The Post-Communist Capital City Effects, Transactional Activities and Regional Development in the Czech Republic in the 1990s: A Modelling Approach

Petr Dostál

Abstract

The paper is concerned with qualitative and quantitative modelling of the role of transactional activities in regional development tendencies in the post-communist Czech Republic in the 1990s. The concentration of transactional activities supported through highly educated human resources ("creative class and talent") in the capital city of Prague indicates the importance of so-called post-communist capital effects in the regional development tendencies of the country. The modelling approach is based on a system of standardised multivariate regressions and documents across seventy micro-regions (i) a clear dominance of the Prague agglomeration and also shows (ii) important relationships between the geographical differentiation in transactional activities and a number of crucial regional development tendencies including revaluation of economic outputs. Postulated explanatory model indicates that the relationships were largely determined in the 1990s by *specific* post-communist transformation processes and simultaneously by *general* post-industrial transformation processes carried upon the concentration of transactional activities. The results of the explanatory modelling suggest certain path dependencies and combined effects of endogenous and exogenous factors.

Keywords: post-communist regional development; transactional activities, talent and creative class; capital city effects; the Czech Republic.

1. Introduction

An overview of urban and regional analyses concerned with the macro-region of Central Europe has shown that the national capitals in the Czech Republic (Prague), Hungary (Budapest) or Slovakia (Bratislava) have become leading dominant units in the national city-systems and in patterns of regional development and have functioned as national gateways cities and major centres of innovation in the context of European integra-

tion and accelerated interactions and interdependences in the current world system (see Dostál, 2000). The collapse of the communist bloc at the end of the 1980s resulted in unparalleled institutional, economic and geographical changes and confronted the countries concerned with various geographically differentiated impacts of the European integration and globalisation processes. This historical change started the post-communist transformation process that has been carried on institutional processes of democratisation and liberalisation of internal and external economic relations (Dostál, 1998). It is therefore essential to note that these institutional processes have importantly been influencing differentiations in economic, social and environmental situation of the countries and regions concerned including changes in geographical patterns of economic outputs. The so-called capital city effects have become a key feature of regional development tendencies indicating that in the new circumstances the post-communist capital cities have been "super-dominant" or "dominant" in their respective largely monocentric national city-systems (see also Musil, 1993; 2005; Musil and Illner, 1994; Dostál and Hampl, 1994a; 1994b). Accordingly, there have also arisen questions whether the regional development tendencies have mainly been supporting increasing competitiveness of the national economy and a few regional centres and have tended to undermine necessary cohesion of the regional development pattern in the post-communist countries (see also ESDP, 1999; Dostál, 2000). There are indications that concentrations of so-called transactional activities (see Gottmann, 1966; 1970; 1990) supported through highly educated human resources or "creative class and talent" (see Florida, 2005a; 2005b) in the capital cities have been underlying the increasing importance of so-called post-communist capital effects in the regional development tendencies of the countries concerned. Accordingly, in this paper I make an attempt to provide answers to two interrelated questions. Firstly, what is the character of the transactional activities underlying the present emergence of dominating capital city effects in the post-communist countries? Secondly, what were the implications of the dominant capital city effects for regional development tendencies in the case of the Czech Republic in the 1990s?

Therefore, the main structure of this paper is necessarily threefold. First, I consider the transactional processes that have appeared to sustain and even strengthen dominant capital city effects in the post-communist monocentric national city-system. Second, I work out major hypotheses concerning the capital city effects in the Czech national city-system in the framework of an explanatory model that incorporates some regional development conditions inherited from the pre-1989 period and specifies

their effects on regional transformation processes in the 1990s. Thus, I develop specific research questions enabling to construct an explanatory quantitative model. Differences in changes in economic level in 1991-2001 across seventy micro-regions (districts) are explained with the help of a statistical modelling approach (LISREL modelling procedure based on a system of standardised multiple linear regressions). The explanatory model is conceptualised in such a way that it is indicating the impact of differences in concentration of transactional activities and "creative class and talent" and also can estimate across the Czech micro-regions the differentiating effects of a number of conditions sustaining and strengthening the dominance of the capital city of Prague. Finally, I draw major conclusions concerning the key factors that seem to account for differences in the economic development in 1991-2001. I highlight major outcomes of the explanatory modelling which are indicating that the dominating effects of the capital city and privileged positions of a few regional centres of the country were largely determined by *specific* post-communist transformation processes and simultaneously by *general* post-industrial transformation processes carried upon the concentration of transactional activities. The outcomes of explanatory modelling suggest certain path dependencies and combined effects of endogenous and exogenous factors.

1. Transactional activities, creative class and talent in the post-communist transformation

Since the mid-1950s, Gottmann added importantly in his publications to the understanding of transactional processes as shapers of capital cities and metropolitan regions (Gottmann, 1955; 1961; 1966; 1970; 1990). He was timely drawing attention to "the constellation of activities generating urban centrality" based on "a novel organization of the labour market for a highly qualified and specialized personnel, which in turn needs the assistance of large numbers of specialized clerical staff. This labour problem becomes one of the major factors of concentrations for new jobs, adding to the situation inherited from the past in which the networks of information were centralised in hubs of power and accessibility". The common feature of these activities has been that they have mainly appeared "concerned with and operated through abstract transactions, which by more or less remote control" have been directing "the processes of production and distribution" (1970, 324-325). These interwoven transactional activities have formed a quaternary sector including such a wide

range of activities as banking, insurance and financial intermediation, producer services providing advanced business expertise for non-programmed decision-making of corporate headquarters and government organisations, private and public research establishments or transactional real estate market of offices and hotels (see also Corey, 1982). Since Gottmann's publications in the 1960s and 1970s, the importance of the quaternary sector with its highly diversified transactional activities has been growing and increasingly characterises the advanced post-industrial economies and societies in which the pre-eminence of the professional class and the primacy of knowledge-intensive activities have been evident (see early formulations of Bell, 1974). It is also important to note that these considerations enable to identify the specific character of the main capital city functions. The specific character is twofold and grants capital cities an important advantage over other even larger cities that lack such qualities. As Gottmann argued "the commanding operations of political, economic and cultural affairs necessitate the gathering and processing of masses of information. With the modern evolution of employment and society, the function of the capital city increases in weight as a factor in the selection of growth centres. It also improves the way in which the community looks at itself. The web of capitals becomes the foundation of the shaping of networks of transactional cities" (1990, 82.).

2.1 Capital city function

On the one hand, the capital city plays the role of a gateway city for establishing transnational linkages with other capital cities and states and attracts many international contacts and activities from outside the state (see also Dostál, 2000, 188). It is crucial to emphasise that this internationalising part of the capital city function is in particular important for capital cities in the post-communist countries as foundation for their significant socio-economic expansion in new conditions of open national economies. As opposed to their counterparts in Western Europe, the capital cities in East Central Europe have been involved since the beginning of the 1990s in a process of intensification and widening of this internationalising and globalising function (see also Musil, 2005; Musil and Illner, 1994; van der Wusten, 1994). It is therefore little surprising that the capital city of Prague has been classified as an important gateway city in the post-communist part of Europe (see Taylor, 2004, 92-93). Importantly, recent regional development tendencies show that current extraordinary dynamics of the Czech capital city tended to be utilised in the diffusion of development impulses within the national city-system

(Dostál and Hampl, 2005). On the other hand, the capital city plays the role of a dominating centre of administrative control and representative organs of the state. In the case of unitary states such as the Czech Republic, this central state control is obviously strong. The central state organisation attracts a variety of private corporate actors articulating their specific interests as they demand and supply information and advice and lobby for their interests. One may expect that this organisational dominance of the capital city within the post-communist countries concerned tends to be stronger if their national city-systems have a monocentric structure. Such is clearly the case in East Central Europe in the Czech Republic (Dostál and Hampl, 1994a; 1994b). In more polycentric national city-systems (see Germany or Poland), capital cities have to share their organisational dominance with other large cities and agglomerations housing significant numbers of the transactional activities (see also Dostál, 2000, 188-189).

2.2 Routine and non-routine communication

It is clear that the personnel in the transactional sector need to discuss business, to perform transactions, to inform themselves and to gather in the specific environments of the capital cities well equipped with technical and social infrastructure for such purposes (Gottmann, 1970; ter Hart, 1979; Lambooy, 1998). At this point of discussion of the importance of transactional activities it is necessary to point out to the distinction between routine and non-routine activities and associated types of communication. Routine information is well-structured and can currently be transferred in efficient and rapid ways by means of telecommunications and computer networks. Routine information flows control manufacturing processes, and allow firms and public organisations to control establishments widely territorially scattered at national and supranational levels (Dostál, 1984, 20-24). Communication of this type is standardised and usually one-way following routine formal lines and, in consequence, uncertainty in communication is limited. However, transactional activities of key importance for the dynamic development of capital cities are involving communication that is concerned with unpredictability, surprise and, thus, with uncertainty. These transactional activities are associated with orientation, search and negotiations (Törnqvist, 1998, 119-122). This more complex type of transactional communication is particularly involved in the formation of knowledge and renewal of activities and also often associated with important location decisions (Hägerstrand, 1970, 108-111). From the geographical viewpoint on the

transactional communication it is crucial to note that this complex communication and its results mainly occur as outcomes of face-to-face contacts and group discussions and negotiations. These considerations indicate that routine transaction activities can transfer information within already established networks using more or less developed techniques and media. However, they cannot replace face-to-face contacts between decision-makers who are not known to each other and between transaction networks beset by uncertainties. Significantly, the face-to-face contacts are needed in creative transactional processes (Törnqvist. 1998, 120; Bryson and Rusten, 2005), because it appears that "complexity and uncertainty cannot be totally separated" (Jackson, 1982, 118). As a consequence, an important paradoxical tendency of the post-industrial economy and society must be emphasised: while possibilities of material and goods transportation and standardised communication have been continually increasing, the necessity of direct personal contacts remained or even increased (Dostál, 1984, 22-23). In geographical and also in institutional-organisational terms, the environments of the capital cities appear to be attractive meeting places for non-routine and creative transactional processes. Variation, diversity, flexibility, pluriformity and tolerance seem to promote and sustain creative transactional activities and standardisation, homogeneity and uniformity do not (Törnqvist, 2004, 13-17).

2.3 Creative class, talent and creative centres

Considering the current U.S. post-industrial economy and society, Florida introduced the notion of "creative class" in order to characterise people who "create meaningful new forms". He pointed out that "the super-creative core of this new class includes scientists and engineers, university professors, poets and novelists, artists, entertainers, actors, designers, and architects, as well as the thought leadership of modern society: non-fiction writers, editors, cultural figures, think-tank researchers, analysts, and other opinion makers". He further claimed that such a "creative class" also "includes creative professionals who work in a wide range of knowledge-intensive industries such as high-tech sectors, financial services, the legal and health-care professions, and business management". These people engage in "creative problem-solving, drawing on complex bodies of knowledge in seeking innovative solutions. Doing so typically requires a high degree of formal education, and thus a high level of human capital" (2005a, 34). Importantly, Florida gave emphasis to the fact that the "creative class" tends to concentrate in the national city-system of the United States in large "creative centres", because such centres "pro-

vide the integrated eco-system or habitat where all forms of creativity – artistic and cultural, technological and economic – can take root and flourish" (2005a, 35). The capital city of Washington belongs to this league of "creative centres". It is little surprising that most of the so-called creative class members are engaged in the routine and non-routine complex transactional activities. In other words, Florida (2005a; 2005b) was largely further elaborating on the Gottmannian theme of the whole gamut of interwoven transactional activities. However, Florida went a step further and is also emphasising some other interesting aspects. First, he recognised "that the driving force behind the growth and development of cities and regions is the productivity gains associated with the cluster-ing of talented people or human capital" (2005a, 87). Second, he claimed that talent is associated with diversity of population, firms and other or-ganisations in "creative centres" and with high levels of tolerance and low-entry barriers for human capital (2005b, 53). Significantly, open tol-erant "creative centres" attract varied talent from across the whole national city-system. Third, Florida used the classical cumulative causa-tion concept (Myrdal, 1957, 16-17) claiming that tolerant cities and regions that "are open and possess low barriers to entry for human capital gain distinct economic advantage in the competition for talent or human capital and, in turn, in their ability to generate and attract high –technol-ogy industries and increase their income (2005a, 91). Accordingly, it seems that similar processes have been underlying the current socio-economic expansion of the post-communist capital cities in the countries of East Central Europe (see also Musil, 1993, 904-905; 2005).

2.4 Revaluation of economic outputs

However, the milieus of post-communist "creative centres" have been shaped under simultaneous pressures of the post-industrial and post-communist transformations. There must be given considerable emphasis to the point that in circumstances of the transforming post-communist economy and society "creative" transactional personnel and principal lo-cation decision-makers have had to operate in an environment that has characteristically been fast-changing and also difficult to understand, an-ticipate and, consequently, control effectively (see also Dostál, 1998; 2002, 233-234). And in such fast-changing circumstances it has been the milieu of the post-communist capital city which has seemed to provide necessary conditions and creative human resources that have appeared to sustain the whole gamut of transactional activities characterising the radi-cal post-industrial transformation processes in the countries concerned.

In this context, therefore, one has to take into consideration the combined impacts of the *specific* post-communist transformation and the *general* post-industrial transformation on both the differentiation in regional development and the emergence of the dominating capital city effects. The post-communist transformation was in the 1990s not only a radical process of institutional changes, but it was also involving necessary behavioural adaptations of people, firms and public organisations towards a political system of plural democracy and an economy with a diversified structure of economic property forms in which the private sector and market allocation perform pivotal roles (Musil, 1992) . After 1989, new institutional and organisational changes were resulting in democratic institutions, in liberalisation of internal and external economic relations (i.e. "marketisation" and opening of the national economic system), and in reinstallation of private economic sectors (through privatisation and restitution). It is important to note that these radical institutional and associated behavioural changes inevitably have resulted in the Czech Republic in some selective regional development tendencies and have been causing a deepening of regional disparities, and, in part, even some reversal in regional economic patterns inherited from the communist era (Hampl, 2005; Dostál, 2007). These new regional tendencies revealed in the first stage of the post-communist transformation (i.e. in the 1990s) some real development potentials of regions and agglomerations that tended to be used in new circumstances of an open market economy based on world market prices formations. In consequence, there took place in the Czech Republic very significant revaluation processes of economic outputs in separate sectors in which (a) some industrial activities were loosing and (b) many post-industrial sectors based on transactional activities were clearly winning (see further Dostál, 2000; 2004; Dostál and Hampl, 2005). Therefore, it is worthwhile to explore in this paper the regional pattern of this revaluation process of economic outputs in terms of changes in economic product in 1991-2001 across seventy micro-regions (see Map 1) and make an attempt to estimate differentiating impacts of the unequal localisation of the transactional activities and highly educated human resources with talent and associated skills and consider the importance of the capital city effects.

Summarising the discussion so far one can postulate major impacts of the post-communist and post-industrial transformations and the revaluation processes in the newly open market economy in the Czech Republic as follows:

1. forty years long lasting preferences of the former regime for heavy industrial sectors (mining, metallurgy, heavy chemicals, heavy me-

chanical engineering) were terminated (see also Dostál, 1982; Dostál and Hampl, 1994a; 2005);

2. tertiary sector activities have substantially been expanded and have had important substituting effects in relocation of labour force from industrial sectors (Hampl, 2005);

3. quaternary transactional activities and quality of human resources have become key factors of regional economic growth (Dostál, 2000);

4. location preferences for dynamic economic activities of the quaternary sector in the capital city of Prague with diversified economic base rested on spatial concentration of contact activities and were sustained through highly qualified human resources, talent and "creative class" (Dostál, 2004; 2007);

5. new regional development tendencies have revealed in the 1990s real economic potentials of urban centres and micro-regions that have been resulting in an intensive revaluation of economic outputs across the Czech national territory (Dostál and Hampl, 2002; 2005; Hampl, 2005).

3. Economic product and dimension of transactional activities and talent in 1991-2001

The next task in this paper is to use statistical sources available in the Czech Republic and make an attempt to construct an explanatory model that can specify and test the tendencies and associated hypotheses postulated above. First, the dependent variable of the postulated model has to be considered. The revaluation of economic outputs has led in 1991-2001 to intensive differentiating tendencies in economic results across seventy micro-regions of the country (Map 1). Due to the lack of GDP data at the level of micro-regions it is necessary to use so-called economic aggregate. This measure is defined as the product of number jobs and average wages of employees and is expressed in per capita terms (the national level = 100). Map 1shows that in 1991-2001 a positive change in the economic product took place in only 10 micro-regions (districts) and other 60 were lagging behind. Data from the censuses held in March 1991 and in March 2001 make it possible to establish that there occurred a relative concentration of jobs in the capital city of Prague and in a few regional centres. However, the data on the change in job opportunities in the period March 1991 – March 2001 indicate that in the 1990s there took place a considerable shrinking of employment in the Czech economy (Dostál, 2007, 265-266). Only in the Prague agglomeration and the district of

Mladá Boleslav there took place an increase in number of jobs (by 2.9 respectively 13.9 percent). In all other 68 micro-regions, the numbers of jobs were decreasing. The most extreme decreases occurred in the two main districts of mining, heavy chemical industries and metallurgy, i.e. in Most district (a decrease of 25.7 percent) and in Ostrava-Karviná micro-region (a decrease of 24.4 percent). It must be noted that structural over-employment was a characteristic feature of so-called shortage economy of the communist regime (see further Kornai, 1980). A soft budget con-straint system of the centrally administered economy stimulated state-owned enterprises to hamster all production factors, including labour force. The long-term cumulative effect of this peculiar behaviour was even a structural shortage of available labour force in the national labour market. Economic activity levels of population were unusually high, in particular in respect to female participation rates (Dostál, 1983). It is therefore little surprising that almost all micro-regions experienced a sig-nificant reduction in job opportunities in the 1990s. Yet, the most important factor was the above-mentioned revaluation of economic out-puts of separate sectors that is expressed in the economic product measure by the average wage component (see also Dostál, 2004; Dostál and Hampl, 2005). The increase in the share of the capital city of Prague in the national volume of the economic product was in 1991-2001 extreme (from 16.01 to 23.74 percent). Also in terms of this measure, the polari-sation between the Prague agglomeration and the rest of the national territory importantly increased. This polarisation is in accordance with a general tendency in geographical differentiation in periods of intensive transformations and booming (Dostál and Hampl, 2002). Great attractive-ness of the capital city was appearing under spontaneous market relationships in concentration of investment and jobs opportunities. Hence, one can postulate the hypothesis claiming that increasing distance from the Prague agglomeration tended in 1991-2001 to have systematic negative differentiation effects across the micro-regions on the economic revaluation process. Only the Mlada Boleslav micro-region (housing the leading passenger cars producing firm Škoda Auto) and the regional cen-tres of the national city system (i.e. Brno, Jihlava, České Budějovice, Hradec Králové, Plzeň and Liberec) tended to suppress this national cen-tre-periphery gradient in the regional development. Accordingly, it can be assumed that the differentiation in population size of the main centres of micro-regions had also positive affects on the revaluation process.

Map 1 Change in economic aggregate per capita in 1991-2001 (CR = 100)
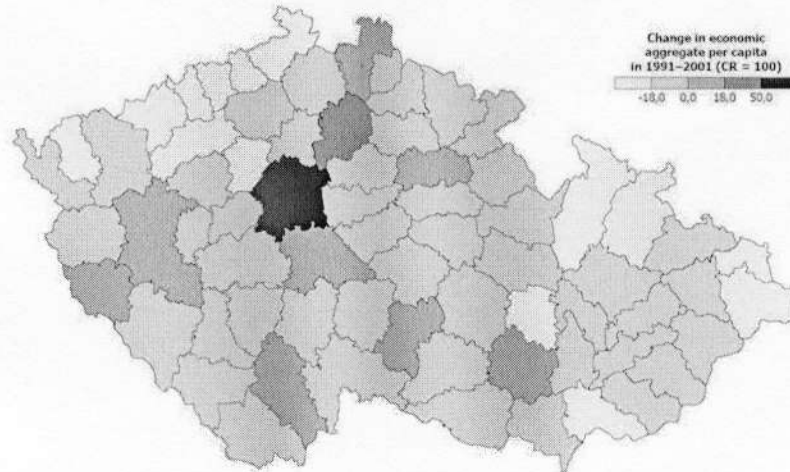
Data sources: Czech Statistical Office, Prague; Hampl, 2005, 125-127.

The second key measure to be specified and used in the postulated explanatory model must represent the level of the transactional activities and highly educated human resources (and talent) and indicate the differentiation in "creative class" across the micro-regions of the national territory and its concentration in the capital city of Prague. There can be used five indicators and this necessitates specification of a complex multivariate measure incorporating the various aspects concerned. The multivariate measure indicating the differentiation in level of the transactional activities and highly educated human resources (and talent) across the 70 micro-regions is derived with the help of the principal component analysis (see Rummel, 1970). In Table 1 there is shown the loading structure of five indictors that are used in order to derive from their correlation matrix a first principal component. The component is strong, because it represents already 77.9 percent of the total variance of the five variables.

Table 1.   Dimension of transactional activities and talent 1991-2001
               (component loadings)

Indicators	Component loadings
(1) share of financial intermediation in total job opportunities (%) in 2000	0.849
(2) share of research, commercial services and real estate in total job opportunities (%) in 2000	0.852
(3) level of population having university education in total population 15+ (%) in 1991	0.966
(4) level of population having university education in total population 15+ (%) in 2001	0.976
(5) change in level of population having university education in total population 15+ in 1991-2001	0.754

Notes:
Extraction Method: Principal Axis Method
One component extracted (no rotation)
component eigenvalue = 3.89; represented variance = 77.9 percent

Each of the indicators is having a high positive component loading on the dimension which is showing that intercorrelations of the five variables are high and positive. Two indicators are representing across the seventy micro-regions the intensity of transactional activities in total employment. There is the share of financial intermediation, banking and insurance in total job opportunities and has a high loading on the dimension (0.849). The second indicator represents the intensity of activities in research and development, commercial services, and transactional real estate and has also a very substantial loading on the multivariate measure (0.852). These outcomes clearly document that the multivariate dimension represents the highly overlapping regional patterns of the levels of transactional activities across the Czech national territory. Importantly, very high component loadings on the dimension have the two indicators specifying the levels of university education of regional populations in March 1991 (0.966) and March 2001 (0.976). There is also a high loading of the indicator describing the change in 1991-2001 in the levels of population having university education. This is a remarkable outcome that clearly substantiates the hypothesis about the cumulative process of concentration of highly educated human resources (a core of the "creative class") and talent postulated in the discussion above. Considering this indicator, it must be noted that in the Prague micro-region (i.e. the amalgamated unit of the city of Prague, district Prague-west and district Prague-east) the 1991-2001 level increase was 2.80 percentage points equalling to 188 percent of the average increase (1.49) in the set of 70 micro-regions. The Brno micro-region is the second leading unit in the Czech national city-system, and this unit was similarly successful in increasing the level of highly

educated human resources and talent (173 percent of the average increase). There were in the micro-regions of the other main regional centres of the country (i.e. Olomouc, Hradec Kralové , Plzeň, Pardubice or České Budějovice) lower increases (below 150 percent of the average increase) and in the Ostrava-Karviná and Ústí nad Labem micro-regions there were only low increases close to the average. Similar clear capital city effect appeared regarding the concentration of jobs in banking, insurance and other financial intermediation: 45 percent of these transactional jobs were located in 2000 in the Prague micro-region (see also Association for Property Market Development, 2006). It must be reiterated that the expansion of transactional activities is obviously based on localisation of highly educated human resources that are able to handle standardised information and particularly non-routine information flows. This essential interrelation between the patterns of qualified human resources and the quaternary transactional activities is documented by the high positive component loadings of all five variables on the dimension. This clear loadings structure of all relevant indictors makes it possible to call this multivariate dimension a scale of transactional activities and talent in 1991-2001 (measure TRANSACT 91-01).

The scores on this dimension shown in Map 2 represent main differences in the level of transactional activities and the highly qualified human resources and talent across the set of 70 micro-regions. Importantly, the geographical pattern shown in Map 2 clearly suggests that these activities and resources tended in 1991-2001 to give the national capital city of Prague and a few leading regional units of the Czech national city-system their capacities to dominate regional socio-economic tendencies in the country. It must therefore be assumed in the causal order of the postulated explanatory model that the differentiation in scores on the transactional activities and talent dimension will have in particular an important positive effect across the micro-regions on the differentiation in the changing economic level in 1991-2001 (the economic aggregate). Indeed, Map 2 also shows that the clear dominant position in the transactional sector differentiation was taken by the Prague agglomeration. At this point of the discussion it is again necessary to stress the specific character of the capital city function. Because already in the 1990s Prague was functioning in a globalised web of capitals and world cities that became the basis of the shaping networks of transactional cities (see Taylor, 2004). Accordingly, explaining the extraordinary socio-economic dynamics of the Prague agglomeration enhancing transactional activities of the quaternary sector one has largely to consider factors at the European and even global scales (Musil, 1993; 2005).

Map 2   Scores on dimension of transactional activities and talent 1991-
            2001
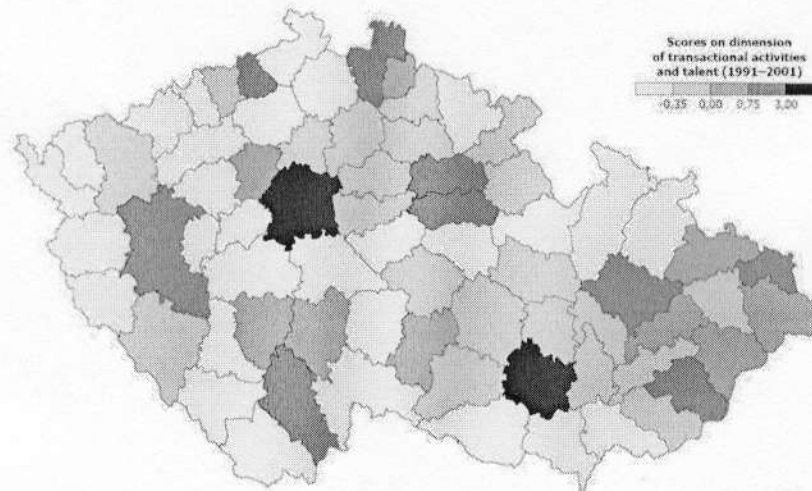
Data sources: Czech Statistical Office, Prague.

It has been emphasised earlier in this paper that the extraordinary dy-
namics of the Czech capital city tended to be utilised in the diffusion of
post-industrial development impulses within the national city-system and
the whole gamut of regional development tendencies. However, the
dominance of the micro-region of Prague (see Map 2) in terms of the five
indicators is extraordinary. Figure 1 shows the correlation between the
logarithm of population size of district capitals in 1980 (LOGSIZE) and
the scores on the dimension of transactional activities and talent in 1991-
2001 (TRANSACT 91-01).

Figure 1 Correlation between population size of district capital in 1980 (LOGSIZE) and scores on dimension of transactional activities and talent in 1991-2001 (TRANSACT)
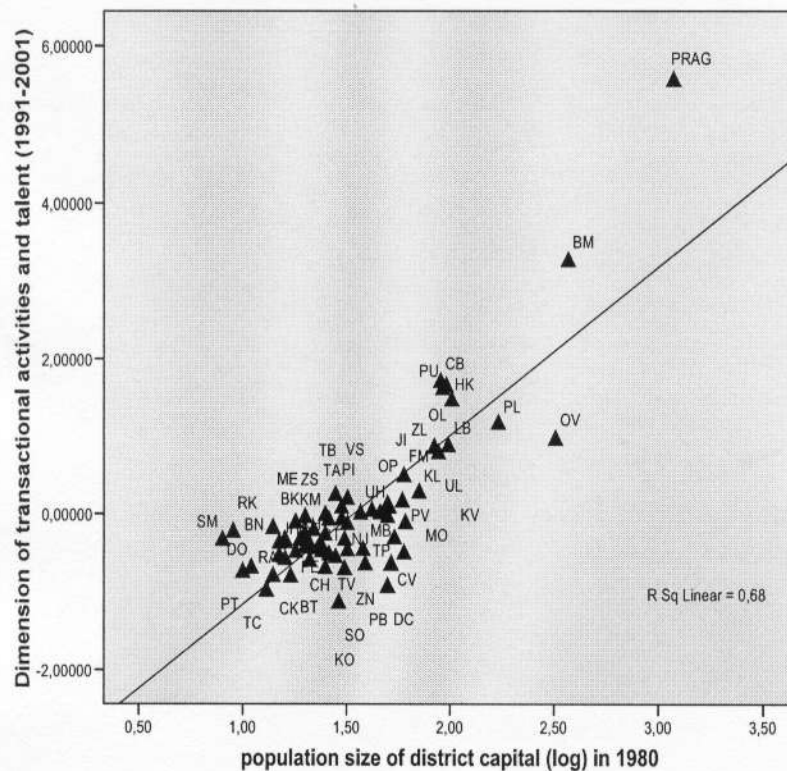
The scatter diagram in Figure 1 clearly indicates the "super-dominant" position of the Prague micro-region and the significantly lower position of the second unit in the national city-system, i.e. the Brno micro-region (BM) in Moravia (amalgamated unit of Brno and its rural district). The micro-regions of other regional centres – České Budejovice (CB), Pardubice (PU), Hradec Králová (HK), Olomouc (OL) and Plzeň (PL) – have much lower positions in the geographical ladder of the transactional activities and talent. Given the enormous difference in population size varying from small district capitals of about 15 thousand inhabitants to 1.2 million of Prague, however, the population indicator must be transformed in decimal logarithms in order to obtain a more normal statistical distribution. In spite of this statistical transformation, there are still indi-

cated in the quantitative terms of population size existing significant hierarchical differences in the national city-system. Figure 1 also indicates that the development condition of population size tends to have only intensive positive impacts at the highest hierarchical levels, in particular in the case of Prague (Dostál and Hampl, 2002). The correlation between the two variables is high, because the differentiation in the population size appears to statistically determine 68 percent of the differentiation in the scores on the dimension of transactional activities and talent in 1991-2001. By the beginning of the 1980s, the communist regime realised through its centrally directed investment policies concerning industrial production facilities, infrastructure and housing a considerable concentration of population in the district capitals. Accordingly, in the explanatory model the population size variable will be postulated as an important inherited development condition (see also Dostál, 2007, 262-263).

4. Postulated explanatory model

The modelling approach in this paper is based on a combination of two multivariate statistical techniques. First, there is the principal component analysis (see Rummel, 1970) has been used in the specification of the multivariate measure TRANSACT 91-01. Second, there is made use of so-called LISREL modelling (a system of multivariate linear regressions; see Saris and Stronhorst, 1984). The approach enables to construct the needed quantitative version of the postulated causal order of an explanatory model. The basis of the LISREL modelling is classical multiple regression analysis which estimates relationships between a dependent variable and a number of explanatory variables. Accordingly, the goodness-of-fit of a LISREL model or its determination is measured by classical multiple correlation coefficient. In contrast to classical multiple regression, however, the LISREL analysis is explicitly concerned with the structure of effects within the set of explanatory variables that statistically determine the variation in the dependent variable and the effects (standardised regression coefficients) are independent affects as in the multiple regression. Als it were, one can gain insight into the causal order of multivariate regressions.

The postulated explanatory model of nine variables is derived from the hypotheses that were spelled out in the preceding sections of this paper and from a number of complementary hypotheses which still have to be specified in this section. The explanatory model shown in Figure 2

appears to statistically explain the variation in changes in the economic product in 1991-2001 across the 70 micro-regions with the help of eight variables at level of 77 percent. This outcome clearly demonstrates substantial determination level of the postulated model (square of Pearson multivariate correlation coefficient = 0.77; adjusted 0.74).

On the left hand side of the postulated model, there are three variable representing development conditions inherited from the communist era. It is indicated that the correlation between the explanatory variables LOGSIZE 19980 and the distance from Prague variable (DISTPR) is negligible (Pearson correlation coefficient of 0.08). Obviously, this means that there is no systematic interaction across the micro-regions between these two inherited conditions. Next, there is the third inherited development condition represented by the differentiation in value of industrial fixed assets (in pre-1990 Czechoslovak crowns) per worker in 1980 (variable FIXA1980). The inherited economic base of extensive industrialisation was largely completed by the communist regime in the beginning of the 1980s (Dostál, 1982). The communist regime had ideological preferences for the industrialisation process, in particular for long-term investment in heavy industrial sectors (see also Kornai, 1980; Dostál and Hampl, 1994a). Considering the impacts of this economic heritage in the 1990s, it is important to know whether there are some systematic effects of huge industrial investments realised by the beginning of the 1980s across the 70 micro-regions on other explanatory variables in the postulated model as well as on the differentiation in changes in the economic product in 1991-2001. In particular, it is interesting to know whether there were tendencies in regional allocation of investment in the 1990s that were largely reproducing the inherited regional industrial investment pattern from the communist past under the new institutional circumstances of an open market and privatised economy. The explanatory model in Figure 2 indicates that the variable LOGSIZE 19980 has a considerable direct effect on the variable FIXA1980 (0.45). In terms of the LISREL modelling based on the standardised multiple regression coefficients this means that a shift of one standard deviation on the variable LOGSIZE1980 implies a positive effect of 0.45 standard deviation on the FIXA1980 variable. This positive direct effect is certainly an interesting result demonstrating that the communist regime tended to realise big investments in micro-regions with large cities. This is an important aspect of the industrial heritage. The direct affect of the distance variable (indicator TDISTPR) on the FIXA1980 variable is very weak (0.19), but it indicates a certain tendency of the communist regime to create industrial investment assets in greater distance from Prague. There is chosen a

strait-forward topological distance indication. The distance measure is defined in terms of zones of micro-regions (districts) extending from the neighbouring micro-regions of Prague towards the most peripheral micro-regions in north-eastern and eastern Moravia. However, the variable FIXA1980 is determined by the two variables at a low level (22 percent).

Figure 2 Explanatory model on changes in economic product
in 1991-2001 (determination = 77 percent)
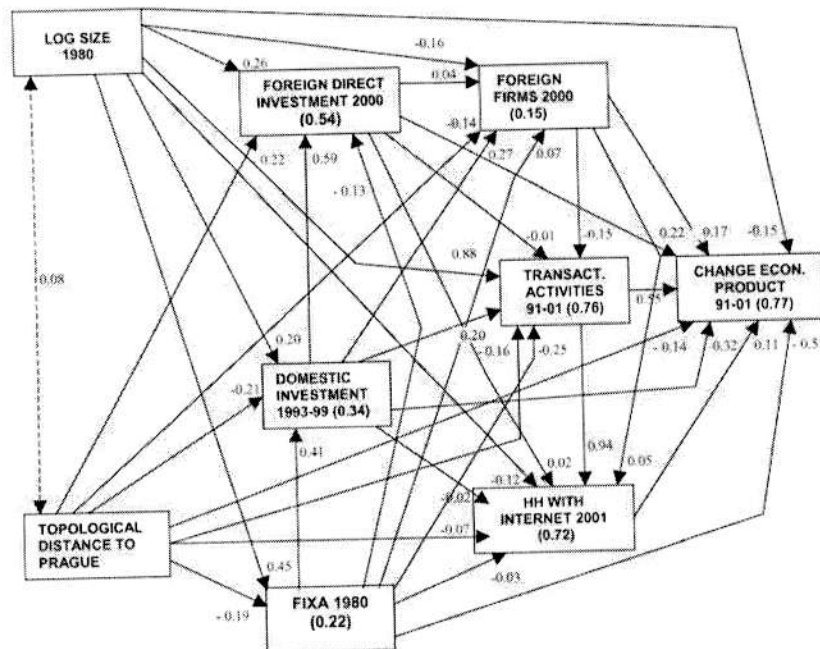
There is also included in the model the differentiation in the intensity of tangible investment per capita in 1993-1999 in annual prices in Czech crowns (variable DOMESINV93-99). Since the split of Czechoslovakia on 1st January 1993, the differences in investment intensity across the micro-regions have been considerable. The variable is determined at a moderate level of 34 percent, and it is strongly influenced by the variable FIXA1980 (direct effect of 0.41). In the framework of the hypotheses of the explanatory model, this outcome of the statistical analysis is important. It means that the pattern of domestic investment per capita tended in the 1990s to be significantly overlapping with the inherited pattern of huge industrial investment from the communist period. In brief, this result

suggests a certain path dependency in investment processes during the 1990s. The other effects influencing the differentiation in the DOME-SINV93-99 variable are low. There is a low positive effect (0.20) of the LOGSIZE1980 variable indicating a certain tendency of domestic investors to invest in the micro-regions of larger centres of the national city-systems. There is again also a low negative effect (-0.21) of the distance variable indicating that the intensity of domestic investment tended to decrease with increasing distance from the capital city of Prague.

The inflow of foreign direct investment in the Czech Republic was enabled by the liberalisation of external economic relations in the 1990s. The inflow was gradually increasing in the 1990s and its intensity in per capita terms in December 2000 in US dollars (indicator FDI2000) was a result of its gradual cumulative development since the beginning of the 1990s. Obviously, the FDI inflow is a process that plays a key role in exogenous growth theories that point out to embedding of exogenous resources in selected regions of national economies (see Dicken, 2003; Pavlínek, 2004). Regarding the differentiation in the intensity of foreign direct investment per capita (FDI2000) one can draw a similar conclusion as in the case of the domestic investment. The FDI variable is determined at a higher level (54 percent), but there is again only one strong independent effect influencing across the 70 units its differentiation: the strong positive effect of 0.59 coming from the domestic investment variable. This is also an important result in terms of the theoretical considerations in this paper. Because this outcome suggests that the external component of the investment process was tending in the 1990s to support the regional pattern of the domestic investment. There is very weak negative effect coming from the variable FIXA1980 (-0.13). However, there is an interesting indirect positive effect that is mediated through the domestic investment variable (0.41 x 0.59 = 0.24). These outcomes of the statistical modelling suggest that if the micro-regions inherited the intensive industrial assets from the beginning of the 1980s then they tended in the 1990s to attract high intensities of the domestic investment and as a result, the foreign investors were seemingly also inclining to follow the inherited pattern of old industrial investment. These results are indications of certain cumulative tendencies in the investment process. Importantly, these tendencies support interpretations indicating certain path dependency features of regional development pointing to the importance of industrial heritage (Dostál and Hampl, 1994a; see also general theoretical discussions in Martin and Sunley, 1998; 2003). The next explanatory variable in the model is indicating across the micro-regions the differentiation in the share of foreign own firms in 2000. It appears

that this variable is determined by the five other explanatory variables at a very low level (0.15). Surprisingly, there is no independent systematic effect coming from the FDI variable (0.04). This indicates that the intensity of the foreign direct investment did not tend across the micro-regions to stimulate the proliferation of foreign own firms. There is a low positive effect (0.27) of the intensity of domestic investment.

In Table 2, there are direct effects of the explanatory variables that are considered to be determining the differentiation in the scores on the dimension of transactional activities and talent (TRANSACT 91-01 variable) and the differentiation in the changes in the economic product in 1991-2001 (variable CHANGE ECON. PRODUCT 91-01). The model documents high levels of determination of the two variables: 76 and 77 percent respectively. The outcomes clearly indicate that far the most important positive effect on the differentiation in the scores on the dimension of transactional activities and talent is coming from the LOG-SIZE1980 variable (a very strong effect of 0.88). This considerable independent standardised regression effect was suggested by the high correlation shown in Figure 1. But, this result of the modelling documents the causal importance of the population size differentiation whereby all other explanatory variables are statistically held constant. The correlation in Figure 1 already indicated the importance of the capital city effect and also some effects of the higher hierarchical positions of a few large regional centres. There are other four statistically significant effects to be considered. There is an interesting negative effect (-0.25) of the FIXA1980 variable suggesting that the inherited economic base of the micro-regions with intensive industrial investment from the communist period has tended in the 1990s to discourage the development of the transactional activities and further that the regions concerned were lacking highly educated human resources and talent. There is also a positive effect of the intensity of the domestic investment (0.20) indicating a facilitating impact on the expansion of the transactional activities and talent. Interestingly, there is no systematic independent effect (-0.01) coming from the differentiation in the intensity of foreign direct investment. There is even a low negative effect of the share of foreign firms (-0.15).These results of the modelling can be explained by the character of the inflows of the FDI in the 1990s that were mainly directed towards the industrial sectors of the Czech economy (see Pavlínek, 2004). There is also the expected significant, but low effect of the distance variable (-0.16). This outcome indicates that there was taking place in the 1990s a certain centre-periphery polarisation in the important post-industrial development processes. There is the eighth explanatory variable in the

model representing the share of households that had in 2001 an internet connection (variable HH INTERNET 2001). This variable is included in the explanatory model in order to control the claims that the transactional activities and talented labour force have tended to stimulate intensive use of new communication media (Florida, 2005, 49-56) because such communication devices make possible significant extensions of "technical reach" (Törnqvist, 1998, 88-101). The model estimates a very strong positive direct effect (0.94) coming on this use-of-internet variable from the differentiation in the scores on the transactional activities and talent dimension. The determination level of the variable is high (0.72), but the other seven explanatory variable do not have significant effects on this communication technology indicator. Thus, it appears that the shift towards the post-industrial sectors of the economy in the 1990s has also tended across the Czech micro-regions to significantly stimulate the use of the internet media extending the communication reach of the human resources.

Table 2   Direct effects of explanatory variables on TRANSACT 91-01 scores and CHANGE IN ECONOMIC PRODUCT 91-01

Explanatory variables	Direct effects on TRANSCACT 91-01	Direct effects on CHANGE IN ECON. PRODUCT 91-01
LOGSIZE1980	0.88	-0.15
TDISTPR	-0.16	-0.14
FIXA1980	-0.25	-0.51
DOMESINV93-99	0.20	0.32
FDI 2000	-0.01	0.22
FOREIGNFIRMS2000	-0.15	0.17
HHINTERNET2001	--	0.11
TRANSACT91-01	--	0.55

Note: coefficients in bold are at least at 5 percent of significance level.

Finally, the attention can be turned in Table 2 towards the last dependent variable in the explanatory model, i.e. the differences in the change in the level of economic product in 1991-2001. There are eight direct effects to be considered, but only five appear to be statistically significant. The most important direct effect comes from the differentiation in the scores on the transactional activities and talent dimension: a strong positive effect of 0.55. Given the major theme of the paper, this result is of key theoretical importance. It demonstrates that already in the 1990s the shift towards the post-industrial economy and society was a very important factor determining the regional socio-economic tendencies in the Czech Republic. It is also important to note that the heritage of the intensive industrial investment from the communist era (variable FIXA1980) has a

strong negative effect (-0.51) on the differentiation in the change in the level of economic product in 1991-2001. This negative effect is clearly in accordance with the assumption that this inherited development condition was a negative factor in the revaluation of economic outputs in the first stage of the post-communist transformation. There is also a significant positive direct effect (0.32) indicating the facilitating impact of the intensity of domestic investment. The positive effect (0.22) of the intensity of the FDI inflow is lower, but still statistically significant. These two effects indicate the importance of combined effects of recent endogenous and exogenous factors of the regional economic change in the 1990s. The differentiation in the share of foreign firms across the micro-regions has a very low, but significant positive effect (0.17) suggesting that the foreign control of local production capacities tended to be a favourable factor in the revaluation of economic outputs. It is necessary to note there is a very low and statistically insignificant negative effect (-0.15) of the LOG-SIZE1980 variable. However, the indirect effect mediated by the differentiation in the scores on the dimension of the transactional activities and talent is important: 0.88 x 0.55 = 0.48. This is a substantial positive indirect effect which documents that if the large population size of the centre was combined with the intensive development of the transactional activities and the concentration of high quality human resources than the increase in the economic product level was considerable. Also this outcome of the explanatory modelling is important in the view of the main research theme of the paper. Because, this indirect effect is a result of the dominating capital city effects on the differentiations of the two measures shown in Figure 1.

5. Conclusions

The outcomes of the LISREL modelling have indicated important interrelationships between the regional development tendencies that were largely determined by the post-communist transformation processes and the post-industrial transformation processes. However, the results of the explanatory model have shown that the interrelationships have been complex.

First, the Gottmannian theme of the importance of the transactional activities made it possible to consider the underlying processes of the capital effects in the post-communist countries in East Central Europe. In particular, the concentration and intensity of the transactional activities resulted in the monocentric national city-systems in considerable capital

city effects on the regional development tendencies in the 1990s. The capital city effects were also strengthened through the concentration of highly educated human resources. The high intensity of clustering of so-called creative class and talent and non-routine (face-to-face) contacts in the capital city and in a few regional centres was indicating low barriers to entry for human capital and suggesting gains in economic advantage in the competition for talent or human capital. In turn, the ability to generate and attract transactional and other post-industrial activities and increase their income also suggested the existence of important cumulative causation mechanisms in the emerging post-industrial economy in the post-communist Czech Republic.

Second, favourable revaluation of economic outputs took place in the Prague micro-region and in a few regional centres. There occurred in the Czech economy very significant revaluation processes of economic outputs in separate sectors in which some (heavy) industrial activities were loosing and many post-industrial sectors based on transactional activities were clearly winning. The specification of a consistent dimension of transactional activities and highly educated human resources indicated extraordinary dominance of the Prague micro-region in the regional pattern. This result of the principal component analysis confirmed that the expansion of transactional activities tended to be based upon localisation of skilled human resources that are able to handle standardised information and particularly non-routine information flows.

Third, the explanatory model estimated the effects on the differentiation in the scores on the dimension of transactional activities and talent across the seventy micro-regions at the level of 76 percent. The outcomes clearly indicated that far the most important positive effect on the differentiation in the scores on the dimension of transactional activities and talent was coming from the differentiation in the population size in 1980. This very strong effect of the inherited development condition indicated the importance of the capital city effects and also some effects of the higher hierarchical positions of a few regional centres. There was an interesting negative effect suggesting that the inherited economic base of the micro-regions with intensive industrial investment from the communist period tended in the 1990s to discourage the development of the transactional activities and that the regions concerned were lacking highly educated human resources and talent. The explanatory model also confirmed that the transactional activities and talented labour force tended to stimulate intensive use of new communication media. Thus, it appeared that the shift towards the post-industrial sectors of the economy in the 1990s also tended across the Czech micro-regions to significantly stimu-

late the use of the internet media extending the communication reach of the human resources.

Fourth, the explanatory model determined the differentiation in the changes in the economic product in 1991-2001 at the level of 77 percent. The most important direct and positive effect came from the differentiation in the scores on the transactional activities and talent dimension. This result is of key theoretical importance. It demonstrated that the shift towards the post-industrial economy and society was a very important factor determining the regional socio-economic tendencies in the Czech Republic in the 1990s. It is also important to note that the heritage of the intensive industrial investment from the communist era was having a strong negative effect on the differentiation in the change in the level of economic product in accordance with the hypothesis that this inherited development condition was a negative factor in the revaluation of economic outputs in the first stage of the post-communist transformation. The combined lower positive effects of the domestic and foreign investment indicated the importance of recent endogenous and exogenous factors for the regional economic change in the 1990s. Importantly, the explanatory model also specified the indirect effect of the population size differentiation that was mediated by the differentiation on the dimension of the transactional activities and talent. This substantial positive indirect effect documented that if the large population size of the centre was combined with the intensive development of the transactional activities and high quality human resources than the increase in the economic product level in 1991-2001 was considerable. Also this outcome of the explanatory modelling seemed largely to be a result of the dominating capital city effects on the differentiations of the two measures.

It must be recognised that the extreme positions of the capital city of Prague in the various differentiations in the explanatory model significantly contributed to the results of the modelling approach. Important changes in socio-geographical structures tend to be usually much slower than institutional and organisational changes and can only be assessed from a long-term perspective (Dostál and Hampl, 2002). Hence, the modelling approach indicated that some regional conditions created before the post-1989 institutional transformations still tended to have important effects on differentiations in the socio-economic development across the Czech micro-regions in the 1990s. However, the analysis indicated that the shift of the socio-economic activities towards the post-industrial economy and society was in the Prague agglomeration in the 1990s very fast. This shift and its effects on the rising socio-economic level in the agglomeration were caused by the endogenous factors as well as by the

supra-national factors (see also Musil, 1993; 2005). There is also the question whether the post-1989 regional development tendencies in the monocentric national city-system and the organisational and economic dominance of the capital city can significantly constrain policies towards more decentralisation and deconcentration (see also Dostál, 2000, 189-191). In view of the European spatial development policies specified in the ESDP (1999) there is the policy tension between necessary competitiveness and needed cohesion in the national spatial development pattern. The outcomes of the modelling in this paper indicate that the dominance of the capital city of Prague is considerable, but there are also some counterbalancing tendencies that are based upon the development of main regional centres in more peripheral parts of the national territory. In the Czech national city-system there took place post-industrial transformation processes also in a few regional centres that were providing attractive locations for the development of transactional activities and supplied necessary qualified human resources. As a consequence, the explanatory model documented important capital city effects, but it did not indicate some dramatic effects of a centre-periphery polarisation that tend radically to undermine necessary cohesion of the national city-system. Of course, there was the positive extreme of the Prague agglomeration and the negative extremes of the micro-regions in the main mining and heavy industry areas (such as Ostrava-Karviná or Most). However, some other main regional centres (such as Brno, České Budějovice, Hradec Králové, Plzeň, Zlín or Liberec) appeared in the 1990s to maintain or improve their relative socio-economic positions in the national city-system (see also Hampl, 2005; Dostál and Hampl, 2005). In consequence, the postulated explanatory model indicated that the relationships were determined in the 1990s by *specific* post-communist transformation processes and simultaneously by *general* post-industrial transformation processes carried upon the intensity of transactional activities and high quality human resources. The results of the explanatory modelling suggested certain path dependencies and combined effects of endogenous and exogenous factors.

References

Association for Property Market Development (2006) *Trend Report 2006*. Prague, ARTN.

Bell, D. (1974) The Coming of Post-Industrial Society. A Venture in Social Forecasting. London, Heinemann.

Bryson, J. R. and Rusten, G. (2005) Spatial divisions of expertise: knowledge intensive business service firms and regional development in Norway. In: *The Service Industries Journal*, vol. 25, no. 8, pp. 959-977.

Corey, K. (1982) Transactional forces and the metropolis. In: *Ekistics*, no. 297, pp. 416-423.

Dicken, P. (2003) *Global Shift. Reshaping the Global Economic Map in the 21ˢᵗ Century*. London, Sage.

Dostál, P. (1982) Geleide agglomeratietendenzen in Tsjechoslowakije: een institutioneel-geografische benadering (Commanded agglomeration tendencies in Czechoslovakia: an institutional-geographical approach). *KNAG Geografisch Tijdschrift*, vol. 16. no. 4, pp. 328-341.

Dostál, P. (1983) De gespannen arbeidsmarkt in het etatistisch socialisme: enkele institutionele en geografische aspecten (Tensions in the labour market under the etatist socialism: some institutional and geographical aspects). In: van der Wusten, H. (red.): *Werkloosheid*. Universiteit van Amsterdam, SGI Publikatie no. 6, pp. 47-63.

Dostál, P. (1984) Regional policy and corporate organizational forms: some questions of interregional social justice. In: de Smidt, M., and Wever, E. (eds.) *A Profile of Dutch Economic Geography*, Assen, van Gorcum, pp. 12-28.

Dostál, P. (1998) Democratization, economic liberalization, and transformational slump: a cross-sectional analysis of twenty-one postcommunist countries. In: *Environment and Planning C. Government and Policy*. vol. 16. no. 3. 1998. pp. 281-306.

Dostál, P. (2000) The European Spatial Development Perspective and the Accession Countries: Polycentric Guidelines versus Uneven Spatial Development. In: Informationen zur Raumentwicklung. Bonn. Heft 3-4, pp. 183-192.

Dostál, P. (2002) Territorial government and flexibility: a critical assessment. In: Belgian Journal of Geography, no. 3, pp. 227-241.

Dostál, P. (2007) Explaining differentiation in regional development level in the Czech Republic: non-experimental LISREL modelling. In: Dostál, P., and Langhammer, J. (eds.) Modelling Natural Environment and Society: Geographical Systems and Risk Processes. Prague, Publishers P3K, pp. 257-283.

Dostál, P. and Hampl, M. (1994a) Development of an urban system: general conception and specific features in the Czech Republic. In: Barlow, M., Dostál, P., and Hampl, M., (eds.) *Territory, Society and Administration. The Czech Republic and the Industrial Region of Liberec.*. Amsterdam, Universiteit van Amsterdam, pp. 191-224.

Dostál, P. and Hampl, M. (1994b) Changing economic base of Prague: towards new organizational dominance. In: Barlow, M., Dostál, P., and Hampl, M., (eds.) *Development and Administration of Prague*. Amsterdam, Universiteit van Amsterdam, pp. 28-44.

Dostál, P. and Hampl, M. (2002) Regional development in the Czech Republic. In: Domański, R. (ed.) *Cities and Regions in an Enlarging European Union*. Polish Academy of Sciences, Committee for Space Economy and Regional Planning, Warsaw, pp. 129-149.

Dostál, P. and Hampl, M. (2005) Current development of socio-geographical organisation in the Czech Republic: concentration and/or selection? In: Markowski, T. (ed.) *Regional Scientists Tribute to Professor Ryszard Domański*. Polish Academy of Sciences, Committee for Space Economy and Regional Planning, Warsaw, pp. 87-100.

ESDP (1999) *European Spatial Development Perspective: Towards Balanced and Sustainable Development of the Territory of the EU*. Luxembourg, European Commission.

Florida, R. (2005a) *Cities and the Creative Class*. New York, Routledge.

Florida, R. (2005b) *The Flight of the Creative Class: The New Global Competition for Talent*. New York, Harper Collins.

Gottmann, J. (1955) *Virginia at Mid-Century*. New York, Henry Holt.

Gottmann, J. (1961) *Megalopolis: The Urbanized Northeastern Seaboard of the United States*. New York, The Twentieth Century Fund.

Gottmann, J. (1967) Why the sky scraper?. In: *Geographical Review*, vol. LVI, no. 2, pp. 190-212.

Gottmann, J. (1970) Urban centrality and the interweaving of quaternary activities. In: *Ekistics*, no. 174, 322-331.

Gottmann, J.(1983) *The Coming of the Transactional City*. College Press. Maryland.

Gottmann, J.(1990) Capital cities. In: Gottmann, J., and Harper, R. A. (eds.) *Since Megalopolis. The Urban Writings of Jean Gottmann*. The John Hopkins University Press. Baltimore, pp. 63-82.

Hägerstrand, T. (1970) Tidsänvändning och omgivinsstruktur (Time use and environmental structure). In: Statens offentliga utredningar 1970:14, Bilaga 4. Stockholm.

Hampl, M. (2005) *Geografická organizace společnosti v České republice: transformační procesy a jejich obecny context (Geographical organisation of society in the Czech Republic: transformation processes and their general context)*. Praha, DemoArt, Karlova Univerzita, Přírodovědecká fakulta.

Hart, H. ter (1979) *Vestigingsplaatsaspecten van top-management: verkenningen op het terein van de transactionele geografie (Aspects of the location of top-managenent: a survey of the domain of transactional geography)*. Meppel Krips, Repro.

Jackson, P. M. (1982) *The Political Economy of Bureaucracy*. Deddington,

Korec, P. (2002) The transformation of basic functions of Bratislava after 1989: trends and consequences. In: *Acta Universitatis Carolinae – Geographica*, 37, 2, pp. 85-103.

Lambooy, J. G. (1998) *Agglomeratievoordelen en ruimtelijke ontwikkeling: steden in het tijdperk van de kenniseconomie (Agglomeration advantages and spatial development: cities in the era of the knowledge-economy)*. Oratie Universiteit Utrecht, Utrecht.

Lichtenberger, E. (1993) *Wien - Prag. Metropolenfoschung*. Wien, Böhlau Verlag.

Kornai, J. (1980) *The Economics of Shortage. Volumes I and II.* , Amsterdam, North-Holland.

Martin, R., and Sunley, P.(1998) Slow convergence? Post neo-classical endogenous growth theory and regional development.In: *Economic Geography*, vol. 74, no. 3, pp. 201-227.

Martin, R. and Sunley, P.(2003) Deconstructing clusters: chaotic concept or policy panacea? In: *Journal of Economic Geography*, vol. 3, no. 1, pp. 5-35.

Musil, J. (1992) Czechoslovakia in the middle of transition. In: *Czechoslovak Sociological Review*, vol. 28, pp. 5-21.

Musil, J. (1993) Urban systems in post-communist societies in Central Europe. In: *Urban Studies*, vol. 30, pp. 899-905.

Musil, J. (2005) Prague returns to Europe. In: Hamilton, F.E.I., Dimitrowska Andrews, K., and Pichter-Milanović, N. (eds.) *Transformation of cities in Central and Eastern Europe: towards globalisation.* Tokyo, United Nations University Press, pp. 281-317.

Musil, J. and Illner, M. (1994) Development of Prague: long-term trends and scenarios. In: Barlow, M., Dostál, P., and Hampl, M., (eds.) *Development and Administration of Prague.* Amsterdam, Universiteit van Amsterdam, pp. 145-170..

Myrdal, G. (1957) *Economic Theory and Under-Developed Regions.* London, Duckworth.

Pavlínek, P. (2004) Regional development implications of foreign direct investment in Central Europe. In: *European Urban and Regional Studies*, vol. 11, no. 1, pp. 47-70.

Rummel, R.J. (1970*) Applied Factor Analysis.* Evaston, Northwestern University Press.

Saris, W., and H. Stronkhorst (1984) *Causal Modelling in Nonexperimental Reserach. An Introduction to the LISREL Approach.* Amsterdam, Sociometric Research Foundation.

Taylor, P.J. (2004) *World City Network. A Global Urban Analysis.* London, Routledge.

Törnqvist, G. (1970) *Contact Systems and Regional Development.* Lund, Gleerup Publishers.

Törnqvist, G. (1998) *Renässans för regioner – om techniken och den sociala kommunikationens villkor (Renaissance for regions - about techniques and conditions of social communication).* Stockholm, SNS Förlag.

Törnqvist, G. (2004) *Kreativitetens geografi (Creativity geography).* Stockholm, SNS Förlag.

Turnock, D. (2001) Location trends for foreign direct investment in East Central Europe. In: *Environment and Planning C. Government and Policy*, vol. 19, pp. 849-880.

Wusten, H. van der (1994) A capital city is a node, a hinge and a focus. In: Barlow, M., Dostál, P., and Hampl, M., (eds.) *Development and Administration of Prague.* Amsterdam, Universiteit van Amsterdam, pp. 141-148.

Data sources: Czech Statistical Office. Prague.
                    Czech National Bank. Prague.

Adress: CharlesUniversity in Prague, Faculty of Science, Department of Social Geography and Regional Development, dostal@natur.cuni.cz