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**The central public sector transport infrastructure investment
deficit in Catalonia and future prospects**

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1. Introduction

Public investment is the most flexible and discretionary budgetary item that the governments of modern societies have to achieve their political objectives. The administrations can increase or reduce the resources destined to investment at their discretion, and they can decide to which expenditure policies they assign this investment and in which territories.

Likewise, public investment in general, and that devoted to transport infrastructures in particular, is one of the most direct public instruments to influence both the aggregate growth rate and the geographic distribution of economic activity, on reducing the costs of transport and favouring accessibility¹. This type of investment is thus the basic instrument for policies of economic growth, of regional development and of meeting regional infrastructure needs.

These objectives can, however, give rise to different patterns of territorial distribution of the investment, so in some cases there can be a certain trade-off between them. According to some contributions, such as Sala-i-Martin (1997), the effect of infrastructure investment on production depends on the public capital/private capital ratio, as both productive factors are complementary in the production function. The higher this ratio, the lower the marginal profitability of the investment. This suggests that, from the point of view of economic growth and economic efficiency, it would be necessary to invest in those regions in which the ratio between stocks of public capital and private capital is the lowest. Moreover, in so far as public investment is conceived as an instrument to correct territorial disparities of income, redistribution or equity criteria come into play which would favour the poorest regions. The conflict exists when the regions with a low public capital/private capital ratio do not coincide with those of least economic development.

Regional infrastructure needs can be defined as the financial resources necessary for a region to be able to provide its citizens with a level of infrastructures similar to that provided by the average of the regions, taking into account the factors that we consider to be relevant². The investment expenditure needs can thus differ between regions due to different factors: A) The population, although in the case of transport infrastructure expenditure it can be considered that there is an initial investment amount which is independent of the population. B) The number of potential users of the infrastructures (for example, number of passengers), when they represent a higher proportion than that of the population. C) The level of economic activity, which can greatly influence the infrastructure production needs. D) Certain supply variables which represent the scope of the service (for example, the km of main road for their maintenance expenditure). E) The cost of remuneration of the production factors, if this is higher in some regions than in others (for example, if the construction costs are higher). F) The geographic characteristics of the region (surface area, orography, etc.). The territorial distribution under this criterion of meeting needs does not necessarily coincide with the two mentioned previously.

An additional criterion which can determine the territorial distribution of public investment is politics. That is to say, the central government can decide to invest in those territories in which it obtains the greatest political profitability, in the sense of

¹ For a general view of the relationship between investment and economic growth, see Díaz and Martínez (2006).

² Castells et al. (2005a).

investing in those territories in which it is most feasible to increase the number of MPs of the government party³.

In addition to this criterion of political profitability, there is another deeper political criterion of an ideological nature which can also explain in a very precise manner the territorial distribution of the investment in transport infrastructures. It is a question of the territorial model of country which the governments defend and support. Transport infrastructures are a key element in the organization of the territory on permitting trade and interpersonal relations, so their design implies a way of understanding the relations between the different territories of a country. Thus, in the Spanish case, the transport model which has been perpetuated from the 18th century until the present has been the radial model with the centre in Madrid. This has meant granting Madrid the role of a fundamental node in the Spanish transport system, increasing its central position.

Indeed, a certain imbalance and contradiction can be observed between a highly decentralized state in political and economic terms such as the Spanish one, but which is interconnected with a highly centralized transport infrastructure system.

It is for all these reasons that, for some time now, an intense debate has been open in Spanish society on investment and in particular on that devoted to transport infrastructures, both as regards its size and its territorial distribution. As for its size, it is observed that in the years in which the greatest effort of budgetary consolidation has been made, this has been the item which has suffered the greatest adjustment, which has been a reason for concern due to the effects that this low investment can have on economic productivity and, consequently, on competitiveness and economic growth.

Moreover, in some autonomous communities, such as Catalonia, there is discontent because of the perception of unfair treatment as regards the territorial distribution of the investment in transport infrastructures by the central public sector, given the expenditure needs existing in this type of infrastructures and the coverage offered by this administration.

This chapter is intended to contribute to this debate by analyzing the evolution of the investment in transport infrastructures by the central public sector from 1991 to 2008 in Catalonia and comparing it with the state mean. In particular, it examines the investment in road, railway, port and airport infrastructures. The erratic behaviour of public investment, relating to the situation at the time, recommends not considering annual data, but rather a broader period of time which includes the different phases of the economic cycle. The study therefore covers the period 1991-2008. As the data for the years 2007 and 2008 are forecasts, the data for 1991-2006 are also shown for reasons of homogeneity.

The study consists of five sections, including this introduction. The second section contains the main methodological aspects. The third section is devoted to analyzing the investment in transport infrastructures on an aggregate level and by categories. The fourth section analyzes Additional Provision Three of the 2006 Statute of Catalonia, which refers to the state investment in infrastructure in Catalonia. Finally, the fifth and final section offers the main conclusions.

2. Methodological aspects

³ The work by Castells et al. (2005b) shows that investment by the central public sector is determined to a certain extent by the electoral margin existing in each province.

This study focuses exclusively on the actual investment for the corresponding year, that is to say it only includes chapter 6 of the expenditure budget. Notwithstanding this, we are aware that there are other forms of financing the investment which are assigned in other budgetary chapters and which are not therefore included in this study. Thus, for example, it does not include the investment effort that the state may make through capital transfers (chapter 7 of the budget) to other public administrations so that the latter can implement the investments. The investments which are financed using the “shadow toll” method are not considered either, the budgetary posting of which is assigned to chapter 2, and neither is the financing through acquisition of assets (chapter 8 of the budget). Despite this budgetary limitation, it should be indicated that the investment made by the central public sector is basically materialized through the chapter of actual investments, so the possible investments not considered are very minority.

The institutional sphere is restricted to the central public sector. In particular, the actual investment made by the state through the Ministry of Public Works, its autonomous bodies and the public companies dependent on this ministry is analyzed.

The data used are figures settled in the period 1991-2006 and those forecast in the state budget for the years 2007 and 2008. All the data come from the Statistical Yearbooks of the Ministry of Public Works and, if appropriate, from the state budget.

3. The investment in transport infrastructure in Catalonia in the period 1991-2008

In the period 1991-2008, the total accumulated volume of investments in transport infrastructures by the central public sector in Catalonia was 19.286 billion euros, representing 15.9% of the total. If we relativize it in accordance with GDP and in per capita terms, it is observed that Catalonia is below the Spanish mean. The investment for this period in Catalonia represents 0.73% of Catalan GDP, while the Spanish mean is 1.08%. In per capita terms, 3,053 euros were invested in Catalonia and the Spanish mean is 3,128 euros (table 1).

It should be indicated that in 2007 and 2008 the central investment in infrastructures in Catalonia experienced a considerable increase for two reasons. The first is the construction of the high-speed train and the second is the impact of Additional Provision Three of the 2006 Statute of Catalonia, which obliged the state investment in infrastructures in Catalonia to have a specific weight out of the total investment equivalent to Catalan GDP in relation to the state total.

Thus, if we analyze the period 1991-2006, it is observed that the central investment in infrastructures in Catalonia is still below the Spanish mean. In terms of GDP, it goes from an index of 67 in relation to the mean in the period 1991-2008 to one of 64 in the period 1991-2006, and in per capita terms it goes from an index of 98 to 91.

Table 1

Investment by the central public sector in transport infrastructures in Catalonia

A) Period 1991-2008* (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	19,286	15.9	0.73	67	3,053	98
Spain**	121,558	100.0	1.08	100	3,128	100

B) Period 1991-2006 (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	15,862	14.4	0.65	64	3,053	91
Spain**	110,126	100.0	1.03	100	2,671	100

* Investment budgeted in the years 2007 and 2008.

**Regionalized total.

Source: Own preparation from the Statistical Yearbooks of the Ministry of Public Works (1991-2006) and state budget (2007-2008).

One way of analyzing whether the investment made by the state in Catalonia meets the needs of the territory consists of directly comparing the relative weight of the investment made with the relative weight of the economic activity and of the Catalan population and to quantify the differences⁴. The economic activity and population variables are considered on being the basic indicators of the infrastructure need, although it is true that in the case of transport infrastructures there are others which can have an impact, such as the number of users or the physical characteristics of the territory⁵.

The analysis shows that the relative weight of state investment does not reach the economic weight of Catalonia or the weight of its population. The transport infrastructure investment in Catalonia over the period 1991-2006 represented 14.4% of the state total, while during this same period its economic weight was 18.8% and the weight of its population 15.6% (table 2). For this period state investment in Catalonia is therefore 4.4 percentage points below the specific weight of Catalan GDP and 1.2 percentage points below that of the population of Catalonia. This differential is corrected slightly when we add the years 2007 and 2008 to the period analyzed.

Table 2

Investment by the central public sector in transport infrastructures in Catalonia in relation to GDP and the population. Period 1991-2006

% / total investment	% / GDP	% / population	Differential % / total investment in relation to	
			% / GDP	% / population
14.4	18.8	15.6	-4.4	-1.2

Source: Prepared from table 1 and INE.

Tables 3, 4, 5 and 6 analyze the investment in transport infrastructures of the central public sector in Catalonia for roads, railways, ports and airports, respectively. The low level of state investment is caused by that made in roads and ports. As regards roads, in the period 1991-2008 the investment in Catalonia had an index of 49 considering 100 as the state mean in relation to GDP, and an index of 60 considering 100 as the state mean in per capita terms. As for investment in ports, these indices are 63 and 81,

⁴ See Bosch et al. (2003) and Sánchez (2006).

⁵ See Castells et al. (2005a) and Bosch and Espasa (1999).

respectively. The relative position of Catalonia hardly changes when the period 1991-2006 is analyzed.

On the other hand, state investment in railways in Catalonia was above the state mean in the period analyzed. In terms of GDP, it reached an index of 103 and in per capita terms 125 in the period 1991-2008. The reason is the construction of the high-speed train. In the last few years Catalonia has also improved its position in relative terms compared with the state average in the case of investment in airports, being on the mean when measured in terms of GDP and above when measured in per capita terms.

Table 3

Central public sector investment in roads in Catalonia

A) Period 1991-2008* (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	5,608	9.3	0.21	49	870	60
Spain**	60,615	100.0	0.43	100	1,439	100

B) Period 1991-2006 (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	4,687	9.2	0.21	48	743	59
Spain**	50,954	100.0	0.44	100	1,254	100

* Investment budgeted in the years 2007 and 2008.

**Regionalized total.

Source: Own preparation from the Statistical Yearbooks of the Ministry of Public Works (1991-2006) and state budget (2007-2008).

Table 4

Central public sector investment in railways in Catalonia

A) Period 1991-2008* (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	8,865	19.8	0.30	103	1,309	125
Spain**	44,811	100.0	0.29	100	1,047	100

B) Period 1991-2006 (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	6,459	19.8	0.26	102	977	126
Spain**	32,614	100.0	0.25	100	778	100

* Investment budgeted in the years 2007 and 2008.

**Regionalized total.

Source: Own preparation from the Statistical Yearbooks of the Ministry of Public Works (1991-2006) and state budget (2007-2008).

Table 5

Central public sector investment in ports in Catalonia

A) Period 1991-2008* (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	2,569	18.5	0.09	63	389	81
Spain**	13,896	100.0	0.14	100	479	100

B) Period 1991-2006 (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	2,136	19.3	0.09	65	330	85
Spain**	11,070	100.0	0.14	100	389	100

* Investment budgeted in the years 2007 and 2008.

**Regionalized total.

Source: Own preparation from the Statistical Yearbooks of the Ministry of Public Works (1991-2006) and state budget (2007-2008).

Table 6

Central public sector investment in airports in Catalonia

A) Period 1991-2008* (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	3,985	20.1	0.13	99	580	125
Spain**	19,787	100.0	0.13	100	464	100

B) Period 1991-2006 (2006 values)

	Millions €	% / total	% / GDP	Index	€/inhabitant	Index
Catalonia	2,580	16.7	0.10	83	387	105
Spain**	15,486	100.0	0.12	100	370	100

* Investment budgeted in the years 2007 and 2008.

**Regionalized total.

Source: Own preparation from the Statistical Yearbooks of the Ministry of Public Works (1991-2006) and state budget (2007-2008).

4. Additional Provision Three of the Statute of Autonomy of Catalonia

Additional Provision Three (section 1) of the 2006 Statute of Autonomy of Catalonia stipulates: "State investment in infrastructures in Catalonia, excluding the Interterritorial Compensation Fund, should be put on a level with the relative share of the gross domestic product of Catalonia in relation to the gross domestic product of the state for a period of seven years. These investments can also be used for the discharge of tolls or the construction of alternative dual carriageways".

Additional Provision Three of the Statute of Autonomy of Catalonia is recognition of the deficit in infrastructures that Catalonia has suffered in the last decades. It is an

exceptional clause with a limited duration which is intended to resolve an exceptional situation. This situation is not repeated in other autonomous communities and, therefore, requires a unique, particular and not necessarily generalizable treatment.

The 2007 state budget already incorporated the mandate of Additional Provision Three as the Statute was passed in 2006. However, a provisional amount was fixed and it was stipulated that a calculation methodology would be established. Last September, the governments of Catalonia and of the state agreed on the methodology to be applied. In accordance with this methodology, 4,021.6 million euros are due to Catalonia. This represents an upwards revision of 827 million in relation to the 3,195 million initially foreseen, an amount which will be made up to the Generalitat.

The following points should be highlighted from this agreement:

- The amount of the investment increases with the methodology agreed on because the infrastructure investment concept is extended to all the actions of an economic nature: agriculture, fishing and food; industry and energy; trade, tourism and SMEs; transport subsidies, infrastructures, research, development and innovation; and other actions of an economic nature.

Initially, the Ministry of Finance only considered as investment in infrastructures part of that carried out by the Ministries of Public Works and Environment. The Catalan government considered from the outset that this interpretation was excessively restrictive and that, moreover, it did not correspond to that used by the reference international economic organizations, such as the OECD or the IMF.

The methodology agreed on extends this calculation basis to all the actions of an economic nature. This includes all – and not just part – of the investments made by the two ministries considered initially and all those relating to agriculture, fishing and food; industry and energy; trade, tourism and SMEs; transport subsidies, infrastructures, research, development and innovation; and other actions of an economic nature. For all these policies, not just the actual investments (chapter 6) will be taken into account, but also the transfers of capital to the autonomous communities and to the local corporations (chapter 7). For 2008, then, the new calculation basis includes 90% of all the state's regionalized investment.

- The weight of Catalonia in state GDP used in the financial year 2007 is 18.85%. The agreement establishes that this percentage will be updated annually at the time of preparing the state budget on the basis of the latest data available from the regional accounting of the National Statistics Institute on 15 September, expressed as a percentage with two decimals. The percentage used in 2007 corresponds to 2005. In the 2008 budget, the percentage 18.72%, corresponding to 2006, will be used, and so on.
- The agreement also establishes a series of guarantees regarding the execution of the investments, their degree of regionalization and the deviations in relation to the figures settled, as the percentage of investments attributed to Catalonia should be fulfilled both in the initial budget and in its settlement. More in particular, the following rules have to be fulfilled: a) if, once the budget has been settled, the percentage of GDP established has not been reached, the deviation will be offset in the following budget; b) if this deviation is not corrected, the state will make a transfer of capital in favour of the Generalitat for this amount;

c) the rate of execution cannot be lower than the average of the two subsequent years. In the event of a deviation occurring, the working group will propose corrective measures to the Bilateral Commission; d) the degree of regionalization of the actual investments (chap. 6) must be at least that of the 2007 state budget (83.7%), that of the transfers of capital (chap. 7) should be at least 90%, and that of the investments settled cannot be lower than the mean of the last two years settled; e) in 2015 an overall valuation of the application of the methodology agreed on will be carried out, and if a deviation is detected the necessary resources shall be allocated to offset it.

According to estimations of the government of Catalonia, in the period 2007-2103 the application of the Additional Provision of the Statute may represent for Catalonia some 34.557 billion euros (30.816 billion constant euros from 2007) of investments in accordance with the methodology approved (table 7).

Table 7

State investment in Catalonia for the purposes of fulfilling Additional Provision 3 of the Statute

Forecast state investment in Catalonia in accordance with the methodology agreed on* (Millions of euros)

	At current prices	At constant prices
2007	4,022	4,022
2008	4,365**	4,142
2009	4,578	4,267
2010	4,885	4,395
2011	5,212	4,526
2012	5,561	4,662
2013	5,934	4,802
Total	34,557	30,816

* The forecasts were made supposing that the investment computable for the purposes of the calculation basis will grow at an annual rate of 6.7%, the percentage of increase of the ceiling of expenditure of the Public Administrations foreseen for 2008 in relation to 2007.

** The application of the methodology agreed on in the state budget for 2008 (still pending approval by parliament) fixed the state investment for the coming year at 4.365 billion euros.

Source: Department of Economy and Finance. Generalitat de Catalunya.

5. Conclusions

- In the period 1991-2008, the total accumulated volume of investments in transport infrastructures by the central public sector in Catalonia was below the Spanish mean. The investment in the above-mentioned period in Catalonia represented 0.73% of Catalan GDP, while the Spanish mean was 1.08%. In per capita terms, in Catalonia 3,053 euros were invested and the Spanish mean was 3,128 euros.
- If we analyze the period 1991-2006, it is observed that the central investment in infrastructures in Catalonia is even more below the Spanish mean. In terms of GDP, it goes from an index of 67 in relation to the mean in the period 1991-2008 to one of 64 in the period 1991-2006, and in per capita terms it goes from an index of 98 to 91. This is because, in the years 2007 and 2008, the central investment in infrastructures in Catalonia experienced a considerable increase for two reasons. The first is the construction of the high-speed train and the

second is the impact of Additional Provision Three of the 2006 Statute of Catalonia.

- The analysis shows that the relative weight of state investment in infrastructures in Catalonia does not reach its economic weight or the weight of its population. The state investment in Catalonia for this period is 4.4 percentage points below the specific weight of Catalan GDP and 1.2 percentage points below that of the population of Catalonia. This differential is corrected slightly when we add the years 2007 and 2008 to the period analyzed.
- The low level of state investment in infrastructures in Catalonia is caused by that made in roads and ports. On the other hand, state investment in railways in Catalonia is above the state mean in the period analyzed. Also in the case of investment in airports, it is observed that in recent years Catalonia improved its position in relative terms compared with the state average, being on the mean when measured in terms of GDP and above when measured in per capita terms.
- Additional Provision Three (section 1) of the 2006 Statute of Autonomy of Catalonia stipulates: “State investment in infrastructures in Catalonia, excluding the Interterritorial Compensation Fund, should be put on a level with the relative share of the gross domestic product of Catalonia in relation to the gross domestic product of the state for a period of seven years. These investments can also be used for the discharge of tolls or the construction of alternative dual carriageways”.
- This Provision is recognition of the deficit in infrastructures that Catalonia has suffered in the last decades. According to estimations of the government of Catalonia, in the period 2007-2103 the application of the Additional Provision of the Statute may represent for Catalonia some 34.557 billion euros (30.816 billion constant euros from 2007) of investments.
- It is therefore observed that in recent decades the state investment in infrastructures in Catalonia was not governed by criteria of economic efficiency, which would have led to invest a percentage closer to the weight of Catalan GDP. It should be expected that in the future this historical deficit can be corrected starting from the provisions of the Statute of Catalonia itself and from a new policy of territorial investment by the central government.

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