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Pole cities: economic development enhancers and limits. Case of two Hungarian regional centres

Abstract. Pecs and Szeged, two Hungarian Pole cities (refers to F. Perroux's Growth Pole Theory) in the top-down initiative Hungarian Pole Programme are examined in this research. The Pole cities which have been appointed to the Programme are those regional centres of Hungary where significant public and private companies, chambers, civil organisations, municipalities, universities and R&D institutions operate.

The analysis carried out for years 2013-2014 has shown that the simulation of multiplier effects in the regions of the two cities was limited due to the relatively low level of the for-profit enterprises participation in the examined Programmes, limiting the increase of employees' income level in the cities where Universities are the most influential factor in local economic development.

We conclude that the Pole Programme itself was not the ultimate victorious strategy to decrease the regional disparities in Hungary. In the near future, economic Programmes must focus on how the local industries can relate to other industries and through productive consumption enhance the regions' well-being.

Keywords: Economic Development; Cohesion; Growth Models; Hungarian Pole Programme; Productive Consumption

JEL Classification: R00, R11

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Міста-поліуси: стимули та обмеження економічного розвитку. На прикладі двох угорських регіональних центрів

Анотація. У цьому дослідженні розглядаються Печ і Сегед, два угорські міста – поліуси зростання (відповідно до теорії поліусів зростання Ф. Перру), у рамках запропонованої урядової Програми розвитку угорських поліусів. Проведений аналіз показав, що моделювання ефектів мультиплікатора в цих двох регіональних містах обмежене через відносно низьку участь комерційних підприємств в реалізації подібних програм. Це стримує збільшення доходів від продуктивного споживання і зростання рівня доходів працівників в тих містах, де університети є найбільш впливовим чинником місцевого економічного розвитку.

Ключові слова: економічний розвиток; моделі зростання; Програма розвитку угорських поліусів; продуктивне споживання.

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Города-поллюсы: стимулы и ограничители экономического развития.

На примере двух венгерских региональных центров

Аннотация. В данном исследовании рассматриваются Печ и Сегед, два венгерских города – полюса роста (в соответствии с теорией полюсов роста Ф. Перру), в рамках предложенной правительственной Программы развития венгерских полюсов. Проведенный анализ показал, что моделирование эффектов мультипликатора в этих двух региональных городах ограничено из-за относительно низкой степени участия коммерческих предприятий в реализации данной Программы. Это сдерживает увеличение доходов от производительного потребления и рост уровня доходов работников в тех городах, где университеты являются наиболее влиятельным фактором местного экономического развития.

Ключевые слова: экономическое развитие; модели роста; Программа развития венгерских полюсов; производительное потребление.

Introduction. Parallel to the spread of globalization, attention to the economic growth of regions has revived (Csete & Szabo, 2014 [1]; Martin & Sunley, 1998 [2]). Often factors which influence economic development (capital flow among countries, delocalization of international enterprises, remittances) are not under the control of governments (Csete & Szabo, 2014 [1]; Shera & Meyer, 2013 [3]). Consequently, there is a need to design, choose appropriate tools for promoting local economy in order to attract these exogenous factors. Governments are

expected to ensure the rational rate of the natural environment transformation (supply of biosphere resources to mankind) to man-made capital, since it provides a stable base of living (Costanza, 1991 [4]; Daly, 1994 [5]; Meadows, Randers & Meadows, 2004 [6]; Szendro, Csete & Torok, 2012a [7]). Due to the globalization, the role of transnational unions, cooperation, and agreements ascends in advancing economic growth in member/associate countries. Let us consider the European Union, and its Regional (Cohesion) Policy what is dedicated to

reducing regional disparities among member states aiming to strengthen economic-, social-, and territorial cohesion (European Commission, n.d. [8]). The convergence performance – the progress of integration of new EU Member States – is expressed by the catch-up potential (or catch-up capacity), which is the growth premium derived from the growth rate of the convergence country, continuously exceeds the one of the developed countries (Halmai & Vasary, 2012 [9]). The widely used indicator for assessing the convergence performance is development of GDP per capita.

In 2004, Hungary has become a Member State (MS) of the EU, it got a chance to promote economic development both through the system of the four freedoms and access to EU funds. The Hungarian convergence performance developed moderately: from 2002 to 2012 the GDP per capita in PPS Index (the percentage of Hungarian GDP per capita of the average of the EU 28 countries) developed by 6% and was lower than the European average in the period. In 2012, the GDP per capita was 67% of the European 28 countries' average, the same value as of Latvia, which value was 20% lower than the Hungarian one in 2002 (European Commission – Eurostat [10]).

The reason of the particular Hungarian development is the special structure of the economy which is rooted in Hungarian history: the age of Dual Monarchy (started with the Austro-Hungarian Compromise in 1867) when due to the competition with the Austrian capital (Wien), the main focus of spatial development was the capital city; approximately 2% of the National Income of the Kingdom of Hungary was spent on community and infrastructural ameliorations in the capital (concentrating 60% of the public investment stock to the city where 5% of the population lived) per year between 1890 and 1914 (Illes, 2009 [11]). The economic environment of the country in the recent regional development economic literature is described as follows: the territorial hegemony of the capital, increasing differences between the capital and rural areas, emergence of the «West-East decline», variant development patterns of micro-regions and settlements (Dusek, Lukacs & Racz, 2014; Nemes Nagy & Tagai, 2011; Obadovics, 2013; Penzes, 2012 as cited in Csete & Szabo, 2014 [1]; Csete, Palvolgyi & Szendro, 2013 [12]). Aftermath the Hungarian spatial development has two main purposes: strengthening the rural communities' (territories outside the capital) economy, improving the population retention and enhancing their competitiveness (1); and promote those territories where flagship enterprises are located thus can improve the functioning of the local economy (2). This approach resembles to the holistic approach described in the EU Sustainable Development Strategy that environmental protection, social cohesion and economic growth must be developed collaterally (Csete & Horvath, 2012 [13]). Consequently the development aims must support the improvement of regions' adaptive capacity to ensure regional resilience in social structures, natural environment, institutional framework and economic background (Szendro, Csete & Torok, 2014 [14]).

In the fourth Programming period of the European Union (2007–2013) the Hungarian Pole Programme was introduced to promote economic growth, development within the country and offsetting the territorial hegemony of the capital.

The Programme has appointed seven cities as main focus points of economic development (Figure 1), which are basically the regional centres/centre cities of all the seven NUTS-2 regions in Hungary: Budapest, Miskolc, Debrecen, Szeged, Győr, Szekesfehervar-Veszprem, Pecs (Bendo, 2010 [16]).

In our research we examine two Pole cities: Pecs; the «*Pole of quality of life*» (responsible for the *cultural and environmental industry's* development) and Szeged; the «*Biopolis*» (associated with the *healthcare, environmental, agricultural, bio-technology industries'* development). Firstly, we provide a short overview of the theories growth, highlighting theoretic background of the Pole Programme. Secondly, we implement a situation analysis of the two cities regarding the population patterns and economic activity. In order to position the cities on national level, we examine how many enterprises were located in the cities among the 500 companies with best sales performance (TOP 500 list) according to the list published in HVG

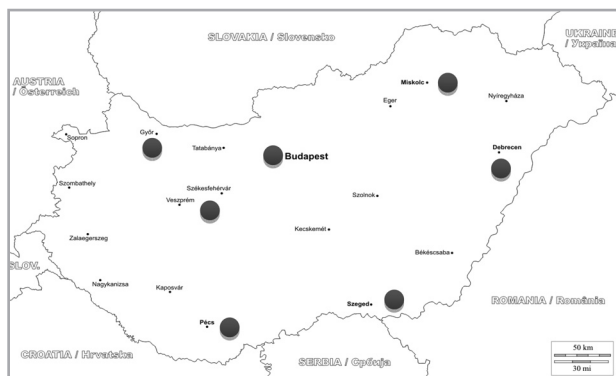


Fig. 1: Hungarian Pole Cities

Source: Own compilation. The map is retrieved from [15]

(Heti Világgazdaság – a dominant economic weekly review in Hungary) in 2013. Taking into account their Pole role, we analyse two Programmes in 2007–2013 period: we look at the structure of nine call for proposals, available in the Green Economic Development Programme (2013–4013), and examine for which purposes grants have been used. Also, we review the ten largest projects in Science–Innovation Programme (2013–4013) and examine how the fund is distributed among different local participants: universities, for- and non-profit organizations with respect to the share of own contribution they provided in relation to the total amount. The two Programmes have high importance in the cities' future development as the human capital and the natural environment are those endogenous factors which affect the possible inventory of economic tools ensuring sustainable growth (Szendro, Csete & Torok, 2012b [17]).

In order to analyse the enterprises of Pecs and Szeged, in the range of the TOP 500 list and MS excel database based on the weekly's list, we identified the enterprises location on NUTS-3 level (as there was a statement in the weekly review) then we checked the company seats resulted the sample of enterprises from the TOP 500 list in Pecs and Szeged. To analyse the Green Economic Development Programme (2013–4013) and Science–Innovation Programme (2013–4013), we collected data from the website of the Hungarian Government and elaborated MS excel data pool by which we were able to carry out the research. For collecting general data about Europe and Hungary, we used data from Eurostat and Hungarian Central Statistical Office.

Purpose of the article is to examine the effectiveness of the Pole Programme in the two selected cities; to find out how the industries which have been chosen as development priorities support regional growth, and how the organizational structure of the local economy influences utilization of development funds.

Brief Literature Review. How economics grow? Will regions of different economic performance converge or diverge to each other in long term? These are question to which interest has revived since the mid of the 20th century. In neoclassical equilibrium, economics convergence among regions derived from the lack of barriers to the operation of market forces. One of the most influential statements supporting this theory, published in 1965, is Williamson's analysis of the evolution of regional income differences in advanced industrial countries. While in equilibrium economics the convergence of regional incomes over time is a consequence of that inequalities stimulate self-correcting movements in prices, wages, capital, labour; divergence models argues that economies of scale and agglomeration (concentration of large number of enterprises within the same geographical location) lead to the cumulative concentration of the capital, labour and output in certain regions at the expense of others. Authors of divergence-type growth models are Perroux (1950, 1955), Myrdal (1957), etc. During the mid-1980s, the neoclassical growth model was reviewed again from the returns of capital point of view. Concerning production theory, neoclassical growth model considers diminishing returns to scale, consequently an economy in mature state reaches its limits of growth and mobile production factors flows to such (undeveloped) regions where the returns are higher due to the scarci-

ty of them. Since the model considers technology as exogenous the long-term growth becomes exogenous as well. Endogenous growth theory state the opposite regarding economies of scale (main factors: agglomerative advantages, big market sizes, human capital, knowledge, endogenous technology and innovations), it introduces increasing returns through disparities are conserved in spatial economy. (Csete & Szabo, 2014 [1]; Martin & Sunley, 1998 [2]; Halmaj & Vasary, 2012 [9]).

The Hungarian Pole Programme could be linked to Perroux Concept of Growth Poles which are the concentration of such highly innovative and technically advanced industries that are able to stimulate economic development in linked businesses and industries through productive consumption. The wished effect of growth poles on regional growth is the strong multiplier effect they initiate if they prefer local products and services to procure. As the income increases in the territory, the consumption structure of the consumers becomes more diversified, the increasing demand and improving purchasing power attract more and more participants of the market economy. The cumulative processes increase concentration and provide more favourable conditions to enterprises. Myrdal's Circular Cumulative Causation Model (1957) accepts growth poles as initiators of economic development in regions, but calls the attention to that the structure of the economy affects their effectiveness. The Pole cities which have been appointed in the Programme are those regional centres of Hungary, where significant public and private companies, chambers, civil organisations, municipalities, universities and R&D institutions operate. We suppose if the Pole positions of the cities are in accordance with their economic structure, then, funding mechanisms promote innovative, developing sectors/participants, supporting, consequently, the convergence of incomes.

Results. Pecs; the «Pole of quality of life» (responsible for the cultural and environmental industries' development) and centre of the Southern Transdanubia NUTS-2 region, is the 5th largest city in Hungary with 156,049 inhabitants. It is located on the slopes of the Mecsek Mountains and represent the defence-driven location decision. Szeged; the «Biopolis» (healthcare, environmental, agricultural, bio-technology industries' development) and the centre of Southern Great Plain NUTS-2 region, is the 3rd largest city in Hungary with 168,048 inhabitants. It is situated next to rivers, representing the beneficial combination of different land use model (HCSO – Hungarian Central Statistical Office, 2013 [18]; Szabo, 2012 [19]). The populations' economic activity shows similarities in the two cities: approximately 40% of the population is employed, the share of inactive beneficiaries is around 28%, the share of dependents from the population is 27% and unemployed people are about 5% (a bit higher in Pecs than in Szeged) of the population. The distribution of employees among sectors is the following (HCSO, 2013, p. 9. [18]): the most significant sector is Education (Pecs: 25%, Szeged: 23%), then Industry (Pecs: 17%, Szeged: 19%), then with a slight lag goes Public services (Pecs: 16%, Szeged: 15.5%), Commerce (Pecs: 11%, Szeged: 10%), then Transportation and Warehousing (Pecs: 9%, Szeged: 9%), and Health services (Pecs: 6%, Szeged: 2%), Building Industry (Pecs: 2.5%, Szeged: 2%), and Agriculture (Pecs: 1.5%, Szeged: 2%) are trailing the list (there is also «Other», miscellaneous economic branches' category; Pecs: 12%, Szeged: 17.5%).

From the range of enterprises with the highest sales value on NUTS-2 level, Pecs has enterprises operating in Energy, Retail, Machine Engineering, Transport and Wholesale industries/sectors, while Szeged has enterprises operating in Energy; Food; Construction; Chemical, Rubber and Plastic; Wholesale industries/sectors (Szabo, 2012). On the national level, considering the spatial distribution of the 500 companies with best sales performance (TOP 500 list) published last year in HVG, there were four compa-

nies located in Pecs, and eight companies located in Szeged in the range.

Table 1 shows the companies and their sector with respect to their rank in the TOP 500 list. In order to make the comparison easily implementable, we have divided the TOP 500 list into 5 subgroups of one hundred companies. The Roman numbers indicate the divisions. From the results we can see that Szeged not just has more enterprises in the TOP 500 list, but also has ones with better rank than Pecs. If we look at the sectorial structure of enterprises in the cities, we will see that in case of Pecs the horizontal, service provider companies have strong influence on economic performance (energy, wholesale). From the TOP 500 list, one enterprise operates in production sector, and one in machine engineering. In case of Szeged, the service provider enterprises have a few dominance (energy, wholesale) and the structure of the enterprises belonged to production sector is more diversified (two representatives of the Food Industry and one representative of the Chemical, Rubber & Plastic Industry) furthermore, there is a representative of the Construction sector. The distribution of the industries in production and service sector is crucial from income generation point of view. If the production sector is strong in a specific region, it creates demand for the related branches in the service sector. Return of investments in the service sector requires optimal market size maintained by stable or growing population rate. The more income a region generates the more productive consumption it has, because it is possible to multiply the incomes. If a region satisfies local needs, the savings can be invested in the local economy development (accelerator effect). The reinvestment can multiply the incomes again, if the participants of local economy are related, enhancing the development of the regions. The Pole titles given for the cities as a result of a top-down spatial planning procedure, harmonize with the economic structure of the two examined city. One potential reason of the limitation source in the Programme's application was that the investments, perhaps, did not encourage productive consumption in the region. The other reason is that a top-down-type economic development Programme does not mobilize to high extent local participants to face bottom-up approaches, when the actors of local economy design development and action plans together. To examine how the accession of Hungary to the EU influenced the structure of investments fund amount, we have selected two Programmes which could be linked to the Pole role of the cities. The fourth Programming period, and the first full-time one in Hungary's history in EU, has a speciality: due to the change of the Government in 2011, the National Strategic Reference Framework between 2007 and 2011 is called New Hungary Development Plan, but from 2011 through 2013 it is called New Szechenyi Plan. In our research we investigated two Programmes of the New Szechenyi Plan: the Green Economic Development Programme (as both cities are responsible for the environmental industry development) and the Science-Innovation Programme (testing the dominance of the universities, non-profit and for-profit organizations in the range of beneficiaries). At first, let us take a look at the Green Economic Development Programme (2013–2013). It is impor-

Tab. 1: Distribution of participants (with positions) according to sectors in 500 companies with the best sales performance list (Pecs, Szeged, 2012)

Pécs (rank)					Sector	Szeged (rank)				
I.	II.	III.	IV.	V.		I.	II.	III.	IV.	V.
	191			469	Energy	37, 83	170			
		276			Machine Engineering					
			306		Wholesale			253		
					Food Industry		146	202		
					Chemical, Rubber & Plastic Industry			207		
					Construction				367	
0	1	1	1	1	TOTAL	2	2	3	1	0

Source: Own work based on (HVG, 2013 [20])

tant to note that projects connected to climate change and sustainable energy management have synergic effect on regional development (Fur & Csete, 2010 [21]). The proposals which received fund in the two cities had been submitted to the following nine calls (Table 2) : «Developing the energy performance of buildings and the energy-efficient transformation of public lighting» (A), «Developing the energy performance of buildings combined with the usage of renewable energy sources» (B), «Energy efficiency investments of central government agencies» (C), «Modernization of the energy performance of the district heating sector with the potential usage of renewable energy sources» (D), «Promotion of sustainable lifestyle and consumption – social awareness raising, expert advice» (E), «Renewable energy based electricity, heat and electricity cogeneration and bio-methane production» (F), «Sample project promoting sustainable lifestyle and consumption alternatives» (G), «Satisfying local heating and cooling needs by using renewable energy sources» (H), «Strategic planning and project preparation in 2014-2020 period» (I).

Both cities have the same amount of proposals get funded in the Green Economic Development Programme (2013-4013), though the structure of the proposals is slightly different: in case of Pecs the proposals are more diversified then in case of Szeged. The call with the highest funding in case of Pecs received one submitted proposal (the establishment of Biogas Plant of Pecs), while we can see the reverse in Szeged: twenty projects which have been funded in the call «Satisfying local heating and cooling needs by using renewable energy sources» has the highest share of funds available. In case of Pecs the second largest amount of funding was provided for strategic planning and project preparation for next Programming period, while in Szeged one was funded for improving the energy efficiency of a governmental agency. The two largest calls in the Green Economic Development Programme concentrate in case of Pecs 59.26% of the total fund with two projects from thirty, while in case of Szeged 91.63% with 21 projects from thirty. In the Science-Innovation Programme we have selected the ten largest projects funded in case of both cities.

Figure 2 shows how the fund of the first 10 largest projects in the cities is distributed among different organizations. We can see that the two cities have quite a large difference in the development funds. This is due to that Szeged has been involved in the European Project: Extreme Light Infrastructure (ELI) which is about the establishment of the first structure in the world for studying the interaction between light and matter with ultrahigh intensity laser. In case of the ELI project the beneficiary is a non-profit organization. That is why, according to organizational structure, this segment concentrates the highest level of grant. If we compare the distribution of fund among universities and for-profit organizations, we see that in both cities the Universities dispose higher amount of them. We have analysed how the total cost of the 10 largest projects is financed in terms of grant and own contribution: dominant share of the largest projects were financed with funding intensity of 100%. In total, the share of own contribution to the total

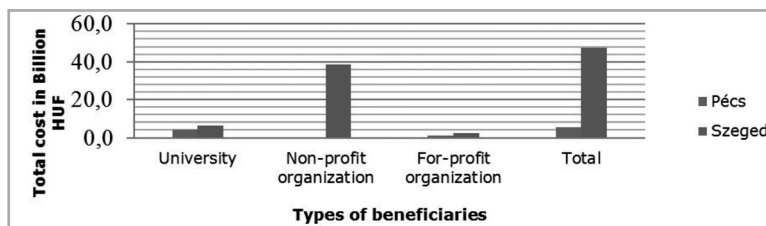


Fig. 2: Hungarian Pole Cities
Source: Ten largest projects' total cost in Pecs, Szeged, Science-Innovation Programme 2011–2013

cost of the ten largest projects is 4.68% in case of Pecs and 4.68% in case of Szeged.

Conclusions. Our results indicate that in the period we investigated (2013–4014) several projects have been realized which can be related to the Pole role of the cities. In Green Economic Development Programme the largest amount of fund has been allocated to the establishment of the Biogas Plant in case of Pecs, while in Szeged projects which serve decreasing the energy dependency of households had the priority. From economic development point of view, these activities are important, but have limited impact on strengthening the supply of labour market in the regions. This is less favourable because convergence requires the local economy's expansion. If we assess the projects which we have taken into consideration in line with the Science–Innovation Programme, we can conclude that the relative dominance of the Universities compared to for-profit organizations indicates that there is lack of either interest or capability of the local enterprises to attract funds for broadening their capacities in the field of science and innovation. This is a loss, since the people graduating each year have limited variety of jobs provided in the cities. The Extreme Light Infrastructure project in Szeged potentially could be a breakout point, but its impact on local economy will be revealed in future. Thus, we can conclude that the Pole Programme itself was not the ultimate victorious strategy to decrease the regional disparities in Hungary. In the near future, economic Programmes must focus on how the local industries can relate to other industries and through productive consumption enhance the welfare and well-being of the regions' inhabitants.

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Tab. 2: Proposals get funded (Million HUF) in Green Economic Development Programme (2011-2013), Pecs & Szeged cities

Code of the call of proposals	Pécs			Szeged		
	Grant	Σ	No.	Grant	Σ	No.
A	247,5	4	4.	0	0	-
B	91	1	8.	170,3	5	3.
C	0	0	-	998,8	1	2.
D	409,5	2	3.	0	0	-
E	179,8	5	6.	125,6	3	4.
F	925,5	1	1.	0	0	-
G	94,2	1	7.	6,6	1	5.
H	200,3	15	5.	2 271,3	20	1.
I	852,5	1	2.	0	0	-
SUM	3 000,5	30	-	3 572,7	30	-

Source: Own compilation based on data from Hungarian Government [22]