

Infrastructure policy and spatial imbalance

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1 Preface

Regional economic development is not only the result of a combination of private factors such as labour and capital, but also of infrastructure in general, and transport infrastructure in particular. Improved infrastructure contributes to economic development by increasing productivity. Infrastructure services are intermediate contributions to production, and any reduction in input costs raises the profitability of production, permitting higher levels of output, income and/or employment. Since infrastructure raises the productivity of other factors (labour and other capital), it is often described as an 'unpaid factor of production', since its availability leads to higher returns for other capital and labour inputs.

Clearly, many wealthy and growing regions have a well developed infrastructure, whereas the lagging regions have many deficiencies in this respect. It is noteworthy, however, that several regional development policies, aimed at creating infrastructure in lagging regions, have frequently shown disappointing results. For example, in the European Community, the European Regional Development Fund (ERDF) has spent approximately 80% per cent of its funding on infrastructure projects in the period 1965-1980. Regional disparities appeared to narrow down in the period before 1970, but then widened in the 1970s, and to stabilise again in the 1980s (Eurostat, 1990). This phenomenon suggests that infrastructure is perhaps irrelevant to regional growth and development. On the other hand, one may argue that investment in infrastructure is a sine qua non for maintaining an absolute level of development, i.e. a necessary condition for economic growth. Obviously more investment in these lagging regions will help them to enlarge the size of their markets due to their increased accessibility and the improved economic situation, as reflected, for example, in purchasing power.

The aim of the present paper is to review the impact of infrastructure on less developed regions, with a particular view to its consequences for regional economic growth and the related regional welfare disparities. The paper will address a case study based on infrastructure policy in Hungary.

2 Views on Transport Infrastructure

2.1 Definitions

Infrastructure can be defined in different ways (see also

This paper addresses the impacts of transportation infrastructure. Various definitions, effects and caveats are dealt with. The arguments will be illustrated by a case study in Hungary. A historical and political description of Hungarian transport policy is given. The Hungarian infrastructure policy has shown an unprecedented dynamics. In the past years a great many new initiatives have been launched. These plans concern mainly road infrastructure, but also railways all over the country. It is noteworthy that infrastructure policy is also playing an important role in regional development policy. The successes have shown a gradual improvement, so that equity policy and efficiency objectives are running in parallel.

Bruinsma, 1994). For example, an integral definition with the purpose of giving a comprehensive description of infrastructure has been given by Kessides (1996) who describes infrastructure as follows: "Infrastructure can be defined as the long-lived engineered structures, equipment and facilities, and the services they provide, that are used both in economic production and by households". This grouping of infrastructure implies mainly economic components while, according to this definition, it is used in economic production. The economic infrastructure includes, *inter alia*, public utilities

(e.g. electric power, telecommunications, water supply), public works and transport sectors.

In the Anglo-Saxon literature the expression 'social overhead capital' also is frequently used (Bruinsma, 1994). Youngson (1967) provides a general scientific definition of 'overhead capital'. In his opinion, the indivisibility of the service offered and the characteristic substantial external benefits of this service are the most important features of infrastructure. Due to these two characteristics, intervention by the public sector can be defended firstly because demand is preceded by a large-scale supply, which necessitates planning and supervision. Secondly, the substantial external benefits need intervention to ensure a maximum social benefit. A complementary definition has been offered by Biehl (1986) who describes infrastructure as: "a part of the overall capital equipment of a region, namely that part characterised by relatively high degrees of capitalness and publicness". Like Youngson, he emphasises the need for governmental intervention, but adds the 'capital-intensive' character of infrastructure. To define infrastructure in an operational sense, Biehl distinguishes 12 main measurable categories and a great many sub-categories. To enumerate all relevant elements of infrastructure, clearly would be a difficult task. For the transport sector, the enumeration of economic infrastructure has to be restricted to public works that are used for transport aims, for example, bridges and roads. According to this interpretation, transport facilities such as railways, urban transportation, ports, waterways and airports are covered by the transport sector. The definition used by the Dutch Social and Economic Council (see Bruinsma, 1994) suggests that transport infrastructure can be divided into: roads, railways, waterways, airports, ports, pipelines and information transmission, and in general those immovable public capital goods that are not exclusively provided by market forces.

This enumeration meets the useful definition of Rietveld (1994) who describes transport infrastructure as: "those immovable capital goods for transport which are characterised by a considerable degree of economies of scale so that it is usually supplied as a collective input into production. Transport infrastructure includes facilities such as railway lines, railway stations, highways, canals, seaports and airports".

It should be added that studies in the field of regional science have proven that transport infrastructure offers greater inter-regional accessibility that may trigger comparative advantages for prosperous core areas by exploiting infrastructure to the detriment of poorly developed neighbouring peripheral areas (Bergman and Sun, 1996). It is clear that the above-mentioned characterisation of (economic) infrastructure/social overhead capital also applies to transport infrastructure.

2.2 Development indicators

Transport infrastructure aims at fostering economic development. However, the notion of economic development' is ambiguous and, therefore, a clear definition is not easy to find. First of all, the concept of economic development depends on the spatial scale: local, regional, national and international. Next, economic development can be described by a variety of indicators and factors. In addition, the development process is influenced by several restrictions, for example, the availability and reliability of data. Finally, economic development is a relative concept which makes comparisons between different levels of development complicated.

An indicator for economic development that is frequently used is the Gross Domestic Product (GDP). The GDP is usually measured and registered on a national level by a national statistical agency and is often used by independent national and international organisations which make comparisons over time and between countries. Another key indicator is the Consumer Price Index (CPI). Both the GDP and the CPI illustrate the importance of a decomposition of value changes into the underlying developments of prices and volumes. The United Nations' s System of National Accounts (SNA) is an example of an accounting framework for measuring changes in prices and volumes. It emphasises that these changes should not be measured in isolation to increase the reliability of the estimates at meso- and macro-levels and to enable a systematic and detailed analysis of inflation and economic growth and fluctuations (Keuning, 1995).

An interesting indicator that is used particularly in analyses of economic development in fast developing countries or economies in transition, is foreign direct investment (FDI). The level and distribution of FDI may reflect the degree of progress of a regional or national economy. However, it needs to be pointed out that the attraction of FDI also presents a 'chicken-egg problem'. Investors prefer a stable economy in an advanced stage of transition, while stability and advanced transition need FDI as a crucial input (Nijkamp and Van Geenhuizen, 1997). This indicator is not used very frequently.

More recently, much emphasis is placed on knowledge and innovation infrastructure. Currently mineral and material resources play a declining role in determining the rate of economic development, while the role of non-material resources, known as 'human capital', is rising. The human capital theory stresses investment of individuals in knowledge creation by means of education and training in order to acquire an increasing income in the long run. The importance of 'human capital' is according to Levin (Groot, 1991) among others based on the close relationship between educational investments and economic growth in a society.

Progress due to innovation that determines economic development, can be used as well. However, the question is how to measure innovation? The best measure is the dynamics of economic development, although it can happen that the maintenance of economic development at a predetermined level, also requires a stream of innovation, especially in the case of an economic recession (Markowski, 1997). Research on this topic, carried out in Western countries, shows that in the long run there is a clear relationship between the transfer of technology and the level of innovation measured by reference to the number of research and development (R&D) centres; the proportion of personnel working in R&D; the nature or degree of centralisation of R&D centres; and the degree of co-operation with universities and research institutes.

In a Schumpeterian world, innovation is generated by entrepreneurs. In the opinion of Perroux, however, propulsive enterprises are the moving force (Higgings, 1988). The following factors and elements that favour innovation, frequently are mentioned:

- a favourable legal incentive system (e.g. protection of patents);
- a high level of education;
- economic diversity;
- the accumulation of capital and investment in research and development;
- higher education and scientific institutions;
- a system of institutions to support and transmit innovation and technological progress;
- co-operation between higher education institutions and industry;
- trading and exhibition centres;
- an entrepreneurial climate;
- an efficient flow of information;
- spatial mobility of inhabitants;
- a good transport and communication system;
- availability of a capital and credit system.

The set of indicators described here has been chosen to provide a comprehensive insight into the concept of economic development. Assessment of quantitative indicators such as GDP and FDI are necessary in order to investigate the impact of transport infrastructure on regional economic development. Transport infrastructure contributes to economic development by increasing both productivity and household consumption and by providing amenities that enhance the quality of life. It leads to a reduction of transport costs and/or travel times. The

services generated by infrastructure lead to a growth in the production of firms in two ways (Kessides, 1996):

infrastructure services give intermediate input to production, and any reduction in these input costs raises the profitability of production, permitting higher levels of output, income and/or employment;

infrastructure services raise the productivity of other factors; less labour and capital are needed to reach the same production level.

In addition, the impact of the transport infrastructure on economic development can be characterised from different points of view. The first is the removal of bottlenecks in the development of a particular region or city in order to improve its accessibility. Another point is the role of infrastructure in diminishing the structural inequality conditions between regions. Finally, there is the extension of the previous point of view with interregional competitiveness conditions. This point is relevant in regard to FDI's (Van Geenhuizen and Nijkamp, 1997).

In principle, three approaches can be identified in the discussion about the economic importance of transport infrastructure. The first approach is (social) cost benefit analysis (CBA). CBA is a practical way of assessing the desirability of projects, where it is important to take a long-range view (in the sense of looking at repercussions in the distant as well as near future) and a broad view (in the sense of allowing for side-effects of many groups, industries, regions, etc.). It implies the enumeration and evaluation of all relevant costs and benefits (Prest and Turvey, 1965; Button, 1993). This approach takes for granted that GDP per capita is a proper indicator to measure the output of social overhead capital expenditures Nijkamp (1995) emphasises that the consumer surplus is the main concept in this approach, which is based on efficiency objectives. Despite the widespread adoption of this approach, there has been gradual disappointment about the all-embracing, stereotype appraisal advocated by Prest and Turvey. According to many critics, CBA is biased because of many implicit political and social value choices; it is surrounded by uncertainties and difficulties of computation.

In the second approach, productivity is the basic concept instead of consumer surplus. As mentioned before, an improvement of transport infrastructure services implies that on the one hand an economy can make use of its private production factors in a more productive way, and on the other hand, households can take advantage of travel-time savings. The choice of productivity in this approach is dictated by the fact that CBA is sometimes too broad, because its outcome may strongly depend on household travel-time savings, which do not have implications for GDP. The policy question underlying research on the relationship between investments and the development of productivity is whether it is necessary to accelerate investments in infrastructure to stimulate productivity or economic growth (Toen-Gout and Jongeling, 1994). Finally, employment is the key subject discussed in the third

approach. Focusing on employment occurs especially in countries in which a high level of structural unemployment exists and the creation of jobs is the prime interest. Particularly, in this approach, the spatial dimension is relevant. Transport infrastructure investments have spatially different impacts on employment (Nijkamp, 1995). Local and regional governments often base their argumentation on assumed employment effects. It is easier to communicate to the general public that a project will generate a certain number of jobs instead of an internal rate of return (Rietveld, 1998). Clearly, employment effects are too narrow to be the sole basis for policy analysis of infrastructural projects. However, the study of employment effects adds insight into the impact of infrastructure on economic development.

In a wider context (other than employment), it is notable that equity aspects are significant in infrastructure investments. Generally, the benefits of infrastructural projects are unevenly distributed among people and firms, depending on their location. It often happens that the improvement of accessibility for a majority of people due to infrastructural investments, has a negative impact on the accessibility for a minority of people. Another aspect is formed by the environmental effects which are often distributed in an uneven way. For example, regions which are disturbed most by high speed railways, are usually not the ones who profit from them (Rietveld, 1998).

It is obvious that these three mentioned approaches are not entirely independent. To some extent, they overlap, are in conflict, or are complementary. To properly analyse the effects of infrastructural changes, general equilibrium models are more appropriate. Since, in that case, more than one sector is considered, these models are of course much more complex (Bruinsma, 1994). A sketch of these general effects will be given in the next section.

3 A Framework for Impact Assessment

Transport infrastructure investments have both *temporary* and *non-temporary* effects on the economy. These effects occur both at the supply and the demand end. A major *temporary* effect relates to the stimulation of employment and income during the construction phase via the demand side. Not only the sectors involved in the construction but also the supply sectors will profit from the building process: the indirect effects.

The stimulation of employment and income during the construction phase via the demand side can be studied by means of input-output analysis and there is little controversy about it, except for the fact that one should pay attention to the question of how the infrastructure is financed (Rietveld, 1994). Government borrowing on the capital market can lead to an increase of interest rates and tax increases. If so, this would have a negative impact on consumption or investments, which would reduce or even eliminate the initial demand stimulus of government spending. These effects, generally known as 'crowding-out' effects, are often ignored in studies on a smaller spatial level, because an infrastructure project at

this level is considered to be modest in relation to the national economy.

Another type of effect is formed by spin-off effects. These effects occur when private investments are stimulated by public investments and vice versa. In case of periods when a strong emphasis on public investments alternates with periods of a strong emphasis on private public investments, unbalanced growth occurs. Some approaches show that there is indeed a causal relationship between public and private investments taking place at given intervals (see for example Den Hartog et al, 1986; Nijkamp and Rietveld, 1993).

A *non-temporary* effect, which is also demand related, is the consequence of the exploitation of an infrastructural project: operations and maintenance. Although maintenance is not an activity which appeals to the imagination of the general public as much as new infrastructure projects may do, it is nevertheless an important activity with high rates of return on investments (Bruinsma, 1994).

On the supply side, there are no or hardly any *temporary* effects, but mainly *non-temporary* effects, sometimes called programme effects. Figure 1 depicts a scheme with a number of possible non-temporary effects at the supply side. It has to be considered to be a mono-causal model aiming to map out the structuring effects of transport infrastructure.

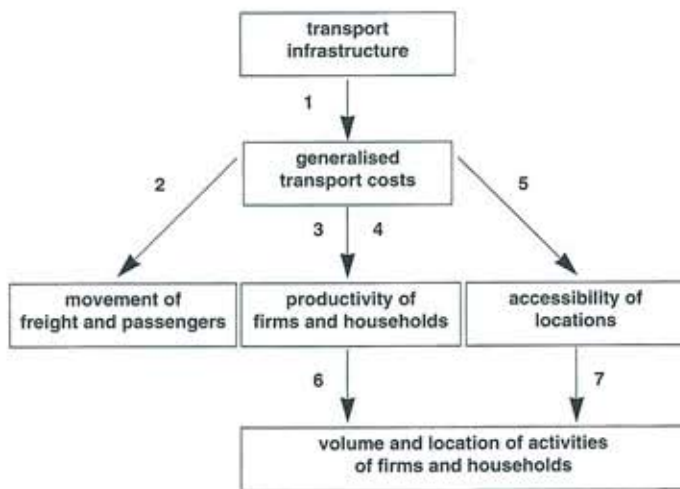


Fig. 1: Non-temporary effects at the supply side

Relation 1 shows that due to newly built or improved transport infrastructure, the generalised transport costs are influenced. Shorter distances and higher speeds will result in a reduction in fuel, capital and/or labour costs. These kinds of changes will have an impact on the transportation system on route choice, mode choice, choice of time of day (in case of congested networks) and the generation and attraction of trips per zone (**relation 2**).

Relation 3 and **4** indicate the effects of the reduction in generalised transport costs in combination with the changes in transport behaviour of both households and firms. Consequently, it leads to an increase in productivity in the

region concerned. Households take advantages of the productivity growth by travel-time savings. It is possible to continue the same level of production and consumption in a shorter span. Actually, an increase in productivity of households is rarely perceived; more speed often encourages longer travels. For transport firms and firms relying on transport, in general an increase in infrastructure quality means that less drivers and trucks are needed to produce the same level of services; accordingly private capital and labour are substituted by public capital. This effect on transport-related private capital and labour, results in a decrease of transport costs which in turn offers possibilities for a more transport intensive way of production, for example by increasing the frequency of delivery or expanding the market area in a spatial sense.

Infrastructure improvements also lead to more reliable transport by reducing the probability of congestion on a certain route. The improved reliability of supplies affects productivity in a beneficial way, since it is not only the average travel time that has to be considered but also the variance. This may contribute to reduce slack in the production process and helps to diminish the size of stocks.

Infrastructure improvement may also have an impact on the functioning of the labour market. The expansion of the area from which people can be recruited to work without the need to change their residence, has led to a spatial expansion of regional labour markets and in some cases to long-distance commuting.

As **relation 5** indicates, a reduction of the generalised transport costs leads to an improvement in accessibility of the zone or region concerned. The accessibility of a zone can be interpreted as the weighted average of the generalised transport costs out of a zone to all other zones.

The increase in productivity and accessibility in a particular region or zone may induce growth or relocation of economic activity or population (**relation 6** and **7**). It should be noted that this theory does not guarantee a positive impact on employment or population as a result of the increase in productivity and accessibility. The opposite may also be true: a decrease in interregional transport costs leads to more severe competition, which may harm those industries mainly producing for local demand. This negative effect only happens in case of an improvement of the interregional infrastructure. Improvements of interregional or local infrastructure (e.g. regional or local public transport) do not bring about such a negative effect.

Two other important effects connected with the volume and location of activities of firms and households are the generative and distributive effects, respectively. A generative effect refers to the overall impact of economic activity as measured, for example, by employment for all regions affected. This effect, therefore, is not distributed evenly over space: some regions experience higher benefits than others. The distinction between generative and distributive effects are especially significant at a low spatial level. At such a level, one may observe significant effects, but mainly of a distributive character. In other regions or zones, which are not investigated.

losses of employment are experienced. Therefore, the spatial scale of analysis of infrastructure impacts should be broad enough to minimise the risk that distributive effects are interpreted as generative effects.

In the previous model, presented in Figure 1, feedback mechanisms were omitted. It only showed the direct relationships between transport infrastructure and spatial development. The indirect relations are added in Figure 2. This figure is an integrated model providing insight into the structuring effects of transport infrastructure.

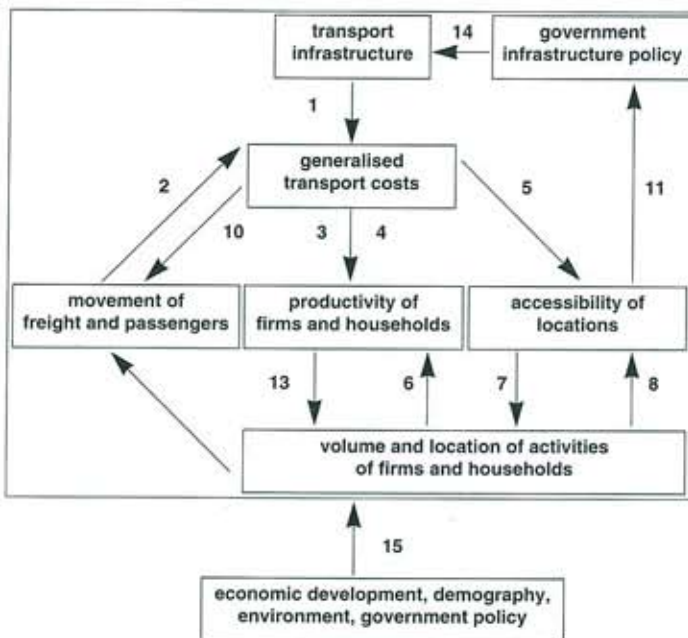


Fig. 2: An integrated model of the structuring effects of transport infrastructure

Relation 8 shows the first feedback in which the relocation of economic activities leads to changes in accessibility, because masses change. In accordance with this relocation, the number of movements of freight and passengers alters (**relation 9**). In case this leads to congestion, the generalised transport costs will change as well (**relation 10**). The relocation of economic activities may also lead to economies of scale, obtained by households and firms (**relation 13**).

Transport infrastructure is not entirely exogenous, because it is supplied by governments, which respond to the changes in the transport system. Infrastructure policy may focus on maintaining a certain, acceptable level of accessibility for all zones. Furthermore, the policy can be concentrated on the development of additional infrastructure in those zones with a fast economic growth, in order to restrict the change in congestion (**relation 11 and 12**). From the preceding description, it would seem that transport infrastructure not only induces economic growth, but also brings about economic growth in particular regions. Therefore, these two characteristics of transport infrastructure are essential for policy makers (**relation 14**).

Finally, some other variables such as technology, environment and government policy are added to Figure 2 (**relation**

15). For example, road infrastructure will have several effects on the environment. Construction or improvement of a highway will result in a competitive advantage of road transport in relation to rail and inland navigation. The resulting modal shift is disadvantageous from the perspective of transport related emissions. However, it also has some positive effects: it leads to changes in route choice, so that local environmental effects are reduced in urban areas (Rietveld, 1998).

4 A Case Description: Hungary

The previous observations will now be put in the context of a Hungarian case study. Hungary is a country of 93.000 square kilometres and a population of some 10 million people. Owing to its central location on the Danube in the Karpathian Basin, Hungary forms an important link between east and west and between north and south. Moreover, Hungary borders on of no less than seven countries. It shares borders with Austria (356 km), Croatia (355 km), Romania (453 km), Serbia and Montenegro (164 km), Slovakia (679 km), Slovenia (102 km), and Ukraine (137 km). These borders are the result of the Treaty of Trianon, effective since 1920. As one of the countries defeated in World War I, with large numbers of minorities clamouring for independence within its borders, the kingdom of Hungary was reduced to one-third its historical size. Especially the Dual Monarchy lost territory in Slovakia, Serbia and Romania. Nowadays, the Hungarian Republic consists of the capital Budapest and 19 counties with 3126 municipalities (200 towns and 2926 villages) (Központi Statisztikai Hivatal, 1996). Its main geographic regions are Transdanubia to the west of the Danube; the Great Plain east to the Danube; and the mountainous area in the north. The regional classification used study covers eight, so called macro-regions. Six of these macro-regions consist of counties.

After a decade of severe repression, the Kádár regime managed to establish a degree of political and economic autonomy for Hungary. In 1968 the economic reform process started in Hungary. This process known as 'the new economic mechanism' (NEM) built the regulatory market principles of demand and supply in the system of central planned economy. The main objective of NEM was the increase of efficiency. NEM was characterised by limited central planning: companies were not controlled by the central government by means of production objectives. There only were dependent on the government by taxes and loans. As result of this, loans granted by the government were soaring due to a lack of domestic competitiveness and increasing prices of energy and raw materials. As a consequence, many companies were kept alive in an artificial way. In 1972 the reform process came to a sudden halt and the decline was reinforced by the oil crisis of 1973. Nevertheless, a new phase of economic reform was launched in the late 1970s, which included the introduction of competitive wholesale prices and the reduction of subsidies on basic goods. In 1984 more enterprises were granted the right to engage in foreign trade, and a year later Hungary became the first COMECON² country to join the

International Monetary Fund (IMF) and World Bank. Despite these reforms, Hungary's fundamental economic problems persisted and popular dissatisfaction continued to grow. Finally, this resulted in the removal of Kádár in 1988. Negotiations about the transition to democracy were conducted with a number of opposition groups and parties. In 1989 an agreement was reached on a draft legislation to effect a 'peaceful transition to democracy'. The Hungarian Parliament approved the agreement and Hungary was re-proclaimed a republic. The constitution declared that the Republic of Hungary is a social market economy, and thereby acknowledged the equality of proprietary forms (Szaló, 1997).

The period between 1990 and 1994 was one of dramatic changes in the Hungarian economy and society. The building process of the legal and institutional structure of a market economy speeded up significantly. One of the major aspects of transition was privatisation.

The first privatisation was introduced during 1986-1987 when managers of some state enterprises appropriated the assets under their control. This process known as 'spontaneous privatisation' was the trailblazer for a legal framework for privatisation. This framework was created by a series of laws in 1989 and 1990. The State Property Agency (SPA) was set up to administer the privatisation process. Direct involvement by the SPA in the privatisation of particular enterprises led to the creation of a new agency, the State Asset Holding Company (ÁV Rt). This agency, working alongside the SPA, was originally founded to manage state-owned companies, which would remain in state-ownership long-term. Eventually, its main objective became the acceleration of the progress of 'active privatisation'. A wide variety of methods were used to privatise state-owned companies, for example, public offers and tenders, employee share ownership programs and the provision of preferential credit. Towards the end of 1994 a new government adopted a new privatisation strategy in an attempt to increase the amount of cash generated for the exchequer. It had to be achieved by merging the SPA and ÁV Rt into a single agency, the State Privatisation and Asset Management Company (ÁPV Rt); also by emphasising the sale of strategic interests in large enterprises to foreign investors. The new approach proved to be very successful: in 1995 the privatisation revenues were three times higher than expected.

Hungary's competitiveness has partly been due to its ability to attract large flows of foreign direct investment. The early start to market reform enabled Hungary to draw a very high proportion of total FDI committed to Central and Eastern Europe during the early 1990s. In a broader sense the Visegrád³ countries have attracted two-thirds of the total influx, while the rest of the region (with 91% of the population) received only 32% of the cumulative inflows during the period 1989-1996. Compared with the amount of FDI in Hungary (see also Table 1), in Poland the annual inflow of FDI in 1997 was almost twice as much as in 1995. As in Hungary, in the Czech Republic there has been a noticeable decline in the annual FDI since 1995. Nevertheless, according

to all indications, this year the influx of FDI will be nearly twice as much as in 1997 and even higher than in Hungary.

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
550	900	1614	1641	2481	1420	4500	1900	2000	1500

Source: Hungarian Statistical Office; Csáki, Sass and Szalavetz (1996)

Table 1. Annual FDI in Hungary (\$ mn)

According to an Institute for World Economics' survey among Hungarian-based joint ventures, the investment climate in Hungary has the following advantages over neighbouring locations (Csáki et al. 1996):

- the country has political and economic stability;
- the established legal frameworks are of European standards;
- the geographical location is an important factor. Exporting from Hungary is generally seen as a serious option. The future European Union (EU) membership; and full EU access is also attractive to non EU investors;
- the quality of labour also attracts investors. Hungarian workers are generally regarded as talented and valuable, relatively skilled, disciplined, creative and intelligent;
- the low costs of production facilities in spite of the diminishing of cost advantages compared with other Central and European countries;
- an ultimate clear advantage is its pioneer status in attracting FDI. Having five years of steady capital influx, the stock of FDI has reached a threshold level that makes it imperative for initially less attracted investors to invest in the country.

The origin of FDI stock during the period 1992-1996 shows that German companies invested the most with a share of almost 15 per cent. Neighbouring Austria, and The Netherlands are next with a share of 13,3 and 10,6 per cent respectively. In 1998, The Netherlands was the main investor in Hungary.

The first few years after the transition in Hungary were characterised by marked declines in income and output. Real GDP declined steeply during the 1990s as enterprises were hard hit by the end of budget subsidies and the loss of export markets in the former Comecom. Several indicators point to a resumption of output growth getting under way in mid-1993, and this led in 1994 to the first recorded annual increase in GDP since 1989. The strong demand growth contributed to the recovery of GDP in 1994. The contribution of collective consumption to the demand growth was negative in 1994 due to large and growing budget deficits. The following year, 1995, the recovery of GDP was held back by the effects of the policy formulated by the new government. The tight wages policy intended to reduce consumption and the cut-backs in public spending resulted in real GDP grew by only 1,5 per cent. The recovery has been set in last year due to restraining the inflation rate, and as a result of this a higher

domestic consumption, partly responsible for an increase in industrial production of 8 per cent.

With regard to the composition of the GDP, it is remarkable that agriculture still plays a substantial role in Hungary's economy. It accounts for 6.5 per cent of GDP (compared to an average of 2.3 per cent in the EU) in 1996. Some relevant data are contained in Tables 2 and 3.

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Sbn	39.3	33.1	33.4	37.3	38.6	41.6	43.7	44.8	48.1
Indices	100	96.5	85	94.9	98.2	105.9	111.2	114	122.4

Source: Hungarian Statistical Office, 1998

Table 2. General domestic Product of Hungary

Sector	Agriculture	Industry and construction	Trade, tourism transport	Other Services
Share in percentages	6.6	30.7	22.2	40.5

Source: Hungarian Statistical Office, 1998

Table 3. Composition of the GDP in 1997

The attention of policy makers for the regional structure of Hungary is an entirely new phenomenon. Regional matters such as, for instance, regional unevenness and the relationship between settlements, was only an item for regional scientists. Nowadays, the regional dimension has gained greater impact from a network perspective. According to Nemes-Nagy (1997) this is result of a set of four developments:

- due to political changes in 1989, regional differences have sharpened;
- in the decentralised political and social system and due to market economy conditions, regional and local characteristics have been given more importance;
- the fall of the Iron Curtain led to new possibilities for horizontal international relationships;
- regional policies in Europe and the idea of regionalism have an exemplary impression.

Of course, the intention to integrate with the EU, also contributed to the augmenting attention for regional problems. The disparities and processes described above have determined the objectives and priorities of regional policy. The development of the seven East Hungarian counties and the catching up of the most critical regions of Eastern Hungary have been given priority (Szaló, 1994). In order to realise this policy, an institutional system for regional development has been established. In 1990 the government established the Ministry for Environment and Regional Policy. In earlier times the tasks attached to regional development used to be fulfilled by three ministries and the National Planning Bureau. For lack of

experience with regional development, this new ministry was quite weak in the beginning. Furthermore, a co-ordination and inter-sector co-operation between several policy aspects were lacking. As a consequence the ministry worked in isolation, and only concentrated on its own activities: nature conservation, environmental protection, housing and public construction, physical and regional planning. Another institutional barrier was the important role of county governments in the centrally planned economy. Together with the former Yugoslavia, Hungary was considered to be a leading country in regional policy thanks to the independent state activity. Nevertheless, this type of regional policy failed because of limited efficiency, caused by its lack of correlation with the socio-economic system (Artobolevskiy, 1994). A new act on local governments, adopted in 1990, cancelled the former responsibilities of the counties concerning regional development. Since then, the management of regional problems has fallen under the sole competence of the central government. Parliament set the main directions of regional policy and the guidelines for regional development support in its decree, according to which: the government was to reduce disparities between the different parts of the country and different types of regions and reduce the inequality in opportunities. The government was, above all, to diminish the differences in regional economic development between East Hungary and West Hungary, which increased in the period of transition. To achieve this, the principal objectives of regional policy formulated, should be:

- regional crisis management, and the economic reorganisation and development of permanently underdeveloped or declining depression areas;
- the acceleration of selective infrastructural developments focusing on the least developed regions, in order to help reduce infrastructural underdevelopment in the country as a whole;
- the reduction of existing differences and operational decrees of infrastructure, falling under the competence of local municipalities.

During the period of economic transformation, the government was urged to concentrate on the reorganisation of regions in critical situations and consequently adjusted its regional local development priorities. To implement the objectives of regional development, operational instruments were devised. Along with the formulation of the instruments, requirements of regional crisis management had been taken into consideration. This concerned, in particular:

- instruments designed to assist the development of national infrastructural systems;
- industrial and agricultural crisis management;
- employment policies;
- operation of funds and organisations assisting the promotion of investments and enterprises;
- compensating mechanisms of municipal regulations;
- the establishment of commercial and non-profit regional

development agencies with the participation of the state.

After the formulation of the main objectives and the creation of an institutional framework, the establishment of the Regional Development Fund (RDF) in 1992 was the next step in diminishing regional inequalities. This fund is a facility rendering aid in underdeveloped and crisis regions to assist the renewal of the economic structure, and along with this the improvement of the infrastructural conditions. The RDF provides grant assistance on a co-financing basis to the public and private sector for individual projects in regions that are suffering structural and development handicaps or are experiencing high levels of unemployment. In backward regions the RDF is accessible for projects which (Száló, 1994):

- promote job creation;
- intend to promote the re-utilisation of agricultural resources;
- use land currently under agricultural cultivation for non-agricultural enterprises;
- result in the establishment of businesses by farmers under 35 years of age;
- develop village tourism;
- provide services in social and educational investments.

The National Council for Regional Development, established in December 1996, assist in fulfilling government tasks. The members include, for example the Chambers of Commerce, representatives of the interested ministries, and representatives of the County Development Councils.

The main purpose of the creation of a regional level was European harmonisation. Corresponding to the European system (NUTS-II), regions are statistical and planning units. These units were established according to the proposals of the participating county committees and the National Council for Regional Development. There are two regions where the regional development councils were established by law: Budapest metropolitan region and the Balaton resort region. In case of the capital and its agglomeration, the establishment by law of a regional development council was necessary, because it forms an organic unit from the point of view of development and physical planning. The environmental problems of the overwhelmingly urbanised region, traffic system, land use, and the development of its infrastructure and economy, require an obligatory co-operation among all the parties interested in these issues. In the region of Lake Balaton the authorised reinforcement of the regional development council is justified by the co-ordination of the interests in environment protection and nature conservation, including the underlying interest of tourism.

The intention of integration with the EU bring along the following additional tasks in relation to the Act on regional development and physical planning:

- the necessity of a high-level regulation, in harmony with EU regulations;
- development of regional levels of planning and development;

- provision of resources for the regional to fund their development programs within decentralisation;
- development of a decentralised decision-making mechanism and participation of social partners in the decision-making process;
- adjustment of a several year liability of regional plans and programs for regional development in the annual state finance and budget system;
- enforcement of the principle of partnership and subsidiaries.

5 Transport Infrastructure in Hungary

In the year 1997, the density of the Hungarian road network was 379 kilometre per thousand square kilometres (km/ thousand km²). This territorial density approaches the European average. When we consider the density of motorways only, it remains behind European standards. According to OECD figures, the density of Hungarian motorways is only 3 km/ thousand km² (Központi Statisztikai Hivatal, 1997). Compared with a Western European country of the same size, like Portugal, the Hungarian density is half of that. In a classification of the densities of EU member states, even Portugal comes up in the rear, along with Greece, Ireland and Sweden. By Central and Eastern European standards, the density of motorways is quite normal (the average in Central and Eastern European is about 3.2 km/ thousand km²).

As mentioned above, the density of the road network meets European standards. However, the quality of the road surface is particularly poor. In 1996, 7 per cent of the total road network was not yet paved. The quality of the surface of the paved roads, mostly the second-class main roads, is often abominable as well, due to the lack of maintenance during the socialist era. Some data are contained in Table 4.

Road category	Number of kilometres	Average traffic in number vehicles a day	Average number of kilometres per 1000 vehicles a day	Average road usage in percentage
Motorway	421	22640	8360	11
First-class main road	2051	8370	17370	21
Second-class main road	4380	5390	23130	28
Minor road	23197	1440	33400	40
Total	30049	2780	82260	100

Source: Köztársaság Közlekedési, Hírközlési és Vízügyi Minisztérium, Közúti Főosztály; Utgazdálkodás 1997 (translated)

Table 4. Road statistics 1996

The Hungarian motorway system has the character of a radial network; all motorways lead to and start at the border of Budapest. However, outside Budapest these motorways are not connected to each other. So, it could be characterised as a 'hub-network' without spokes.

As a result of a tender put out by the Ministry of Transport, Communication and Water Management, a concession was given to a consortium led by the French Transroute Internationale. Accordingly, in 1993 the First Hungarian Motorway Concession Co. (ELMKA) was founded. This so

lled Build-Operate-Transfer (BOT) agreement was a novelty because it was the first motorway in a former socialist country to be financed by western capital. Under a BOT deal, contractors build and operate a toll road, and make a profit through the toll levies they charge. The contractors fund 20-40 per cent of the costs of the project with their own cash, relying on bank loans or subsidies for the rest. After a fixed period, usually around 25-35 years, the contractors hand the road back to the state.

After two years of exploitation, it turned out that especially local car-users refused to pay the 0.15 USD a kilometre for road usage. This was to be expected; the original business plan assumed that half of Hungarian car-drivers would opt for the back roads (Manasek, 1997). However, the unpleasant surprise was that freight and foreign traffic did not grow at all. The reason is obvious: in the view of the media and public, the toll levies were far too high; in fact, the highest in Europe.

South of Budapest, the M5 motorway is still under construction. The elongation of the existing southern motorway from Budapest towards Belgrade had been contracted in 1995. That year the EBRD arranged loans and guarantees to upgrade a 96 kilometre stretch of motorway. The immediate aim was to improve transportation between Budapest and southern Hungary. Nevertheless, the long-range goal was to form part of a network connecting Western Europe with the Balkans. Currently, the road construction has progressed up to the city of Kiskunfélegyháza: a new stretch of about 16 kilometres. Last year the toll levies were extended to the existing part of the M5, and after some initial protests, traffic levels have doubled. Thirty years ago, the first motorway in Hungary - the M7 - was built for the weekend traffic in the direction of the lake Ablation. To fit the role of the south-western part of the Ukraine-Adria axle⁴, it had to be extended and broadened. In the opinion of the Hungarian Ministry of Transport, Communication and Water Management, rehabilitation of the current section and the completion of the two-lane section, should take priority.

The extension of the existing eastern motorway M3 towards north-east Hungary began in 1996. The elongation to the Ukraine border involved another 70 kilometres and that would cover the North-eastern part of the Ukraine-Adria4 axle. The upgrading of this motorway, with a relatively low traffic impact of 14,000 vehicles a day, became a controversial issue. Due to this situation, private contractors were not very keen on this project. As a result, the government decided to establish a state-owned joint stock company to carry out the M3 extension.

The budget resources requested were financed by loans from the European Investment Bank (EIB). Accordingly, future toll levies were to be used to pay back the interest. This announcement was met by public protest. Reference was made to the change in traffic impact caused by those unable to levy the toll (e.g. Ukrainian transport companies), which would end in environmental pollution and decreasing traffic safety. Nowadays, it seems pressure groups only want to accept a toll road, when vignette tolling is introduced. Instead of a gate-

system, the vignette tolling took over throughout the whole country and has a levelling effect. The enlargement of the M3 motorway has now reached the city of Gyöngös. The next 40 kilometre stretch to Füzesabony (Heves) will probably be completed at the end of this year.

The most essential point of the policy formulated by the Ministry of Transport, Communication and Water Management has been recorded in the 'Transport policy reflected in numbers 1995-1998'. This policy document was a continuation of the 'principles of the Hungarian transport policy' from 1992. The basic assumptions of the original policy have not been changed; only accents were shifted. The intended measures have been based on EU harmonisation and integration and the two pillars of the originally formulated policy, are kept upright.

Infrastructural network development and the supply of basic public services have remained of strategic importance and the policy-makers learned from the experiences gained in the first years after the transition. The state kept several tasks to itself, tasks which in market economies, are performed by ventures controlled by local governments, but failed to perform them effectively enough. In trying to play too big a role, and excluding others, the state did not involve enough other sources, performance was insufficient and development was made impossible. To change this situation, the government realised that it had to encourage concessions, thereby ensuring the interest of entrepreneurs, privatisation and intensification of enterprise in the infrastructure. Within this framework, the rules for concessions and the permanent share of the state in service companies had to be revised.

As mentioned before, the intended EU integration became an important part of the policy formulation. Consequently, Hungarian policy makers are ruled by EU transport policy. The 'White Book' approved in 1993 by the Committee of the European Community, as well as the recommendations of the so called Christophersen Group, are to be regarded as the basis for the unified European transport policy, which lays down the following basic principles for transport development (Ministry of Transport, Communication and Water Management):

- the legal harmonisation with EU of existing and new sectoral laws of production infrastructure must be provided. This progress must involve business federations as well;
- unions must be allowed to express their opinions at the official visits of the World Bank and the International Monetary Fund;
- other EU multilateral co-operation must be further improved, especially in the area of environment protection, regional policy, energetics, information technology and transportation safety;
- it is necessary to take more intensive advantage of the EU regional and bilateral infrastructure assistance program;
- Employment attributes must be built into the various labour laws and sectoral regulations by the gradual acceptance of EU standards and other international organisations (ILO).

Particularly, in the case of the economical reconstruction of the Central-Eastern-European transport service companies, the development of their operational legal framework must be executed on the principles of market economy in such a way that in the meantime their reorganisation and technical modernisation can take place. The integration of these countries with the EU may only take place under these conditions, within the framework of multilateral treaties regulating certain sectors.

6 Empirical Findings

6.1 General

Based on extensive fieldwork and a survey of questionnaires among some 150 entrepreneurs, over all the regions under consideration, the following findings and lessons could be distilled. These conclusions focus on both the national and regional economies in relation to the infrastructural situation. The central point of interest here is the extent to which the lack or presence of transport infrastructure is responsible for differences in economic development. Of course, this question prompts another one; namely, do simple differences in economic development cause the inequities in the quality of infrastructure between regions? A clear definition of the point of departure is necessary to offer a satisfactory answer to the question of whether there is a relationship between transport infrastructure and economic development in the Hungarian regions concerned. The initial impetus can be gleaned from the historical perspective.

Generally speaking, the differences in regional economic development in Hungary are not a direct consequence of the transition in the early 1990s. The imaginable borderline drawn by the river Danube has always existed. Differences in economic development between the western and the eastern part of the country have only been accentuated by the transition. The artificial distribution of welfare throughout the country, disguised the actual economic structure of Hungary. Due to the euphoria which dominated the period following the transition, Hungarian policy-makers were too heavily focused on the short term successes of privatisation of state-owned companies. The prevailing sense of self-satisfaction was fed by the relatively well-developed Hungarian economy which resulted from the market-oriented initiatives that had been taken over the years. Hungarian policy-makers were not aware enough about the urgent need for structured economic policy. A positive exception was the restructuring of the Hungarian financial sector, which mainly can be attributed to foreign banking companies.

The geographical situation of the North and North-eastern counties is also a reason for disparities in economic development. The dependence of these counties, i.e. Borsod-Abaúj-Zemplén, Szabolc-Szatmár-Bereg and Hajdú-Bihar on the (Comecon) markets in the neighbouring countries, took its toll, much more than in the central, southern and western situated counties. Moreover, the unidirectional economic structures of the regional economies, which were orientated

only towards other Comecon-members, worsened the economic situation after the transition.

Furthermore, the lack of an institutional system and the inexperience with a co-ordinated regional policy contributed to the present economic disparities within the country. This situation, that could only be characterised by ad hoc policy, came to an end with the adoption of the law on regional development and physical planning in 1996. This law includes the conditions for an institutional framework within reachable objectives. The most important criterion of this law is that centralisation and decentralisation go hand in hand. More specifically, the available national means are distributed according to regional or even local authorities (bottom-up approach). It is worth mentioning that this law came about solely because of the intended entry into the EU. Consequently, the risk exists that it may only be seen as a step towards European integration.

6.2 Railways

The economic development of the counties and regions also are reflected by the quality and presence of the (transport) infrastructure. Already during the previous century, Hungary, as part of the Habsburg monarchy, fulfilled a leading role in Europe because of its infrastructural networks. Nowadays the Budapest underground is the most appealing example of the heritage of building activities in the fin-de-siècle. Another well-developed infrastructure dating back to those days, was the railways. Depending on the point of view, this infrastructure was well maintained until late in the 20th century. Today, in spite of the ongoing closure of railway tracks, the density of the present Hungarian railway network is above European average.

The actual quality level of the Hungarian railway network has, however, gradually gone down since the Second World War, and has been below Western European standards for at least three decades. The policy on the construction of railways and restructuring of the railway sector, formulated in the 'Transport policy reflected in numbers 1995-1998', is based on the concept that the present Hungarian railway sector can adopt measures which are invented and sometimes applied in West Europe. An example is the intended privatisation of the Hungarian railways, dictated by a craving for efficiency and profitability. Privatisation will irrevocably lead to more focus on the international Intercity connections with Budapest and profitable tracks of the inland Intercity network, because they are attractive for private investors. Of course, attention is paid to the upgrading and extension of these tracks, but it may not be considered as a separate issue. There are two arguments which will help maintain the government's direct intervention in the Hungarian railways. On one hand, private car ownership is not as high as in Western European countries, so that in many cases public transport is the only alternative for (long) distance travelling. On the other hand, the purchasing power of Hungarians still requires the inference of the government in the pricing of railway services. This is obvious from the fact that the share

of rail transport in passenger kilometres is twice as high as in EU member states.

6.3 Road infrastructure

The opposite is to be seen when examining road usage and the supply of road infrastructure. Although, the density of the total Hungarian road network does not differ significantly from the European average, the structure of the road system is quite unlike that of Western Europe. The density of the motorways remains far behind Western European standards, but this is not the only problem of the motorway network in Hungary; its radial structure is another. All the motorways lead in the direction of the capital and as a consequence, large parts of the country are not opened up by a motorway. Of course, this is a heritage from the communist era; the heart of the central planned economy has always been Budapest.

The extension of the motorway network started with the construction of the remaining part of the motorway between the Austrian border and Budapest (M1). To provide an entry to the market economies in Western Europe, this was a logical infrastructural investment. The only doubt was about the way these investments were financed.

The extension of the M1 had been fully financed by private capital. Therefore, the Hungarian government did not have a decisive vote in the way the road was exploited. The interests of the investors and the Hungarian government were sharply divided. The investors aimed for as much return on investment as possible, while the government strove for accessibility of the capital and the mobility of the Hungarians. This is obvious from the high toll levied, and the resulting over-capacity of the M1, with the result that the motorway could not be adequately used by the policy makers as an instrument for regional economic development.

In spite of these experiences, Hungarian policy-makers still use this example to extend the motorway network. It should be mentioned at this point that the elongation of the M5 was not fully financed with private capital. Due to the interference of the ERBD, tolls are reasonably lower than those levied along the M1. For this reason, the alternative routes towards south Hungary are overloaded and the usage of the M5 meets all expectations.

The M3, the motorway running east of Budapest, is a completely different matter. The expansion started back in 1996, makes slow progress and the financing of this project is a grave concern. Despite non-private financing, the government introduced a toll to cover the necessary interest payments. This means that the role the M3 could fulfil in the economic development of North-eastern, is overlooked. In the first place, the use of the motorway will be limited because the purchasing power of the people situated in the North-eastern part of Hungary, does not allow it. This is not only the case for private road users; both Hungarian and foreign (in particular Ukraine, Romanian) companies will not have budgets for toll levies. Secondly, this puts further pressure on the main roads, which in turn has a negative impact on traffic safety and the environment in these regions.

The fourth motorway in the direction of Lake Balaton, the M7, seems to be the ideal 'cash cow' for the Hungarian government. On the one hand, a toll levy on this motorway would relieve the settlements on the southern shore of Lake Balaton, where traffic congestion is a major problem. On the other hand, this also presents an opportunity since (foreign) tourists could be obliged to pay for the use of the M7 in summertime. To introduce this mechanism effectively, a tariff must be decided on, which will benefit both toll revenues and road usage. First, however, it is necessary to upgrade the already existing track.

Finally, we take a look at the M5 motorway, situated south of Budapest. As mentioned earlier, the extension of this stretch was not financed fully by private capital. Due, partly to the relatively low toll levies, the usage of this motorway has increased. It should be mentioned that the lack of alternative route is an important additional argument for road users. The road that runs parallel with the M5 till Kecskemét, the E75 that connects Budapest with the southern part of Hungary (Szeged), is mainly used by freight traffic. Especially, trucks coming from central and eastern European countries choose this route to avoid the M1 and M5 toll routes. It goes without saying, that this results in stoppages caused by overloading of the road capacity. The time gained by using the M5, is cancelled out by the limited road capacity of the linked E75. Nevertheless, the M5 upgrading and extension may be considered as a successful concession.

6.4 Concluding remarks

The Hungarian infrastructure policy has shown an unprecedented dynamics. In the past years a great many new initiatives have been launched. These plans concern mainly road infrastructure, but also railways all over the country. It is noteworthy that infrastructure policy is also playing an important role in regional development policy. The successes have shown a gradual improvement, so that equity policy and efficiency objectives are running in parallel.

7 Future Perspectives

Recently, the idea of investments in infrastructure with a view to accelerate economic growth in general and to reduce regional economic differences in particular, has led to a new national development plan. The Hungarian counterpart of the 'New Deal' has been named after István Széchenyi, who has laid the foundation for the economic development of a backward country in the Habsburg monarchy during the first half of the nineteenth-century. The 'Széchenyi plan' is advocated by the government led by the young democrats (see Ministry of Economic Affairs, 2000). According to critics, the government confined itself to vent criticism on the hard economy measures during its period of office in the last two years. Nevertheless, the heritage of the social-democrat leaders resulted in a steadily descending inflation and an ongoing economic growth.

Notwithstanding the 4.5 percent economic growth in 1999, the government intends to stimulate the Hungarian economy

by an ambitious investment plan. The master plan includes a set of seven policy areas amounting to HUF 250 billion together (Postma, 2000). As expected, the government will not pay the entire sum; 30 percent should be produced by the (international) business sector. Clearly, the 'eye-catcher' of the program is the focus on building motorways. Following the indicative financing proposal of the plan for the years 2001-2002, about one third of the total budget will go to the motorway development plan. The plan serves mainly two objectives. First, the extension of the links of the Hungarian motorway network with six international routes of the Trans European Network (TEN). Second, it serves the purpose of promoting catch-up procedures in backward regions; according to the Ministry for Economic Affairs (2000) a reduction in the access time to export markets of about 10 minutes will reduce the unemployment rate by 0.3 percent in any given region. In other words, the Ministry argues that for every 50 to 60 kilometres of new motorway stretch a 0.5 percent economic growth seems plausible.

We may conclude that the intentions and chosen direction of economic policy makes clear that the government attaches a great importance to the reduction of the spatial imbalance in economic development in Hungary. Besides, government has opted for keeping the financing and thus the exploitation of the motorways under control. The disappointing contribution to regional economic development of the toll roads built in the present past may explain this attitude of the government.

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NOTES

¹ In the older literature the theory of economic development was associated with the growth potential of developing countries, while the theory of economic growth was dedicated to industrialised countries. Due to the recent developments in growth theory, these two terms are not used separately anymore.

² Originally, COMECOM was established as an answer to the Marshall assistance plan for Western Europe. Finally, COMECOM, which is the well-known name for the Council for Mutual Economic Assistance (CMEA), became the ideological counterpart of the EEC. COMECOM consisted of the former Soviet-Union, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary and Poland.

³ These countries derive this name from the foundation of the Central European Free Trade Agreement (CEFTA) in Visegrád, Hungary, in 1992. The founding members Poland, Hungary and the former Czechoslovakia, were later joined by Slovenia in January 1996 and Romania in July 1997.

⁴ This axle is also defined as the V. transport corridor by the ECMT (European Conference of Ministers of Transport) during the second Pan-European Transport Conference in Crete in 1994.