Accounting for growth in Spain, the Basque Country (and its three Historic Territories), Navarre, and Madrid since 1965

Este artículo analiza el crecimiento económico en España, el País Vasco (y sus tres territorios históricos), Madrid, y Navarra desde 1965. El crecimiento del capital y la productividad total de los factores (PTF) fueron, en general, el principal motor del crecimiento de la producción desde 1965. Se estudian tres períodos con características muy diferentes. A pesar de que el período reciente 1995-2008 ha mostrado un crecimiento débil de la PTF, en el subperíodo 2003-2007 se da una importante recuperación de las tasas de crecimiento de la producción, la productividad del trabajo, y la PTF. Esto parece ser coherente con un estadio impulsado por la innovación. De entrada hay que advertir de tomar los resultados obtenidos para el País Vasco con cierta precaución dado que varían sustancialmente dependiendo de la fuente de datos empleada. A pesar de que las divergencias han disminuido últimamente, el Instituto Vasco de Estadística ofrece generalmente tasas de crecimiento del valor añadido bruto mayores que las del Instituto Nacional de Estadística.

Artikulu honek Espainian, Euskal Autonomia Erkidegoan (eta bertako hiru lurralde historikoetan), Madrilen eta Nafarroan 1965etik aurrera hazkuntza ekonomikorako egon diren arrazoiak aztertzen ditu. Kapitalaren hazkuntza eta faktoreen produktibitate osoa izan ziren, oro har, produkzioaren eragile nagusiak 1965etik. Ezaugarri oso ezberdinak dituzten hiru aldi aztertu dira. Nahiz eta 1995-2008 aldian faktoreen produktibitate osoaren hazkuntza txikia izan, 2003-2007 azpialdiak susperraldi garrantzitsua du produkzioaren hazkuntza-tasetan, lanaren produktibitatean eta faktoreen produktibitate osoan. Badirudi hori guztia bat datorrela berrikuntzak bultzatutako estadioarekin. Azkenik, Euskal Autonomia Erkidegorako eskuratutako emaitzak arretaz hartzeko iradoki da, oso ezberdinak direlako erabilitako datu-iturriaren arabera. Azken aldian desadostasunak murriztu diren arren, Euskal Estatistika Erakundeak Estatistikako Institutu Nazionalak baino hazkuntza-tasa handiagoak eskaini ohi ditu balio erantsi gordinerako.

This paper analyzes the economic growth for Spain, the Basque Country (and its three historic territories), Navarre, and Madrid since 1965. Overall, capital and total factor productivity (TFP) growth were the main engines of output growth since 1965. Three different periods are characterized. Despite the recent period 1995-2008 has exhibited a poor TFP growth, the subperiod 2003-2007 has shown an important revival for output, labor productivity, and TFP growth rates. This seems to be consistent with an innovation-driven stage. Finally, some caution is suggested on the results for the Basque Country since they change substantially depending on the source of data employed. Despite divergences have narrowed recently, the Basque Statistics Office offers generally higher growth rates for gross value added than those provided by the Spanish counterpart.

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1. INTRODUCTION

The post-war period has been a fruitful period as long as economic progress is concerned. Aggregate economic activity, as measured by gross value added (GVA), grew at an annual average rate of 3.23% in Spain from 1965 to 2008, while labor productivity did at 2.40% on annual average. However, growth did not proceed at a steady pace. Looking from a broader perspective, while the European Union (EU) was «catching up» the United States (US) before 1975 due to the spectacular growth

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rate of labor productivity, a productivity slowdown took place until 1995. Labor productivity growth has also performed poorly in the EU since the mid 1990s, falling behind that for the US[1]. A fall in the average growth rate of total factor productivity (TFP), which is also known as multifactor productivity (MFP) and captures technical change very roughly, has usually accompanied to the gloomy performance in labor productivity.

Territories throughout Spain have also performed unevenly, with substantial differences from some periods to others. Looking at how the three autonomous communities with the highest output per capita in Spain[2], such as the Autonomous Community of the Basque Country (Basque Country, for simplicity), the Foral Community of Navarre (Navarre, for simplicity), the Autonomous Community of Madrid (Madrid, for simplicity), have behaved in the post-war period, we find that the annual average growth rate for the GVA in the Basque Country was 2.93%, whereas labor productivity improved at an annual average growth rate of 2.39% during the period 1965-2008[3]. The figures for Navarre were 3.25% and 2.27%, respectively, and 3.35% and 1.49% for Madrid in the same period.

This paper provides a long term analysis on the proximate sources of economic growth for Spain for the period 1965-2008 focusing on the three leading autonomous communities so that some common patterns on growth paths are extracted[4]. Some attention is also devoted to the impact of information and communication technologies (ICT) and infrastructures on economic growth. Why 1965 is the start date of the analysis needs to be justified. Data availability is a key restriction. Thus we are more inclined to ground our analysis on «harder» sources (such as the Spanish National Institute of Statistics (INE), Fundación BBVA, and especially Fundación BBVA-IVIE[5]), which implies going back to 1965 «only», rather than on the recent «tentative» (and rich) research pursued by Prados de la Escosura and Rosés (2009) for the period 1850-2000[6]. Additionally, the

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[1] See, for example, O´Mahony and van Ark (2003), Timmer, Ypma and van Ark (2003), Sapir et. al. (2004), and van Ark, O´Mahony and Ypma (2007), Cette, Fouquin, and Sinn (2007), van Ark, O´Mahony, and Timmer (2008), and Mas and Robledo (2010) for the EU, Mas and Quesada (2005), Gual, Jódar and Ruiz (2006), Escribá and Murgui (2007), and Pérez and Robledo (2010) for Spain, and Erauskin (2008a, 2008b, 2009) for the EU, the US, Spain, the Basque Country, and Navarre.

[2] See, for instance, the results released by the Spanish Statistical Office (INE) at http://www.ine.es/daco/daco42/cre00/c10d_cre.xls (23 March 2010).

[3] If we look at the data provided by the National Institute of Statistics (INE) figures were at 2.52% and 1.93%, respectively.

[4] The impact of intangibles (capital) on economic growth is also receiving much attention, following recent research by Corrado, Hulten, and Sichel (2006).

[5] More on this can be found in Section 4 below.

[6] See also the interesting discussion created around the estimation of the «true» series of GDP [Maluquer (2009a), (2009b), and Prados de la Escosura (2009)].

choice is related to the fact that the paper focuses on the performance of the Basque Country (including Araba, Bizkaia, and Gipuzkoa), Navarre, and Madrid, and on the impact of ICT technologies and infrastructures on economic growth, which also restricts the period of analysis to 1965-2008.

The paper shows, first, that output and labor productivity growth have been substantial from 1965 onwards. The three periods characterized exhibit important differences in performance, as in the EU: catching up, low productivity, and falling behind the US. We then show that TFP and capital growth have been the main engines of output growth since 1965, even though important differences arise in the economic performance from some periods to others. This is consistent with the evidence found in previous studies[7]. Thus, as Prados de la Escosura and Rosés (2009, p. 1064) point out, between 1850 and 2000, «Factor accumulation dominated long-run growth up to 1950, while efficiency gains led thereafter and, especially, during periods of growth acceleration«. Labor contribution has been dominant recently, with an increasing ICT contribution, even though it remains behind that for the US. However, the subperiod 2003-2007 shows a spectacular positive dynamism for all the Spanish territories, but for the Basque Country especially, in terms of output, labor productivity and TFP growth rates. It also brings forward why this is so. Finally, we suggest that the results for the Basque Country should be taken with some caution since different sources of data lead to important differences in the results[8]: as a rule of thumb, the annual average growth rate of GVA provided by the Basque Statistics Office (Eustat) is between 0.25 and 1 percentage points above that offered by the Spanish one (INE) due to differences in GVA deflators (mainly recently) and values in current prices. Divergences have narrowed substantially in the most recent period.

This paper is organized as follows. In Section 2 the standard framework of growth accounting is revised. Section 3 briefly summarizes the results of previous studies. In Section 4 the sources employed are described. The main results of the analysis are shown in Section 5. First, the performance of Spain is analyzed, and compared to that for the EU, and the US. Then the study focuses on the three autonomous communities, such as the Basque Country, Navarre, and Madrid. Finally, the performance of the three historic territories of the Basque Country, such as Araba, Bizkaia, and Gipuzkoa, is studied. Section 6 concludes.

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[7] See Section 3 below.

[8] Prudence would suggest that this caution should probably be extended to other territories as well.

2. **THE GROWTH ACCOUNTING METHOD**[9]

Growth accounting is a method to study the proximate causes of growth (Bosworth y Collins, 2003, p. 114). The principal framework of analysis for economic growth accounting is based on the pioneer work by Solow (1957).[10] The analysis starts from a standard neoclassical production function,

$$\mathbf{Y}_t = \mathbf{A}_t \cdot \mathbf{F}\left(\mathbf{L}_t, \mathbf{K}_{INF,t}, \mathbf{K}_{ICT,t}, \mathbf{K}_{O,t}\right) \quad (1)$$

where Y denotes output, A the level of technology (Hicks-neutral or output augmenting), or TFP, L labor, and K capital, with 3 types of capital. Subscript INF refers to (road, water, railway, airport, port and urban) infrastructures, ICT to Information and Communications Technologies (Hardware or Office machinery and computer equipment, Software, and Communications), and O to other types of (non-residential) capital (such as Constructions other than dwellings and the infrastructures referred earlier, Transport equipment, and Machinery, equipment and other products, except hardware, software or communications)[11]. Labor input is measured as hours worked, unadjusted for changes in the composition of labor. Capital input is measured as the value of the capital services provided (Jorgenson and Griliches, 1967).

Assuming competitive factor markets, then the growth rate of production can be disaggregated into the growth rate of TFP, on the one hand, and the growth rate of inputs (adjusted by their contribution to output), on the other hand,

$$\Delta ln\,\mathbf{Y}_t = \Delta ln\,\mathbf{A}_t + \overline{\alpha}_{L,t} \cdot \Delta ln\,\mathbf{L}_t + \overline{\alpha}_{KINF,t} \cdot \Delta ln\,\mathbf{K}_{INF,t} + \overline{\alpha}_{KICT,t} \cdot \Delta ln\,\mathbf{K}_{ICT,t}, \\ + \overline{\alpha}_{KO,t} \cdot \Delta ln\,\mathbf{K}_{O,t} \quad (2)$$

where

$\overline{\alpha}_{L,t} = \frac{1}{2} \cdot \left[\alpha_{L,t} + \alpha_{L,t-1}\right]$ is the average share of labor compensation in total output,

$\overline{\alpha}_{KINF,t} = \frac{1}{2} \cdot \left[\alpha_{KINF,t} + \alpha_{KINF,t-1}\right]$ is the average share of the value of capital services provided by infrastructures in total output,

$\overline{\alpha}_{KICT,t} = \frac{1}{2} \cdot \left[\alpha_{KICT,t} + \alpha_{KICT,t-1}\right]$ is the average share of the value of capital services provided by information and communications technologies in total output, and

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[9] The content of this section draws heavily from Erauskin (2008a). See also Barro and Sala-i-Martín (2004, chap. 10), and Mas and Quesada (2005, Ch. 8).

[10] The initial studies on growth accounting go back to the 30s, but Solow (1957) is the main contributor to the literature on growth accounting since it integrates explicitly economic theory into the accounting exercise (Griliches, 2000, p. 12).

[11] See Mas, Pérez, and Uriel (2005b) for more details.

$\bar{\alpha}_{KO,t} = \frac{1}{2} \cdot [\alpha_{KO,t} + \alpha_{KO,t-1}]$ is the average share of the value of capital services provided by other types of capital in total output.

Then the share of the compensation of employees (including an imputation for self-employed persons), *CE*, in total output, *Y*, is defined as

$$\alpha_{L,t} = \frac{CE_t}{Y_t},$$

the share of the value of capital services provided by infrastructures, VCS_{KINF}, in total output, as

$$\alpha_{KINF,t} = \frac{VCS_{KINF,t}}{Y_t},$$

the share of the value of capital services provided by ICT, VCS_{KICT}, in total output, as

$$\alpha_{KICT,t} = \frac{VCS_{KICT,t}}{Y_t},$$

and the share of the value of capital services provided by other types of capital, VCS_{KO}, in total output, as

$$\alpha_{KO,t} = \frac{VCS_{KO,t}}{Y_t}, \text{ where}$$

$$\alpha_{L,t} + \alpha_{KINF,t} + \alpha_{KICT,t} + \alpha_{KO,t} = 1.$$

If we have data on the quantities, Y, L, and K, and on the input shares, α_L, α_{KINF}, α_{KICT}, and α_{KO}, then the growth rate of TFP, $\Delta ln A_t$, can be calculated as the growth rate of output that cannot be attributed to the growth rate of inputs (weighted by their respective contributions), from equation (2) as,

$$\Delta ln A_t = \Delta ln Y_t - \bar{\alpha}_{L,t} \cdot \Delta ln L_t - \bar{\alpha}_{KINF,t} \cdot \Delta ln K_{INF,t} - \bar{\alpha}_{KICT,t} \cdot \Delta ln K_{ICT,t}, \\ - \bar{\alpha}_{KO,t} \cdot \Delta ln K_{O,t} \qquad (3)$$

that is, as a «residual». Thus the term $\Delta ln A_t$ is usually known as Solow residual, or a «measure of our ignorance» (Abramowitz, 1956). It captures shifts in the production function, which can be caused by «technical innovations, organizational and institutional changes, changes in societal attitudes, fluctuations in demand, changes in factor shares, omitted variables, and errors of measurement» (Hulten, 2001, p. 40): it needs not to be equal to technical change[12]. More recently, Timmer, O´Mahony and van Ark (2007, pp. 4-5, footnote 4) point out that «under strict neoclassical assumptions, MFP growth measures disembodied technological change. In practice, MFP is derived as a residual and includes a host of effects such as improvements in allocative and technical efficiency, changes in returns to scale and mark-ups and technological change proper. All these effects can be broadly summarised as

[12] See Hulten (2001, p. 8, footnote 5).

«improvements in efficiency», as they improve the productivity with which inputs are being used in the production process. In addition, being a residual measures MFP growth also includes measurement errors and the effects from unmeasured output and inputs». This is also the approach we follow in the paper. Please note that changes in the composition of the labor force (or «labor quality») are not taken into account in order to compare more consistently the performance of different economies, as data is not available with respect to the three historic territories of the Basque Country: those changes will be attributed to TFP growth.

Alternatively, equation (2) can be rewritten in intensive terms, that is, measured in hours worked, as

$$\begin{aligned} \Delta ln\mathbf{Y}_t - \Delta ln\mathbf{L}_t = \Delta ln\mathbf{A}_t + \overline{\alpha}_{KINF,t} \cdot \left(\Delta ln\mathbf{K}_{INF,t} - \Delta ln\mathbf{L}_t\right) \\ + \overline{\alpha}_{KICT,t} \cdot \left(\Delta ln\mathbf{K}_{ICT,t} - \Delta ln\mathbf{L}_t\right) + \overline{\alpha}_{KO,t} \cdot \left(\Delta ln\mathbf{K}_{O,t} - \Delta ln\mathbf{L}_t\right) \end{aligned} , \quad (4)$$

where the growth rate of GDP per hour is decomposed into the growth rate in TFP plus the growth rate in capital intensity (weighted by her contribution). Then the growth in TFP can be derived from (4) as,

$$\begin{aligned} \Delta ln\mathbf{Y}_t - \Delta ln\mathbf{L}_t = \Delta ln\mathbf{A}_t + \overline{\alpha}_{KINF,t} \cdot \left(\Delta ln\mathbf{K}_{INF,t} - \Delta ln\mathbf{L}_t\right) \\ + \overline{\alpha}_{KICT,t} \cdot \left(\Delta ln\mathbf{K}_{ICT,t} - \Delta ln\mathbf{L}_t\right) + \overline{\alpha}_{KO,t} \cdot \left(\Delta ln\mathbf{K}_{O,t} - \Delta ln\mathbf{L}_t\right) \end{aligned} , \quad (5)$$

Equations (2), (3), (4) or (5) have been obtained using non-econometric procedures. This is the estimation method most frequently used in the literature. However, those equations can also be estimated using an econometric approach. The main advantage of the econometric method is that there is no need to assume that the marginal social product of inputs coincides with the observed prices of inputs. Additionally, it allows introducing adjustment costs and variations in capacity utilisation, or other forms of technical change (apart from the Hicks-neutral specification). It is not required to assume, in general, constant returns to scale. However, it has many disadvantages. First, the growth rate of inputs cannot be taken as exogenous with respect to the changes in the growth rate of TFP. Second, in case measurement errors arise in the growth rate of inputs, then the estimates would be inconsistent. This is especially relevant for capital. Third, estimations often raise complex econometric issues and it cast doubts on the robustness of results sometimes. This also implies that it loses attractiveness for statistical offices. Finally, the regression equation should be extended so that changes in input shares and the growth rate of TFP are allowed as time evolves. Given the numerous problems associated to the regression method we are inclined to adopt the non econometric approach despite this choice is not problem free either[13]. The non econometric method requires quantifying previously input shares in total output, thus postulating a

[13] See Barro and Sala i Martín (2004, pp. 441-442) and OECD (2001a, pp. 18-19) for a discussion on this. Please note that the non econometric approach, as employed here, does not impose the restriction that constant returns to scale are satisfied.

relationship between production elasticities and income shares, which may or may not be true. We admit that to some degree our choice is a question of taste. In the end, both approaches are probably better seen as complements (Hulten, 2009).

3. A BRIEF REVIEW OF RESULTS

Several studies have analyzed the sources of economic growth for Spain as a whole. However, very few have studied the sources of growth for the autonomous communities and provinces of Spain. Additionally, the results of those studies differ due to the methodologies (econometric or not)[14], and data sets (provided by international, national or local statistics offices) employed and, of course, due to the different time periods analyzed. Erauskin (2008a) provides an overview on this literature. Here we briefly review the main results and add the most recent evidence on this issue.

Escribá and Murgui (1998), and Goerlich and Mas (2001) showed that the growth rate in TFP was the most important source of economic growth in Spain when focusing on extended periods, 1980-1993 and 1965-1996, followed by the contribution of private capital. The contribution of labor was residual.

However, as O´Mahony and van Ark (2003, p. 17) have pointed out, «since the mid 1990s the average growth rates of real GDP, labour productivity and total factor productivity in the European Union have fallen behind those in the United States. What makes this remarkable is that this is the first time since World War II that these performance measures have shown lower growth rates for the EU for several years in a row». The weaker impact of ICT on growth seemed to play a crucial role [Timmer, Ypma and van Ark (2003)]. This was also broadly confirmed by Mas and Quesada (2005) for Spain in their study on the impact of ICT capital on economic growth in the period 1985-2002.

Mas and Robledo (2010)[15] have recently provided evidence on the performance of advanced countries for the period 1980-2005, based on the EU KLEMS database. As shown in Table 1, in Japan and EU-15ex[16] output growth (much higher in Japan) was mainly sustained by non-ICT capital and TFP growth for the first period 1980-

[14] Additionally, there are other minor methodological differences. For instance, some studies make some adjustment to output to exclude actual and imputed rents paid in the case of owner-occupied dwellings since residential capital is excluded [Timmer, Ypma, and van Ark, (2003)]. Others exclude rents from output, and the contribution of domestic service from output and employment [Mas and Quesada (2005)], for example.

[15] See Mas (2010) for a brief review on the same issue.

[16] EU-15ex comprises Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Spain, and United Kingdom, that is, the former EU-15 excluding Greece, Ireland, Luxembourg, Portugal, and Sweden.

1995. Instead, labor contribution was predominant to explain output growth in the US (lower than in Japan but higher than in the EU-15ex). Things changed in the mid-90s. Table 2 captures the main results. Japan exhibited a much poorer performance in the second period 1995-2005: low output growth, explained by a negative contribution of labor and a poor contribution of TFP. The US showed an important growth in output, backed by a substantial TFP growth and, more notably, ICT capital contribution. While EU-15ex grew at similar rates, the sources of growth changed enormously: the poor performance of TFP growth was a key feature of the period. This is also much truer for Spain since TFP contribution became negative, with an important contribution of labor during 1995-2005.

Van Ark, O´Mahony, and Timmer (2008, p. 25) have recently argued that «the European productivity slowdown is attributable to the slower emergence of the knowledge economy in Europe compared to the United States». Three are the main (complementary) explanations for the productivity divergence: lower contribution of ICT capital, technology-producing industries imply a relatively smaller share in the EU, and lower TFP growth. This is directly related to how European labor markets work, and the high regulation of product markets in the EU. Market services sectors would play a key role explaining why the EU is falling behind, according to van Ark, O´Mahony, and Timmer (2008).

Pérez and Robledo (2010) have described the experience of output growth in Spain during 1970-2007 attributed mainly to the contribution of capital accumulation and, lately, to the contribution of labor. TFP growth has not been the main force behind the engine of growth. However, they argue, this pattern is also applicable to the majority of economies. The major (and differential) drawback has been the declining role of TFP growth in the last period 1994-2007. Three are the standard causes suggested for the poor performance of TFP growth. The first is associated to the fact that too much investment has been oriented to the building sector and mainly to residential buildings. The second cause has to do with the additional orientation of investment (other than to the building sector): it has been directed to services, rather than manufacturing. The third is to be found in deficiencies in the education (despite new entrants in the labor market have higher qualifications) and the inadequate working of the labor market: the contribution of human capital to growth has been weak. They also attribute the poor performance in TFP to an additional fourth source: the unproductive overinvestment in productive assets. Thus a good deal of non-residential investments seek profits in the short run (derived from price increases in land and buildings), rather than improvements in productivity.

Erauskin (2008a) studied the sources of economic growth for the Basque Country (and its three historic territories), Navarre, and Spain for the period 1986-2004[17] (Table 3). Growth rates were higher during 1995-2004 than in the pe-

[17] These results are also briefly described in Erauskin (2008c) for a wider audience.

riod 1986-1995. The figures for the Basque Country were lower than for Spain and Navarre. Labor and capital were the main engines of economic growth during 1986-2004. The role of TFP growth was residual and it was declining, even reaching negative figures. Similar results were found by Erauskin (2008b) from a sectoral perspective for the period 1986-2000, despite remarkable differences arise across industries.

Table 1. **SOURCES OF GROSS VALUE ADDED GROWTH MARKET ECONOMY. 1980-1995**

	Japan	US	EU-15ex	Spain
GVA growth. (1)	3.87	2.97	2.06	2.42
Total contribution of labor. (2)=(3)+(4)	0.39	1.19	0.02	0.31
Hours worked. (3)	0.11	0.95	-0.28	-0.01
Changes in the composition of labor. (4)	0.27	0.24	0.30	0.32
Contribution of capital, Total. (5)=(6)+(7)	1.98	1.12	1.06	1.44
Contribution of capital, Non-ICT. (6)	1.52	0.60	0.67	0.98
Contribution of capital, ICT. (7)	0.46	0.52	0.38	0.47
Contribution of TFP. (8)=(1)-(2)-(5)	1.51	0.65	0.98	0.66

Source: Mas and Robledo (2010, pp. 109-110).

Table 2. **SOURCES OF GROSS VALUE ADDED GROWTH MARKET ECONOMY. 1995-2005**

	Japan	US	EU-15ex	Spain
GVA growth. (1)	0.99	3.69	2.20	3.61
Total contribution of labor. (2)=(3)+(4)	-0.52	0.66	0.64	2.55
Hours worked. (3)	-0.94	0.37	0.42	2.15
Changes in the composition of labor. (4)	0.42	0.28	0.21	0.40
Contribution of capital, Total. (5)=(6)+(7)	1.06	1.34	1.19	1.91
Contribution of capital, Non-ICT. (6)	0.61	0.57	0.62	1.44
Contribution of capital, ICT. (7)	0.46	0.77	0.57	0.47
Contribution of TFP. (8)=(1)-(2)-(5)	0.45	1.70	0.38	-0.85

Source: Mas and Robledo (2010, pp. 112-113).

Table 3. **SOURCES OF GROSS VALUE ADDED GROWTH. 1986-2004**

	EU-15ex	US	Spain	The Basque Country	Navarre
GVA growth. (1)	2.21	2.89	3.14	2.50	3.15
Contribution of labor. (2)	0.55	1.02	1.48	1.17	1.41
Contribution of capital, Total. (3)=(4)+(7)	1.20	1.18	1.21	0.97	1.34
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.76	0.60	0.87	0.66	0.97
Contribution of capital, Public infrastructure. (5)			0.12	0.10	0.09
Contribution of capital, Other Non-ICT. (6)			0.74	0.56	0.88
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.44	0.58	0.35	0.31	0.36
Contribution of capital, Hardware. (8)			0.18	0.17	0.20
Contribution of capital, Software. (9)			0.08	0.07	0.07
Contribution of capital, Communications. (10)			0.09	0.07	0.10
Contribution of TFP. (10)=(1)-(2)-(3)	0.47	0.68	0.44	0.36	0.40

Source: Erauskin (2008a, p. 47).

4. DATA SOURCES

The data for the EU and the US is based entirely on the EU KLEMS Growth and Productivity Accounts database: GVA, GVA (volume indices), number of hours, labor compensation, capital compensation, ICT share, Non-ICT share, Labor services (volume indices), ICT capital services (volume indices), Non-ICT capital services (volume indices), and so on. Even though the availability of data goes back to 1970, the complete data set is found only from 1980 onward for growth accounting purposes[18].

The data for Spain has been obtained from two different sources. Results based on both sources will be shown in the analysis, so that they can be compared. On the one hand, EU KLEMS provides the complete data set for Spain, as for the EU and the US.

On the other hand, the data on National Accounts for Spain and the Spanish territories has been gathered from the Contabilidad Regional de España database from the Instituto Nacional de Estadística (INE), for the periods 1986-1995 (base 1986), and 1995-2005 (base 2000): GVA at factor prices (until 1995), Total GVA (from 1995 onward), GVA deflator, total employment, number of employees, gross compensation of employees, and so on. The data prior to 1986 (going back as far as 1954) is provided

[18] Changes in the composition of the labor force are available from 1980 onwards, while the rest of the variables can be traced back to 1970.

by the database constructed by Fundación BBVA (FBBVA) during many years [Fundación BBVA (1999)]: GVA, and so on. The data on the number of hours worked in each country (per worker and per year) has been obtained from the EU KLEMS database[19]. In addition, Fundación BBVA and Instituto Valenciano de Investigaciones Económicas (FBBVA-IVIE) provide the database for the estimates of the capital stock in the Spanish territories so that the value of capital services can be computed. Mas, Pérez and Uriel (2005b) were the first estimating the capital stocks for Spain as a whole (1964-2002), following the new methodology suggested by the OECD (2001a; 2001b)[20]. The first estimates for Spain and each of its provinces (1964-2003) can be found in Mas, Pérez and Uriel (2006a)[21]. The methodology to obtain the value of capital services in this paper follows Mas, Pérez and Uriel (2005b) with the most recent data provided by Mas, Pérez and Uriel (2010) for the period 1965-2009 for Spain, but 1965-2008 for the autonomous communities. The availability of data on capital stock restricts the complete period of analysis from 1965 to 2008.

In addition, the Basque Statistics Office (Eustat) provides an independent database on many series for the Basque Country as a whole (as well as for each of the historic territories). Only data on GVA and employment is available on a regular basis since 1980. Results based on the data provided by Eustat are also shown in the analysis, so that they can be compared again to those based on the data provided by INE. Important differences between these sources arise, as it will be shown below.

Finally, please note that no adjustment has been made in the data other than excluding residential capital from the estimates on capital stock[22].

5. **THE RESULTS**

The evidence on growth accounting will be shown in three stages. First, Spain (with data based on both INE and FBBVA-IVIE, and EU KLEMS), the EU, and the US take the lead. Then the results for the Basque Country (with data based on both INE and Eustat), Madrid, and Navarre will be shown. Finally, the performance of the three historic territories of the Basque Country, such as Araba, Bizkaia, and Gipuzkoa, is studied. The time span ranging from 1965 to 2008 has typically been divided into three

[19] For simplicity, the number of hours worked per worker and per year in the Spanish territories are assumed to be equal to that in Spain.

[20] This methodology has been recently revised (OECD, 2009). Results for Spain following the new methodology are not available yet.

[21] See Mas, Pérez and Uriel (2006b) for a brief summary of the new methodology.

[22] Adjustments usually imply excluding actual and imputed rents paid in the case of owner-occupied dwellings (since residential capital is excluded) [Timmer, Ypma, and van Ark, (2003)], or excluding rents from output, and the contribution of domestic service from output and employment [Mas and Quesada (2005)].

periods. Thus in the immediate postwar period (in our case restricted to 1965-1975), «European productivity growth was characterized by a traditional catch-up pattern based on the imitation and adaptation of foreign technology, coupled with strong investment and supporting institutions» [van Ark, O´Mahony, and Timmer (2008)][23]. Then the convergence process stopped: a «productivity slowdown» took place during two decades approximately. However, European figures were above American ones. Finally, European productivity performed worse than the American one in the most recent period 1995-2007. This has been dubbed as «Europe´s falling behind», where ICT performance in the US played a key (positive) role. Some information on the subperiod 2003-2007 has also been provided to get an idea on how the economy performed right before the crisis reached: these years contain substantially different (and positive) features compared to those of the recent period 1995-2008[24]. Finally, please note that the evidence for the EU, and the US has been restricted to the period 1980-2007 due to data availability on the sources of growth (EU KLEMS database).

5.1. **The evidence for Spain**

Spain has outperformed the EU and US in average growth rates of output and TFP in the whole period 1965-2008 (Table 4)[25]. TFP and capital growth were clearly the main engines of economic growth in Spain for the whole period. ICT contributed modestly (0.32%) to output growth in Spain. However, the contribution of ICT capital in Spain was slightly stronger than for the EU during 1980-2007, remaining far behind the figures for the US[26]. Public infrastructures contributed only (and stably) around 0.1% to output growth.

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[23] Their study goes back to 1950 and finishes in 2006, but their analysis on the sources of growth has been restricted to 1980-2004 due to data availability (EU KLEMS database). Additionally, please note that, even though in their paper the first period finishes in 1973, in this paper it finishes in 1975 in Spain (instead of 1973) because the change of gear comes a bit later for Spain.

[24] Future data will show the full consequences of the current crisis. As Mas and Robledo (2010, p. 30, footnote 12) point out, the data in 2008 does not exhibit the severe implications of the crisis yet. Additionally, they suggest that it will be reasonable to analyze the period 1995-2006 from the subsequent ones separately. However, since the economy achieved in 2007 a high growth rate as well (in 2008 the economy decelerates severely), we are inclined to include 2007 coherently in the short subperiod starting in 2003.

[25] The contribution of labor includes changes in the composition of the labor force (or «quality of labor»), as well as changes in the number of hours worked in the results for Spain (EU KLEMS), the EU and the US. Additionally, the evidence on growth accounting for the EU refers only to 10 «old» European countries (EU-15 except Greece, Ireland, Luxembourg, Portugal, and Sweden).

[26] Please note that there some differences between our own estimation based on INE, FBBVA, and FBBVA-IVIE, and that based on EU KLEMS, basically focused on capital stocks. It worth noting that in the EU KLEMS estimation the user cost is based on the endogenous procedure and harmonized geometric rates of depreciation, whereas FFBVA-IVIE employs an exogenous approximation, and age-efficiency hyperbolic functions (See Mas and Robledo, 2010, p. 20).

Spain was characterized in the first period 1965-1975 by a very high average growth rate sustained by a very high average TFP growth rate (Figure 1)[27]. In the next period 1975-1995 we find lower growth rates of output and TFP, but figures were still remarkable. In the recent period 1995-2008, high output growth was backed fundamentally by labor growth, except for the EU (Table 5). The growth in TFP declined substantially (except for the US) and it even became negative in Spain. The contribution of ICT capital increased in the recent period 1995-2008, but it remained behind the level achieved in the US. The most recent data for the period 2003-2007 in Spain does show some improvement in output and TFP growth. We will turn to this issue below. In terms of labor productivity, average growth rate of output per hour in Spain was very high for the whole period and growth in TFP was the main engine of growth, rather than capital intensity. However, growth in output per hour, and contributions made by capital per hour and TFP have been declining over the years. In contrast, subperiod 2003-2007 (not shown) exhibits some labor productivity and TFP «growth revival» in Spain.

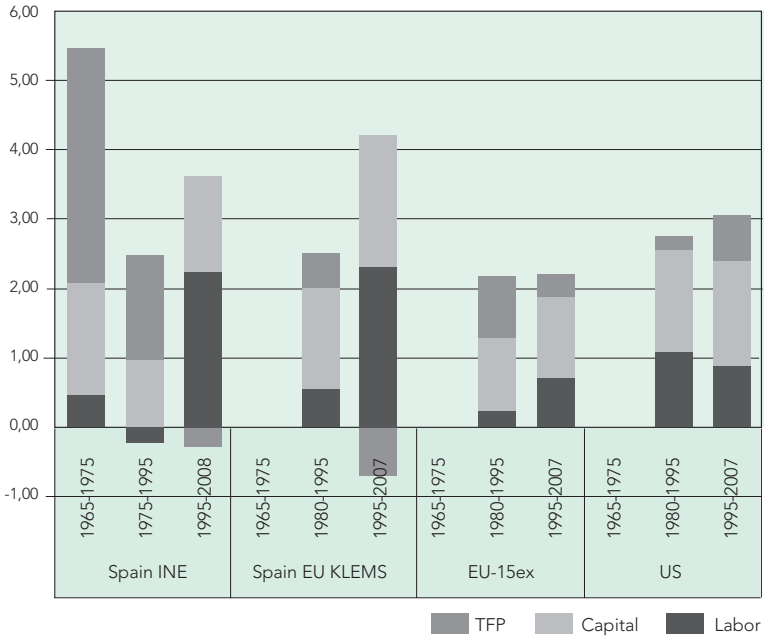
Table 4. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-2008**

	Spain INE-FBBVA-IVIE	Spain EU KLEMS 1980-2007	EU-15ex EU KLEMS 1980-2007	US EU KLEMS 1980-2007
GVA growth. (1)	3.23	2.96	2.19	2.89
Contribution of labor. (2)	0.64	1.37	0.47	1.02
Contribution of capital, Total. (3)=(4)+(7)	1.18	1.64	1.09	1.49
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.86	1.21	0.71	0.82
Contribution of capital, Public infrastructure. (5)	0.10			
Contribution of capital, Other Non-ICT. (6)	0.76			
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.32	0.43	0.37	0.67
Contribution of capital, Hardware. (8)	0.17			
Contribution of capital, Software. (9)	0.07			
Contribution of capital, Communications. (10)	0.09			
Contribution of TFP. (10)=(1)-(2)-(3)	1.42	-0.04	0.64	0.39

Sources: EU KLEMS database (for Spain (1980-2007), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-2007), the EU-15ex and the US.

[27] Please note that full results in different periods are relegated to the Appendix of this paper (Tables A1 to A6). A few results for the period 2003-2007 are provided (within parentheses) in the same Table for the period 1995-2008 in order to gain some additional insights for the subperiod with higher dynamism.

Figure 1. **SOURCES OF GROSS VALUE ADDED GROWTH IN SPAIN, THE EU AND THE US**



Sources: EU KLEMS database (for Spain (1980-2007), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-2007), the EU-15ex and the US.

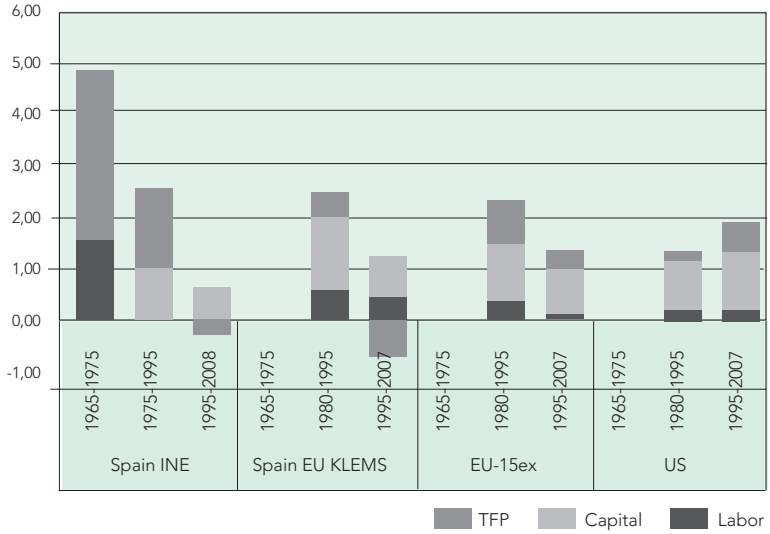
Table 5. **SOURCES OF GROSS VALUE ADDED GROWTH. 1995-2008**

	Spain INE-FBBVA -IVIE	Spain EU KLEMS 1995-2007	EU-15ex EU KLEMS 1995-2007	US EU KLEMS 1995-2007
GVA growth. (1)	3.34 (3.55)	3.52 (3.57)	2.22 (2.42)	3.05 (2.93)
Contribution of labor. (2)	2.27	2.32	0.73	0.92
Contribution of capital, Total. (3)=(4)+(7)	1.35	1.89	1.13	1.50
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.89	1.43	0.69	0.76
Contribution of capital, Public infrastructure. (5)	0.11			
Contribution of capital, Other Non-ICT. (6)	0.78			
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.45	0.46	0.44	0.74
Contribution of capital, Hardware. (8)	0.22			
Contribution of capital, Software. (9)	0.10			
Contribution of capital, Communications. (10)	0.13			
Contribution of TFP. (10)=(1)-(2)-(3)	-0.27 (0.29)	-0.69 (-0.53)	0.36 (0.73)	0.63 (0.74)

The figures within parentheses show the results for Spain, the EU-15ex, and the US for the period 2003-2007.

Sources: EU KLEMS database (for Spain (1995-2007), the EU and the US), INE, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1995-2007), the EU-15ex and the US.

Figure 2. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR IN SPAIN, THE EU AND IN THE US**



Sources: EU KLEMS database (for Spain (1980-2007), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-2007), the EU-15ex and the US.

5.2. **The evidence for the Basque Country, Navarre, and Madrid**

Two independent and reliable sources provide the data for many economic variables in the Basque Country. The Spanish Statistics Office (INE) usually employs a «top-down» procedure to allocate an aggregate magnitude for Spain as a whole to different regions, while the Basque counterpart (Eustat) normally works «bottom up». Overall, INE provides lower figures for real gross value added growth than Eustat. Looking at the data, for instance, while GVA at current prices was in 2008 5.08 times higher than in 1986 (average annual growth rate at 7.39%), according to Eustat, the figure amounts to 4.66 higher according to INE (average annual growth rate at 6.99%)[28]. However, whereas real GVA is 2.22 higher in 2008 than in 1986 for Eustat (average annual growth rate at 3.62%), it is only 1.78 times higher when we look at the figure provided by INE (average annual growth rate at 2.63%). This implies that, as a rule of thumb, annual average GVA growth rate has been, approximately, 1 percentage point higher for the Basque Country when the whole period 1986-2008 has been considered and data are based on figures from Eustat. As shown, divergences in real GVA performance are due to differences in deflators as well as values in current prices. However, fortunately, divergences have narrowed substantially in the

[28] Please note that 2008 is the final year for our analysis and 1986 is the first year that INE provides aggregates for the Basque Country (1980 is the first year for Eustat).

recent period: during 1998-2008 annual average GVA growth rate has been 0.25 percentage points higher when data from Eustat is employed, now mainly due to differences in deflators. Figure 3 captures clearly the differences between both sources looking at growth rates for real GVA during 1987-2009.

The most remarkable feature about average growth rates of output and TFP is that only Madrid (and Navarre by a whisker) has slightly outperformed Spain concerning output in the whole period 1965-2008 (Table 6). The engines of economic growth in Spain show important differences from some territories to others. Madrid is probably the territory with the most differentiated performance: the highest output growth rate accompanied with the lowest TFP growth. Finally, ICT contribution was generally around 0.31%, with much more impetus during the most recent period. Infrastructures contributed stably around 0.08% to output growth, with small differences from some periods to others.

How performance has been characterized in different periods is worth analyzing in some detail[29]. Enormous growth in output was accompanied by spectacular TFP growth rates during the first period 1965-1975 (Figure 4). This is broadly coherent with the evidence found for the EU: rapid labor productivity growth and catching-up with the US in terms of per capita income levels (van Ark, O´Mahony, and Timmer, 2008). Technology imitation and incremental innovation (developed mainly in the US), and new institutions for wage bargaining (restraining wage demand so that this provides incentives for companies to invest more) mainly contributed during this period. This was also reinforced by sectoral changes towards more productive sectors[30].

During the productivity slowdown for 1975-1995 output and TFP growth rates were below that of Spain. Capital and TFP growth were the main engines of growth, while the contribution of labor became negative. This period is characterized by the consequences of the international economic crisis (aggravated by a differential manufacturing crisis for the Basque Country, accompanied by weaknesses in the services sector), the accession to the European Communities in 1986, leading to a recovery period, which ends up in 1993[31].

In the recent period 1995-2008 high output growth has been accompanied by high contributions of labor since much employment was created, whereas TFP growth fell drastically (Table 7). It is worth pointing out that ICT capital contribution to output growth increased and it reached around 0.40%. The orientation of investment to the building sector, the additional orientation of investment to the services sector, the ill-functioning labor market, or the unproductive overinves-

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[29] Full results for different periods can be found in the Appendix (Tables A7 to A11).

[30] See, for instance, the recent work by Pérez and Robledo (2010).

[31] See Alberdi (2010, pp. 40-42).

tment in productive assets are the standard causes explaining the gloomy performance of TFP growth in this period (Pérez and Robledo, 2010).

Now it is convenient to remind that changes in the composition of labor, which has not been analyzed in this paper, are attributed to changes in TFP in this paper. Thus Pérez and Robledo (2010) estimate the contribution of changes in the composition of labor to output growth in two different ways. On the one hand, it is based on measures of human capital (education levels or years of schooling). The contribution of changes in the composition of labor was 1.17% during 1970-2007 in Spain, but 0.80% in 1995-2007, and «only» 0.65% in the recent period 2000-2007. On the other hand, it can be measured using relative wages. Then the contribution of changes in the composition of labor has been moving around 0.50%. Furthermore, the contribution of changes in the composition of labor has declined (when human capital is measured) or maintained (when relative wages are used) during 2000-2007 with respect to previous periods in Spain.

On the other hand, during the recent period 2003-2007 it is worth noting that performance results have improved in all the territories, but mainly in the Basque Country, and less so in Madrid or Navarre. Some discussion around why a productivity and TFP growth revival took place during 2003-2007 seems convenient. Given that different territories have performed so diversely, it is not easy to attribute some key common factors that could explain differentially the proximate sources of growth for such a short period, as they cannot be considered more than reasonable conjectures. The behavior of ICT capital or infrastructures does not seem to explain this recovery as its contribution to growth remained stable in this period. The contribution of changes in the composition of labor does not seem to explain this behavior, given the evidence, as shown above (Pérez y Robledo, 2010). Results do not seem to be much affected due to cyclical behavior either, when the series are decomposed into cycle and trend. As Inklaar and McGuckin (2003, p. 166) observed for the EU and the US, there is not a significant effect on the productivity growth measures due to different timings of the business cycle: «Using appropriate filtering techniques we found that these cyclical effects are generally small, except in the most recent year, 2000-2001». In the case of the Basque Country, looking at the data during 1996-2000,[32] productivity and TFP growth figures performed better as well. However, the improvement for the period 2003-2007 is much stronger than that found for 1996-2000. Some studies have argued that the most recent period analyzed may be considered as an innovation-driven stage for the Basque Country[33]. The productivity and TFP revival seems to be consistent with this characterization.

An important caveat applies at this stage. Sectoral analysis will probably provide a deeper understanding of productivity performance. Thus the poorer results of the

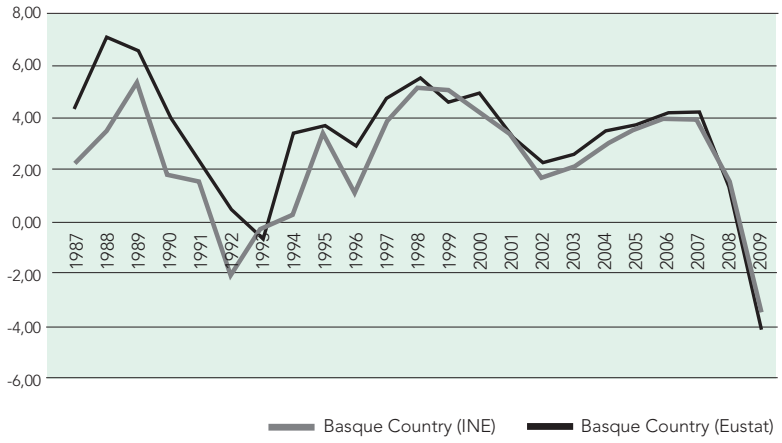
[32] Data are not shown.

[33] See, for instance, Valdaliso (2011). Alberdi (2010) seems to suggest that this is also the case.

recent period are attributed to the worse performance of market service sectors (especially in trade, finance, and business services) in the European Union [van Ark, O´Mahony, and Timmer (2008)]. In their words, «While Europe needs to find mechanisms to exploit service innovations for greater multifactor productivity growth, the traditional catch-up and convergence model of the 1950s and 1960s may not help Europe to get back on track. First, because Europe had reached the productivity frontier by the mid 1990s, it may now require a new model of innovation and technological change to make better use of a country´s own innovative capabilities (Acemoglu, Aghion, and Zilibotti, 2006)» (Ibid., p. 41). However, despite it may become available soon, currently there are no data to analyze the sectoral performance of Spanish territories regarding the proximate sources of economic growth yet.

Finally, productivity growth rates were high for 1965-2008, but lower than that for Spain, while Madrid fell well behind (Table 8). TFP growth was clearly the main contributor, with important differences from some periods to others (Figure 5).

Figure 3. **REAL GROSS VALUE ADDED GROWTH RATES. 1987-2009**



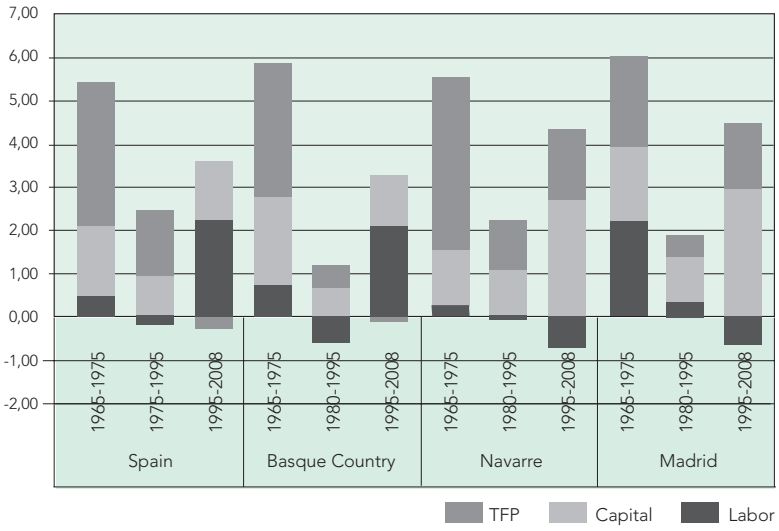
Sources: INE, Eustat, and our own elaboration.

Table 6. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-2008**

	Spain INE-FBBVA-IVIE	The Basque Country INE-FBBVA-IVIE	The Basque Country Eustat-FBBVA-IVIE	Navarre INE-FBBVA-IVIE	Madrid INE-FBBVA-IVIE
GVA growth. (1)	3.23	2.52	2.93	3.25	3.35
Contribution of labor. (2)	0.64	0.45	0.41	0.76	1.50
Contribution of capital, Total. (3)=(4)+(7)	1.21	1.10	1.09	1.19	1.28
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.90	0.79	0.79	0.88	0.88
Contribution of capital, Public infrastructure. (5)	0.11	0.08	0.08	0.09	0.08
Contribution of capital, Other Non-ICT. (6)	0.79	0.71	0.70	0.79	0.80
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.31	0.31	0.31	0.31	0.40
Contribution of capital, Hardware. (8)	0.16	0.17	0.17	0.16	0.22
Contribution of capital, Software. (9)	0.07	0.06	0.06	0.06	0.09
Contribution of capital, Communications. (10)	0.09	0.08	0.08	0.09	0.10
Contribution of TFP. (10)=(1)-(2)-(3)	1.38	0.97	1.43	1.30	0.57

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Figure 4. **SOURCES OF GROSS VALUE ADDED IN SPAIN, THE BASQUE COUNTRY, NAVARRE AND MADRID**



Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table 7. **SOURCES OF GROSS VALUE ADDED GROWTH. 1995-2008**

	Spain	The Basque Country (INE)	The Basque Country (Eustat)	Navarre	Madrid
GVA growth. (1)	3.34 (3.55)	3.25 (3.55)	3.69 (3.95)	3.61 (3.57)	3.87 (3.82)
Contribution of labor. (2)	2.27	2.11	1.83	2.70	2.97
Contribution of capital, Total. (3)=(4)+(7)	1.35	1.19	1.19	1.62	1.55
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.89	0.73	0.74	1.07	1.02
Contribution of capital, Public infrastructure. (5)	0.11	0.07	0.07	0.07	0.11
Contribution of capital, Other Non-ICT. (6)	0.78	0.66	0.67	1.00	0.92
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.45	0.46	0.46	0.55	0.53
Contribution of capital, Hardware. (8)	0.22	0.23	0.22	0.24	0.25
Contribution of capital, Software. (9)	0.10	0.11	0.11	0.14	0.11
Contribution of capital, Communications. (10)	0.13	0.12	0.12	0.18	0.16
Contribution of TFP. (10)=(1)-(2)-(3)	-0.27 (0.29)	-0.05 (1.20)	0.66 (1.68)	-0.71 (0.29)	-0.65 (0.26)

The figures within parentheses show the results for Spain, the Basque Country, Navarre, and Madrid for the period 2003-2007.

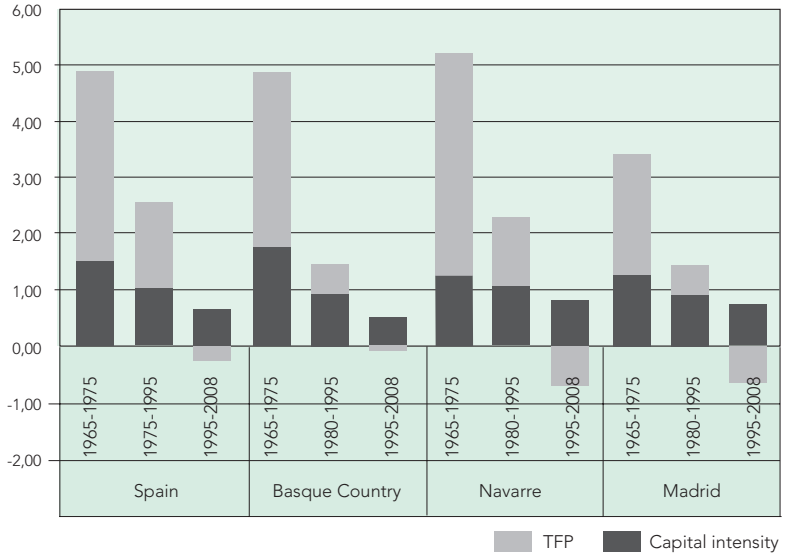
Sources: INE, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table 8. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1965-2008**

	Spain	The Basque Country (INE)	The Basque Country (Eustat)	Navarre	Madrid
GVA per hour growth. (1)	2.40	1.93	2.39	2.27	1.49
Contribution of labor composition per hour (2)					
Contribution of capital per hour, Total. (3)=(4)+(7)	0.98	0.96	0.96	0.97	0.92
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.69	0.68	0.68	0.69	0.59
Contribution of capital per hour, Public infrastructure. (5)	0.08	0.07	0.07	0.06	0.05
Contribution of capital per hour, Other Non-ICT. (6)	0.62	0.61	0.61	0.63	0.54
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.29	0.28	0.28	0.28	0.33
Contribution of capital per hour, Hardware. (8)	0.16	0.16	0.16	0.15	0.19
Contribution of capital per hour, Software. (9)	0.06	0.05	0.05	0.05	0.07
Contribution of capital per hour, Communications. (10)	0.07	0.07	0.07	0.07	0.08
Contribution of TFP. (9)=(1)-(2)-(3)	1.42	0.97	1.43	1.30	0.57

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Figure 5. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR IN SPAIN, THE BASQUE COUNTRY, NAVARRE AND MADRID**



Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

5.3. **The evidence for Araba, Bizkaia, and Gipuzkoa**

Looking at the average growth rates of output Araba clearly outperformed the other territories of the Basque Country in the whole period 1965-2008, even in all the periods considered (Table 9). They were mainly fuelled by capital and TFP growth. Period 1965-1975 was characterized by very high growth rates accompanied by strong TFP growth rates (Figure 6)[34]. Lower output growth and modest TFP improvements featured period 1975-1995. In the recent period 1995-2008 higher output growth rates were sustained by labor, and, to a lesser extent, capital growth: TFP became negative in nearly all the territories (Table 10). Bizkaia followed a different growth pattern: a joint low contribution of labor and mainly capital explained the substantial positive TFP growth in Bizkaia. Additionally, the contribution of ICT capital to output growth increased considerably in the Basque Country in the period 1995-2008. It is worth noting that a spectacular improvement in TFP performance in the Basque Country took place in the most recent period 2003-2007, as noted above. Focusing on labor productivity, the growth rate of output per hour was around 2% in the whole period analyzed (Figure 7).

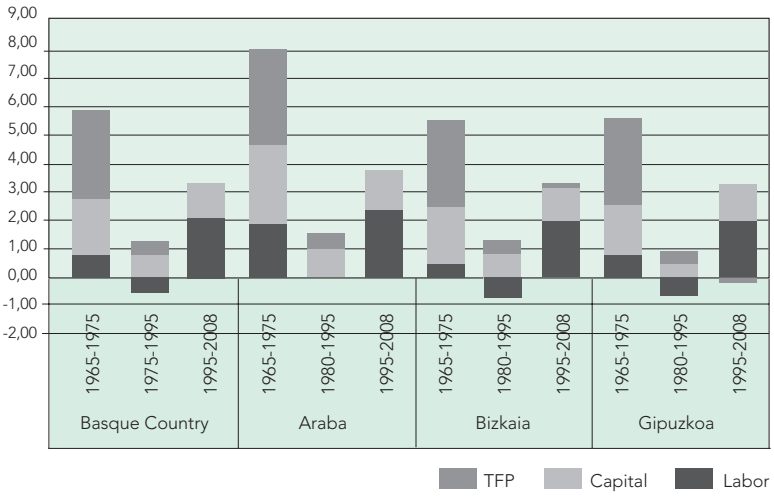
[34] Full results for different periods can be found in the Appendix (Tables A11 to A16).

Table 9. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-2008**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA growth. (1)	2.52	3.59	2.39	2.39
Contribution of labor. (2)	0.45	1.07	0.28	0.47
Contribution of capital, Total. (3)=(4)+(7)	1.10	1.51	1.10	0.96
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.79	1.14	0.79	0.67
Contribution of capital, Public infrastructure. (5)	0.08	0.08	0.08	0.08
Contribution of capital, Other Non-ICT. (6)	0.71	1.06	0.71	0.59
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.31	0.37	0.31	0.29
Contribution of capital, Hardware. (8)	0.17	0.21	0.17	0.16
Contribution of capital, Software. (9)	0.06	0.06	0.06	0.06
Contribution of capital, Communications. (10)	0.08	0.10	0.08	0.07
Contribution of TFP. (10)=(1)-(2)-(3)	0.97	1.01	1.01	0.96

Sources: INE, FBBVA, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

Figure 6. **SOURCES OF GROSS VALUE ADDED GROWTH IN THE BASQUE COUNTRY, ARABA, BIZKAIA AND GIPUZKOA**



Sources: INE, FBBVA, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

Table 10. **SOURCES OF GROSS VALUE ADDED GROWTH. 1995-2008**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA growth. (1)	3.25 (3.55)	3.76 (4.10)	3.32 (3.12)	3.13 (3.97)
Contribution of labor. (2)	2.11	2.41	2.05	2.05
Contribution of capital, Total. (3)=(4)+(7)	1.19	1.41	1.09	1.28
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.73	0.90	0.65	0.81
Contribution of capital, Public infrastructure. (5)	0.07	0.06	0.08	0.06
Contribution of capital, Other Non-ICT. (6)	0.66	0.84	0.57	0.75
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.46	0.51	0.44	0.47
Contribution of capital, Hardware. (8)	0.23	0.25	0.21	0.23
Contribution of capital, Software. (9)	0.11	0.11	0.12	0.10
Contribution of capital, Communications. (10)	0.12	0.15	0.11	0.13
Contribution of TFP. (10)=(1)-(2)-(3)	-0.05 (1.20)	-0.05 (1.65)	0.17 (1.11)	-0.19 (1.13)

The figures within parentheses show the results for the Basque Country, Araba, Bizkaia, and Gipuzkoa for the period 2003-2007.

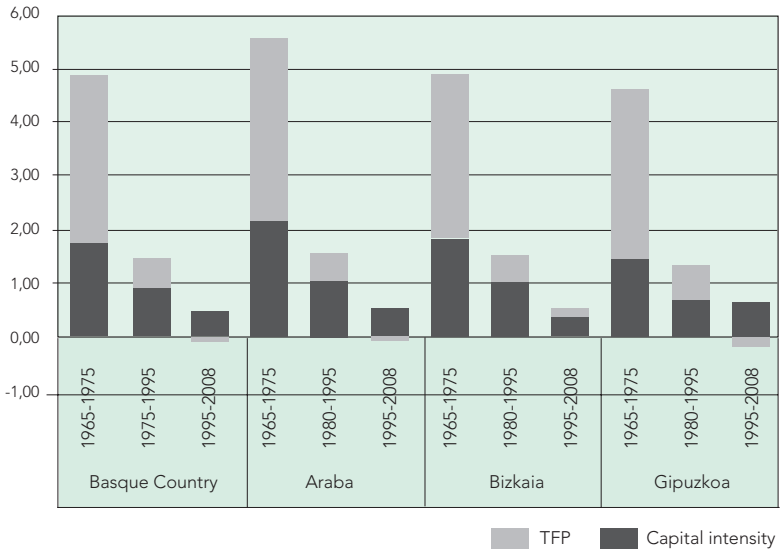
Sources: INE, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

Table 11. **SOURCES OF GROSS VALUE ADDED FOR OUTPUT PER HOUR. 1965-2008**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA per hour growth. (1)	1.93	2.15	2.03	1.78
Contribution of labor composition per hour (2)				
Contribution of capital per hour, Total. (3)=(4)+(7)	0.96	1.14	1.01	0.82
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.68	0.83	0.72	0.56
Contribution of capital per hour, Public infrastructure. (5)	0.07	0.06	0.07	0.06
Contribution of capital per hour, Other Non-ICT. (6)	0.61	0.77	0.65	0.49
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.28	0.32	0.29	0.26
Contribution of capital per hour, Hardware. (8)	0.16	0.19	0.16	0.15
Contribution of capital per hour, Software. (9)	0.05	0.05	0.05	0.05
Contribution of capital per hour, Communications. (10)	0.07	0.08	0.07	0.06
Contribution of TFP. (9)=(1)-(2)-(3)	0.97	1.01	1.01	0.96

Sources: INE, FBBVA, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

Figure 7. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR IN THE BASQUE COUNTRY, ARABA, BIZKAIA AND GIPUZKOA**



Sources: INE, FBBVA, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

6. CONCLUSIONS

The post-war period has brought an enormous economic progress. This paper has explored the sources of proximate economic growth for Spain for the period 1965-2008 focusing on the three leading autonomous communities, such as the Basque Country, Navarre, and Madrid. The main conclusions of this paper are summarized as follows.

First, the rates of growth of output were generally high in the whole period 1965-2008. However, the leading autonomous communities exhibited lower figures than those for Spain. Growth rates during the first period 1965-1975 were spectacular. Subsequent periods have shown a poorer performance.

Second, capital and TFP growth were the main engines of output growth during 1965-2008. However, TFP growth played a residual and declining role in the most recent period 1995-2008 due to the increasing contribution of labor. The contribution of infrastructures to output growth was stable around 0.10% in the whole period. ICT capital contributed approximately 0.30% to output growth during 1965-2008, showing more dynamism during 1995-2008, with similar numbers to those for the EU, and undoubtedly below the contribution in the US. Productivity growth rates in the three autonomous communities were below those for Spain. Growth in TFP was the main contributor to the growth rate of output per hour.

Third, some caution is suggested to interpret the results since we have observed that different sources of data have offered substantially different results for the performance of the Basque Country: the annual average growth rate of GVA is between 0.25 and 1 percentage points higher if data from the Basque Statistics Office are used, instead of that from the Spanish counterpart, due to differences in GVA deflators (mainly recently) and values in current prices. Recent evidence has shown that divergence has narrowed substantially. This caution should also be extended due to the fact that changes in the composition of the labor force have not been taken into account in our growth accounting exercise: it is accounted as TFP growth in this paper. Depending on the measures employed, the average contribution is around 0.50% or 1.20% in Spain.

Fourth, there was an important improvement in the economic performance during 2003-2007, especially for the Basque Country, despite poor labor productivity and TFP growth remain being serious weaknesses since 1995. High output growth, labor productivity growth, and TFP growth characterize this «golden four-year-growth- period». That has also been the case for other territories, but the impact has been stronger for the Basque Country: the most recent period may be considered as a fruitful period of innovation (innovation-driven stage) for the Basque Country. This analysis should be completed on a sectoral basis, as new data on a more disaggregated basis becomes available.

Finally, it is evident that the recent crisis has broken with the expansion associated to this decade (particularly 2003-2007). How will the proximate sources of economic growth react to the current crisis will also probably be an important issue for future research as it may well help to address the main economic concern, that of improving productivity.

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APPENDIX

Table A1. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-1975**

	Spain
GVA growth. (1)	5.46
Contribution of labor. (2)	0.46
Contribution of capital, Total. (3)=(4)+(7)	1.63
Contribution of capital, Non-ICT. (4)=(5)+(6)	1.36
Contribution of capital, Public infrastructure. (5)	0.11
Contribution of capital, Other Non-ICT. (6)	1.25
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.27
Contribution of capital, Hardware. (8)	0.15
Contribution of capital, Software. (9)	0.03
Contribution of capital, Communications. (10)	0.09
Contribution of TFP. (10)=(1)-(2)-(3)	3.38

Sources: INE, FBBVA, FBBVA-IVIE database and EU KLEMS database, and our own elaboration.

Table A2. **SOURCES OF GROSS VALUE ADDED GROWTH. 1975-1995**

	Spain INE-FBBVA -IVIE	Spain EU KLEMS 1980-1995	EU-15ex EU KLEMS 1980-1995	US EU KLEMS 1980-1995
GVA growth. (1)	2.30	2.51	2.17	2.77
Contribution of labor. (2)	-0.19	0.61	0.25	1.11
Contribution of capital, Total. (3)=(4)+(7)	0.99	1.43	1.06	1.48
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.69	1.03	0.73	0.86
Contribution of capital, Public infrastructure. (5)	0.10			
Contribution of capital, Other Non-ICT. (6)	0.58			
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.30	0.40	0.32	0.61
Contribution of capital, Hardware. (8)	0.16			
Contribution of capital, Software. (9)	0.08			
Contribution of capital, Communications. (10)	0.07			
Contribution of TFP. (10)=(1)-(2)-(3)	1.51	0.47	0.87	0.18

Sources: EU KLEMS database (for Spain (1980-1995), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-1995), the EU-15ex and the US.

Table A3. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1965-2008**

	Spain INE-FBBVA-IVIE	Spain EU KLEMS 1980-2007	EU-15ex EU KLEMS 1980-2007	US EU KLEMS 1980-2007
GVA per hour growth. (1)	2.40	1.63	1.89	1.61
Contribution of labor composition per hour (2)		0.55	0.28	0.19
Contribution of capital per hour, Total. (3)=(4)+(7)	0.98	1.13	0.98	1.03
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.69	0.76	0.62	0.38
Contribution of capital per hour, Public infrastructure. (5)	0.08			
Contribution of capital per hour, Other Non-ICT. (6)	0.62			
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.29	0.37	0.36	0.61
Contribution of capital per hour, Hardware. (8)	0.16			
Contribution of capital per hour, Software. (9)	0.06			
Contribution of capital per hour, Communications. (10)	0.07			
Contribution of TFP. (9)=(1)-(2)-(3)	1.42	-0.05	0.64	0.38

Sources: EU KLEMS database (for Spain (1980-2007), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-2007), the EU-15ex and the US.

Table A4. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1965-1975**

	Spain
GVA per hour growth. (1)	4.90
Contribution of labor composition per hour (2)	
Contribution of capital per hour, Total. (3)=(4)+(7)	1.52
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	1.26
Contribution of capital per hour, Public infrastructure. (5)	0.10
Contribution of capital per hour, Other Non-ICT. (6)	1.17
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.26
Contribution of capital per hour, Hardware. (8)	0.15
Contribution of capital per hour, Software. (9)	0.03
Contribution of capital per hour, Communications. (10)	0.09
Contribution of TFP. (9)=(1)-(2)-(3)	3.38

Sources: INE, FBBVA, FBBVA-IVIE database and EU KLEMS database, and our own elaboration.

Table A5. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1975-1995**

	Spain INE	Spain 1980-1995 EU KLEMS	EU-15ex 1980-1995 EU KLEMS	US 1980-1995 EU KLEMS
GVA per hour growth. (1)	2.53	2.50	2.33	1.33
Contribution of labor composition per hour (2)		0.63	0.38	0.18
Contribution of capital per hour, Total. (3)=(4)+(7)	1.02	1.40	1.10	0.98
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.72	1.01	0.77	0.42
Contribution of capital per hour, Public infrastructure. (5)	0.11			
Contribution of capital per hour, Other Non-ICT. (6)	0.61			
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.30	0.40	0.32	0.56
Contribution of capital per hour, Hardware. (8)	0.16			
Contribution of capital per hour, Software. (9)	0.07			
Contribution of capital per hour, Communications. (10)	0.07			
Contribution of TFP. (9)=(1)-(2)-(3)	1.51	0.47	0.86	0.18

Sources: EU KLEMS database (for Spain (1980-1995), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1980-1995), the EU-15ex and the US.

Table A6. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1995-2008**

	Spain INE	Spain 1995-2007 EU KLEMS	EU-15ex 1995-2007 EU KLEMS	US 1995-2007 EU KLEMS
GVA per hour growth. (1)	0.37 (0.96)	0.54 (1.11)	1.34 (1.38)	1.95 (1.51)
Contribution of labor composition per hour (2)		0.58	0.16	0.21
Contribution of capital per hour, Total. (3)=(4)+(7)	0.64	0.79	0.83	1.11
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.31	0.45	0.42	0.43
Contribution of capital per hour, Public infrastructure. (5)	0.03			
Contribution of capital per hour, Other Non-ICT. (6)	0.28			
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.33	0.34	0.41	0.68
Contribution of capital per hour, Hardware. (8)	0.19			
Contribution of capital per hour, Software. (9)	0.07			
Contribution of capital per hour, Communications. (10)	0.08			
Contribution of TFP. (9)=(1)-(2)-(3)	-0.27 (0.29)	-0.69 (-0.54)	0.36 (0.73)	0.63 (0.77)

The figures within parentheses show the results for the period 2003-2007.

Sources: EU KLEMS database (for Spain (1995-2007), the EU and the US), INE, FBBVA, FBBVA-IVIE database and EU KLEMS database (for Spain), and our own elaboration. The contribution of labor includes the impact of changes in the composition of the labor force for Spain (1995-2007), the EU-15ex and the US.

Table A7. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-1975**

	Spain	The Basque Country	Navarre	Madrid
GVA growth. (1)	5.46	5.87	5.56	6.04
Contribution of labor. (2)	0.46	0.75	0.30	2.24
Contribution of capital, Total. (3)=(4)+(7)	1.63	1.99	1.29	1.69
Contribution of capital, Non-ICT. (4)=(5)+(6)	1.36	1.68	1.10	1.30
Contribution of capital, Public infrastructure. (5)	0.11	0.09	0.09	0.09
Contribution of capital, Other Non-ICT. (6)	1.25	1.59	1.01	1.21
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.27	0.32	0.19	0.39
Contribution of capital, Hardware. (8)	0.15	0.18	0.11	0.23
Contribution of capital, Software. (9)	0.03	0.02	0.02	0.05
Contribution of capital, Communications. (10)	0.09	0.11	0.06	0.11
Contribution of TFP. (10)=(1)-(2)-(3)	3.38	3.12	3.97	2.11

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table A8. **SOURCES OF GROSS VALUE ADDED GROWTH. 1975-1995**

	Spain	The Basque Country (INE)	The Basque Country (Eustat)	Navarre	Madrid
GVA growth. (1)	2.30	0.65	1.24	2.17	1.92
Contribution of labor. (2)	-0.19	-0.60	-0.54	-0.09	0.35
Contribution of capital, Total. (3)=(4)+(7)	0.99	0.72	0.71	1.04	1.05
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.69	0.47	0.46	0.76	0.67
Contribution of capital, Public infrastructure. (5)	0.10	0.09	0.09	0.12	0.06
Contribution of capital, Other Non-ICT. (6)	0.58	0.37	0.37	0.64	0.62
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.30	0.25	0.25	0.28	0.38
Contribution of capital, Hardware. (8)	0.16	0.15	0.14	0.16	0.20
Contribution of capital, Software. (9)	0.08	0.06	0.06	0.06	0.10
Contribution of capital, Communications. (10)	0.07	0.05	0.05	0.06	0.08
Contribution of TFP. (10)=(1)-(2)-(3)	1.51	0.53	1.07	1.22	0.52

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table A9. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1965-1975**

	Spain	The Basque Country	Navarre	Madrid
GVA per hour growth. (1)	4.90	4.87	5.20	3.37
Contribution of labor composition per hour (2)				
Contribution of capital per hour, Total. (3)=(4)+(7)	1.52	1.75	1.23	1.27
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	1.26	1.46	1.05	0.94
Contribution of capital per hour, Public infrastructure. (5)	0.10	0.08	0.08	0.06
Contribution of capital per hour, Other Non-ICT. (6)	1.17	1.37	0.96	0.88
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.26	0.29	0.18	0.33
Contribution of capital per hour, Hardware. (8)	0.15	0.17	0.11	0.20
Contribution of capital per hour, Software. (9)	0.03	0.02	0.02	0.04
Contribution of capital per hour, Communications. (10)	0.09	0.10	0.06	0.09
Contribution of TFP. (9)=(1)-(2)-(3)	3.38	3.12	3.97	2.11

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table A10. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1975-1995**

	Spain	The Basque Country (INE)	The Basque Country (Eustat)	Navarre	Madrid
GVA per hour growth. (1)	2.53	1.46	1.96	2.27	1.47
Contribution of labor composition per hour (2)					
Contribution of capital per hour, Total. (3)=(4)+(7)	1.02	0.93	0.89	1.05	0.95
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.72	0.66	0.63	0.77	0.60
Contribution of capital per hour, Public infrastructure. (5)	0.11	0.11	0.10	0.12	0.05
Contribution of capital per hour, Other Non-ICT. (6)	0.61	0.55	0.52	0.65	0.55
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.30	0.27	0.26	0.28	0.36
Contribution of capital per hour, Hardware. (8)	0.16	0.15	0.15	0.16	0.19
Contribution of capital per hour, Software. (9)	0.07	0.06	0.06	0.06	0.10
Contribution of capital per hour, Communications. (10)	0.07	0.06	0.06	0.06	0.07
Contribution of TFP. (9)=(1)-(2)-(3)	1.51	0.53	1.07	1.22	0.52

Sources: INE, FBBVA, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table A11. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1995-2008**

	Spain	The Basque Country (INE)	The Basque Country (Eustat)	Navarre	Madrid
GVA per hour growth. (1)	0.37 (0.96)	0.45 (2.01)	1.25 (2.49)	0.11 (1.33)	0.09 (1.06)
Contribution of labor composition per hour (2)					
Contribution of capital per hour, Total. (3)=(4)+(7)	0.64	0.50	0.59	0.82	0.74
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.31	0.15	0.23	0.40	0.39
Contribution of capital per hour, Public infrastructure. (5)	0.03	0.00	0.01	-0.03	0.04
Contribution of capital per hour, Other Non-ICT. (6)	0.28	0.16	0.22	0.43	0.35
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.33	0.35	0.36	0.42	0.35
Contribution of capital per hour, Hardware. (8)	0.19	0.19	0.19	0.20	0.20
Contribution of capital per hour, Software. (9)	0.07	0.08	0.08	0.10	0.06
Contribution of capital per hour, Communications. (10)	0.08	0.08	0.08	0.12	0.09
Contribution of TFP. (9)=(1)-(2)-(3)	-0.27 (0.29)	-0.05 (1.20)	0.66 (1.68)	-0.71 (0.29)	-0.65 (0.26)

The figures within parentheses show the results for Spain, the Basque Country, Navarre, and Madrid for the period 2003-2007.

Sources: INE, FBBVA-IVIE database, Eustat, EU KLEMS database, and our own elaboration.

Table A12. **SOURCES OF GROSS VALUE ADDED GROWTH. 1965-1975**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA growth. (1)	5.87	8.05	5.54	5.67
Contribution of labor. (2)	0.75	1.87	0.48	0.79
Contribution of capital, Total. (3)=(4)+(7)	1.99	2.78	2.02	1.71
Contribution of capital, Non-ICT. (4)=(5)+(6)	1.68	2.38	1.70	1.43
Contribution of capital, Public infrastructure. (5)	0.09	0.08	0.08	0.12
Contribution of capital, Other Non-ICT. (6)	1.59	2.30	1.63	1.31
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.32	0.40	0.32	0.29
Contribution of capital, Hardware. (8)	0.18	0.25	0.18	0.17
Contribution of capital, Software. (9)	0.02	0.03	0.02	0.02
Contribution of capital, Communications. (10)	0.11	0.13	0.11	0.10
Contribution of TFP. (10)=(1)-(2)-(3)	3.12	3.41	3.04	3.17

Sources: INE, FFBVA, FBBVA-IVIE database and EU KLEMS database, and our own elaboration.

Table A13. **SOURCES OF GROSS VALUE ADDED GROWTH. 1975-1995**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA growth. (1)	0.65	1.56	0.55	0.43
Contribution of labor. (2)	-0.60	0.02	-0.72	-0.67
Contribution of capital, Total. (3)=(4)+(7)	0.72	1.04	0.79	0.48
Contribution of capital, Non-ICT. (4)=(5)+(6)	0.47	0.74	0.53	0.27
Contribution of capital, Public infrastructure. (5)	0.09	0.11	0.10	0.09
Contribution of capital, Other Non-ICT. (6)	0.37	0.64	0.43	0.18
Contribution of capital, ICT. (7)=(8)+(9)+(10)	0.25	0.29	0.26	0.21
Contribution of capital, Hardware. (8)	0.15	0.18	0.15	0.13
Contribution of capital, Software. (9)	0.06	0.05	0.06	0.05
Contribution of capital, Communications. (10)	0.05	0.06	0.05	0.03
Contribution of TFP. (10)=(1)-(2)-(3)	0.53	0.51	0.48	0.62

Sources: INE, FFBVA, FBBVA-IVIE database and EU KLEMS database, and our own elaboration.

Table A14. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1965-1975**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA per hour growth. (1)	4.87	5.59	4.90	4.62
Contribution of labor composition per hour (2)				
Contribution of capital per hour, Total. (3)=(4)+(7)	1.75	2.19	1.86	1.45
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	1.46	1.84	1.56	1.19
Contribution of capital per hour, Public infrastructure. (5)	0.08	0.05	0.07	0.10
Contribution of capital per hour, Other Non-ICT. (6)	1.37	1.79	1.49	1.09
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.29	0.35	0.30	0.26
Contribution of capital per hour, Hardware. (8)	0.17	0.22	0.17	0.16
Contribution of capital per hour, Software. (9)	0.02	0.02	0.02	0.02
Contribution of capital per hour, Communications. (10)	0.10	0.11	0.11	0.09
Contribution of TFP. (9)=(1)-(2)-(3)	3.12	3.41	3.04	3.17

Sources: INE, FBBVA, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.

Table A15. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1975-1995**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA per hour growth. (1)	1.46	1.54	1.53	1.32
Contribution of labor composition per hour (2)				
Contribution of capital per hour, Total. (3)=(4)+(7)	0.93	1.03	1.05	0.70
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.66	0.74	0.76	0.47
Contribution of capital per hour, Public infrastructure. (5)	0.11	0.11	0.11	0.10
Contribution of capital per hour, Other Non-ICT. (6)	0.55	0.63	0.65	0.37
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.27	0.29	0.29	0.23
Contribution of capital per hour, Hardware. (8)	0.15	0.18	0.16	0.13
Contribution of capital per hour, Software. (9)	0.06	0.05	0.06	0.05
Contribution of capital per hour, Communications. (10)	0.06	0.06	0.07	0.04
Contribution of TFP. (9)=(1)-(2)-(3)	0.53	0.51	0.48	0.62

Sources: INE, FBBVA, FBBVA-IVIE database, and our own elaboration.

Table A16. **SOURCES OF GROWTH FOR GROSS VALUE ADDED PER HOUR. 1995-2008**

	The Basque Country	Araba	Bizkaia	Gipuzkoa
GVA per hour growth. (1)	0.45 (2.01)	0.50 (2.23)	0.56 (2.20)	0.47 (1.62)
Contribution of labor composition per hour (2)				
Contribution of capital per hour, Total. (3)=(4)+(7)	0.50	0.55	0.38	0.66
Contribution of capital per hour, Non-ICT. (4)=(5)+(6)	0.15	0.17	0.06	0.29
Contribution of capital per hour, Public infrastructure. (5)	0.00	-0.03	0.01	-0.01
Contribution of capital per hour, Other Non-ICT. (6)	0.16	0.20	0.05	0.31
Contribution of capital per hour, ICT. (7)=(8)+(9)+(10)	0.35	0.38	0.32	0.37
Contribution of capital per hour, Hardware. (8)	0.19	0.20	0.18	0.20
Contribution of capital per hour, Software. (9)	0.08	0.08	0.08	0.08
Contribution of capital per hour, Communications. (10)	0.08	0.10	0.06	0.09
Contribution of TFP. (9)=(1)-(2)-(3)	-0.05 (1.20)	-0.05 (1.65)	0.17 (1.11)	-0.19 (1.13)

The figures within parentheses show the results for the Basque Country, Araba, Bizkaia, and Gipuzkoa for the period 2003-2007.

Sources: INE, FBBVA-IVIE database, EU KLEMS database, and our own elaboration.