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THE EXAMINATION OF THE SUSTAINABILITY OF BROWNFIELD INVESTMENTS PAYING SPECIAL ATTENTION TO PUBLIC POLICIES AND EU SUPPORT¹

Summary

According to the economics of welfare the need (or necessity) for state intervention starts when people experience market failures [Pigou, 1920], the goal and reason for state intervention is usually to develop the welfare of people. Studies of actual state interventions show that not only the market but state interventions can fail as well [Wolf, 1988].

The rehabilitation and revitalization of the unused industrial sites represent new development possibilities and a serious challenge to public policies. The question is how to minimize the cost of industrial changes, when industry has lost its function in some areas and it had a negative effect on people.

In my study I will try to show the value of the effect and success of these policies without which economic growth is impossible, and which make brown field investments sustainable.

In my opinion rehabilitation requires an interdisciplinary approach and one need to pay special attention to the rule of the local and country governance, and the ways of redistribution and financial support both from the European Union and the national state. For long term sustainability it is essential to avert the environmental damage, but without any government help it will not be successful and sustainable.

Keywords: revitalization, public policies, sustainability

Introduction

The most conspicuous accompanying phenomenon of economic growth and development is the structural reorganization of economic function [Szalavetz, 2003]. In this study I aim to unravel the effects of the changes in the struc-

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ture of industry. Since the 1950s industry has had an ever decreasing role in economy, but at the same time there is a proven correlation between the input of processing industry and economic growth [Thirlwall, 2003]. I would like to highlight Schumpeter's work from the economic theoretical framework theories that deal with the transformation of industrial structure, who, when speaking of innovation and new combinations, points out the role of "constructive destruction" in the economic growth: "one perishes and another is formed". At the same time evolutionary economics reminds us of the difficulties posed by "path dependence" which, acting as inertia [Lux, 2010], delay structure change within industry. The industrial life circle theory emphasizes the capital intensity of a given industry, which is accompanied by growing labor-intensity in the downward cycle.

In Hungary the transformation of economy has been enhanced by the transition from planned economy to market economy and brought the flaws of the closed economic system to light. The intensity of development in the once socialist countries was enhanced by a separate economic policy and belated development [Enyedi, 1998]. Gábor Lux [Lux, 2010] includes problems in coordination, an underdeveloped financial sector and the difficult adjustment to consumer market in the list of catalysts.

Regions of industrial depression came into being in the wake of these structural changes in the Hungarian industry as a consequence of meager means and half-baked industrial politics. In 2000 six Hungarian subregions were placed in this category based on the following indicators:

- the ratio of industrial workers was more than 150% of the country's average in 1990;
- between 1990 and 1999 employment in the industrial sector declined;
- the rate of unemployment was above average.

In 2009 Ballabás-Volter added migrational differences (instead of the unemployment rate) to the indicators, thus enlarging the number of subregions to 11. The following indicators were used: in 1990 the amount of industrial and building industry workers was above 45%, the rate of declination of industrial occupation per 1000 inhabitants was above the national average (54%), the annual migration difference between 1990 and 1997 was negative.

The aforementioned categories did not take the newly emerging brownfields into consideration, whose appearance mainly focused in two regions: Northern Hungary and Southern Transdanubia. My main hypothesis is that the existence of such rust belts is in rapport with the development of the economic and social relations in the affected regions.

I suggest taking the size of such brownfields into consideration at determining the boundaries of depressed subregions. All the more since there is a medium correlation (correlation coefficient $r = 0.4347$) between the size of brownfields and the rate of unemployment according to my calculations (2009). Thus I suppose that the prevalence of brownfields and the chance of finding a job for unemployed industrial workers is very low. The chance/willingness to mobility of those working in the secondary segment in the Northern regions is extremely

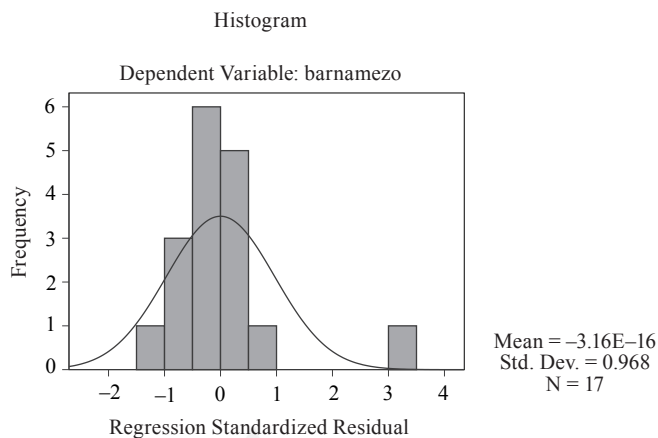


Figure 1. Extension of brownfields

Source: own construction.

limited. The correlation coefficient between brownfields and the migration margin coefficient in Southern Transdanubia ($r = 0.2965$) is somewhat smaller. In this subregion the employees are more willing to commute, as there is a strong correlation between the inland migration margin and the rate of steadily unemployed ($r = -0.5294$). Based on these findings I suggest the integrating the number of steadily unemployed into the indicator system of the industrially depressed areas, too.

International outlook

Whilst constructing my model I studied a few successful international examples. In this study I do not aim to provide an extended international outlook. However, I find incorporating a few relevant examples important, as I aim to depict the revitalizing dimension of the labor market through them, and on the other hand it is not possible to correspond to sustainability without including social aspects as well. The example of Pittsburgh (USA) was the first proper model [Biczó, 2011] where the economic and social aspects were treated and developed equally. The research conducted by L. Babock and M.E. Benedict [Babock, Benedict, Engberg, 1998] proved that the structural change in the county including the city of Pittsburgh yielded different results in the dual labor market. If we interpret the industrial transformation to the point and identify the economic factors on the local level, we must integrate the regional employment policy and the special labor market stimuli into the revitalization. An example of such actions is Aquilippa (USA), where they treated the revitalization of “tired communities” through

social programs integrated into their economic development strategy as a special aspect in a long-term project [Takács, 2004]. In the United Kingdom it was the duty of the regenerating companies founded in industrially depressed regions to institute and coordinate economic and social rehabilitation programs. A splendid example is the Brownfield Internship Program in New York, whose explicit goal is to include deep-rooted local youth into professional training. The aforementioned Aliquippa is also relevant, where they emphasize theoretical and practical education from an early age and teach the children how to reach communal welfare, preparing teens from the age of 12 to settling into the labor market. We can find numerous other examples in brownfields to the special training of the labor force to lessen the rate of migration and provide sufficient human resources to the reestablishment of an ascending economic policy. So far the Hungarian brown-field development policy was not in the spirit of an integrity and synergy-seeking approach.

In the following chart I depict the distribution of industrial workers. From the chart we can read that the rate of industrial workers had fallen drastically in Borsod County. Between 2000 and 2009 the number of people employed in industry has slightly risen in the Southern Transdanubian region.

Table 1. Employment rate of the industrial workers (%)

Empolyment rate of the industrial workers (%)									
	Borsod- Abauj- Zemplén county	Nógrád county	Heves county	Northern Hungary	Baranya county	Somogy county	Tolna county	Southern Trans- danubia	National
1941	5.38	1.96	2.33	9.67	3.21	2.35	1.82	7.37	100
1982	9.29	3.22	2.52	15.03	4.35	2.15	2.14	8.64	100
2000	6.42	3.52	2.38	12.32	2.13	2.37	1.49	5.97	100
2009	5.67	3.32	1.46	10.46	2.94	3.19	1.81	7.93	100

Source: Hungarian Central Statistical Office, own editing.

In Northern Hungary 44.7% of all active workers were employed in the industrial sector, whereas in Southern Transdanubia it was 10% less. The main focal point of Hungarian industry was not only in Budapest but also in Borsod County. For more than 40 years the dominant part of the labor market drew their income from industrial work in Northern Hungary. With such employment levels the number of people commuting to the major industrial centers (Miskolc, Ózd, Kazincbarcika) increased significantly and supported the development or appearance of industrial settlements. The estimated number of commuting workers in the Diósgyőr forge alone was more than 6000. In this region the decline in industrial activities has taken drastic levels.

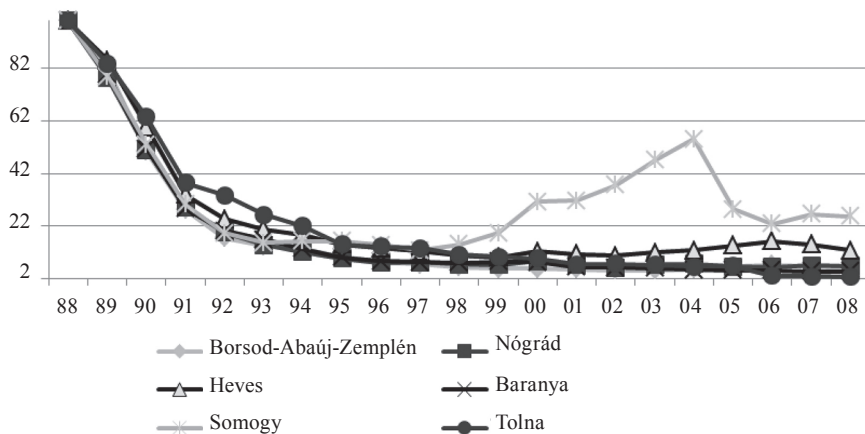


Figure 2. Number of industrial workers based on 1988

Source: Hungarian Central Statistical Office, own editing.

Financing revitalization

In my study I have portrayed how economic and social growth in the subregions is influenced by the presence of brownfields. Upon investigating the regions I assessed the difference of industrial production and the rate of employment in two counties or regions. In the following part I interpret and contrast the dimensions of revitalization in these two regions.

In the 2007–2013 program period the sum for brownfield rehabilitation in Northern Hungary was 4.5 billion Ft and 2 billion in Transdanubia. According to my calculations the affected regions have retrieved the full sum available. In Southern Transdanubia six subregions have retrieved the grants. The correlation coefficient between the grants on the size of brownfields is ($r = 0.796$, $t = 2.76$, level of significance 0.107, $D = 63.3$). We can describe the correlation between the size of the brownfields and the grants in an exponential regressive reckoning. Until 4th October, 2011 in Northern Hungary 4.038 billion Ft has been applied to the rehabilitation of brownfields.

Only ten out of 39 affected subregions could retrieve the grants. An outstanding amount, 1.6 billion Ft was allotted to the region of Miskolc. From the following diagram we can read that the subregions of Bátorfő and Kaposvár should have been entitled to a bigger grant based on the size of their brownfields. Kazincbarcika, Mohács and Siófok received grants above the average in size. In the following diagram I indicated the linear regressive line and the sum of R^2 .

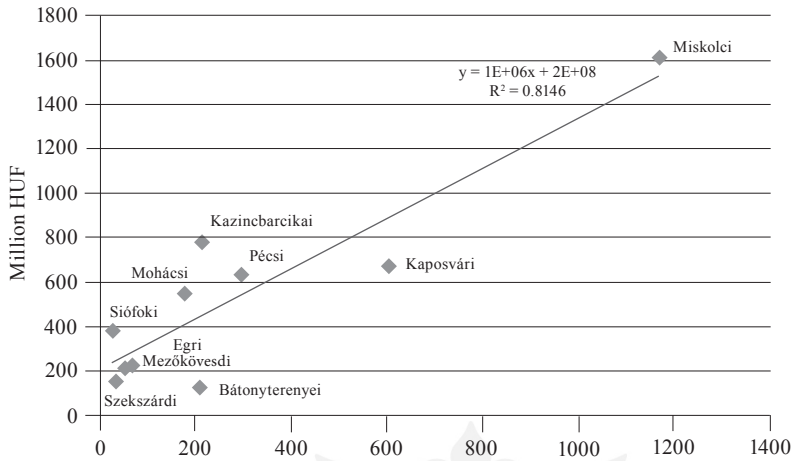


Figure 3. Regression model according to the extension of brownfield and the financial support

Source: own edition.

In the following part I present the revitalization project we have created.

Model creation — based on the case study and on the evaluation of environmental and sociological factors

In my opinion the concept needs to be interpreted broadly, and extended to social processes. In my immediate environment in the labor market surroundings of the abandoned industrial sites the process of social erosion begins. The changes in economic models, the patterns of modernization and the structural changes in the economy leads to erosion in the potentially high employment companies, and it has an effect on the surrounding human capital as well.

The decline in economic activity can be the result of the supply system and lower consumption. We included social capital in the model, because in recent times, particularly economic studies showed that people's life satisfaction and the subjective sense of happiness are an important economic factor. In the area, where the greater part of human capital goes through a time of insecurity and unemployment at the same time, or in a short period of time, the individual's trust in society decreases. The results of unemployment both emotionally and financially, are projected into the economy, and the individual is questioning his belonging to any community and it makes their long term visions questionable. However for real happiness, that is rooted in human personality it is essential to belong to a smaller and wider community. Psychologist Daniel Kahneman received his

Nobel Prize for his economic research, and today is researching the effects of happiness on health and economic development. No solution was developed to handle this situation, there were no special socio-political or environmental policies and the problem was left untreated. Succession; population and activities move out of the area, and the new population and its economic activities can be different and replace the former ones. Another concept similar to succession is a word used in home sociology: filtration. It refers to the fact that over time the residents of homes are changing, poorer people move into the flats, while the former residents gradually move to bigger and better houses. As a result, in the brownfield environment a special circular migration occurs, which leads to less prepared human capital. First, the educated population migrates out, then the social situation significantly deteriorates for the people who stay, and it leads to the decrease of human potential. Due to the exchange the human capital is further reduced.

We extend the concept to the economic dimensions of the current area, in this case to the contaminated, abandoned brownfields, around which the slums are developed. As a result of these findings, from the 1970s and 1980s a number of Western-European and US cities spent serious public money on the restoration of these rundown areas and their revitalization. In Dick et al.'s study [2009] scientists show through UK case studies the characteristics of brownfield investments and introduce a logical model that can help to measure the success of revitalization. In our model below we placed greater emphasis on human resource revitalization. I believe it is not a necessary feature of the environmental rehabilitation of an industrial site. If there is not enough emphasis on social factors it will effect the operations in new industrial structures, and can result in the lack of investors. Bielecka and Król-Korczak's [Bielecka, Król-Korczak, 2010] model introduces the importance of the creation of social places and their utilization. By contrast in our model I believe that these social places are given, during the decades of working existence of the industrial sites the social places were there and helped social cohesion, and the development of social connections. These factors did not change (maybe they amortized) and are present in the examined area. In the beginning of the 21st century after the change of the political system the economic crisis stopped the process of environmental recultivation. The number of areas which were taken out of the industrial production increased. The planned brownfield investments failed. After the decline of industrial production in brownfields; pollution that was caused by the former operation of plants has stopped or has been significantly reduced.

Problems of the environment are not primarily caused by new activities, but the new functions of the area can cause pressure. A much more serious problem is the legacy of environmental damage, including the biggest problem, both environmentally and in urban development, i.e. soil contamination. The bad reputation can remain even after the elimination of the environmental damages; action is needed to rehabilitate the area and to provide all aspects of proper recycling possibilities. Remediation, rehabilitation must always include not only the physical revitalization of the area but also the revitalization of the locals who live there.

The changes in spatial structures can hinder the possibility of complex treatment, and reduce the decision maker's power in the brownfield areas.

These types of changes are expected to continue such as the 'split up buying' of the areas especially where these changes have already started. Thus, in the Northern Hungarian region the privately owned brownfields exceed 58%. Revitalization is defined as "rebirth", "resuscitation". The concept is extended to social and environmental perspectives relating to a certain industrial area's agglomeration and its reuse. On the one hand revitalization is interpreted in a complex way, namely the restoration of the environment, finding new economic functions, and the increased presence of human capital in the employment market. Revitalization is supported by spatial location, being rooted in the urban structure, and accessibility. In addition, the aim of these changes is to allow investors and policy makers to reconcile their long-term interests in utilizing the area. The creation of a more attractive economic and architectural environment, the increase of employment, and the increased production in our hope can lead to a growing revival and revitalization of the area. Here we must mention Wilson and Kelling's [Wilson, Kelling, 1982] theory of broken windows. It refers to the concept that if the architectural environment deteriorates, it has a negative effect on the population's community relations and their need for order.

According to their theory, graffiti, the accumulation of solid waste, the deteriorated buildings that are in need of repair, dilapidated and uninhabited buildings, makes the locals feel vulnerable and refuse to participate in the community to maintain order. In the absence of the adequate rehabilitation of the area a downward spiral process begins, which encourages further migration, increases unemployment, and leads to the appearance of deviant behaviour. Without the involvement of the people actually living in the area revitalization can become more difficult to obtain, and the process can stop easily.

During the social transformation it is worth to have a cost-benefit analysis, and the focus needs to be on the participation of people.

In connection with revitalization, inclusion of the local population and their motivation is emphasized by Bielecka and Król-Korczak [Bielecka, Król-Korczak, 2010]. During their static tests, relating to the revitalization of "rust belts", the following indicators were identified. In their research they analyzed the factors in 5 groups. Social integration and the closeness of buildings were connected to spatial factors of the area and separated from social factors. The environmental factors were separated from the hydro-geological factors and technical factors. Prior to the cost-benefit analyses a quantitative survey is needed. It will support the decision making, and provide the factors on a financial basis. The rehabilitation of the polluted areas, the future usage of the area, the goal of the rehabilitation, can all differ in each decision making alternative. During the revitalization process it is necessary to take into account all the direct costs, which are paid towards the social benefits of the locals, such as the state funded health care costs. Alternative costs can be the following: loss of personal income tax revenue, VAT that is not spent, corporation taxes of companies that

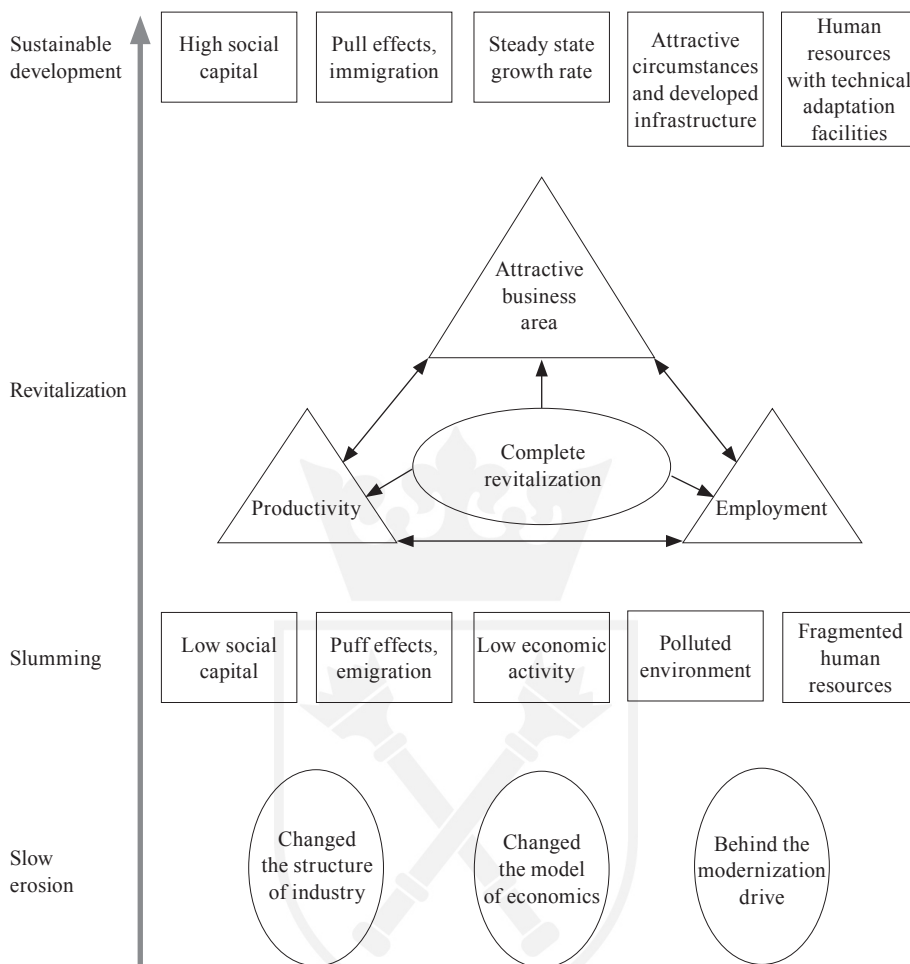


Figure 4. Economic-social model of revitalization

Source: own editing.

did not move to the area. Indirect costs are difficult to calculate, but can be such as: negative reputation, which deters investors, negative bias towards the city, crime, higher education costs of migrants. The resulting benefits of revitalization: rising GDP, increase of personal income taxes after remigration, consumption, corporate taxes of newly settled companies. Further advantages are: attractive landscape culture, structure, competitive human resources, and long-term operation of new companies, who can lean on the already existing industrial culture.

Summary

Despite the fact that literature continually emphasizes the importance of brown-field investments, in practice they do not take the socio-cultural dimension of the revitalization into consideration. In my opinion rehabilitation requires an interdisciplinary approach: Before starting the development of the affected territories it is essential to examine the environmental, economic and social aspects of the brownfield areas and to model these processes from a scientific point of view, including the three pillars of sustainability. The complex evaluation of these underused territories could give important information for regional development, especially in the regions where industrial territories have high potential in human resource, but have lost their function which caused permanent decline of economic performance. Due to the structure change in industry, perpetual job terminations and the steady decline of industrial produce assisted by inflation have led to the emergence of a depressed area, and the economic crisis has only worsened its situation. Targeted interventions which take the ratio of the steadily unemployed and the rate of migration into consideration are needed to revitalize and set the depressed areas on a new growth path.

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