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Fiscal Decentralization and Economic Growth in Spain

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This article analyzes the contribution of the Spanish fiscal decentralization process to economic growth at both the aggregate and regional levels. Our main conclusion is that at the aggregate level, the process of decentralization of responsibilities to autonomous communities (ACs) has not had significant effects on Spanish economic growth when fiscal decentralization is measured in terms of revenue and investment shares, while a statistically significant negative effect is found when decentralization is measured through expenditure shares. When the study is carried out from a regional point of view, we find that fiscal decentralization at the AC level has a positive effect on economic growth for those ACs with the highest levels of fiscal and institutional decentralization, but the opposite effect is found for those ACs with the lowest levels of competencies. Decentralization at the local level has a significant positive effect for ACs with complete fiscal autonomy.

Keywords: *fiscal decentralization; institutional decentralization; economic growth; panel data*

1. Introduction

The effect of decentralization on economic growth is a controversial issue. The bulk of literature on this topic is not conclusive about the statistical significance and sign of the effect of fiscal decentralization on economic growth. While some authors argue that the effect of fiscal decentralization is positive for economic growth (Oates 1993), others find evidence of the contrary (Xie, Zou, and Davoodi 1999). The main aim of this article is to contribute to this debate through the analysis of the

Spanish case. Spain is an interesting case for testing the relationship between fiscal decentralization and economic growth because the decentralization process in the public sector has enjoyed great prominence ever since the return of democracy in 1977. Spain is also one of the youngest federations in the Organisation of Economic Co-operation and Development to experience a high and strong process of fiscal decentralization since the late 1970s. Surprisingly, and to the best of our knowledge, an analysis of the Spanish case has not been conducted in the literature. Besides, the Spanish experience may be useful for other countries that are currently in a process of democratization and decentralization such as those countries in Eastern Europe and some South American and Asian countries. In this regard, we account for institutional particularities of Spanish regions when analyzing the effects of fiscal decentralization on economic growth. It is shown subsequently that the consideration of the heterogeneity of the Spanish regions in terms of fiscal and administrative competencies is crucial in determining the effect of fiscal decentralization on economic growth.

The analysis proceeds in two stages. First, we focus on the decentralization process for overall Spanish growth using time series analysis. Second, we examine the influence of the decentralized levels of government in Spain (regional and local governments) on regional growth. In this case, we use a panel data set for the seventeen Spanish regions.

The analysis at the aggregate level considers three different measures of fiscal decentralization, or measures based on revenue, expenditure, and investment shares. Our results indicate that decentralization to autonomous communities (ACs) has not had a consistent, significant effect on aggregate economic growth. Decentralization to local governments only has a negative significant effect on aggregate Spanish growth when it is measured through expenditure shares. Nevertheless, the heterogeneity of Spanish regions, in terms of the number of competencies that they have assumed since the early 1980s, may bias the conclusions. We tackle this issue by analyzing the effects of fiscal decentralization from a disaggregated point of view. At the

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regional level, the effect of fiscal decentralization is only measured by investment shares because of the lack of statistical information. The results of fiscal decentralization on economic growth, whether for the ACs or local governments, depend on the level of powers that ACs have assumed from 1980 on. We find that those ACs with complete fiscal autonomy show a positive and significant effect of fiscal decentralization at the local level, while there is a nonsignificant effect at the AC level. This is because the regional governments of these ACs transfer most of their resources to the local level. For ACs with a high level of fiscal powers, fiscal decentralization to either the AC or the local level has a positive and significant effect on regional economic growth. Finally, for those ACs with a low level of fiscal power, decentralization to the AC government shows a negative and significant impact, whereas decentralization to the local level is nonsignificant.

The article is structured as follows. Section 2 analyses the influence of decentralization over economic growth, including a summary of the previous empirical evidence on this subject. Section 3 describes the Spanish decentralization process from 1978 to the present day. Section 4 starts by using a model to explain Spanish economic growth (global and regional) by means of the effects of decentralization indicators. The final section summarizes the main conclusions.

2. Fiscal Decentralization and Economic Growth: Empirical Aspects

Traditionally, the theoretical and empirical analysis of fiscal federalism has given little attention to the objective of economic growth. Theory has focused on the efficiency and distributive consequences of fiscal decentralization. Although the traditional argument for fiscal decentralization is that it may provide greater economic efficiency in the allocation of resources in the public sector (Oates 1972), the relationship between efficiency and economic growth has been analyzed to a limited extent.

In this regard, the so-called second generation fiscal federalism literature (Oates 1999) argues that further empirical evidence on the effects of fiscal decentralization should be pursued. Of special relevance is the analysis that fiscal decentralization might have on economic growth, specifically for those economies that have experienced a strong decentralization process in a short period.

There have been several empirical studies that analyze the relationship between fiscal decentralization and economic growth, and the evidence is

inconclusive. According to Bird (1993) and Oates (1993), there are studies that point to fiscal decentralization's positive effect on growth, as measured from either the revenue or expenditure point of view (Zhang and Zou 2001; Akai and Sakata 2002). However, although there is a vast amount of theoretical literature on the potential positive effect of decentralization, most empirical studies have not reported any significant relationship between these variables. Davoodi and Zou (1998) analyzed a panel data set of forty-six developed and developing countries using a specification based on Barro (1990) and did not find any relationship between fiscal decentralization and growth. They also reported a negative relationship for both the whole panel data set and the panel data set of developing countries. This negative relationship was also found by Woller and Phillips (1998) for twenty-three less developed countries, by Zhang and Zou (1998, 2001) for the Chinese provinces (suitably corrected by Lin and Liu (2000)), and by Xie, Zou, and Davoodi (1999) for the United States. Iimi (2005) provided evidence that the results given by Davoodi and Zou (1998) are very sensitive to either the presence of endogeneity or the inclusion of the effects of 1990s decentralization in the analysis.

Among the reasons that explain the presence of differences among the signs of the relationships, we can think of three relevant factors: the economic development level, the achieved degree of fiscal decentralization in each central-regional decentralization process, and the indicator that is chosen to measure the fiscal decentralization. Martínez-Vázquez and McNab (2003) pointed out that decentralization is multidimensional, and the empirical literature has evolved in the selection of the measure of fiscal decentralization. Both budget sides are considered in empirical models, together with a combination of these (expenditures and tax revenues).

3. Fiscal Decentralization in Spain

The adoption of the Spanish Constitution in 1978 heralded the beginning of democracy and the division of the state territory into ACs, provinces, and municipalities. There are thus three current levels of government: central, regional (intermediate), and local.

The regional level was created by the democratic constitution of 1978, in recognition of the right to autonomy of the regions and nationalities in Spain, and comprises seventeen ACs. The local government level consists of two administrative strata: municipalities (around eight thousand) and provinces (fifty). The municipality is the basic local entity of state organization,

and the province is a local entity that includes a number of municipalities. There is an abundance of Spanish municipalities because most of them are small, with 86 percent having less than five thousand habitants. The constitution creates this territorial organization across the territory of the state, without prejudice to the creation of other local entities. Nevertheless, it should be mentioned that there are six regions consisting of a single province. These ACs have integrated their provincial administration, including budgeting, into the autonomous regional administration.

The distribution of power by levels of government in Spain is regulated by the constitution, the statutes of autonomy of the seventeen ACs, and the Local Government Act. The central government has exclusive power in matters of defense, foreign affairs, economic stabilization, and social security. The central government also has responsibilities for public order, although it shares policing responsibilities with the regional governments of the Basque Country and Catalonia in those regions. As far as the responsibilities assigned to the ACs are concerned, a distinction should be made between three types of ACs, depending on the route taken to autonomy, which may be either the route indicated in Article 143 or Article 151 of the constitution and the so-called foral ACs.[1] The fundamental difference between them, as far as the level of responsibilities and expenditures is concerned, is that the Article 143 communities involve access only to common responsibilities and temporarily exclude two basic functions, health and education, which account for a large volume of expenditure. In contrast, Article 151 communities and foral ACs have these responsibilities immediately. Notwithstanding, the main difference between them is that foral ACs have a complete fiscal autonomy; further details are given later. Any reference to Article 143 ACs is thus synonymous with a low level of responsibilities, whereas Article 151 ACs are indicative of a high level of responsibilities. Nevertheless, there has been an ongoing process whereby ACs with the lower level of responsibilities have assumed responsibilities pertaining to health and education. In specific terms, responsibilities in education were gradually transferred to Article 143 ACs between 1995 and 1999, while health responsibilities were transferred to all these ACs in 2002. In fact, those matters that are not expressly vested in the state by the constitution can be devolved to ACs. Table 1 shows the principal differences between the different types of AC.

In any case, there are even some differences between ACs that are regarded as having the same level of responsibilities since the statutes that govern the responsibilities of each region have been individually adopted by different processes. Thus, since their creation, not all the regions have

Table 1
Spanish Regions Heterogeneity Based on Decentralization Dimensions: Political, Fiscal, and Administrative

Autonomous Communities			Particularities	Characteristics	Autonomy	Responsibilities
D_3, foral ACs		Basque Country Navarre	Officially recognized own language Distinct civil legislation Own financial and tax systems Right to establish their own police force	According to the constitution, these are "historic nationalities" or regions with strong identity	Complete fiscal autonomy	Common responsibilities and education and health competencies that were transferred immediately
Common ACs	D_2, Article 151 of the constitution	Andalusia Canary Islands Catalonia Valencia Galicia	Special economic and tax arrangements Officially recognized own language Distinct civil legislation Right to establish their own police force Officially recognized own language Officially recognized own language Right to establish their own police force	According to the constitution, these are "historic nationalities" or regions with strong identity	Fast track to a high level of autonomy	Common responsibilities and education and health competencies that were transferred immediately

(continued)

Table 1
(continued)

Autonomous Communities		Particularities	Characteristics	Autonomy	Responsibilities
D_1, Article 143 of the constitution	Aragon	Officially recognized own language	According to the constitution, these are regions with weak identity	Low track and complex access	Common responsibilities and education (transferred between 1995 and 1999) and health (transferred to all ACs in 2002)
	Asturias				
	Balearic Islands	Officially recognized own language			
	Cantabria				
	Castille–La Mancha				
	Castille-Leon				
	Extremadura				
	La Rioja				
	Madrid				
	Murcia				

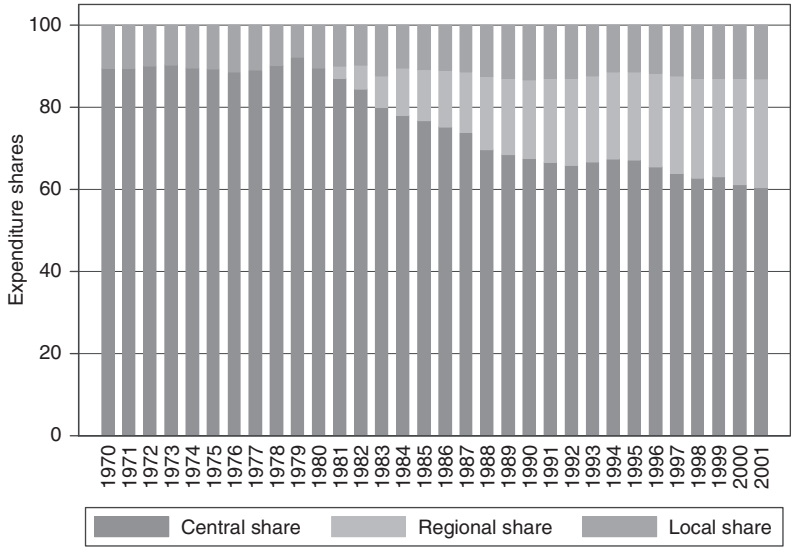
Note: AC = autonomous community. Common responsibilities include organization of the institutions of autonomous government; spatial planning, town planning, and housing; public works, railways, and roads throughout the autonomous community; agriculture, waterways and forestry, and fisheries; expansion of economic activity, culture, and research; museums, libraries, and public monuments; tourism, sport, and leisure activities throughout the autonomous community; and social welfare and safety. Article 148 also provides for the powers of the autonomous communities to be extended to other areas. The powers vary from one autonomous community to another.

been responsible for providing the same public goods and services. These expenditure responsibilities regard the so-called common responsibilities and have been assigned to the regions in different moments of time.

The constitution establishes the division of powers between the state and the ACs but does not refer to the responsibilities of local governments. These powers are regulated in the Local Government Act, which establishes a minimum level of obligatory services per size of municipal population, with a larger population requiring more services. Furthermore, the Local Government Act grants responsibilities to provinces. It should be made clear that in most cases, responsibilities are shared by the central government and the regional governments, as occurs for major roads and transportation, housing, social services, and development policy. Similarly, local governments have an equal share in the provision of these services. On the other hand, the distribution of responsibilities at regional and local levels of government is not always clear as there is some overlapping, and the Local Government Act is very ambiguous in its assignment of powers. Similarly, while the central and regional parliaments may enact laws of the same category, the central government has the right to establish basic legislation in the areas of education, health, and public order.

In Spain, the process of decentralization of the public sector has enjoyed great prominence ever since the return of democracy. The different ACs were gradually established between 1979 and 1983, and the state began to transfer responsibilities and services to them. Figure 1 shows the evolution of the relative importance of the Spanish public sector at different levels of government using consolidated data pertaining to public expenditure from 1970 to 2001. As can be seen, decentralization starts in 1980. The change in the degree of decentralization in the 1980 through 2001 period shows an increasing pattern. In specific terms, central public sector spending in 1980 accounted for 89.5 percent of the whole, while in 2001, it had fallen to 60.5 percent. Regional government spending increased from 0 percent to 26.4 percent in the same period. Finally, local governments did not succeed in increasing significantly their specific weight in the Spanish public sector in this period. This level of government represented 10.5 percent of total public expenditure in 1980 and 13.1 percent in 2001. The forecasts for the year 2002, when the responsibilities for health were to be transferred to all Article 143 ACs, show that the distribution of expenditure by level of government would be 56 percent for central government, 31 percent for regional government, and 13 percent for local government.

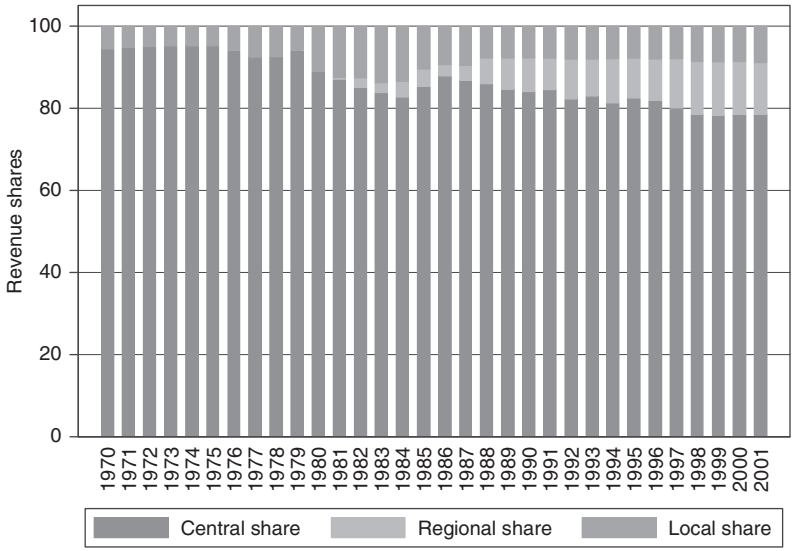
Figure 1
Distribution of Public Expenditure by Level of Government, 1970–2001



While there is a considerable degree of decentralization in public spending in Spain, decentralization is significantly lower when we measure the degree of decentralization on the revenues side. This is due to the effect of intergovernmental grants on consolidated data (see figure 2). The evolution of public revenue consolidated by level of government from 1980 to 2001 shows that the process of revenue decentralization was not comparable to that of expenditures. In 1980, the central government had 88.9 percent of the total public revenue from the Spanish public sector at its disposal, the ACs had 0 percent, and local governments had 11.1 percent. For 2001, these figures were 78.5 percent, 12.5 percent, and 9.0 percent, respectively, which shows that there was a serious lack of symmetry between the decentralization of expenditure and that of revenue, especially at a regional level.

The ACs' financing system is based on Article 157 of the constitution and on the Basic Financing Act of the Autonomous Communities (LOFCA). The constitution includes two systems of autonomous regional financing. The first is applicable to the Basque Country and Navarre,

Figure 2
Distribution of Public Revenues by Level of Government, 1970–2001



regions that have historical charters on fiscal and economic matters. This is known as the foral regime and is based on the transfer of the revenue and the management of most state taxes to the provincial administration of these regions as well as some regulatory powers regarding those state taxes. An annual fee is paid by these regions to the central government for the financing of general state burdens. The second system is applicable to the rest of the ACs, which is known as the common regime. The common regime financing system has gradually taken shape over time, in line with the growth in areas of responsibility and services provided by those autonomous regional authorities.

During the early years of the ACs' development, the central administration would transfer the necessary resources to them to fund their specific areas of responsibility. The goal was to furnish the ACs with adequate resources to enable them to provide the public services included within their scope of authority. This financial system would be complemented by the incorporation of a highly redistributional resource fund. There would be a gradual transfer of taxes to the ACs, allowing tax revenues to become a source of autonomous

funding for such communities. In fact, the first draft of the LOFCA listed the taxes that could be transferred to the ACs. These included the tax on inheritance and gifts, the general property tax, the transfer tax, the tax on official legal documents, and taxes and charges on gaming.

Thus common regime ACs' resources can be grouped into two broad types: (1) income from taxation and resources assigned from the central government's general budgets, in which income from taxation is obtained from the region's own taxes and ceded taxes[2]—totally or partially—from the central government,[3] and (2) resources transferred from the central government's general budgets, which correspond to two kind of transfers: (1) a general grant, in the form of a share of central government general receipts, for financing the common services and education responsibilities when transferred, and (2) earmarked grants, for example, sanitary and social services grants and the interterritorial compensation fund. Article 143 and 151 ACs' resources differ in the amount of resources transferred from the central government based on their level of competencies, mainly on health and education responsibilities.

Spanish local finance is currently regulated by the Local Finance Act of 2002. The Local Finance Act bases local sufficiency on two basic financial mechanisms: the region's own taxes (e.g., the property tax, the business tax, the motor vehicles tax, and others) and sharing in state revenue. Furthermore, Spanish local governments can access other resources such as those derived from the operation of their own property as well as resorting to credit.

4. Empirical Analysis: The Spanish Decentralization Case

4.1. Spain: The Aggregated Evidence

Like Xie, Zou, and Davoodi (1999), we test the impact of fiscal decentralization on overall Spanish growth. Economic growth is denoted throughout the article as g_t and is measured as the annual variation in the logarithm of either the gross domestic product (GDP) per capita or the gross value added (GVA) per capita. The model that we specify explains g_t as the following linear approximation:

$$g_t = \mathbf{X}_t\gamma + \alpha g_{t-1} + u_t, \tag{1}$$

where the analyzed period is either $t = 1970, \ldots, 2000$ or $t = 1965, \ldots, 2000$, depending on the availability of the statistical information; further details are given later. The vector $\mathbf{X}_t$ denotes the degree of fiscal decentralization as well as other macroeconomic variables that are useful in explaining the

determinants of growth. Note that in equation (1), we have included one lag of the growth rate to capture the inertia of the GDP growth.

We consider three different measures of fiscal decentralization: the ACs' and local government's share of total government spending, the ACs' and local government's share of total government revenues, and the ACs' and local government's share of total government investments. It is worth mentioning that when using the investment share as a measure of fiscal decentralization, we only capture a portion of public expenditure, although it is the most productive part. This implies that a higher impact on economic growth is expected to be found when compared to the standard indicators based on revenues or expenditures. We have considered this measure because it is the only available indicator for the disaggregated Spanish estimations given in the next section.

The numerator of the fiscal decentralization variable is either direct spending, revenues, or investment (depending on the indicator that is used) of regional and local government; we consider these quantities net of intergovernmental transfers. The denominator is either the sum of spending, revenues, or investment (again depending on the indicator) of the national, regional, and local governments' net of the intergovernmental transfers. The fiscal decentralization measures for the regional and local levels are computed as

$$\%ACs_t = \frac{\text{ACs expenditure}_t}{\text{Total expenditure}_t}; \%Local_t = \frac{\text{Local expenditure}_t}{\text{Total expenditure}_t}. \tag{2}$$

The other two measures of fiscal decentralization are based on revenues and investment and are obtained in the same way, with expenditure replaced by revenues or investment, respectively. A ceteris paribus rise in the ACs' or the local government's share indicates a higher degree of fiscal decentralization. In the empirical analysis that is based on equation (1), the decentralization measures appear in annual changes, hereafter denoted as $\Delta\%\text{ACs}_t$ and $\Delta\%\text{Local}_t$.

The other explanatory variables in $\mathbf{X}_t$ are those usually applied in the literature on economic growth: the annual change in the natural logarithm of the labor force ($\Delta\ln L_t$), the change in the natural logarithm of the human capital ($\Delta\ln H_t$), and the change in the natural logarithm of the private ($\Delta\ln Kp_t$) and public ($\Delta\ln Kg_t$) capital stock. Other explanatory variables often used in the studies of economic growth and decentralization were tried, although they were not statistically significant. Table 2 presents the details concerning the definitions and sources of the variables. As mentioned previously, the period of analysis is conditioned to the

Table 2
Definition of the Variables

Variable	Definition	National Source	Regional Source
GVA	Gross value added in 1986 euro base	Spanish National Institute[a] for the 1964–2000 period	BDMores database and Doménech, Escribá, and Margui (1999)
GDP	Gross domestic product in 1986 euro base	Spanish National Institute for the 1964–2000 period	
L	Labor force: employed	Institut Valencià d'Investigacions Econòmiques (IVIE)[b] for the 1964–2000 period	IVIE for the 1964–2000 period
Kp	Private capital stock in 1986 euro base		
Kg	Public capital stock in 1986 euro base		
H	Human capital stock, as proportion of employees educated to at least secondary level		
%Local	Revenue: share of local government revenue over the sum of total government revenues	*Government Finance Statistics Yearbook* database for the period 1970–1980 and Spanish Ministry of Finance for the 1980–2000 period	
	Expenditure: share of local government expenditures over the sum of total government expenditures net intergovernmental transfers		
	Investment: share of local investment over the sum of total government investments	IVIE for the 1964–2000 period	IVIE for the 1964–2000 period

(continued)

Table 2
(continued)

Variable	Definition	National Source	Regional Source
%ACs	Revenue: share of AC government revenue over the sum of total government revenues	*Government Finance Statistics Yearbook* database for the period 1970–1980 and Spanish Ministry of Finance for the 1980–2000 period	Base de Datos Económicos del Sector Público Español,[c] Spanish Ministry of Finance
	Expenditure: share of AC government expenditures over the sum of total government expenditures net intergovernmental transfers		
	Investment: share of AC investment over the sum of total government investments	IVIE for the 1964–2000 period	IVIE for the 1964–2000 period
D_1	Dummy variable for the Article 143 ACs		
D_2	Dummy variable for the Article 151 ACs		
D_3	Dummy variable for the foral ACs		

a. See http://www.ine.es.
b. See http://www.ivie.es.
c. See http://www.estadif.meh.es.

availability of statistical information for the fiscal decentralization measures. While most variables cover the period from 1964 to 2000, the expenditure and revenue series only range from 1970 to 2000.[4]

Table 3 shows the results of the estimation of the basic models (i.e., the models that do not include decentralization measures), along with the models that include the decentralization measures. Estimations are reported for the GVA or GDP per capita growth measures. It is worth mentioning that we first estimated the parameters of the model with the application of

Table 3
Growth Equation for the Spanish Economy As a Whole

	1970–2000		Revenue Shares, 1970–2000		Expenditure Shares, 1970–2000		Investment Shares, 1965–2000 (First Estimated Model)		Investment Shares, 1965–2000 (Second Estimated Model)	
	GGVA	GGDP	GGVA	GGDP	GGVA	GGDP	GGVA	GGVA	GGDP	GGDP
C	–0.0176 (–3.19)	–0.0113 (–1.97)	–0.0193 (–3.49)	–0.0131 (–2.38)	–0.0102 (–1.29)	–0.0114 (–1.70)	–0.0173 (–3.34)	–0.0180 (–3.40)	–0.0106 (–1.85)	–0.0115 (–2.09)
Δ%Local			–0.0010 (–0.78)	–0.0015 (–0.94)	–0.0026 (–3.13)	–0.0023 (–2.97)		0.0004 (0.74)		0.0006 (1.10)
Δ%ACs			0.0021 (0.96)	0.0023 (1.23)	–0.0027 (–1.27)	–0.0012 (–0.63)		0.0006 (0.77)		0.0008 (1.07)
ΔLabor	0.6865 (9.51)	0.7211 (10.16)	0.6639 (7.93)	0.6880 (8.32)	0.5891 (6.80)	0.7320 (8.57)	0.6311 (9.38)	0.6344 (8.78)	0.6608 (9.95)	0.6655 (9.36)
ΔHuman capital	0.5300 (3.93)	0.4928 (4.01)	0.5286 (4.18)	0.4859 (4.34)	0.5869 (4.48)	0.5027 (3.82)	0.3555 (3.23)	0.3325 (2.99)	0.3028 (2.95)	0.2763 (2.44)
ΔPrivate capital	0.0011 (0.01)	–0.1038 (–0.47)	0.0770 (0.38)	0.0015 (0.01)	–0.2689 (–0.96)	–0.0442 (–0.19)	0.1404 (0.89)	0.1890 (1.08)	0.0827 (0.46)	0.1425 (0.68)
ΔPublic capital	0.0826 (0.68)	0.0678 (0.55)	0.0556 (0.40)	0.0311 (0.22)	–0.0649 (–0.40)	0.0558 (0.43)	0.2354 (2.31)	0.2274 (2.38)	0.2049 (2.37)	0.1925 (2.48)
g_{t-1}					0.3735 (2.04)					
Sample	31	31	31	31	31	31	34	34	34	34
F-test	44.61 (0.00)	44.71 (0.00)	26.45 (0.00)	26.38 (0.00)	27.38 (0.00)	23.98 (0.00)	53.92 (0.00)	21.25 (0.00)	47.29 (0.00)	30.60 (0.00)
R^2	0.76	0.74	0.77	0.77	0.79	0.79	0.81	0.83	0.79	0.81
Wu-Hausman *F*-test	20.91 (0.00)	26.09 (0.00)	24.22 (0.00)	29.57 (0.00)	16.65 (0.00)	18.15 (0.00)	9.67 (0.00)	8.87 (0.00)	12.23 (0.00)	11.39 (0.00)
Sargan NR^2 test	0.46 (0.79)	0.46 (0.79)	0.13 (0.94)	0.06 (0.97)	1.37 (0.50)	1.37 (0.50)	1.86 (0.39)	2.23 (0.33)	1.54 (0.46)	1.92 (0.38)

Note: Individual significance statistics are reported in parentheses next to the estimated coefficients and are based on the use of robust standard error estimates. The Durbin-Watson statistic for these models is between the lower and upper bounds at the 5 percent level, so the test is inconclusive as regards the presence of autocorrelation. However, the Breusch-Godfrey statistic does not reject the null hypothesis of no autocorrelation in any case. The *F* statistic shows that the null hypothesis of joint statistical insignificance is strongly rejected. The Jarque-Bera test indicates that the null hypothesis of normality cannot be rejected. Finally, we assessed that the estimated coefficients are not affected by the presence of multicollinearity by the computation of the variance inflation factors, all of which are smaller than 5. Wu-Hausman *F*-test indicates that the endogeneity of private and human capital are not rejected, while the Sargan test notes that we are not overidentifying.

the ordinary least squares estimation method, although the Wu-Hausman test indicated that both $\Delta \ln H_t$ and $\Delta \ln Kp_t$ were endogenous regressors. Thus, to account for endogeneity, the instrumental variables estimation method has been applied to obtain the estimates reported in table 3, using the first two lags of $\Delta \ln H_t$ and $\Delta \ln Kp_t$ as instruments. Sargan's test shows that these instruments are valid.

Consider first models that do not include fiscal decentralization measures as explanatory variables. The estimates in the second and third columns of table 3 indicate that neither the growth of private capital nor the growth of public capital influenced the growth of the Spanish economy in the 1970 through 2000 period. We can also see that the coefficients of $\Delta \ln L_t$ and $\Delta \ln H_t$ are highly statistically significant. When we extend the period from 1965 to 2000 (see columns eight and ten of table 3) we recover the significance of the growth of the public capital but not of the growth of the private capital. Finally, the lagged endogenous variable is significant only in one estimate. Note that these conclusions are found regardless of the output growth measure of the Spanish economy that is used.

In general, these conclusions are robust to the inclusion of fiscal decentralization measures. The evidence indicates that the effect of decentralization on aggregate economic growth, if any, comes from decentralization at the local level. These results indicate that aggregate Spanish economic growth can be negatively affected by the increase of fiscal decentralization, measured by the expenditure share at the local level. Surprisingly, our analysis reveals that the growth of ACs-level decentralization does not affect Spanish economic performance, regardless of the definition of decentralization that is used.

These results are based on data for the Spanish economy as a whole. However, the heterogeneity of Spanish regions might affect these results, which in turn might introduce aggregation bias in the estimation of the parameters. To obtain a better picture of fiscal decentralization and its effect on economic growth accounting for heterogeneity of Spanish regions, we carry out the analysis using a regional panel data set. This is dealt with in the next section.

4.2. Spanish Autonomous Communities: The Disaggregated Evidence

In this section, we examine the effect of fiscal decentralization on economic growth using Spanish data for seventeen regions. Economic growth at the regional level is measured as the change in the natural logarithm of

the GVA, with the data obtained from Doménech, Escribá, and Murgui (1999) and the BDMores database. The source of the explanatory variables is summarized in table 2.

Owing to a lack of statistical information, our model only considers the sensitivity of growth to decentralization as measured by the investment share defined previously for the period 1965 to 2000. As mentioned, the use of this fiscal decentralization measure is expected to show a higher impact than standard indicators since it represents the most productive component of government activities. As usual, the investment levels include roads, railways, airports, ports, water structures, and education. Likewise, we consider investment in health when the competence lies on regional governments. However, competencies were transferred to regional governments at different times, which implies that some adjustments must be made to provide the regional investment shares.[5]

Another issue that can be studied at the regional level is the effect of fiscal autonomy on economic growth. It is possible to compute this autonomy measure defined as the share of the region's own revenues out of the total nonfinancial revenues in the region. This measure is different than the one based on revenues in the previous section since now, the numerator only considers those revenues that have been given to ACs and local governments. To be specific, we define the following shares:

$$\%ACs_{i,t} = \frac{ACs\ revenues_{i,t}}{ACs\ nonfinancial\ revenues_{i,t}};$$
$$\%Local_{i,t} = \frac{Local\ revenues_{i,t}}{Local\ nonfinancial\ revenues_{i,t}}. \tag{3}$$

As previously, these measures enter in the model in first differences (i.e., $\Delta\%\mathrm{ACs}_{i,t}$ and $\Delta\%\mathrm{Local}_{i,t}$). In this case, we only use annual data for regional revenues from 1987 to 2000. For the foral ACs, we have imputed as regional revenues the collected taxes by the foral *Diputaciones*.

The most general specification of the growth ($g_{i,t}$) equation is given by

$$g_{i,t} = \gamma_i + \beta_1 d^a_{i,t} + \beta_2 d^l_{i,t} + \mathbf{X}_{i,t}\boldsymbol{\beta}_3 + \alpha g_{i,t-1} + \varepsilon_{i,t}, \tag{4}$$

where $i = 1, \ldots, 17$, $t = 1965, \ldots, 2000$ for the investment shares and $t = 1987, \ldots, 2000$ for the revenue shares, where d_t corresponds to fiscal decentralization indicators. The superscript a is for the AC level, and 1 is for the local level. We therefore compute our fiscal decentralization variable as the change in the share of regional investment compared to total investment, where total investment is defined as the sum of direct investment by the national, regional, and local governments for each AC. This

ratio therefore measures the weight of regional government in the public sector in this region in terms of investment. Finally, the regressors in $\mathbf{X}_{i,t}$ aim to explain growth by means of variables that could reflect regional growth heterogeneity and include the annual change of the natural labor force, human capital, private capital, and public capital logarithms, along with dummy variables to capture the different degree of fiscal and institutional decentralization to be defined subsequently. As before, equation (4) includes one lag of the endogenous variable so that we have a dynamic panel data model. We have estimated the coefficients through the system generalized method of moments (GMM) of Blundell and Bond (1998), where statistical inference is based on robust standard error estimates. In addition, the only regressor that showed an endogeneity problem was the annual growth of the private capital. We have accounted for the endogeneity issue of this regressor when applying the GMM estimation method.

Let us first focus on the results based on the fiscal decentralization measured as investment shares. Table 4 reports in column one the estimation of the models considering only the standard output function variables. As expected, there is a positive effect from the growth in the labor force, human capital, and private capital, although the growth of public capital is not significant. The nonsignificance of public capital is often found in the literature on Spanish regional economic growth; see González-Páramo and Martínez (2002) for further details. In this regard, Puig-Junoy (2001) pointed out that the decomposition of the public capital plays an important role in terms of efficiency on its allocation. Likewise, Bajo-Rubio and Díaz-Roldán (2005) stressed that Spanish public capital endowments have not been allocated following optimal decisions.

We analyze the robustness of this benchmark model, adding the fiscal decentralization indicators. Column two in table 4 shows that there is a nonsignificant impact for the AC and for the local level of decentralization, which is in accordance with the results obtained for the aggregated model. However, the heterogeneity of the Spanish regions in terms of fiscal and institutional decentralization competencies may be affecting this conclusion; see table 1 for a summary on the responsibilities and capabilities of the Spanish regions. To this end, we have defined three dummy variables to capture this heterogeneity, which interact with the fiscal decentralization measures. D_1 denotes the regions whose competencies are defined by Article 143 (lowest level of responsibilities), D_2 stands for those regions with competencies defined in Article 151 (highest level of responsibilities), and D_3 is for those foral ACs with complete fiscal autonomy. These three dummy variables, when interacting with the AC and

Table 4
ACs Growth Equation: Panel Data Approach (GGVA): Investment Shares (1965–2000)

	Equation (1)	Equation (2)	Equation (3)
L(1) ΔGVA*pc*	0.1770 (4.06)	0.1896 (4.47)	0.1922 (4.18)
ΔLabor	0.3280 (7.29)	0.3245 (7.09)	0.3323 (7.15)
ΔHuman capital	0.1197 (5.11)	0.1213 (5.09)	0.1235 (5.01)
ΔPrivate capital	0.3113 (3.77)	0.2892 (3.49)	0.2838 (3.27)
ΔPublic capital	0.0236 (0.85)	0.0204 (0.73)	0.0183 (0.65)
Δ%Local		0.0231 (1.48)	
Δ%ACs		–0.0190 (–0.96)	
Δ%Local-D_1			0.0065 (0.39)
Δ%Local-D_2			0.0218 (0.82)
Δ%Local-D_3			0.1239 (1.90)
Δ%ACs-D_1			–0.0635 (–1.72)
Δ%ACs-D_2			0.0278 (2.29)
Δ%ACs-D_3			0.0390 (0.80)
N	561	561	561
Hansen *J*-test	8.76 (1.0)	0.99 (1.0)	0.09 (1.0)
Arellano-Bond AR	–1.34 (0.18)	–1.67 (0.18)	–1.50 (0.13)
F-test	4,348.17 (0.00)	1,212.88 (0.00)	14,431.63 (0.00)

Note: D_1, D_2, and D_3 represent Article 143 ACs, Article 151 ACs, and foral ACs, respectively. Hansen *J*-test refers to assuming no overidentifying restrictions, the Arellano-Bond AR test null hypothesis assumes no second-order autocorrelation, while the *F* statistic informs about overall parameter significance. *P*-values are reported in brackets. The Davidson-Mackinnon test shows endogeneity for the private capital factor: 9.23 (0.00).

local levels of fiscal decentralization, define six additional regressors that can capture the heterogeneous effect of fiscal and institutional decentralization on economic growth.

Column three of table 4 offers estimates including these institutional dissimilarities. Significant effects of fiscal decentralization are now found, although the sign and magnitude of these effects depend both on the level of government and on the type of ACs. We only find positive and statistical significant effects of fiscal decentralization at the local level for the D_3 ACs but not for the D_1 and D_2 ACs. Also, statistically significant effects of fiscal decentralization at the AC level are found for the D_1 and D_2 ACs, but not for the D_3 ones; however, the sign of the effect is positive for the D_2 ACs but negative for the D_1 ones. Note that in all cases, the conclusions about the other explanatory variables remain unaltered.

Therefore our evidence indicates that fiscal decentralization has significant and positive effects on economic growth—either at the AC or the local level—for those ACs involved in more advanced levels of Spanish fiscal and administrative decentralization processes (e.g., D_2 and D_3 ACs), but it has a negative impact on economic growth for those ACs that belong to the group of regions of lower fiscal and administrative decentralization (e.g., D_1 ACs).

The positive effect on economic growth for the ACs with the higher levels of competencies can be explained by the higher predisposition to assume higher levels of competencies that these ACs have shown as a consequence of being historical communities. This is evidenced by the fast track access to high level of autonomy that was chosen when the regional division of the state of 1978 was created. Likewise, these ACs assumed a higher number of the so-called common responsibilities (e.g., economic promotion, trade, industry, harbors, tourism and roads, among other things) as well as the transfer of responsibilities for health and education, which account for a large volume of investment (nearly 40 percent of overall regional investments). Note that this conclusion is only reached once we decompose decentralization effects through institutional particularities.

Let us now focus on the estimates that use the region's own revenue share as a fiscal autonomy measure. As above, first we present in column one of table 5 the estimation of the benchmark model that does not include the fiscal autonomy variables. Now, the coefficients for the growth of the labor force, human capital, and public capital are significant and have the expected sign, although the growth of the private capital is not significant. The inclusion of the fiscal autonomy measures without distinguishing among institutional decentralization processes indicates that fiscal autonomy does not play a role in economic growth (see column two in table 5). However, the picture changes when the distinction among D_1, D_2, and D_3 ACs is established. Column four in table 5 shows that fiscal autonomy does not cause any effect on economic growth for the D_1 ACs, regardless of whether the decentralization is measured at the AC or the local level. Fiscal autonomy for foral ACs has a significant and negative effect at the local level but is significant and positive when it concerns the AC level. Furthermore, the magnitude of the positive effect of the AC level is larger than the one for the local level. We have tested the null hypothesis that the two coefficients are equal in magnitude but of opposite sign, which has not been rejected. This is a consequence of our revenues' imputation for D_3 ACs between the local and regional levels since in these ACs, the central government does not play any role (e.g., complete fiscal autonomy).

Table 5
ACs Growth Equation: Panel Data Approach (GGVA): Revenue Shares (1987–2000)

	Equation (1)	Equation (2)	Equation (3)	Equation (4)
L(1) ΔGVA*pc*	–0.0129 (–0.25)	0.0459 (0.75)	0.0546 (0.93)	
ΔLabor	0.4293 (6.93)	0.4027 (6.24)	0.3946 (6.32)	0.4052 (7.47)
ΔHuman capital	0.0562 (1.76)	0.1251 (2.39)	0.1279 (2.43)	0.1307 (2.48)
ΔPrivate capital	0.0845 (0.58)	0.0860 (0.53)	0.0833 (0.61)	0.1127 (0.50)
ΔPublic capital	0.1366 (1.98)	0.0719 (1.06)	0.0781 (1.21)	0.0921 (1.44)
Δ%Local		–0.0075 (–0.49)		
Δ%ACs		–0.0001 (–0.12)		
Δ%Local-D_1			–0.0074 (–1.59)	–0.0056 (–0.21)
Δ%Local-D_2			–0.0046 (–0.67)	–0.0062 (–0.64)
Δ%Local-D_3			–0.0600 (–6.50)	–0.0545 (–8.87)
Δ%ACs-D_1			–0.0001 (–0.39)	–0.0001 (–0.32)
Δ%ACs-D_2			0.0101 (3.34)	0.0110 (3.04)
Δ%ACs-D_3			0.0750 (6.25)	0.0704 (6.48)
N	221	221	221	221
Hansen *J*-test	14.76 (1.0)	15.08 (1.0)	7.35 (1.0)	4.75 (1.0)
Arellano-Bond AR	–0.54 (0.59)	0.56 (0.57)	0.52 (0.60)	0.29 (0.77)
F-test	21.88 (0.00)	32.81 (0.00)	62.18 (0.00)	50.21 (0.00)

Note: D_1, D_2, and D_3 represent Article 143 ACs, Article 151 ACs, and foral ACs, respectively. Hansen *J*-test refers to assuming no overidentifying restrictions, the Arellano-Bond AR test null hypothesis assumes no second-order autocorrelation, while the *F* statistic informs about overall parameters' significance. *P*-values are reported in parentheses.

Finally, we have obtained a significant and positive effect of fiscal autonomy at the AC level for D_2 regions. Once the fiscal autonomy variables are included in the model, the growth of the public capital loses its significance, although growth of the labor force and human capital continue to be highly significant and show the expected sign.

In summary, our main conclusion here is that fiscal decentralization at the local level, when significant, contributes positively to regional growth. This effect is significant for those ACs that enjoy complete fiscal autonomy. However, the effect of fiscal decentralization at the AC level depends on the initial assumptions of fiscal responsibilities of the ACs. The coefficient for the ACs with the lowest fiscal decentralization level is negative and significant, whereas those ACs with a high level of decentralization have a positive effect. We find for the foral ACs a coefficient that is positive but not significant. We can therefore conclude that growth and fiscal decentralization at the regional level are positively correlated when

the highest level of decentralization is achieved. Note that similar conclusions are found when a measure of fiscal autonomy is introduced in the model. This suggests that there may be a threshold level of fiscal decentralization from which positive economic growth effects are found.

5. Conclusions

The Spanish decentralization process has focused on the transference of responsibilities from central government level to regional level. We have analyzed the effect of fiscal decentralization on the Spanish economy taken as a whole as well as on the regional level. At the aggregate level, in general, we have not found a significant effect of fiscal decentralization on economic growth. The exception applies to the local decentralization level when expenditure shares are used, for which a negative effect is obtained. At the regional level, our results show a positive relationship between growth and regional decentralization processes in Spain, although the effect of fiscal decentralization depends on the level of government to which decentralization is made and is heterogeneous across regions. As far as the regional growth of the seventeen ACs is concerned, for those ACs that have achieved the highest stage of decentralized power, fiscal decentralization has positive and significant effects on economic growth, but fiscal decentralization has negative effects in terms of economic growth for the ACs with the lower degree of assumed power.

Our overall results would therefore be in line with the literature that analyses developed economies by Akai and Sakata (2002) and Davoodi and Zou (1998), among others. This fact is further evidence of the presence of a development level threshold. Above this level, decentralization would therefore have greater effects on economic growth. As Rodrik, Subramanian, and Trebbi (2002) pointed out, factors such as international economic development and legal and political institutions are determinants on economic growth.

Notes

1. *Foral* denotes those ACs for which historical rights were recognized in the Spanish democratic constitution of 1978.

2. The different financing arrangements began to work, and the need to grant the autonomous communities economic independence and tax responsibilities began to be considered. The first step was to assign the regions a percentage of the tax liability of the personal income

tax declared by the residents within the specific territories. The second step took place on July 2001, when a new agreement for financing the common regime for ACs was approved. The new financing model made many advances on the legal principles that define autonomous financing: financial autonomy, sufficiency of resources, and solidarity. The new model also integrates health financing in the general model.

3. At present, these are the inheritance and gift tax, the wealth tax, taxes on property transfers and documented legal acts, gaming taxes, 33 percent of the income tax (the ACs' share of this tax), 35 percent of the value-added tax, 40 percent of the special tax on hydrocarbons, 40 percent of the special tax on alcohol, 40 percent of the special tax on tobacco processes, the tax on electricity, the special tax on certain means of transport, and the tax on retail sales of certain hydrocarbons.

4. We have analyzed the statistical properties of the variables that appear in the different models by computation of the augmented Dickey-Fuller (ADF; Dickey and Fuller 1979) as well as the modified unit root test statistics in Ng and Perron (2001). Visual inspection of the variables indicates that some time series might be affected by the presence of structural breaks, which are known to cause biases in the analysis of the order of integration (see Perron 1997). To account for the presence of up to two structural breaks, we have therefore computed the ADF statistics proposed in Perron and Vogelsang (1992) for one structural break and in Carrion-i-Silvestre, Sansó, and Artís (2004) for two structural breaks. The unit root statistics either with or without structural breaks indicate that all variables are stationary in variance. These results are not reported in the article, although they are available on request. The estimates that we report in this section are therefore not affected by problems of spurious regression.

5. Andalusia (1985), Canary Islands (1995), Catalonia (1982), Galicia (1991), Valencia (1988), Basque Country (1988), and Navarre (1991) are the years when the health competencies were effective. From these years on, the investment on health has been added to the ACs' investment levels, instead of being considered in the central government's ones.

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