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Stanislav ENDEL¹, Eva WERNEROVÁ², František KUDA³**DECISIVE FACTORS OF CONTEMPORARY URBAN ECONOMY****Abstract**

Urban economy is a field which is currently not too reflected among the professional public. However, it is a significant criterion for the planning of future urban development. The representatives of each domicile should be interested in what resources are invested into the development and operation of their municipality. Suitably applied tools and regulations can control urban development and the overall financial operation of a town, and make operations more efficient. This article tries to point out the main factors which presently substantially negatively impact the overall urban economy of municipalities.

Keywords

Urban Economy, Brownfield, Suburbanization, Land Usage.

1 INTRODUCTION

The forefather of urban economy is W. Alonso, who states in his book, *Location and Land Use* [2], that urban economy deals with the study of towns and urban areas in terms of their most efficient utilization, the evaluation of, for example, the economy of urban development; further, it examines the costs of operating public transport or the location of production facilities in the town with respect to offer and demand. Urban economy is closely linked to regional economy, which addresses the said issues on a broader scale in light of urban regions [11, 12].

Another definition states that territorial (urban) economy tries to understand and explain towns and regions as spatial economic systems in which the respective entities try to maximize their profit by utilizing the potential of land whose development they can affect. Subject to this definition, urban economy is divided into so-called positive and normative forms. Positive urban economy tries to explain how the respective components of urban systems interact and how towns function. Town planners can, with a greater degree of certainty, predict future urban development and also assess the impacts of newly planned building-up. Town planners focus on the direct effects, as well as indirect effects, often unexpected and undesirable [13].

Normative urban economy deals with the principles of how town planners should act during the planning of towns and regions, what principles they should observe and what they should strive for. However, this field is currently not elaborated on in much detail [13].

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From this introductory statement it is clear that one of the decisive factors of the overall economics of development is transport distance. In each town the daily volume of traffic is enormous, whether it is passenger or cargo transport. It is clear that shortening transport distances, while maintaining overall urban comfort, could achieve significant savings, partly of the actual transport costs (fuel, transport vehicle depreciation, etc.), and partly of transport time. Even this saved time can be converted to financial units because previous sociological research has shown that the average household values one hour lost to travelling at approximately 25 – 33% of its net hourly income [13].

As the urban technical infrastructure is often routed along similar routes as transport infrastructure, shortening transport distances can also lead to savings in the area of building and maintenance of utility networks. This measure also achieves savings in energy operating losses [10].

Overall, it can be said that the quality of the urban economy of a domicile is most significantly affected by its compactness. Unfortunately, today's towns have numerous processes and impacts which strongly disrupt this compactness and thereby compromise the urban economy of present domiciles. The following overview shows the most important factors.

2 THE ORIGIN OF BROWNFIELDS

It is evident that brownfield areas significantly disrupt the overall compactness of a domicile. Old, desolate and unused areas are de facto useless in its structure and occupy extensive areas (See Fig. 1). These areas often require operational circumnavigation, which leads to inefficient domicile operation.

Generally, it is said that the regeneration of brownfields is 1.5 – 2 times more expensive than building a similar project on a greenfield [8]. However, these deliberations consider only the immediate capital expenditure and do not look at the subsequent overall operation of the respective area. As a result, the town is developed by expanding its urban footprint, while extensive unused areas become dilapidated in the urban area [1]. In this respect, it must be said that new urban developments are often built on high-quality agricultural land.

Based on the inventory of brownfields, statistical data show that desolate areas take up 3-20% of the development areas of a domicile [4]. Therefore, it can be presumed that, in the case of urban development through brownfield regeneration, the urban area could be reduced by 3-20% while maintaining all current standards. Such a spatial saving would mean a shortening of the distances in towns, saving of time and also costs for building and operating the transport and technical infrastructure [18]. Therefore, the considering only immediate capital expenditure when contemplating brownfield regeneration proves to be short-sighted.



Fig. 1 – Example of brownfield in the city centre

On the other hand, it must be said that the increased costs of operation of transport and technical infrastructure burdens mainly the public budgets. It would be illusory to think that a private investor would be prepared to invest its resources into the regeneration of a brownfield for saving public funds; such an altruist is really difficult to come by [16]. Therefore, it is the task of the public sector to sufficiently motivate investors to regenerate brownfields. One of the methods is most certainly legislative support, whether in the form of laws, regulations or government documents. Unfortunately, the Czech legislative environment is still very backward in this respect, even though calls for improvements of legislative support in the field of brownfield regeneration have been prevalent in literature since 2003! [9] Moreover, one can find several foreign examples of legislative measures which are functional in the long-run [3].

Another possibility is also the co-funding of regeneration by the private sector. In this regard there is either the option of direct support or a system of subsidies. The subsidy systems have been very widespread in recent years and provide investors with a relatively good chance of partially funding regeneration from public resources. As stated above, these resources gradually return to public coffers in the long-term and this method can be seen as correct [6,7].

3 SUBURBANIZATION

The term suburbanization means the moving of population and urban activities from densely populated town centres to the peripheries. In this respect, some authors, e.g. [14] define so-called peri-urbanization, which is used to define the moving of the population from towns to smaller nearby domiciles, which, however, are not related to the central town administratively. Due to the suburbanization processes the development space of towns is expanded without an actual population increase. Specific types of developments originate in the peripheries of towns, mainly houses and complementary transport and technical infrastructure. The general public often calls these parts “satellite towns”; nevertheless, it must be stated that town planners use this term to mark any town which does not contain a production function, regardless of its location. Suburbia is built by big developers whose primary goal, of course, is to maximize profit. Such developments of the past often lack in public areas and other civil facilities. The only acceptable connection of the inhabitants with shopping, entertainment, relaxation and other areas is by car. English literature calls this situation “urban sprawl” (translated as “domicile mush”). In the not too distant future they expect significant demographic problems in these areas due to the ageing of the inhabitants, their decreasing mobility and reduced ability to drive private cars.

With respect to urban economy the actual process of suburbia development can already pose a problem. A frequent scenario in these new zones is the building of transport and technical infrastructure, the plotting of land and subsequent sale of land to final owners and future users. The actual building of buildings is then left up to these owners and, quite often, we can come across situations where only half the buildings are completed in a street while the remainder are either in progress or building hasn’t even begun yet (See Fig.2). Therefore, the infrastructure is operated much earlier than the whole capacity of the area is used. This means that, at the time of full utilization of such locations, the infrastructure has already partially degraded and its renewal will have to be funded much earlier.

In the case of peri-urbanization the whole situation is complicated even more by the fact that the originally small domicile in the background of a big city is not always prepared to accommodate a larger number of inhabitants in a relatively short time. The whole situation can then result in the need for a one-off high investment necessary to maintain the living standard of the inhabitants (e.g. building new higher-capacity water lines). A similar situation applies to commercial and industrial suburbanization.

The negative impact of suburbanization on urban economy processes is unquestionable. This phenomenon doubtlessly disturbs the compactness of domiciles and substantially burdens public budgets from which the development of transport and technical infrastructure is funded, public transport introduced, etc. [15]. For the inhabitants of suburbia this situation means increased transport

costs, which also correlates with the higher consumption of energy from non-renewable resources, which does not conform to sustainable development [17].



Fig. 2 – Example of underexploited suburbium (source: www.mapy.cz)

Unfortunately, it is very difficult, if not impossible, to change this situation. The dream for a considerable part of the population is a house on the periphery, with a garden, clean environment, problem-free parking, and picturesque surroundings, and town planners can hardly convince them of the opposite of this illusory idea. Only once some of them fulfil this dream do they find out that this dream is not exactly idyllic due to the large number of buildings in a relatively small area, that every day they will spend tens of minutes or an hour in the morning and evening traffic jams, and that free-time opportunities in suburbia are practically non-existent. The only tool which could at least partially eliminate suburbanization is land planning. However, not even here can one in the future expect positive developments, because municipalities, in their effort to bring to suburbia more inhabitants and thereby increase tax income, often demarcate more new areas for residential developments even though it is clear that some of them will never be realized.

4 SELECTED TYPE OF DEVELOPMENT

Historically, urban areas were divided into three basic categories (sometimes called basic urban areas): squares (open space), streets (spaces enclosed from both sides) and quays (a space enclosed from one side). With the onset of functionalism this trend was infringed upon. The functionalist method of development subsists of locating isolated, usually monofunctional, high-rise buildings into an area where, due to compliance with hygienic standards (especially lighting and natural lighting of residential rooms), extensive green areas belonging to “nobody” are developed around these buildings and basic urban spaces are therefore not created [5]. Parts of these free areas are used for transport (parking, pavements) and recreation (children’s playgrounds, benches). However, the majority of these areas remain unused and their maintenance is once again the task of the public sector and its budget. Research and calculations have shown that the same density of population of a certain area, as in the case of high-rise developments, can be achieved by low-rise residential developments (approx. 3-4 floors [14]), whereas buildings can be situated closer together and can form classical street spaces. The situation can be improved further by designing polyfunctional developments and locating non-residential functions into the lower floor of buildings [14].

During development of family houses the degree of development economy is also decided by the selected type of development. The most economical is, of course, the development of town houses, or atrium houses, which is not too prevalent under our conditions. If the widths of land plots adjoining an access road are compared, it is clear that the width of a plot for an isolated house is about 30 m (considering a total plot area of 900 m² and a square plot shape), whereas the plot width of a town house is about 7 m according to current house developer catalogues. With respect to the building and maintenance of the traffic and technical infrastructure in the given area, town house development is about four times cheaper than building isolated houses. This higher degree of development economics is, however, counterweighted by less privacy. As a high level of privacy is a frequent requirement today of people contemplating purchasing a house, there is a much greater demand for isolated homes, and new development projects reflect this by building such new houses and we see far less town houses and almost no atrium houses at all. Even in this case we cannot expect a significant improvement in the situation.

5 INTENTIONALLY UNUSED AREAS INSIDE TOWNS

Besides brownfield areas, we quite often see in town centres areas whose use is complicated by some objective issue. Such issues can be, for example:

- Undermined areas.
- Inclusion of areas in a flood zone.
- Territorial limits (protective zones, Ecological Land Stability System, etc.).
- Complicated terrain relief.
- Issue of construction stoppage.
- Specific plan of owner.

Even these areas negatively affect the urban economy and are often represented abundantly in domiciles. However, unless the reason for their use passes, the situation cannot be resolved.

6 CONCLUSION

From the above overview it is clear that there are numerous factors affecting the overall urban economy. If these factors could be eliminated, it can be presumed that, due to an increase in the compactness of domiciles, the overall urban economy would also significantly improve. Unfortunately, numerous defined processes occur spontaneously and are almost uncontrolled. The aim of this article isn't to propose specific measures for improving the urban economy of our domiciles but, rather, to draw attention to this problem and initiate a broader debate, because the urban economy issue is currently not a top priority for today's town planners, even though it is very important for the future development of our towns.

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LITERATURE

- [1] ALBERINI, A. et al. The Role of Liability, Regulation and Economic Incentives in Brownfield Remediation and Redevelopment: Evidence from Surveys of Developers. In: *Regional Science and Urban Economics*. Volume 35, Issue 4, Pages 327-351, ISSN (Online) 0166-0462, DOI: 10.1016/j.regsciurbeco.2004.05.004, July 2005.

- [2] ALONSO, W. *Location and Land Use*. Boston: Harvard University Press, 1964, 220 pp. ISBN 978-0674729568.
- [3] AMEKUDZI, A. & FOMUNUNG I. Integrating Brownfields Redevelopment with Transportation Planning. In: *Journal of Urban Planning & Development*. Volume 130, Issue 4, Pages 204-212, ISSN (Online) 0733-9488, DOI: 10.1061/(ASCE)0733-9488(2004)130:4(204). December 2004.
- [4] BERGATT JACKSON, J. et al. *Brownfields snadno a lehce* [Brownfields quickly and easily]. Prague: Institut pro udržitelný rozvoj sídel, 2004, 78 pp.
- [5] COUCH, C, FRASER, C. & PERCY, S. *Urban regeneration in Europe*. Malden, MA: Blackwell Science, 2003, 234 pp. Real estate issues (Oxford, England). ISBN 0632058412.
- [6] EDWARDS, D. *Best practice guidance for sustainable brownfield regeneration*. Nottingham: Rescue, 2005, 310 pp. ISBN 0-9547474-0-2.
- [7] ELLERBUSCH, F. Brownfields: Risk, Property, and Community Value. In: *Local Environment*. Volume 11, Issue 5, Pages 559-575, ISSN (Online) 559-575. November 2006.
- [8] HISE, R. & NELSON A. C. Urban Brownfields: Strategies for Promoting Urban Brownfield Re-Use At the State and Local Level. In: *Economic Development Review*. Volume 16, Issue 2, Pages 67-72. ISSN (Online) 0742-3713. May 1999.
- [9] KOUDELA, V. Výzkum metod regenerace devastovaných průmyslových ploch [Research of Devastated Industrial Sites Regeneration Methods]. In: *Transactions of the VŠB – Technical University of Ostrava, Civil Engineering Series*. Volume 3, Issue 1, Pages 23-30 ISSN (Online) 1804-4824, DOI: 10.1515/tvsb-2015-0001. July 2003.
- [10] KROČOVÁ, Š. *Strategie územního plánování v technické infrastruktuře* [Town and Country Planning Strategy in Technical Infrastructure]. 1st ed. Ostrava: Sdružení požárního a bezpečnostního inženýrství, 2013, 133 pp. ISBN 978-80-7385-128-6.
- [11] MAIER, G. & TÖDTLING F. *Regionálna a urbanistická ekonomika: teória lokalizácie a priestorová štruktúra*. [Regional and Urban Economy: Theory of Localization and Space Structure] 1st ed. Bratislava: Elita, 1997, 237 pp. ISBN 80-8044-044-1.
- [12] MAIER, G. & TÖDTLING F. *Regionálna a urbanistická ekonomika* [Regional and Urban Economy]. 1st ed. Bratislava: Elita, 1998, 313 pp. ISBN 8080440492.
- [13] MAIER, K. a ČTYROKÝ J. *Ekonomika územního rozvoje* [Economy of Land Development]. 1st ed. Prague: Grada, 2000, 142 pp. ISBN 80-7169-644-7.
- [14] MAIER, K. *Nástroje územního plánování k regulaci suburbanizace* [Town and Country Planning Tools fo Suburbanization Regulation]. In: *Urbanismus a územní rozvoj* [Urbanism and Land Development]. Volume 12, Issue 5, Pages 12-20. ISSN 1212-0855. November 2012.
- [15] RITCHIE, A. & Randall THOMAS. *Sustainable urban design: an environmental approach*. 2nd ed. New York: Taylor & Francis, 2009, 241 pp. ISBN 9780415447829.
- [16] ROYAL, W. *Mining Gold from Brownfields*. In: *Industry Week/IW*. Volume 249, Issue 10, Page 21. ISSN (Online) 0039-0895. May 2000.
- [17] VITKOVÁ, E. *Urbanistická ekonómia ako faktor územného rozvoja* [Urban Economy as a Factor of Land Development]. 1st ed. Bratislava: Slovenská technická knižnica, 2001, 123 pp. ISBN 80-227-1588-3.
- [18] WOJCIK, J. Brownfields Projects Slow as Economy Curbs Funding. In: *Business Insurance*. Volume 44, Issue 38, Page 4. ISSN (Online) 0007-6864. September 2010.