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Regional Analysis of Public Capital Expenditure: To Which Regions Is Public Capital Expenditure Channelled - to 'Rich' or to 'Poor' Ones?

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Regional Analysis of Public Capital Expenditure: To Which Regions Is Public Capital Expenditure Channelled – to 'Rich' or to 'Poor' Ones?

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BLAŽEK J. and MACEŠKOVÁ M. Regional analysis of public capital expenditure: to which regions is public capital expenditure channelled – to 'rich' or to 'poor' ones?, *Regional Studies*. The paper aims to contribute to the debate on the regional dimension of sectoral (that is, non-regional) policies and to demonstrate empirically the huge discrepancy between both the volume and the regional pattern of sectoral public capital expenditure policies, on the one hand, and official regional policy, on the other. Analyses were based on a unique database of public investment in the Czech Republic covering the years 1995–2005. Their results show significant conflicts in policy objectives and thus represent a clear argument in favour of pursuing territorial impact assessment (TIA) of sectoral policies.

Regional impact of non-regional policies Sectoral policies Territorial impact assessment Regional policy Public investments Czech Republic

BLAŽEK J. and MACEŠKOVÁ M. 公共资金开支的区域性分析：公共资金开支应当流向哪些区域–"富裕区域"或者是"贫穷区域"？区域研究。本文旨在进一步讨论部门政策的区域尺度（如：非区域）以及经验性地展示出部门公共资金支出政策的数量与区域模式的巨大差异, 另一方面也展示出官方的区域性政策差异。分析是基于捷克1995-2005年的一个特定的公共投资数据库。 研究结果展示了不同政策目标间出现的主要冲突，也因此提出了一个明确的观点以获得各部门政策的领域影响评价 (TIA)。

非区域政策的区域影响 部门政策 领域影响评价 区域政策 公共投资 捷克

BLAŽEK J. et MACEŠKOVÁ M. Une analyse des dépenses en capital publiques: vers quelles régions les dépenses en capital publiques sont-elles canalisées – vers les régions riches ou les régions pauvres?, *Regional Studies*. Cet article cherche à contribuer au débat sur la dimension régionale des politiques sectorielles (c'est-à-dire, qui ne sont pas à but régional) et à démontrer de façon empirique l'écart sensible entre le volume et la distribution régionale des politiques sectorielles pour ce qui concerne les dépenses en capital publiques d'un côté, et la politique régionale officielle de l'autre côté. Les analyses sont fondées sur une base de données unique sur l'investissement public en République tchèque de 1995 à 2005. Il s'avère d'importants conflits entre les objectifs de politique, et les résultats représentent donc un argument clair en faveur de la poursuite d'une étude de l'impact territorial des politiques sectorielles.

Impact régional des politiques qui ne sont pas à but régional Politiques sectorielles Etude de l'impact territorial Politique régionale Dépenses publiques en capital République tchèque

BLAŽEK J. und MACEŠKOVÁ M. Regionalanalyse öffentlicher Investitionen: In welche Regionen werden öffentliche Investitionen gelenkt – in 'reiche' oder 'arme'?, *Regional Studies*. Mit diesem Artikel möchten wir zur Debatte über die regionale Dimension sektoraler (d. h. nicht-regionaler) Politiken beitragen und empirisch nachweisen, dass zwischen dem Volumen und regionalen Muster sektoraler öffentlicher Investitionspolitiken einerseits und der offiziellen Regionalpolitik andererseits eine gewaltige Diskrepanz besteht. Die Analysen stützten sich auf eine einzelne Datenbank öffentlicher Investitionen in der Tschechischen Republik in den Jahren von 1995 bis 2005. Die Ergebnisse lassen auf signifikante Konflikte hinsichtlich der politischen Ziele schließen und stellen somit ein klares Argument für eine Untersuchung der territorialen Auswirkungen sektoraler Politiken dar.

Regionale Auswirkungen nicht-regionaler Politiken Sektorale Politiken Untersuchung territorialer Auswirkungen Regionalpolitik Öffentliche Investitionen Tschechische Republik

BLAŽEK J. y MACEŠKOVÁ M. Análisis regional de inversión de capital público: ¿A qué regiones se canaliza la inversión de capital público: a las 'ricas' o a las 'pobres'?, *Regional Studies*. El objetivo de este artículo es contribuir al debate sobre la dimensión regional

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de políticas sectoriales (es decir, no regionales) y demostrar empíricamente las enormes discrepancias entre el volumen y el modelo regional de las políticas de inversión de capital público sectorial, por una parte, y la política regional oficial, por otra. Los análisis se han fundamentado en una única base de datos de la inversión pública de la República Checa que abarca los años 1995–2005. Sus resultados muestran conflictos significativos en objetivos políticos y, por tanto, representan un claro argumento a favor de obrar con arreglo a una evaluación del impacto territorial de las políticas sectoriales.

Impacto regional de políticas no regionales Políticas sectoriales Evaluación del impacto territorial Política regional Inversiones públicas República Checa

JEL classifications: E61, H5, R11, R58

INTRODUCTION

The aim of this paper is to contribute to the debate on the regional dimension and the regional impact of sectoral public capital expenditure policies. This debate started decades ago (for example, SHORT, 1978; BENNET, 1980; MARTHUR and STEIN, 1980; and MOLLE and CAPPELLIN, 1988) but recently received a significant impetus in the form of a discussion on the regional impact of sectoral policies and the possibilities of their 'regionalization' (for example, DG RESEARCH, 1991; MARTIN, 1999; ROBERT *et al.*, 2001; and MOLLE, 2007). The 'regionalization' of sectoral policies can be understood as the fine-tuning of sectoral public expenditure according to the needs and circumstances of specific regions.[1] One of the important results of this discussion was the gradual development of the methodology of the territorial impact assessment (TIA) of large projects and, later, also of programmes and policies (SCHINDEGGER and TATZBERGER, 2003; CAMAGNI, 2006). The increasing attention being paid to the regional dimension of public expenditure policies stemmed originally from the effort to learn how to improve or – more precisely – how to ensure the coordination of the territorial impact of European Union policy of economic and social cohesion and of other European policies (for example, COMMISSION OF THE EUROPEAN COMMUNITIES (CEC), 1996; and SHOUT and JORDAN, 2007). Moreover, at the same time, there was a significant research endeavour to discover to what extent the regional impact of economic and social cohesion policy has been in compliance with the spatial effects of numerous national public policies of the European Union Member States (CEC, 2004).

Nevertheless, the number of existing analyses of the regional impact of sectoral policies is still relatively limited (for exceptions, see, for example, HEALD, 1994; AUTERI and COSTANTINI, 2004; KATAOKA, 2005; and MACEŠKOVÁ, 2007; MORGENROTH, 2008), mostly due to the severe data limitations in most countries. Therefore, the main aim of this paper is an attempt to perform an analysis of the regional dimension of public capital expenditure in one of the new Member States – the Czech Republic – at the level of Nomenclature des Unités Territoriales Statistiques (NUTS) 3 and NUTS 4 regions. This analysis is based on a unique data set of capital public expenditure covering investment projects supported during the period 1995–2005.

The analyses undertaken herein are aimed at answering several research questions. Firstly, the relation between the level of the socio-economic development of the regions and the amount of invested public capital expenditure will be investigated. It is assumed that public investments are highly concentrated in the most socio-economically developed regions. Such a regional allocation of this type of public funds would be in accordance with the principles of a strategic regional policy (for more on strategic regional policy, see, for example, GORZELAK, 1992). In other words, given the many deficiencies in the sphere of the technical and other infrastructures inherited from the Communist period, it is supposed that public investment was primarily focused on the enhancement of the infrastructure in major cities and namely in Prague to strengthen the gateway effect (DRBOHLAV and SÝKORA, 1997) and to enhance the competitiveness of the national metropolis on the international scene.

Moreover, another reason for the anticipated concentration of public investment in core regions is the assumed higher efficiency of investment in these regions (for example, CAMINAL, 2004; and DE LA FLUENTE, 2004). Therefore, a positive correlation between the level of socio-economic development and the amount of public capital invested (relative per capita) is expected. However, it should be stressed that such a regional pattern of public investment contradicts the objectives of the Czech national strategy for regional development and of regional policy aiming at decreasing regional disparities and being in compliance with the 'insurance' type of regional policy (MINISTRY FOR REGIONAL DEVELOPMENT OF THE CZECH REPUBLIC, 2006; GORZELAK, 1992). As a result, it can be argued that there is an immense policy conflict between goals of explicit regional policy and mostly unintended spatial impacts of much more vigorous non-regional governmental policies. Therefore, the analyses might also serve as empirical support for the importance of pursuing TIA, both for major public capital projects and for sectoral policies as a whole.

Secondly, a replication of the traditional East–West gradient of socio-economic development by the

regional structure of capital expenditure is also expected (for more on the East–West gradient, see BLAŽEK and CSANK, 2007).

Obviously, given the fact that public capital expenditure is highly 'visible', the allocation is inevitably subject to challenge in the political arena, and a significant role of subjective and 'soft' factors in the regional allocation of this expenditure is envisaged. Despite the fact that the available data do not allow for a thorough explanation of the obtained result, the potentially most important explanatory factors are identified.

Finally, it is believed that a detailed scrutiny of the regional structure of public expenditure significantly helps in an understanding of regional development.

The paper is structured as follows. Firstly, the theoretical debate and the most important findings of previous studies are summarized. Secondly, the data and the methodology are described. Thirdly, the main findings of the empirical analyses of public capital expenditure on the NUTS 3 and NUTS 4 levels are provided and discussed. Finally, conclusions and policy implications are drawn.

REGIONAL IMPACT OF GOVERNMENT POLICY AND ITS SECTORAL POLICIES

The subject of public finance and fiscal policy is an important and traditional sphere of research for economists (for example, MUSGRAVE and MUSGRAVE, 1973; and ATKINSON and STIGLITZ, 1980), nevertheless, geographers have also been interested in this sphere for several decades (for example, BENNET, 1980; HEALD, 1994; and BLAŽEK, 1995). While economists often build models of public sector spending and frequently deal with the issue of the efficiency of public sector spending, geographers tend to derive the implications of public finance for regional development (for example, BLAŽEK, 1995; PORTEOUS, 1995; and MARTIN, 2005).

Obviously, fiscal policy as a whole has a huge regional impact, depending on the design of both the revenue and the expenditure sides of the state budget. However, the regional patterns of both revenue and expenditure are unknown in most countries. Generally, it can be expected that a system of progressive taxation reduces revenues in more affluent regions, while social benefits tend to flow into the less well-off regions, representing an important mechanism for interregional redistribution (PRUD'HOMME, 1993; WISHLADE *et al.*, 1996). The regional redistribution of financial resources via governmental policies is one of the important factors contributing to the economic growth of the respective regions (LEFEBER, 1964; GUISÁN and CANCELO, 1996) and helps the social stabilization and internal cohesion of the country in question (DE LA FLUENTE, 2004). Nevertheless, in the case of the regional allocation of capital expenditure, there is even less certainty about the actual regional pattern of this expenditure than in the case of current expenditure.

Authors focusing on analyses of the impact of governmental policy on the growth of particular regions arrive at the conclusion that public investments are having measurable positive effects on the respective regions (for example, MARTHUR and STEIN, 1980; FÖLSTER and HENREKSON, 2001; and AUTERI and COSTANTINI, 2004). Other studies are devoted to the investigation of efficiency issues (for example, GUISÁN and CANCELO, 1996; and DE LA FLUENTE, 2004). Other authors point to the problem of the insufficient coordination of different public policies and activities, as their goals and effects can be overlapping or even contradictory (for example, WISHLADE *et al.*, 1996; MARTIN, 2005; and SHOUT and JORDAN, 2007). In addition, some other studies have dealt with issues of social justice or equity within the sphere of public finance (for example, BOYN and POWELL, 1995).

One country where the allocation of public money attracts considerable attention from both politicians and analysts is the United Kingdom. However, the main rationale for these studies is mainly the issue of the distribution of public expenditure between England, Wales, Scotland, and Northern Ireland in the context of devolution (for example, SHORT, 1978; HEALD, 1994; HEALD and SHORT, 2002; and MIDWINTER, 2004). In Japan, KATAOKA (2005) assessed the regional distribution of public investments between forty-seven prefectures in the post-war period. Kataoka noticed that periods of high national economic growth are positively correlated with the concentration of public investment into economically strong regions, while in periods of low growth, a more balanced distribution of public capital expenditure was observed. WILSON and WISE (1986) studied the regional implications of public investment in a developing country – Peru – over the period 1968–1983. They showed a high concentration of public investment into the rich coastal regions during three subsequent time periods, while a shift in favour of the poorer inland regions was observed in the second half of the period studied. However, according to these authors, this shift is mainly attributable to the huge investments in the mining industries in the inland regions.

SECTORAL POLICIES AND REGIONAL POLICY

There have already been voices among experts suggesting that the regional impact of vigorously pursued sectoral policies is much more profound than the regional impact of regional policy itself (for example, ROBERT *et al.*, 2001; and MARTIN, 2005). Therefore, within this context, some authors distinguish

regional policy in a 'narrow' and 'broad' sense, while other authors prefer the terms 'explicit' and 'implicit' regional policy (for example, ARMSTRONG and TAYLOR, 1985; and CUADRADO *et al.*, 1993). While it can be agreed that regional policy in a 'narrow' sense is synonymous with explicit regional policy, the difference between implicit regional policy and a regional policy in a 'broad' sense should be stressed. Implicit regional policy encompasses public policies which have been to a certain extent 'regionalized' (that is, there has been some sort of adjustments of an overall design of sectoral or non-regional policy in question to meet specific regional conditions and needs). Regional policy in a 'broad' sense, on the other hand, comprises all public policies or actions executed by the public sector which have important regional impacts and this importance is to some extent recognized (for example, agricultural policy, transport policy, energy policy, competition policy, and science and technology policy). Despite the fact that these policies often lack an explicit definition of regional goals, they are clearly having a specific impact on different regions (for example, CUADRADO *et al.*, 1993; EUROPEAN COMMISSION, 1998, 2004; and HILL and LOWE, 2007). Examples of public policies that reflect at least some specific regional characteristics or which react to specific regional conditions are the policy aimed at attracting large investors to the Czech Republic (UHLÍŘ, 2004) or the research and development policy in Germany (KOSCHATZKY, 2001). Considerable attention has been paid to the regional impact of sectoral policies and analogous policies at the European Union level in studies undertaken within the European Spatial Planning Observatory Network (ESPON) programme (for example, THE ESPON MONITORING COMMITTEE, 2005).

BLAŽEK (2005a) argued that one key component of fiscal policy that has an enormous regional impact is the way the decentralized public administration bodies (municipalities and regions) are financed. For example, in 2007, within the state budget of the Czech Republic only 1.5 billion korunas (CZK) were allocated to explicit regional policy (which represents only 0.06% of Czech gross domestic product, GDP), while in the same year the state distributed more than CZK160 billion to municipalities and regions via a strictly egalitarian tax-sharing formula (this volume amounts to 7.7% of Czech GDP). It is clear that the principles upon which the applied model of financing local and regional government in particular countries rests are of tremendous importance and, consequently, due to the vast amount of money concerned, the system of local government financing has a much more profound regional impact than official 'explicit' regional policy.

Moreover, important regional impacts can be attributable even to non-spending policies, for example to an anti-monopoly policy. WISHLADE *et al.* (1996) considered the spatial impact of non-spending policies as 'blind spots' of regional analyses.

THE BUDGETARY SCHEME OF THE CZECH REPUBLIC

The budgetary scheme of the Czech Republic consists of two prime components: public budgets and extra-budgetary funds created for specific investment purposes such as transport infrastructure, and expenditure on environmental projects (Fig. 1).

Nevertheless, due to the focus of this paper on the identification of spatial patterns in the allocation of public capital expenditure, the analysis was limited to a regional analysis (at the level of the NUTS 3 and NUTS 4 regions) of capital investment allocated from central sources, that is, from the state budget and from state extra-budgetary funds. The Czech state budget operates with the dominant part of public finance assigned to public budgets, but as Table 1 illustrates, the share of state budget allocated to capital expenditure is rather small. This fact can be partly explained by the key role of state extra-budgetary funds in the case of such expenditure (Table 2), as

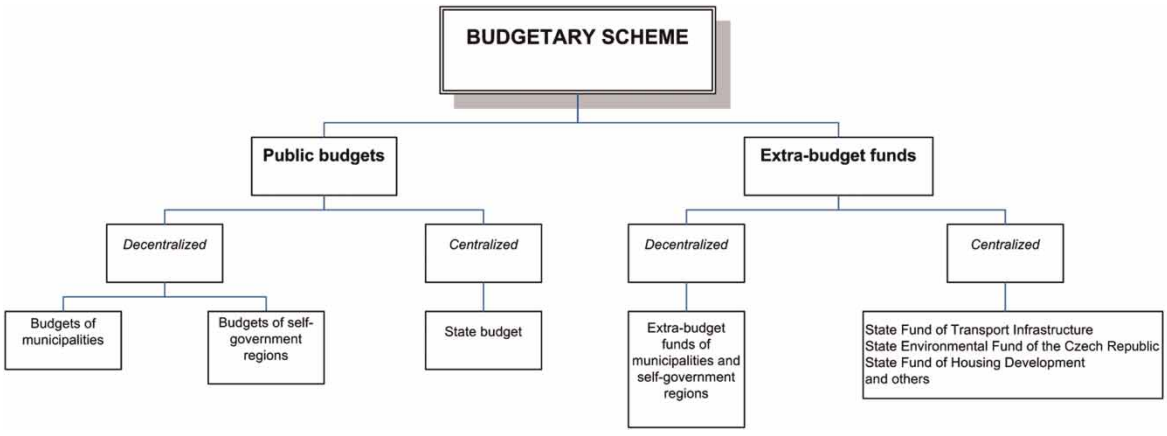

Fig. 1. *Simplified budgetary scheme of the Czech Republic*
Source: Modified on the basis of PEKOVÁ (2002), p. 79

Table 1. *Expenditure of the Czech state budget in 1995–2005*

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total expenditure of the state budget	432.7	484.4	524.7	566.7	596.9	632.3	693.9	750.8	808.7	862.9	923.0
. . . of which capital expenditures of the state budget	44.1	46.4	50.6	50.5	59.0	60.9	49.6	49.7	56.9	66.7	79.0
Share of capital expenditures of the total expenditure of the state budget (%)	10.2	9.6	9.6	8.9	9.9	9.6	7.1	6.6	7.4	7.7	8.3

Notes: Current prices, in CZK billions, are given as percentages. In December 2007, the exchange rate was approximately €1=CZK27.
Sources: STATISTICAL YEARBOOK OF THE CZECH REPUBLIC (1997, 1999, 2001, 2002, 2004, 2006).

Table 2. *Expenditure from selected state extra-budgetary funds, 2000–2005*

	2000	2001	2002	2003	2004	2005
Total expenditure of the State Environmental Fund of the Czech Republic	2.9	3.8	4.2	4.8	4.2	3.4
. . . of which capital expenditure of the State Environmental Fund of the Czech Republic	2.6	3.5	3.7	4.2	3.7	3.0
Share of capital expenditure of the entire expenditure of the State Environmental Fund of the Czech Republic	89.7	92.1	88.1	87.5	88.1	88.2
Total expenditure of the State Fund for Transport Infrastructure	8.5	30.6	40.2	41.3	52.1	48.5
. . . of which the capital expenditure of the State Fund for Transport Infrastructure	5.0	13.9	24.1	25.1	34.6	37.8
Share of capital expenditure of the entire expenditure of the State Fund for Transport Infrastructure	58.8	45.4	60.0	60.8	66.4	77.9

Note: Current prices are in CZK billions.
Source: STATISTICAL YEARBOOK OF THE CZECH REPUBLIC (2000–2006).

they are designed to function as a vehicle allowing the implementation of multi-annual projects, while the state budget in principle provides the financial framework for one year only. In addition, a noteworthy volume of public capital expenditure flows through decentralized public budgets, and especially via municipal budgets (on average in 2000–2005 the capital expenditure of decentralized public budgets accounted for CZK74.2 billion per year, which represents 28.5% of the total decentralized public budgets on average per year). Nonetheless, in line with the authors' research focus, the analysis presented below concentrates only on the capital expenditure allocated from the central level.

Table 3. Financial resources of ISPROFIN, 1995–2005

ISPROFIN	CZK billions	Share of the total sum of ISPROFIN (%)
Total	658.9	100.0
Included into the analysis	478.5	72.6
Totally excluded from the analysis	180.3	27.4
. . . of which regional allocation unknown:	81.7	12.5
Allocation abroad	6.1	0.9
Current expenditures	37.7	5.7
Extraordinary expenditures	14.7	2.3
Other specific capital expenditures, for example, the purchase of fighter aircraft	39.5	6.0

Note: Current prices, in CZK billions, are given as percentages.
Source: ISPROFIN (internal material of the Ministry of Finance of the Czech Republic) and authors' calculations.

DATA AND METHODOLOGY

The prime source for this regional analysis of the capital expenditure of the state budget of the Czech Republic is the Information System of Programming Funding from the State Budget (ISPROFIN) database, which comprises data regarding investment spending from the state budget, in the present case for the years 1995–2005. ISPROFIN is managed by the Ministry of Finance of the Czech Republic and has been operational since 1995.[2] The structure of the entries into ISPROFIN allows a regional breakdown of capital expenditure at the level of the NUTS 3 and NUTS 4 regions. However, several methodological problems arose during the analysis of these data, and consequently a number of projects and programmes (and the corresponding financial volume of capital expenditure) had to be excluded from the analysis. The following criteria for omitting particular projects or programmes were applied:

- The regional allocation of the investment incentives was not given or investment was implemented abroad.
- The project or programme was predominately for current expenditure.
- The project was of an 'extraordinary' nature (that is, expenditure was devoted to the recovery of the territories affected by the 1997 and 2002 floods or devoted to the restitution to former owners of private property that was nationalized during the Communist period).

An overview of the financial amounts included (and excluded) from the regional analysis of public capital expenditure is given in Table 3. Another methodological challenge was represented by projects that benefited the whole country, but in ISPROFIN were assigned to one region only. This was especially the case for the purchase of jet fighter aircraft which were also excluded from the analysis.

This problem relates to the fundamental methodological question of which principal investment expenditure should be attributed to a certain region. For instance, SHORT (1978) has explicitly distinguished two types of regional expenditure: 'regionally relevant' and 'total expenditure' allocated to the region. According to Short, 'regionally relevant' expenditure benefits only the region in which the particular public money was allocated. Alternatively, WISHLADE *et al.* (1996) and also CAMINAL (2004) differentiated between the 'flow' and 'benefit' approaches to the analysis of the regional distribution of public expenditure. The 'flow' approach assigns expenditure to regions regardless of whether or not the region in question is an 'end user', while the 'benefit' approach concentrates on the final beneficiaries of the public money spent, or more precisely on the final beneficiary regions. Consequently, in the present analysis, the flow approach has been applied as it would be impossible to judge each of the approximately 40 000 investment projects of ISPROFIN included in the analysis on the basis of the benefit approach.

In addition to ISPROFIN, which covers capital expenditure financed from the state budget, the two most relevant extra-budgetary funds were incorporated into the present analysis. These two funds are: The State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF). The data on the individual projects supported by these funds were obtained from the responsible institutions. In the case of the SFTI, the capital expenditure for the period 2001–2005 was analysed at the level of NUTS 3 regions. Investment projects to a total value of CZK125.5 billion were included in the analysis. The SEF is represented by the data concerning expenditure during the years 1999–2005, which amounted to CZK13 billion. Therefore, this analysis covers capital expenditure from the state budget and from two extra-budgetary funds to a total value of CZK617 billion. The analysis was structured into six parts, covering the most relevant thematic spheres of public capital expenditure (Table 4).

Table 4. Overview of the analysed data, 1995–2005

Thematic sphere of capital expenditure	Financial volume	Source	Level
Total capital expenditure	617.2	State budget (ISPROFIN), SFTI, SEF	NUTS 3
Capital expenditure excluding transport infrastructure investments	394.9	State budget (ISPROFIN), SEF	NUTS 3 and 4
Transport infrastructure investments	222.3	SFTI, State budget (ISPROFIN)	NUTS 3
Explicit regional policy and regional development	7.2	State budget (ISPROFIN)	NUTS 4
Environmental capital expenditure	25.6	SEF, State budget (ISPROFIN)	NUTS 4
Capital expenditure devoted to universities and research and development	25.4	State budget (ISPROFIN)	NUTS 4

Note: Current prices, in CZK billions, are given as percentages.
NUTS, Nomenclature des Unités Territoriales Statistiques.
Sources: ISPROFIN (internal material of the Ministry of Finance of the Czech Republic); internal materials of the State Fund for Transport Infrastructure (SFTI) and of the State Environmental Fund (SEF); and authors' calculation.

RESULTS

This section presents the main results of the regional analysis of capital expenditure committed within the sectoral governmental policies in the Czech Republic (Table 4 provides an overview of the financial volumes analysed). Firstly, attention is paid to an analysis of the distribution of all capital expenditure, that is, an analysis of investment projects financed from the state budget and from relevant state extra-budgetary funds. In view of the fact that the overall nature of regional differentiation of investment allocation is considerably influenced by investments in the transport infrastructure, in the next stage such investments are excluded from the analysis and analysed separately. Next, the regional allocation of investments in other relevant sectors is considered, namely the territorial allocation of investments within explicit regional policy, investments in universities and the research and development sector, and finally investment assigned to the environmental sector.

Regional analysis of total capital expenditure

The regional analysis of total capital expenditure financed from the central level (that is, from the state budget and from both state extra-budgetary funds) in the period 1995–2005 includes nearly CZK617 billion after the data have been 'cleaned' by the above described procedure. The nature of the capital expenditure determined that such invested funds were used primarily for development activities, and allocation of such investments has an undoubted dynamic effect on the relevant regions (for example, SHORT, 1981; and AUTERI and COSTANTINI, 2004).

The overall spatial pattern of the regional distribution of the analysed funds can be considered as significantly unbalanced. In the period studied, over one-quarter of the analysed investments (which in absolute terms represents approximately CZK168 billion) were allocated from the national level into the capital city of Prague, socio-economically the most advanced region of the Czech Republic (for regional GDP per capita, see Fig. 2). The dominance of Prague is also proved by relative indicators, that is, investments per inhabitant (approximately CZK142 000 per inhabitant, which is 237% of the average for the Czech Republic; Table 5). With respect to economic performance indicators, that is, after putting capital expenditure in relation to the regional GDP level, it was 116% of the average allocation of the Czech Republic, and in relation to the economic aggregate it was 123% of the national average. The term 'economic aggregate' was defined by HAMPL (2005) as the product of the number of jobs (the number of jobs is determined as the number of economically active persons after deducting the unemployed and adding the commuting balance calculated on the basis of the 2001 Census) and the average wage in the region in question. The Plzeňský and Olomoucký regions achieved an even higher investment allocation than Prague with respect to GDP (136% and 137%, respectively; Table 5), and the same order applies when the allocated investment volume is related to the economic aggregate.

Regional analysis of total capital expenditure after exclusion of transport investment

Since the extraordinary volume of investment devoted to transport infrastructure (CZK222 billion from the state budget and from the SFTI; Table 4), which undoubtedly influences the overall picture of the regional allocation of investment, such expenditure was excluded from the analysis in the following stage. The remaining investment projects thus represent approximately CZK395 billion again for the period 1995–2005.

After the exclusion of projects in the transport infrastructure sector, the position of Prague is even higher (Table 5). In absolute terms, its share of public capital expenditure in the Czech Republic actually increased to 37.5%, while in per capita terms the investment allocation to Prague was 326% of the average value for the Czech Republic. No other NUTS 3 region received an above-average allocation per inhabitant. Even when the

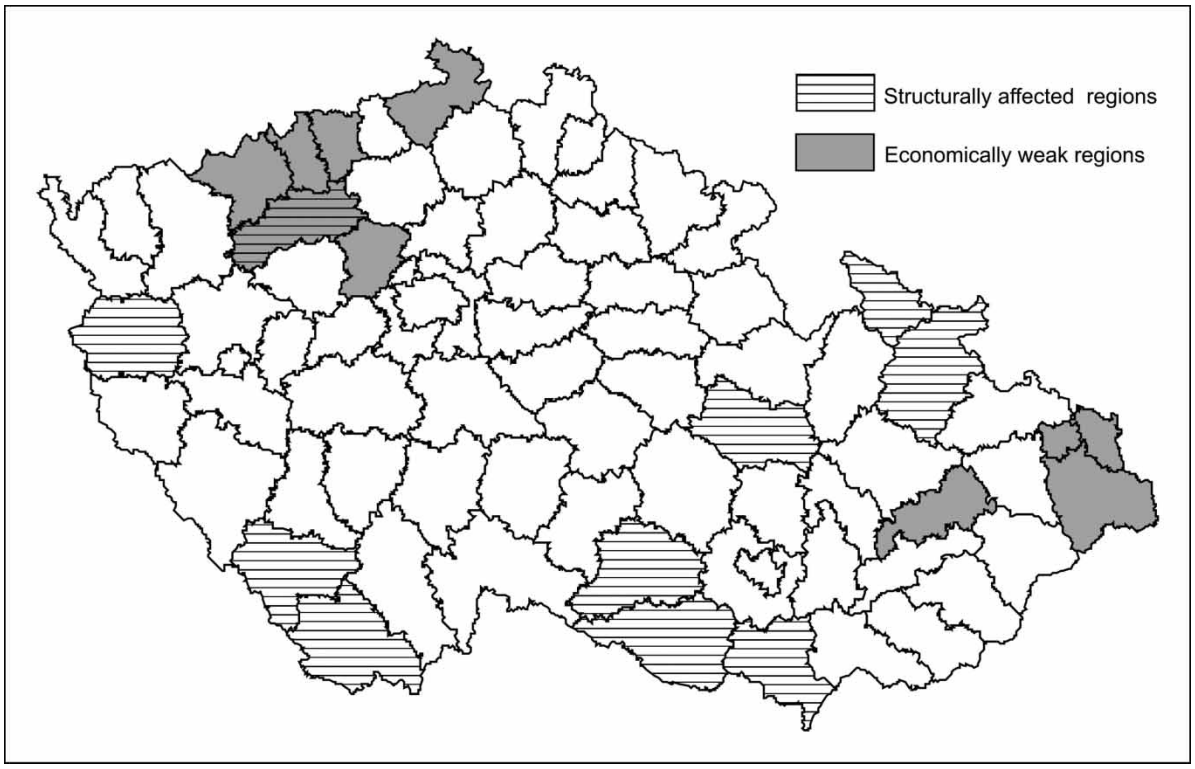

Fig. 2. *Assisted regions supported within Czech explicit regional policy*
Source: MINISTRY FOR REGIONAL DEVELOPMENT OF THE CZECH REPUBLIC (2006)

allocated investment projects are related to the regional GDP, the Prague region is still above the national average (Table 5). Investments in Prague were directed particularly to the state administration (approximately CZK55 billion), state defence (CZK24 billion), health service (CZK18.1 billion), infrastructure development (CZK18.9 billion), as well as public city transport (4.8 billion CZK), research and development (CZK6.9 billion), and education (CZK8.7 billion).

As all data except for those on transport infrastructure projects were territorially identified up to NUTS 4 level, a detailed analysis of the regional distribution of capital expenditure, after exclusion of transport expenditure, could be carried out on the NUTS 4-level regions. At this hierarchical level, Prague dominates absolutely. The district of Kutná Hora achieved the second highest allocation per inhabitant and the highest allocation per economic aggregate, but this was thanks to extraordinary investments in the military air force base in Čáslav. The district of Brno-město (after Prague the second most important economic centre of the Czech Republic) is in third position with 162% of the average allocation per inhabitant. Brno also achieved the second highest share of 6%. The districts of Ostrava-město (2.2%), Olomouc (2.6%), and Plzeň-město (2.2%) also received significant shares. Other districts received only minor allocations.

Where capital expenditure was considered per inhabitant, above-average investments compared with the average for the Czech Republic were allocated to only eleven out of seventy-seven districts, and twenty-two districts did not even achieve 50%. The regions receiving significantly below-average investment funds per inhabitant include the majority of districts in North-Western Bohemia and Northern Moravia (which, however, are mostly among the regions supported within Czech regional policy; Fig. 2) – the internal periphery – as well as a large area of Southern, Western, Northern and Eastern Bohemia and the Czech–Slovak borderland (Fig. 3).

Due to the unavailability of GDP data for NUTS 4 regions and the limited reliability of this indicator on the NUTS 3 regions, GDP was replaced by an economic aggregate. At a regional level, this indicator achieves a very high correlation with regional GDP (0.998). After putting the allocated investment funds in relation to the economic aggregate (Fig. 4), Prague achieved 169% of the average for the Czech Republic (the highest allocations went to the districts of Kutná Hora, 257%, and Prostějov, 170%, in both cases thanks to extraordinary investments in the defence sector). The highly uneven distribution of this expenditure illustrates well the fact that above-average values were achieved by only thirteen districts, among which was also the second largest city (district Brno-město, 119%).

Capital expenditure in the transport sector

The extraordinary importance of investment devoted to the transport infrastructure is given by their very high

Table 5. *Capital expenditure per capita and related to regional gross domestic product, 1995–2005*

Region	Total investments (CZK billions)	Total investments per capita (Czech Republic = 100%)	Total investments excluded of transport infrastructure investments per capita (Czech Republic = 100%)	Gross domestic product per capita (Czech Republic = 100%)	Total investments per gross domestic product (Czech Republic = 100%)	Total investments excluded of transport infrastructure investments per gross domestic product (Czech Republic = 100%)	Transport infrastructure investments per gross domestic product (Czech Republic = 100%)
Prague	168.3	237	326	206	116	159	38
Central Bohemia region	55.9	84	76	95	86	78	100
South Bohemia region	29.2	78	66	89	87	74	109
Plzeňský region	42.3	128	89	94	136	95	209
Karlovarský region	13.1	71	44	80	89	55	150
Ústecký region	45.3	91	53	82	111	64	194
Liberecký region	21.9	85	85	83	102	103	102
Královehradecký region	22.6	68	78	90	76	86	57
Pardubický region	23.6	77	66	84	92	78	116
Vysočina region	18.8	60	67	87	69	78	54
South Moravia region	61.6	90	93	93	98	101	93
Olomoucký region	40.9	106	87	77	137	113	181
Zlínský region	19.9	55	57	82	68	71	64
Moravskoslezský region	53.9	70	51	80	89	65	131
Czech Republic	617.2	100	100	100	100	100	100

Note: Values are given as percentages.

Sources: ISPROFIN (internal material of the Ministry of Finance of the Czech Republic); internal materials of the State Fund for Transport Infrastructure (SFTI) and of the State Environmental Fund (SEF); CZECH STATISTICAL OFFICE (2001); CZECH STATISTICAL OFFICE (1995–2005); and authors' calculations.

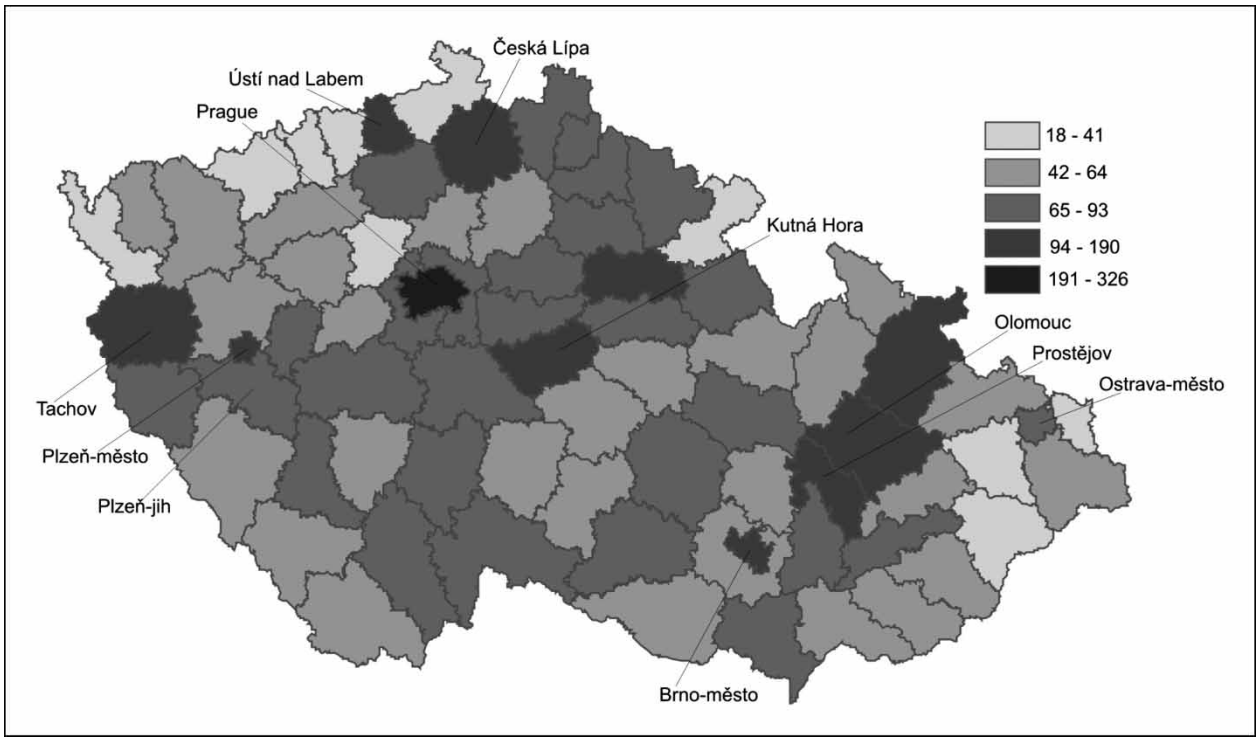

Fig. 3. *Capital expenditure per capita (%) after exclusion of transport infrastructure in Nomenclature des Unités Territoriales Statistiques (NUTS) 4 regions, 1995–2005; Czech Republic = 100%*
Sources: Information System of Programming Funding from the State Budget (ISPROFIN) database; State Environmental Fund (SEF); Czech Statistical Office (2001); and authors' calculations

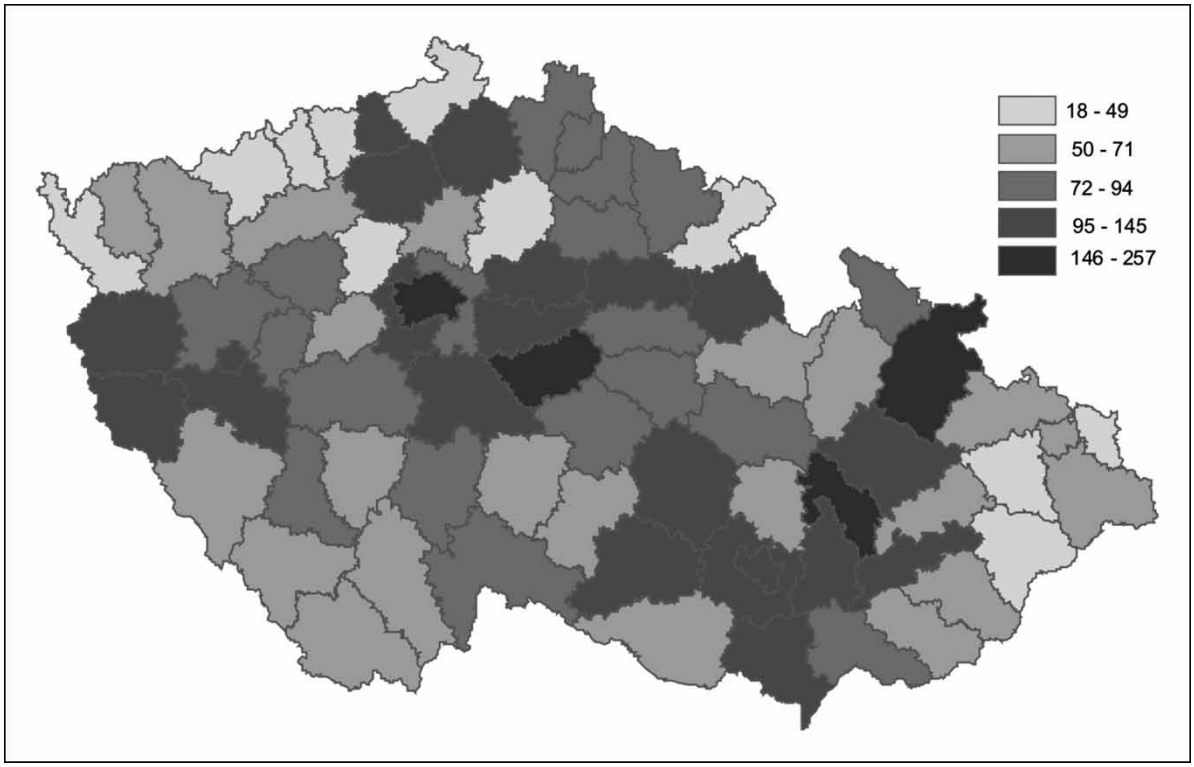

Fig. 4. *Capital expenditure (%) per economic aggregate after exclusion of transport infrastructure investments in NUTS 4 regions, 1995–2005; Czech Republic = 100%*
Sources: ISPROFIN; SEF; Czech Statistical Office (2001); Hampl (2005); and authors' calculations

volume (CZK222 billion), which represents approximately 36% of the volume of the investment observed in this study. In addition, it is obvious that the regional formula of transport constructions, often linear in nature, may significantly differ from the spatial formula of other investment projects. For this reason, the transport sector was chosen for a separate regional analysis (that is, investment in the construction of motorways, expressways, railway corridors, and the underground in Prague). Despite a number of methodological constraints, it was possible to unite the two most important sources of funds for this sector: the state budget (that is, ISPROFIN) and the SFTI. The total analysed investment volume of 1995–2005 exceeds CZK222.3 billion (ISPROFIN, CZK96.7 billion; the SFTI, CZK125.5 billion), and the data are available only for NUTS 3 regions.

Fig. 5 illustrates the considerably above-average allocation of investment in transport in Western Bohemia, which corresponds to the hypothesis of allocation of investment along a traditional West–East gradient in the level of socio-economic development. In transport investment, this gradient is raised by the effort to ensure transport connections for the Czech Republic or its capital of Prague with nearby economic centres in Germany (Munich, Frankfurt, Berlin). Although the area of Northern Moravia is a structurally affected region, as is North-Western Bohemia, transport investment has flowed more to Northern Bohemia in recent years because the transport connection with Poland was of less priority than connections to Germany or Western Europe.

The spatial formula for the allocation of per capita investment in transport is very similar to the case where transport investment is related to GDP (the correlation coefficient is 0.954). In both indicators the position of Prague is well below national average (78% and 38%, respectively, of the Czech Republic average). On the contrary, Plzeňský, Olomoucký, Ústecký, and Karlovarský regions achieved significantly above-average allocations. However, in evaluating the regional distribution of transport infrastructure investments (and of general investments as well) it is necessary to consider the time aspect in the sense that if a significantly higher amount of funds is granted to a region in a certain time range, it may mean that the necessary infrastructure had not previously been constructed in the region in question and it is being built behind schedule or out of needs arising from the different geopolitical orientation of the Czech Republic after the fall of the Iron Curtain. For example, as early as the Communist era, the D1 motorway was completed between Prague and Brno, leading across the Vysočina region, so this region records a significantly below-average allocation, while in the districts of Tachov and Plzeň-jih districts, the D5 motorway connecting Prague and Bavaria was built during the period considered here.

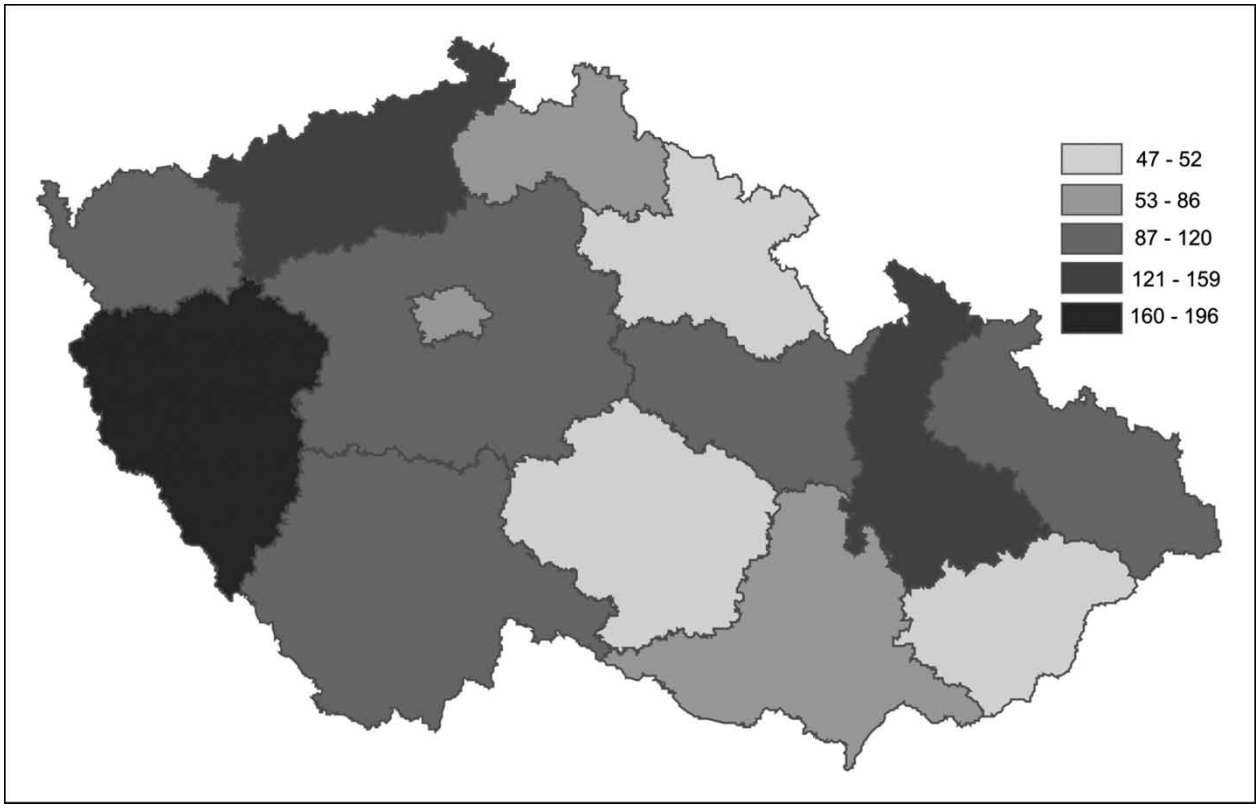

Fig. 5. *Transport infrastructure investment per capita (%) in NUTS 3 regions, 1995–2005; Czech Republic = 100%*
Sources: ISPROFIN; The State Fund for Transport Infrastructure (SFTI); CZECH STATISTICAL OFFICE (2001); and authors' calculations

The regional distribution of capital expenditure after the exclusion of transport infrastructure investments when related to the economic level of the region (GDP) shows that transport investments are what 'aid' economically weaker regions to reach above-average values. If transport investments are not considered, Prague is quite clearly the region that gains most from redistribution of public investment both in per capita terms and in relation to GDP (116% or 159% of the Czech Republic average; Table 5).

Capital expenditure allocated within explicit regional policy

Since one of the aims of this paper is to show a significant discrepancy between the regional formula for the allocation of public investment funds within non-regional policies and regional policy, this is presented in Fig. 6, which shows investments granted to explicit regional policy from the state budget. Strikingly, the funds allocated within regional policy are spread widely across the whole territory of the Czech Republic. This is in sharp contrast to the very conception of regional policy as a policy that supports only selected regions. This finding cannot be justified by changes of assisted areas over the investigated period as there was considerable stability of both the regional pattern of lagging and leading regions and consequently also of assisted areas delineated for the sake of regional policy (Blažek, 2005b). On the other hand, the pattern of investment within regional policy does confirm that a certain priority was given to the assisted areas. Namely, the Moravian districts, especially the southern and, to some extent, northern ones ranked among the largest recipients of such investments (together with North-Western Bohemia they rank among the regions supported within Czech explicit regional policy, as does Northern Bohemia to some degree). Nevertheless, it is necessary to mention a paradox as a statistically highly significant positive relation of regional policy investment to regional GDP and to the economic aggregate was demonstrated for NUTS 3 regions (in both cases excluding Prague; Table 6a). The same also applies to the level of NUTS 4 regions (Table 6b) where a statistically significant positive relation was found between the regional policy capital expenditure and the level of economic development measured by the economic aggregate as a proxy for regional GDP. At the same time, a larger part of Moravia ranks, with other regions supported within explicit regional policy, as an area significantly under-financed with respect to the total investment from the state budget after the exclusion of transport. In simple terms, districts supported within the explicit regional policy in the Czech Republic received only a very limited volume of investment from the national level (after the exclusion of transport constructions) (compare Figs 2, 3 and 4). On the other hand, support within Czech regional policy was significantly concentrated into

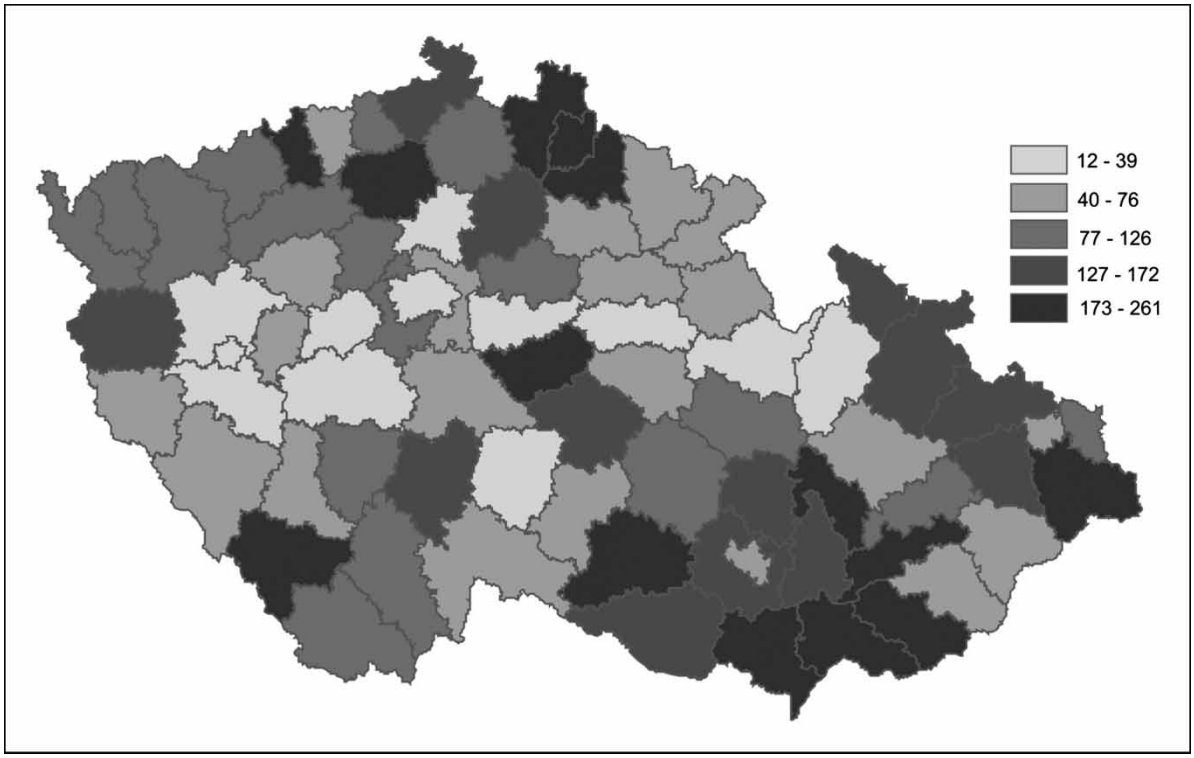

Fig. 6. Capital expenditure per capita (%) from the state budget devoted to explicit regional policy in NUTS 4 regions, 1995–2005; Czech Republic = 100%
Sources: ISPROFIN; Czech Statistical Office (2001); and authors' calculations

Table 6a. *Correlation of selected indicators for NUTS 3 regions*

	Regional share of gross domestic product	Regional share of economic aggregate	Regional unemployment rate	Regional share of total investment	Regional share of transport investment	Regional share of investment excluding transport	Regional share of investment in universities and research and development
Regional share of economic aggregate	0.993						
Regional unemployment rate	0.304	0.357					
Regional share of total investment	0.906	0.910	0.399				
Regional share of transport investment	0.717	0.741	0.634	0.892			
Regional share of investment excluding transport	0.905	0.890	0.097	0.903	0.612		
Regional share of investment in universities and research and development	0.583	0.592	−0.001	0.618	0.323	0.775	
Regional share of expenditure on regional policy	0.782	0.818	0.547	0.710	0.573	0.698	0.617

Notes: $n = 13$, Prague excluded.
The critical value of the correlation coefficient for a 95% level of significance is 0.497.
NUTS, Nomenclature des Unités Territoriales Statistiques.
Sources: ISPROFIN (internal material of the Ministry of Finance of the Czech Republic); internal materials of the State Fund for Transport Infrastructure (SFTI) and of the State Environmental Fund (SEF); CZECH STATISTICAL OFFICE (2001); CZECH STATISTICAL OFFICE (1995–2005); HAMPL (2005); and authors' calculations.

Table 6b. *Correlation of selected indicators for NUTS 4 regions*

	Regional share of economic aggregate	Regional unemployment rate	Regional share of investment excluding transport	Regional share of investment in universities and research and development
Regional unemployment rate	0.111			
Regional share of investment excluding transport	0.851	−0.009		
Regional share of investment in universities and research and development	0.822	−0.039	0.915	
Regional share of expenditure on regional policy	0.320	0.404	0.228	0.122

Notes: $n = 76$, Prague excluded.
The critical value of the correlation coefficient for a 95% level of significance is 0.200.
NUTS, Nomenclature des Unités Territoriales Statistiques.
Sources: ISPROFIN (internal material of the Ministry of Finance of the Czech Republic); internal materials of the State Fund for Transport Infrastructure (SFTI) and of the State Environmental Fund (SEF); CZECH STATISTICAL OFFICE (2001); HAMPL (2005); and authors' calculations.

these regions (Fig. 6). However, a huge difference in the financial sums invested has to be stressed again: CZK7.2 billion for regional policy versus the total volume of the analysed funds amounting to CZK617 billion. Nevertheless, although the volume of investments for regional policy at the national level is nearly negligible, its importance is significantly higher for the supported regions.

Capital expenditure for higher education, research and development, and the environmental sector

Within the regional analysis of capital expenditure from the state budget of the Czech Republic, sectoral analyses were also carried out. As an example, Fig. 7 shows investment from the state budget in the infrastructure of universities and colleges and other research and development institutions amounting to approximately CZK25 billion. The expected regional distribution of such expenditure into economically more developed regions (Prague, Brno) and to regions where a public college is located, or to regions with headquarters of important research institutes (the Prague hinterland) was demonstrated (similar regional pattern of public research and development expenditure was shown by WISHLADE *et al.*, 1996, or THE ESPON MONITORING COMMITTEE, 2005). Nevertheless, it is necessary to point out that it is not only capital

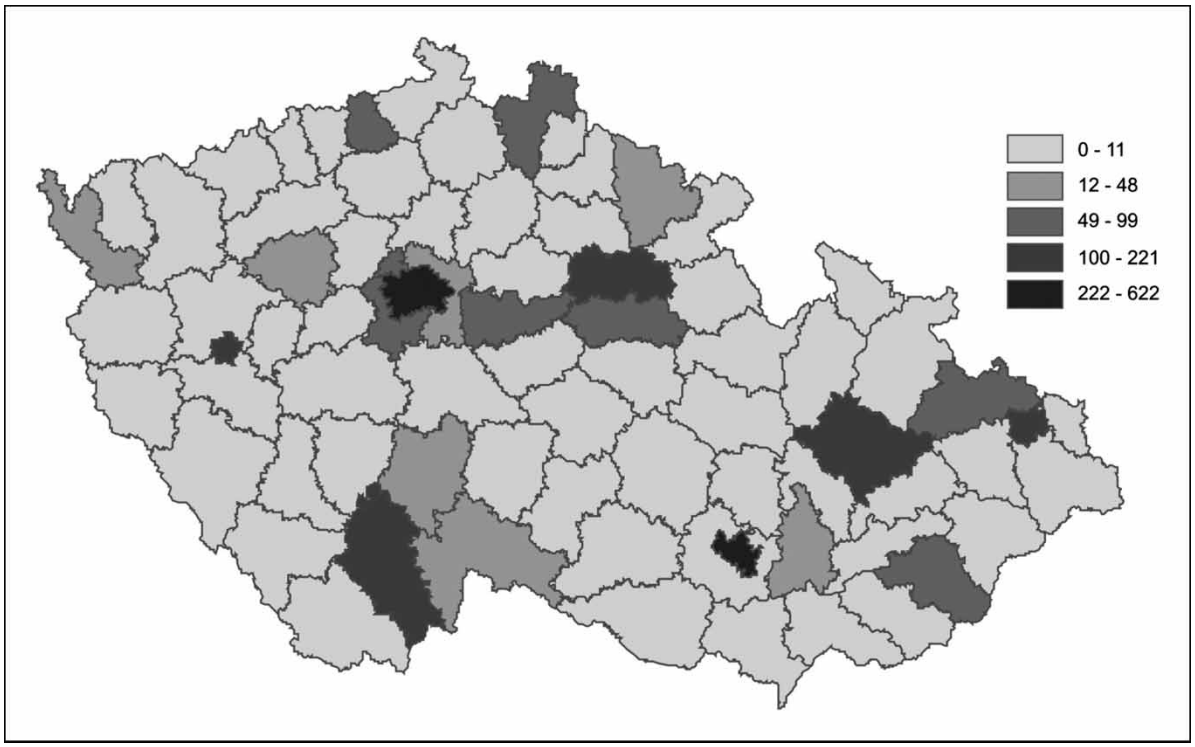

Fig. 7. *Capital expenditure per capita (%) of the state budget devoted to universities and for research and development institutions in NUTS 4 regions, 1995–2005; Czech Republic = 100%*
Sources: ISPROFIN; CZECH STATISTICAL OFFICE (2001); and authors' calculations

expenditure from the central level that is devoted to this sector. For example, it was not possible to obtain data on the regional allocation of financial support for research and development projects allocated by the Grant Agency of the Czech Republic. In addition, it is necessary to take into account a frequent methodological problem, when some analysed data are allocated according to the headquarters of the institution in question, although such funds may then be invested in branches of the institution in a different region. It is thus probable that in fact investment in higher education and research and development is less concentrated than the data analysed show.

Fig. 8 shows investment in the environment sector amounting to CZK25.6 billion allocated both from the state budget and the State Environmental Fund (SEF). Although no clear relation between the distribution of funds and environmental quality has been shown, it can be confirmed to some extent that investment was allocated to regions in which it is necessary to solve a specific problem with respect to the environment (for example, support of mining reduction, revitalizing the river system, pond reconstructions).

A surprisingly high allocation of investment to border districts in South-Western Bohemia relates to investment in the territorially largest national park in the Czech Republic: The Šumava National Park. Fig. 8 provides, however, a surprising finding, that investment projects in the environment sector are not greatly concentrated in the structurally handicapped regions in Northern Bohemia and in Northern Moravia where the environment is seriously damaged. There is one exception with high investment – the Česká Lípa district – where the running down of the uranium industry and subsequent cultivation of the area are jointly in progress.

Relation of capital expenditures to selected socio-economic variables

On the basis of correlation coefficients for selected indicators for NUTS 3 regions (Table 6a), a statistically significant relation between all regional allocations of investment via all analysed categories of investment (that is, total investment, total investment after exclusion of transport investment, transport investment, investment into research and development and universities, and regional policy investment, and their economic performance expressed by the GDP and the economic aggregate) is demonstrated. The same finding counts for correlation coefficients for NUTS 4 regions (Table 6b). However, due to data limitations, only the correlation between three investment categories and the economic aggregate could be calculated. It is important to stress again that with respect to the declared objectives of Czech regional policy, the correlation between the share of investment allocated within explicit regional policy and economic performance should

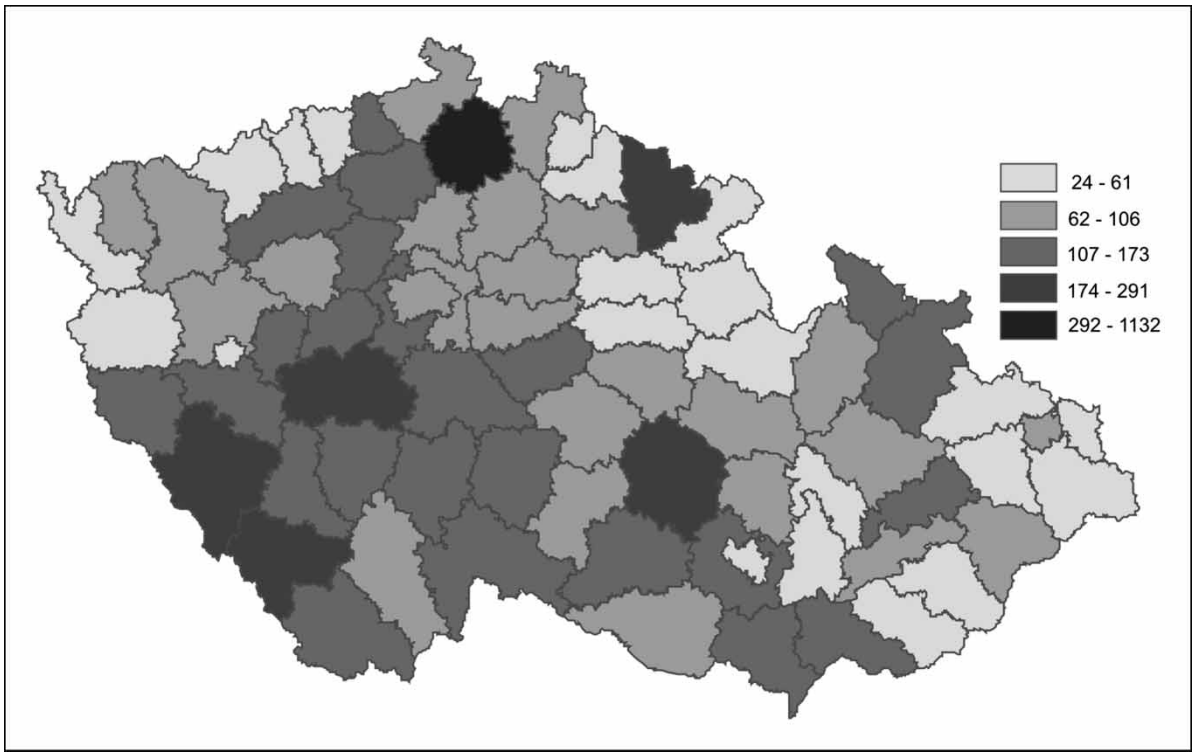

Fig. 8. *Environmentally related capital expenditure per capita (%) of the state budget, 1995–2005, and of the State Environmental Fund, 1999–2005, in NUTS 4 regions, Czech Republic = 100%*
Sources: ISPROFIN; SEF; CZECH STATISTICAL OFFICE (2001); and authors' calculations

be negative. However, on both NUTS 3- and NUTS 4-level regions, positive and even statistically significant values were obtained indicating that even allocation of investment within regional policy is not in line with its own strategic objective.

The identification and detailed assessment of factors behind these observed patterns goes beyond the focus of this paper. However, at least a brief discussion should be included. In countries like the Czech Republic which are lacking instruments for the systematic evaluation of the effectiveness and efficiency of planned public investment, a relatively important role can be assumed for subjective factors. The decision-making process on public investment committed from the central level basically proceeds at two levels. Firstly, on the basis of a proposal of the Ministry of Finance, the government and parliament decide about financial allocations to particular sectors that come under the responsibility of particular ministries. Secondly, there is a process of selection of priorities by a particular ministry. In this case, three main factors influencing the decision-making process on public investments might be identified:

- The adopted strategy for a specific sector (inevitably even these strategic documents can to some extent reflect subjective factors).
- The interests of (especially high-ranking) public servants.
- The interests of politicians.

On the basis of the authors' experience of more than ten years of contractual cooperation by one of the authors with one central administration body, two preliminary conclusions can be drawn. Firstly, the relevance of these three types of factors differs widely among different sectoral policies. Secondly, in some cases each of the three above-mentioned factors can be decisive. This, therefore, makes a clear case for the introduction of some instruments (including TIA) that would be able to 'objectivize' the need for public investment.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper aims to contribute to the debate on the regional dimension of sectoral (non-regional) governmental policies and to demonstrate empirically the huge discrepancy between both the volume and the regional pattern of public capital expenditure committed within the national sectoral policies, on the one hand, and the official regional policy, on the other hand. The performed analyses focused 'only' on the public capital expenditures allocated by the government of the Czech Republic, but it can be claimed that public capital investments have the most important implications for the development of particular regions (SHORT, 1981; YAMANO and OHKAWARA, 2000). Obviously, the financial volume of the total public capital expenditure is

incomparably higher than the financial volume allocated to explicit regional policy.

The regional analyses performed were based on the data set of public capital expenditure in the Czech Republic covering the years 1995–2005 and demonstrated uneven regional distribution of these investments in favour of the most economically developed region of the Czech Republic – the capital city of Prague. Such a regional pattern for the distribution of public investment supports the hypothesis that there exists a contradiction between the regional impact of sectoral policies, on the one hand, and the goals of explicit regional policy, on the other hand. The discrepancy between these two is particularly striking as assisted regions delineated for the sake of national regional policy were to a large extent left aside by decisions regarding the allocation of public capital expenditure (with the exception of expenditure on transport infrastructure). Moreover, a surprising pattern was identified even in the case of investment committed within explicit regional policy (Fig. 6), which is not coinciding well with the map of assisted areas (Fig. 2). Clearly, the allocation of regional policy investments is not respecting fully the objectives of regional policy itself.

Consequently, there is a clear conflict between the goals of explicit regional policy aiming at the support of less well-off regions and mostly unintended regional impacts of much more vigorous non-regional governmental policies generally supporting the most developed regions. These findings are in line with research performed by, for example, WILSON and WISE (1986) but in contrast to the results of YAMANO and OHKAWARA (2000).

However, it is necessary to stress that from the point of view of the entire expenditure side of the governmental policies comprising both capital and current expenditure, the region of Prague is very likely the most important net payer in the system of public finance due to its buoyant tax base and its relatively low share of persons receiving social benefits (OUŘEDNÍČEK and NOVÁK, 2006). Nevertheless, it is clear that the uneven distribution of public capital expenditure, generally favouring more developed regions, is one of the most important mechanisms of regional differentiation and is, moreover, cumulative in nature.

The expectation of a replication of the traditional East–West gradient in the level of socio-economic development by the regional structure of total capital expenditure has not been experienced. However, the evidence supporting this expectation can be observed in the case of the capital expenditure allocated to transport infrastructure. The greater support of transport infrastructure projects in the Western part of the Czech Republic is a reflection of the priority assigned to connecting the Czech Republic to Western European structures.

Key implications deriving from the conducted regional analysis relate in particular to the necessity of developing a sound methodology for the TIA of public policies and programmes. In other words, it is essential to develop a procedure evaluating not only the regional impact of incentives carried out within explicit regional policy (which is already becoming common practice in the most developed countries), but also the impact of public interventions which do not explicitly incorporate a regional dimension but where implementation might have a significant regional impact. Such an evaluative instrument is essential for tackling regional development issues and problems more effectively by achieving synergies and eliminating contradictions between different policies (SCHÄFFER, 2005; CEC, 2006a, 2006b). Nevertheless, this approach is a real challenge because public policies in most advanced countries are traditionally being implemented via sectorally structured public administration at central governmental level while the relevance of sectoral policies for the development of particular regions has been clearly underestimated (ROBERT *et al.*, 2001; MACEŠKOVÁ, 2007).

Despite the effort that has been put into developing territorial impact assessment (TIA) methodology, no comprehensive and satisfactory tool for regional impact assessment has yet been developed. Therefore, as also documented by the empirical results herein, which showed both an uneven spatial pattern of the allocation of public capital expenditure and a huge mismatch between the regional pattern of this expenditure and the assisted regions, the development of a suitable instrument for territorial/regional impact assessment and its application at least to the most relevant sectoral policies remains a critical challenge for both researchers and decision-makers.

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NOTES

1. Such fine-tuning can take many different forms, for example, differentiation of the form and the rate of public support or the involvement of regional self-government or other regional bodies in decision-making procedures, although in practice such an approach is rather rarely applied.
2. Except for the programmes set by a special act such as state support to the national cultural heritage or agriculture.

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