterprises). The ratio shows an uneven distribution of construction sector enterprises in the region. They are mostly centered in the south-eastern part of the region, in Nowy Sącz County (26.3), Limanowa County (25.3%), Gorlice County (23.7%) and Brzesko County (23.5%). Their density ratio is much lower in the north-western, western and south-western part of the region, in particular in Tatrzański County (7.7%) and Olkusz County (11.5%). In addition, the lowest density ratio was reported for all three cities which enjoy county rights i.e.: Kraków (9.2%), Tarnów (9.5%) and Nowy Sącz (10.2%) (Fig. 2).

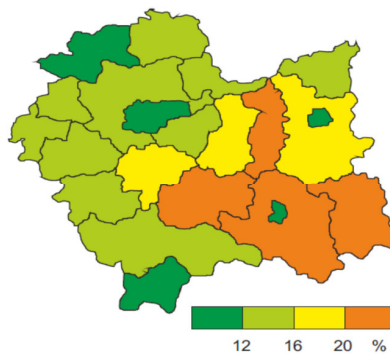


Fig. 2. The share of construction enterprises in the total number of enterprises of the Małopolska Region, 2011 year (prepared by authors)

A spatial analysis focused on distribution of construction enterprises showed that their dominance in the total number of enterprises does not correspond to entrepreneurial activity of residents, measured by the number of enterprises per 1000 inhabitants. One could claim the opposite – in counties reporting higher entrepreneurship, a relatively low density of construction enterprises is reported, as best evidenced by the three largest cities of the region (cities enjoying county rights) which reported one of the highest values of the entrepreneurial activity ratio for their residents. Kraków (153.0), Nowy Sącz (110.0), Tarnów (95.5) and also the lowest construction business density ratio: 9.2%, 10.2%, 9.5%, respectively. A similar trend was reported for other counties displaying the highest entrepreneurial activity ratio: Tatrzański (140.0), Wieliczka (101.8) and Olkusz County (101.2), given relatively low values of the construction business density ratio: 7.7%, 14.9%, 11.5%. At the same time, counties having low entrepreneurial activity ratio, in particular: Brzesko (62.7), Nowy Sącz (65.3), Gorlice (67.2), Limanowa (67.7) reported the highest construction business density: 23.5%, 26.3%, 23.7%, 25.3% (Table 5).

Table 5. Entrepreneurial activity ratios and construction business density in the Małopolska Region, 2011 year (prepared by authors)

No.	County	Entrepreneurial activity ratio (local residents) – the number of enterprises/1 000 inhabitants	Construction business enterprises to the total number of enterprises ratio (%)
1	The City of Krakow	153.0	9.2
2	Tatrzański	140.0	7.7
3	The City of Nowy Sącz	110.2	10.2
End of table 5.			
No.	County	Entrepreneurial activity ratio (local residents) – the number of enterprises/1 000 inhabitants	Construction business enterprises to the total number of enterprises ratio (%)
4	Wieliczka	101.8	14.9
5	Olkusz	101.2	11.5
6	Wadowice	98.7	13.7
7	Krakowski	96.2	14.1
8	The City of Tarnów	95.5	9.5
9	Myślenice	90.9	18.2
10	Suski	89.2	14.6
11	Chrzanów	89.0	13.3
12	Oświęcim	88.0	12.2
13	Miechów	82.0	12.5
14	Nowy Targ	74.7	14.5
15	Proszowice	68.7	14.3
16	Limanowa	67.7	25.3
17	Gorlice	67.2	23.7
18	Nowy Sącz	65.3	26.3
19	Brzesko	62.7	23.5
20	Bochnia	60.7	19.5
21	Tarnów	52.9	19.8
22	Dąbrowa	49.3	14.9

Construction businesses are typically located in areas reporting a relatively low entrepreneurial activity in the south-eastern part of the Małopolska Region, which is economically weaker and less industrialised, with a lower living standard (Województwo małopolskie, 2012; Development Strategy of the Małopolska Region 2011–2020; Płaziak, 2004). One could conclude that this type of business is an alternative employment opportunity for residents,

who cannot find jobs in other economic sectors. This fact is excellently proven by the counties in the central and north-western part of the region, more industrialised and urbanised and, consequently, offering more opportunities for different types of businesses, i.e. containing the agglomeration factor (a factor important for location of enterprises) (Krugman, 1991; McCann, 2001; Fujita, Thisse, 2002; Karlsson, Johansson & Strough, 2005), as well as by counties which specialise in tourism (Tatra County) or agriculture (Proszowice, Miechów). It is not an overstatement to say that the not highly industrialised and specialised counties specialized in construction. These would be counties in south-eastern part of the region, i.e. Nowy Sącz, Limanowa, Gorlice and Brzesko.

The second analysed factor was the cubic capacity of buildings accepted for use in m<sup>3</sup> per 1000 inhabitants in 2011. The authors assumed the value of the ratio as the size of the potential sales market within the borders of the Małopolska Region for construction enterprises in the region. No direct link between location of construction enterprises and the potential sales market was found. It was confirmed by a low negative correlation (-0.29) between the location of construction enterprises and their potential sales market (Figs 3 and 4).

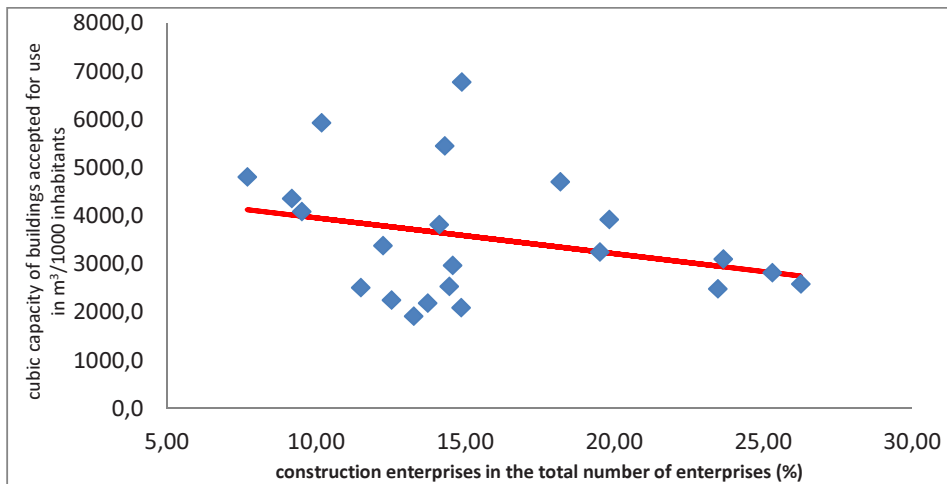


Fig. 3. Correlation between location of construction enterprises and their potential sales market in the Małopolska Region, 2011 year (prepared by authors)

The largest sales market for the enterprises in the Małopolska Region is the central part of the region, i.e. the city of Kraków and its counties. Wieliczka, Proszowice, Myślenice, Tarnów and Kraków. Tatra County occupies a very special position here, as it demonstrates a very high degree of specialization in tourism, generating high demand for construction services.

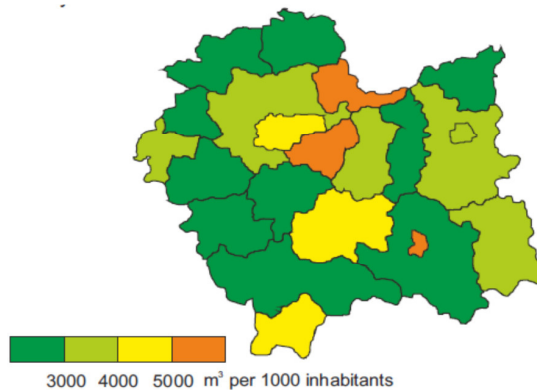


Fig. 4. Cubic capacity of buildings accepted for use in the Małopolska Region, 2011 (prepared by authors)



In line with the classical location factors, the sales market plays an important role in locating an enterprise (Fierla, 1998; Kupiec, 1999; Wieloński, 2004; Domański, 2011). Earlier pilot questionnaire research run by the authors showed that entrepreneurs from the construction sector in the Małopolska Region also indicated that the factor was important when deciding about location of an enterprise in the economic space (Fig. 5).

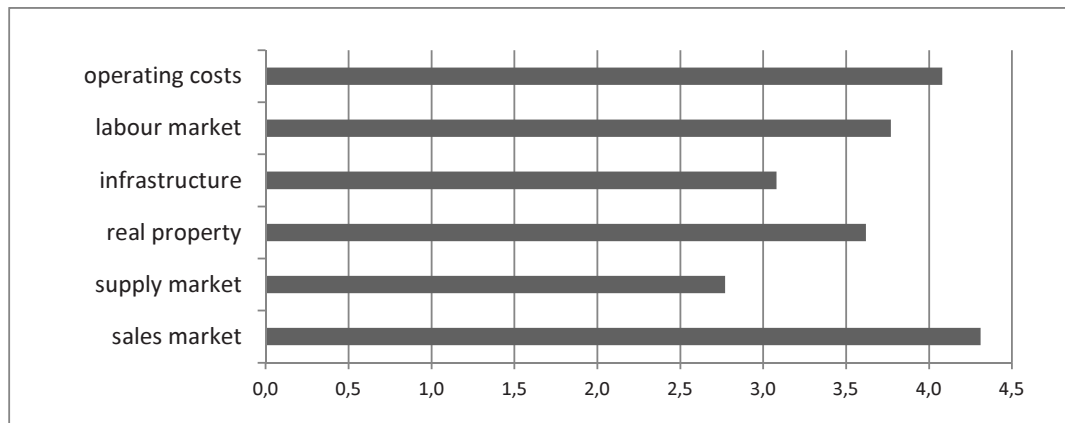


Fig. 5. Importance of traditional factors considered in location of construction enterprises according to the construction sector entrepreneurs in the Małopolska Region (prepared by authors).

However, the analysis discussed here does not confirm this observation. It turns out that the sales market, declared a major business factor by respondents (for the purpose of this research defined as the cubic capacity of buildings accepted for use), is wishful thinking at the very best. According to the size structure of construction enterprises in the Małopolska Region, described above, micro and small enterprises prevail in the region. Such small entities are typically registered at the place of residence to reduce business costs, somehow detached from the potential sales market.

## 5. Summary

The Małopolska Region shows a relatively high proentrepreneurial attitude of its residents and the construction sector's role here is very important. Still, according to the analysis, a geographic increase in the entrepreneurial attitudes of residents does not followed by any increased entrepreneurial activity in the construction sector. To the contrary, a reverse trend was found: in counties reporting a high level of entrepreneurship, the share of the construction sector was relatively low and vice versa – it was rather high in areas reporting the ratio at its low. The specialisation in construction of the “less entrepreneurial” counties in the south-eastern part of the region is a resultant of a low, when compared to the rest of the region, development of the enterprise agglomeration factor as well as absence of any other specialisation in the area, e.g. tourism, as it is the case in Tatrzański County. The fact that entrepreneurs from the south-eastern part of the region, in particular counties: Nowy Sącz, Limanowa, Gorlice and Brzesko) specialize in construction industry results from a lack of alternative employment options. The size structure of construction enterprises indicate that micro and small enterprises prevail, which is related to a large share of the self-employed in that particular sector.

The above-mentioned substantial share of micro- and small enterprises in the total number of construction enterprises in the region results directly from a poor link between their location and the potential sales market, here defined with the cubic capacity of apartments admitted to use. However, note that the sales market is predominantly mobile for construction enterprises and it responds to ever-changing location of construction sites and, even for this reason, any straight forward reasoning about the importance of the factor is difficult.



To sum up, an analysis showed the inverse relationship between the level of population entrepreneurial activity and taking a business in construction sector in Małopolska Region. It was found also that there are no direct interdependencies between the location of the construction companies and proximity of potential sales market. However, it should be noted, that the issue is more complex as it should be considered depending on the distance between a location of an enterprise and its sales market and in the context of the maximum distance that the owners and, in particular, employees, will be able to cover daily when commuting to work. Furthermore, let's not forget the personnel factor of a decision on location which, in case of smaller size enterprises is certainly important, even though an entrepreneur's interest to operate actively in an area located far from his business location or business seat. There is also an important tradition of running a business in a location as well as many other circumstances, including the general business climate of a location. At the next stage of the research, the authors will analyse other factors important for location of construction enterprises.

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