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**Development axes in the new spatial structure of Hungary
The role of the motorway-network in regional disparities**

Main findings of the doctoral (PhD.) thesis

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I. Aims of the dissertation

The aim of my dissertation is to do regional science within the frames of a concrete examination of spatial structure, where I step beyond the question of *how large* are the regional differences of development in Hungary, thus in the thematic framework of this study I rather lay emphasis on exploring *orderliness and spatial configuration*. It was also referred by the phrase “*axes*” in the title meaning not else than searching for *axis-like*, “*linear*” patterns in the country’s spatial structure of development. That is to say I am searching whether settlements and regions close to each other in the *development’s internal space* are also close to each other in the *external (physical) space*, and if so, can any linear or axis-like structure in this dispersion be discovered.

As a starting hypothesis I drafted that these specific spatial patterns do not come off without *premises*, they are rather been *created* by a sort of spatial externalities, namely the presumed *development axes are not separate from the geographical relations of the country*. To my conception such development patterns can be potentially created by elements of physical geography such as rivers, lake shores, or by social creations like borders, railroads, motorways, or even by fair-lines connected to trade routes. If we spend some time on the above mentioned assignment, by all natural and social formation a historic age could be found, when it – probably or even proven – played an important role in the economic life of the country, thus in forming its spatial structure of development. If we consider the not so late turn of the millennium as the historic age and recent Hungary as geographic place, the circle of the potential “development axes” is strongly narrowed: *essentially only the motorway-network* is disposable.

The development and the full range building up of the Hungarian motorway-network acting upon the plans part of the official traffic policy is one of nowadays’ most important question of national public policy. This was clearly reflected in the all-time government’s large scaled documents of development conceptions, such as the Széchenyi Plan and the first and second National Development Plan, or it is just enough to retrace on messages and arguments of last election campaigns: building up of motorways was continuously among the most important questions. Accordingly, if there are axis-like spatial structures in Hungary today, from which we could expect large scaled local development surplus with influences on national spatial structure, then those could only be the motorways.

In the Hungarian political and business life it is obviously expected from the development of the motorway-network, that these investments notably contribute to development of the

concerned regions. In my dissertation I examine, whether the motorway-network has truly got a large scaled influencing power in order to appear as a substantive factor in shaping the country's spatial structure of development.

II. Premises of the research on economic development influences of motorways

In connection with economic influences of motorway-networks there are plentiful on the other hand only too narrow research experiences and results available. This contradiction is basically originated from thematic faults: numbers along many aspects and with the application of high different methodological apparatus researched this field, resulting a relatively wide background of the literature. Although only evanescent part of these works belongs to regional analyses of scientific demand, that is why the mentioned scarcity of usable knowledge is present. A sort of – many times hardly tangible – faults between professional standpoints further structures the relating literature. The “mainstream” (Ajtay – Albert 2004, Bartha – Klauber 2000a and 2000b, Bíró – Molnár 2004, Kálnoki Kis – Molnár 2003, Molnár 1999, Tóth 2005) generally does not or barely formulate discredits concerning economic (regional development) influences of building motorways or large infrastructures: their researches prepared mostly on governmental orders are essentially starting at the point, where this dissertation has its end.

The other basically sceptic system of arguments (Banister–Berechman 2001, Fleischer 2002, Fürst–Schürmann–Spiekermann–Wegener 2000, Ohnsorge-Szabó 2006) got in minority concerning its volume and acceptance in state administration. Professionals representing this approach do not commit themselves to the question without examinations of many respects, mapping of interests and conflicts, or pondering of the expected costs and benefits. This latter stream stands close to me, to that very reason this dissertation has a strong critical attitude. The recited works had great influence on my research approach, as well as on answers of the formulated questions and on the interpretations of the answers. I stress two of them now. One is a large European project from the end of the nineties (SASI¹) with the primer goal to define how transport infrastructure affects regional economic growth in different regional contexts. The largest virtue of the SASI model for me is that it examines the possible influences of transport networks on different fields, separating the changing spheres of regional social and economic processes having connections with each other but also having different sensibilities

¹ Socio-Economic and Spatial Impacts of Transport Infrastructure Investments and Transport System Improvements

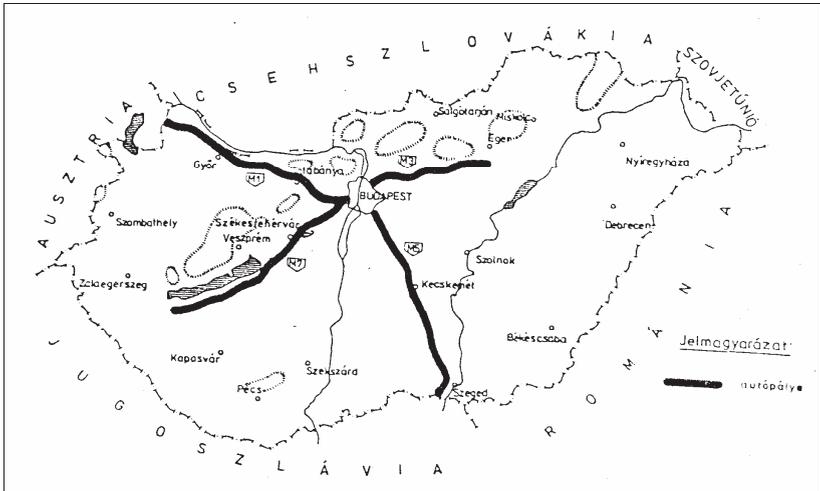
and scales. The other is the paper of Banister and Berechman, who examine whether investments in transport infrastructure *in developed economies* are supporting economic growth. According to their theory a new investment, for instance the construction of a new motorway induce more economic dynamism only when the economic system of the region is opened, namely the economic and political conditions required for development are disposable. This was illustrated by the following figure.

Connections between economic and transport investments	
The economic system of conditions is opened and dynamic	
<p>1. Strong economic self-sufficiency and environment protection</p> <p><i>Transport investments set forth robust invigorating effect</i></p>	<p>2. National and international markets with further development potential</p> <p><i>The already developed transport network is support of development, but not as required condition</i></p>
Accessibility is on low level	Accessibility is on high level
<p><i>Fast transport opportunities contribute to splitting off, but infrastructure development on its own does not result economic acceleration</i></p> <p>Isolated, static regions with lagging behind economic activities</p> <p>4.</p>	<p><i>Even though favourable conditions along corridors further investments have small influences since economic conditions are missing.</i></p> <p>Accessibility limited to corridors of lagged regions, special zones in the neighbourhood of nodes</p> <p>3.</p>
The economic system of conditions is closed and static	

III. Regional economic background of motorway-network plans

Motorway development plans of the 60s and 70s treat *connection to international network* as an accentuated motive, primarily due to traffic reasons. They call attention also on tourism aspects, but mention (traffic) demands of settlement-network development plans and industry development concepts. From the diverse system of factors it is already possible to conclude on capacity shortages of future, however, accordingly it was emphasised that motorway development plans and concepts should be revised and adjusted to supervened changes time by time. According to my research there truly happened modifications on plans, but their application in practice did not take place. *Motorway constructions of today were planned in the 60s and the decisions were made at the beginning of the 70s.*

Planned motorway constructions until 1985 by the 3073/1971. decision of the Council of Ministers



The 1971 National Settlement-network Development Plan (NSDP) had also influence on network plans. In the course of the creation of NSDP, guidelines of the already existing concept of transport policy were taken into account, irrespectively of that in the years after the acceptance of the legislative provision it seemed essential to harmonise transport policy and concepts of regional and settlement-network development. Two main consequences of the NSDP can be highlighted. Firstly, the settlements standing on a higher level of hierarchy are having more extensive spatial connections, while the range of these connections are reducing towards lower classes. Secondly, the highest levelled elements of the settlement-network should be connected by highest levelled roads, while towards lower settlement classes even lower ordered roads are needed. Consequently both transport and regional development plans connect Budapest and the five accentuated superior centres of the country with motorways. By today this idea became completely out-of-date, new conceptions, however, did not take effect: we are building the same and in the unchanged directions as it was dreamed many decades ago by professionals and demands of that time.

IV. Moving forces of differences in the spatial structure of development

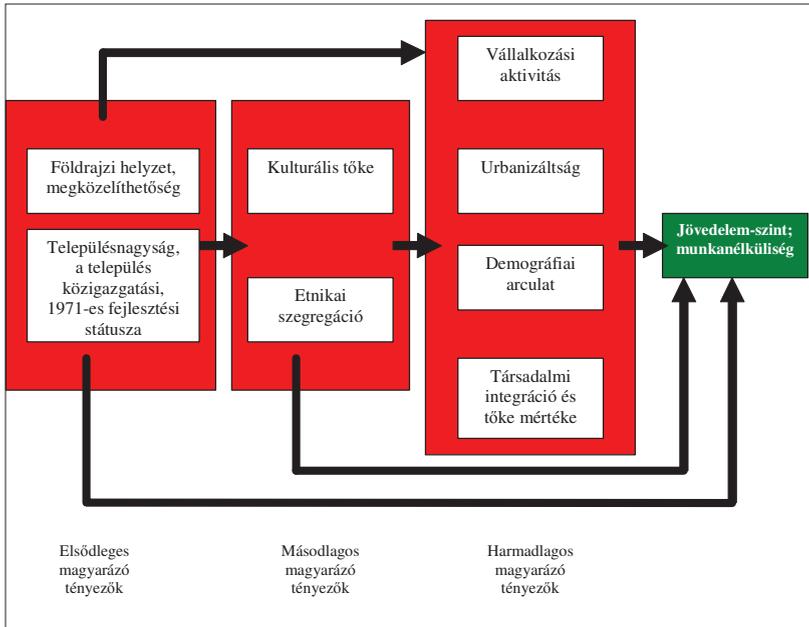
I prepared my empirical examinations on the *level of settlements*, where economic development is identified by two factors, personal taxable income and unemployment. A complete chapter was dedicated to the introduction of regional processes of the last 40 years; a part of my work was composed of the processing of the literature, on the other hand recent characteristics of regional inequalities were interpreted already through my own research outcomes. The approach of my dissertation is throughout quantitative; I searched for answers of questions at almost all cases by the application of *multivariable mathematical-statistical methods*. My examinations – excluding one case study – were prepared on a whole country settlement database. During my work mostly the T-STAR database of the Hungarian Statistical Office was applied, but the electronic versions of the 1970 and 2001 census were also stressfully used. Datasets of time distance on roads are originated partly from Terra Stúdió Kft. (2001) and – by favour of GEONARDO Kft. – from János Péter Kiss (2006).

My main results:

1. Based on literature and on own research experiences – firstly by the application of an information compressing factor analysis, then a K-means cluster analysis – by involving several important factors reaching beyond economic development, I separated characteristic groups of settlements after the millennium. Besides, that among the formed groups several show characteristic scale dependency, it is definitely perceptible from the spatial distribution of clusters, that relatively high economic activity and dynamism is significantly connected to the capital and its neighbourhood, as well as to Northern-Transdanubia, while poverty and relative backwardness appear in contiguous zones in Northeast-Hungary and South-Transdanubia.
2. With the support of some simple, but rather expressive quantitative method I reviewed features of income and unemployment differences. It has been proven that although income dynamics and unemployment are seemingly complementary elements of economic transformation, but from the aspect of regional processes they can be described far not the same. General experience is the “stiffening” of spatial structure in the last years.
3. In the background of the stiffening spatial structure – either by low or high level of regional inequalities – *are standing certainly not short-term, ad hoc reasons, but rather long affecting, traditional regional features*. After reviewing the concerning literature I examined by means of path analysis that what factors are resulting recent

differences of income and unemployment. The application of the method was justified, because to my assumptions spatial structure is shaped by certain socio-economic phenomena not only directly but also indirectly through influencing other explanatory factors. Beside exploring of these, my main task was to answer what role the distance from motorways plays in the explanatory model of the following figure.

The system of causality of the variable groups of the path analysis



The method showed adverse multicollinearity between indicators of the distance from motorways and the distance from Budapest, so that the “behaviour” of this latter got distorted compared to the expected direction of the connection. *The effect of distance from motorways on explaining income and unemployment differences is in vain significant, there is an other variable, which can cover the same heterogeneity part better.* Already the statistical results draw up the real story: *the spatial structure of economic development is actually shaped by the differentiating influence of the capital city, while motorways are only mediating this effect.* The motorways’ separate influence on spatial structure is though only an appearance.

4. I made multivariable regression analyses in order to know more about long-term definition of the spatial structure of recent economic development. From the examinations I wanted to filter out the endogeneity of development as far as possible, in the interest of that I applied “instruments” (mostly relating to 1970) among the explanatory variables. I tried to choose indicators that were definitely factors of *development* 40 years ago, however they have changed and lost their differentiating role by today. Beside the possible filtering of endogeneity the indicators of relative geographical positions happened to be important explanatory factors every time in differences of income and unemployment. Distance from motorways could appear substantively nor in these models.
5. Applying factor scores of the examination mentioned at the 1st point as dependent variables I tested not only the motorways', but the complete primary route network's role in regional differences. Beside controlling the settlement size and the distance from Budapest, and from the western border, various elements of the primary route network could take part significantly in explaining the examined inequality relations, although their influencing force lag behind of the other three factors.

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