

Productive model and productivity in Catalonia

Executive summary



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PRODUCTIVE MODEL AND PRODUCTIVITY IN CATALONIA

REPORT

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1. EXECUTIVE SUMMARY

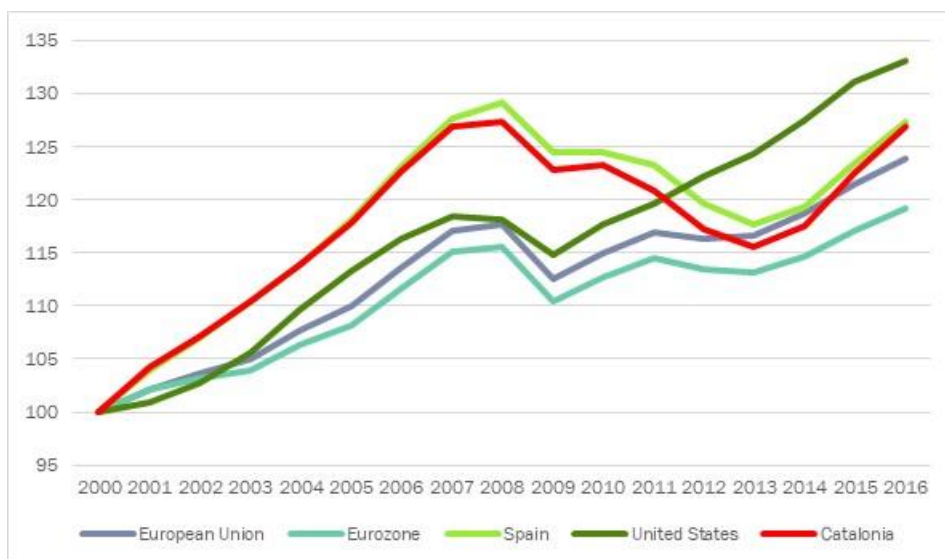
1.1. PRODUCTIVITY AND PRODUCTIVE MODEL: INTERNACIONAL COMPARISON

The economic cycle

The Catalan economy has a relatively differential economic growth with regard to most western economies, which shares with seven other economies, Spain, Italy, Portugal, Greece, Cyprus, Croatia and Slovenia.

On the one hand, 2000-2007 were years of more intense GDP growth compared to the European or US average. On the other hand, the impact of the financial crisis plunged the Catalan economy into a deeper crisis, both in intensity, higher, and in duration. The Catalan economy GDP is reduced until 2013, when it is 9.0% below the 2007 level, while the recovery process does not begin until 2014. Thus, the activity level in Catalonia in 2016 is barely at the maximum levels reached in 2007 and 2008, while most comparative western economies reach this level from 2013.

CHART 1. Comparison of the GDP evolution at 2010 prices in different fields, 2000=100. 2000-2016



Units: base index (2000 = 100).

Source: the AMECO database has been used for all countries at constant 2010 prices. For Catalonia, INE has been used.

GDP per capita

The differential behaviour of the Catalan economy growth becomes even more evident when we correlate it with the population evolution.¹

Despite the highest rates of GDP growth in the years 2000-2007, the rhythm of the GDP per capita growth rate of the Catalan economy during these years is slightly below that of the Eurozone, of the United States, clearly below that of the EU-28, at the same time that practically below all compared economies, with only a better performance than Denmark, France, Japan, Portugal, Italy and Mexico.

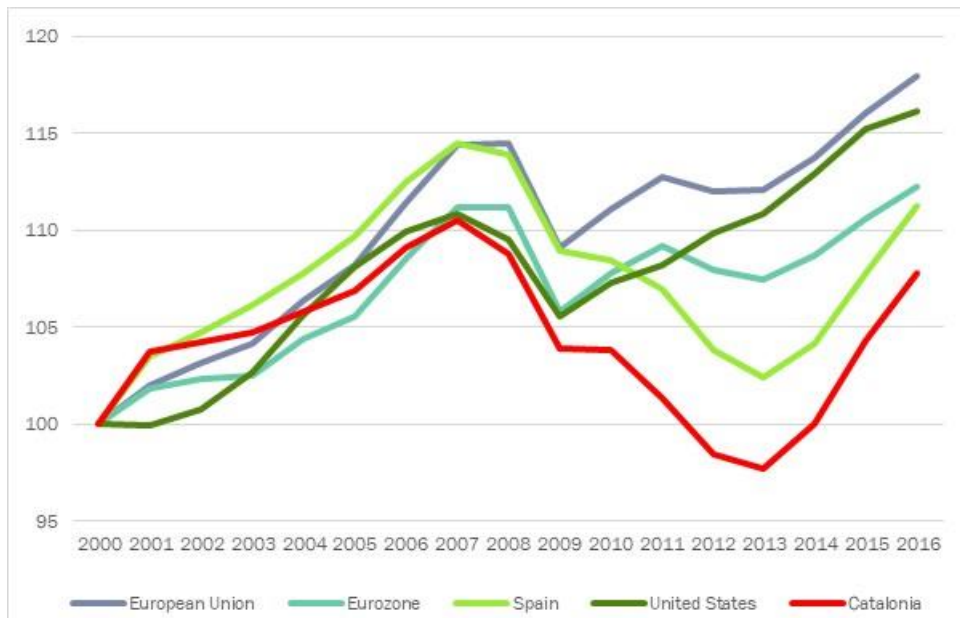
¹ It should be borne in mind that during these years Catalonia has experienced one of the highest population growth rates in the compared economies during the years 2000-2016, of 1.03% a. ac. In the United States it has been of 0.86% a. ac., in the Eurozone of the 0.38% a. ac., in EU-28 of 0.30% a. ac. and in Spain of 0.85% a. ac. This differential growth has been mainly due to the evolution between 2000-2007 (2.0% a. ac), while, from the crisis, the population evolution in Catalonia behaves in parallel with the rest of economies, with a growth of 0.28% a. ac.

The evolution between 2007 and 2016 is marked by the intensity and duration of the crisis and by the subsequent recovery, with a balance in which the GDP per capita in Catalonia deteriorates, while it increases -albeit at slower rates than before the crisis- both in the US, EU-28 and the Eurozone.

The intensity and the longer duration of the crisis impact are evidenced by the decline in GDP per capita between 2007 and 2013, when Catalonia shows one of the worst developments -meaning a cumulative fall until 2013 of 11.56%- only surpassed by the economies of Cyprus and Greece. Meanwhile, in most countries GDP per capita levels are already recovering since 2010.

It is also worth noting that over the last three years (2014-2016), GDP per capita in Catalonia is rising above almost all economies - only surpassed by the evolution of 9 of the 37 compared countries -. Thus, the growth rate of the well-being level between 2013 and 2016 in Catalonia is above that of the United States, the EU-28 and the Eurozone.

CHART 2. Comparison of the GDP per capita evolution of Catalonia, at 2010 prices, in different fields, 2000 = 100. 2000-2016



Units: base rate (2000 = 100) for each economy of GDP per inhabitant at 2010 prices and expressed in euros.
 Source: For all countries the AMECO database has been used at constant prices for 2010. For Catalonia, INE has been used.

This evolution has resulted in a relative deterioration in living conditions in the Catalan economy regarding most compared economies. From 2000 to 2016, Catalonia loses relative well-being with respect to 34 of the 37 countries. This loss occurs during the years of growth, 2000-2007, when relative well-being is lost with respect to 31 of the 37 economies, and, more intensely, during the years of impact of the crisis, between 2007 and 2013, in which it loses relative well-being with respect to 35 of the 37 economies. In the last three years, 2014-2016, a relative welfare recovery has started with respect to 32 of the 38 economies.

Thus, the Catalan GDP per capita, expressed at 2010 prices, has gone from representing 77.2% of that in the United States in 2000 to 71.2% in 2016; from meaning 99.0% of the Eurozone it has passed to 95.2% in 2016; whilst, compared to the EU-28, from being 14.3% higher, it has become 4.1% higher in 2016.

Productivity in terms of labour

In all compared economies there has been an increase in labour productivity during the first years of growth of the analyzed series, 2000-07. However, the crisis is stopping these growths (in 34 of the 37 compared countries). In most countries (in 26 of the 37 countries), during 2008-2009 the labour productivity is reduced as a result of the GDP fall in relation to the level of contracted working hours. From the moment economic activity recovers -in most economies in 2010-, labour productivity returns to grow, although at lower rates than it was growing before the crisis (in 31 of the 37 compared countries).

During the years 2000-2016 Catalonia maintains a level of labour productivity around the median of the 37 compared economies, located in the medium low productivity group, although its evolution shows a slightly differentiated profile. In the pre-crisis years, 2000-2007, labour productivity grew below 34 of the 37 compared economies (0.65% a. ac.); later, during the crisis impact years, labour productivity accelerates its growth (1.43% a. ac.) -largely as a result of an adjustment in the face of the drop in production demand that occurs, differentially from other economies, reducing the labour factor more intensely-. From the recovery (2014-2016), labour productivity increases at higher rates than the years before the crisis, concretely the 0,95% a. ac.

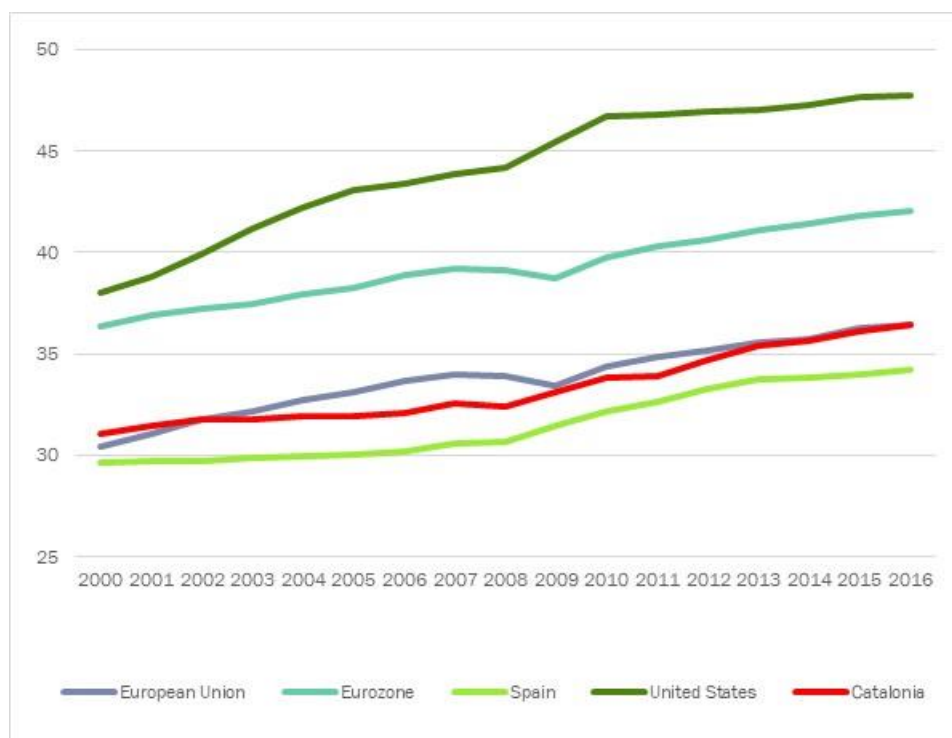
During the first years of the analysis, 2000-07, Catalonia's economic growth occurs with a relative deterioration in the labour productivity with respect to 34 of the 37 compared economies, and with a loss of relative positioning with respect to the aggregates of the UE28, the Eurozone and the United States. In these years, Catalonia only gains relative productivity in relation to Spain, Italy and Mexico.

In the following years, during the crisis period (2007-2013), the labour productivity of the Catalan economy improves its relative position with respect to most compared economies (29 of the 37 countries). It also improves its position with respect to the EU-28 (95.6 to 99.7), the Eurozone (82.9 to 86.2) and the United States (74.2 to 75.3). In this sense, only 8 economies perform better in terms of labour productivity (Bulgaria, Ireland, Spain, Lithuania, Poland, Romania, Slovenia and Iceland).

Also during the years of economic recovery (2014-2016), labour productivity continues to improve its relative position, although at lower rates and with respect to less economies (21 from the 37 compared countries), with a slight improvement over EU-28 (99.7 to 99.9), the Eurozone (86.2 to 86.7) and the United States (75.3 to 76.4). During this period, there are 16 economies that perform better in terms of labour productivity (Bulgaria, Czech Republic, Estonia, Ireland, Croatia, Latvia, Malta, Poland, Romania, Slovenia, Slovakia, Sweden, Iceland, Canada, Mexico and Australia).

During the years 2000-16 the Catalan economy has deteriorated its relative position in terms of apparent labour productivity with respect to 22 of the 37 compared economies, has maintained with a slight improvement the relative position with respect to 10 economies (Belgium, Denmark, Spain, France, Netherlands, Portugal, United Kingdom, Norway, Switzerland, and Canada), and has done it significantly with respect to 5 economies (Italy, Cyprus, Greece, Mexico, and Luxembourg). The relative level of labour productivity is deteriorating with respect to the United States - in 2000 it was 18.22% lower and in 2016 it is 23.64% below -, improves slightly compared to the EU19 - from 14.5% lower than the average for the Eurozone goes to 13.33% below-, while it worsens with respect to the EU-28 - from being 2.0% higher than EU-28 average it goes to 0.07% below in 2016.

CHART 3. Comparison of the GDP per capita evolution of Catalonia, at 2010 prices, in different fields, 2000 = 100. 2000-2016



Units: euros per contracted hour at 2010 prices.

Source: own elaboration based on AMECO data. For Catalonia, INE data have been used; for Mexico, Australia and New Zealand the total hours are obtained from the Total Economy Database. The Conference Board.

Productivity in terms of capital

Throughout the years 2000-2016, the Catalan economy maintains a relatively small level of capital productivity and it is located in the "very low" capital productivity group.

The continuous process of capital accumulation followed by the compared economies has generally been accompanied by a reduction in the apparent capital productivity, which has been more pronounced in the case of the Catalan economy.

Productivity measured in terms of capital has a relatively more heterogeneous behaviour throughout the economic cycle, in the sense that although it is reduced in the crisis years -and more intensely than labour productivity- in expansive phases there are economies with capital productivity increases, and economies that grow with capital productivity reductions.

In 22 of the 37 countries of the study, economic growth in the years 2000-07 was accompanied by an increase in productivity in terms of capital, whereas in 15 countries economic growth was accompanied by a decrease in capital productivity. The impact of the crisis stops growth or worsens productivity declines, and all economies see how capital productivity is reduced in the worst years of the 2008-2009 crisis (in 37 of 37 countries). From the moment economic activity recovers -in 2010 in most economies-, we can observe again economies with capital productivity reductions (20 out of 37 countries) as well as economies that carry out the recovery process with capital productivity increases (in 17 countries out of 37).²

² It should be borne in mind that in calculating the apparent capital productivity a measure of net capital stock is used, which accounts for the net capital accumulation, irrespective of the degree of use of its productive capacity, since it is not established on the basis of a concept rela-

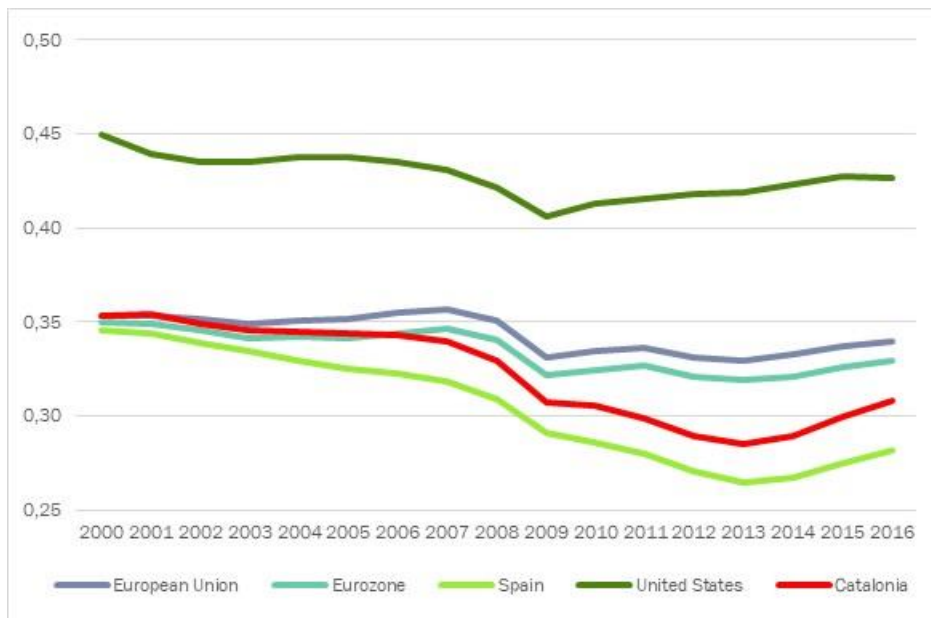
During the years 2000-07, the Catalan economy offsets economic growth with a fall in the capital productivity (-0.54% a. ac.), an evolution that is below 26 of the 37 compared economies. The crisis impact accelerates the capital productivity decline in Catalonia more sharply than in most economies -with a sharp fall of 2.89% a. ac. between 2007-2013-, a worse behaviour than that of 30 of the 37 economies, whereas in the last three years 2013-2016 it recovers at a rate of 2.66% a. ac., over 34 of the 37 compared countries.

Between the years 2007 and 2016, in which the Catalan economy has recovered pre-crisis levels of production -although it may not yet have recovered the use of all its installed capital capacity-, the capital productivity has intensified its rate of decline with respect to the years of growth, at a rate of -1.07% a. ac., evolving in these years below 23 of the 37 compared economies. So, for the whole of the seventeen years (2000-16), in which the effect of the use of installed capital capacity is more diluted, the increase of economic activity has been accompanied by a reduction in capital productivity of -0.84% a. ac., a fall below 26 of the 37 economies.

This evolution has resulted in the fact that the relative positioning of the Catalan economy in terms of apparent capital productivity over the analyzed years 2000-16 has deteriorated with respect to 26 of the 37 economies, and has improved over 11 economies (Bulgaria, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Portugal, Canada, Mexico and Australia).

In 2016 Catalonia maintains a capital productivity level below 31 of the 37 compared countries, 16.5% below the median, while it is 27.6% lower than the capital productivity of the United States, 9.2% lower than the EU-28 aggregate, 6.2% lower than the EU19 aggregate, while it remains 9.5% above that of Spain.

CHART 4. Comparison of the productivity level in terms of capital of Catalonia, at 2010 prices, in different fields. 2000-2016



Units: euros per capital stock unit at 2010 prices.

Source: own elaboration based on AMECO data. For Catalonia, INE data for GDP have been used, and capital stock series charged according to the value estimated by IVIE in 2010, corrected by the bias between the estimates of AMECO and IVIE in the same concept, and prolonged for the rest of the years according to the actual variations estimated by Idescat.

ted to its effective services. This explains that part of the sharp drop in the apparent capital productivity during the most intense crisis years is associated with the underuse of installed capacity, as correction to lower demand is made with a more intense reduction in the contracted hours. At the same time, part of the increase in capital productivity seen from the moment in which economic activity recovers is associated with a recovery in the use of underutilized installed capacity. When the evolution of capital productivity is analyzed over longer periods -which include the recession years and those of full recovery of the installed capacity-, reflects better the behaviour of capital productivity used in its full capacity.

Joint productivity of productive factors (TFP)

Throughout all the years (2000-2016) the Catalan economy shows a level of joint productivity of the factors that places it in the group of "low-average" TFP in the comparative countries, just below the median.

The joint productivity of the factors (TFP) can be interpreted as a geometric average of the apparent labour productivity and the apparent capital productivity:

$$\text{Joint productivity of productive factors (TFP)} = \left(\frac{Y}{H}\right)^{\alpha_{i,t}} \times \left(\frac{Y}{K}\right)^{1-\alpha_{i,t}}$$

The weighting factors are the adjusted weight of labour remuneration ($\alpha_{i,t}$) and the weight of capital remuneration in GDP ($1-\alpha_{i,t}$), respectively, where at the same time for each country and for each year this weighting is the arithmetic mean between the adjusted weight of labour remuneration in year t in country " i " and the adjusted weight of labour remuneration in the reference country and the reference year (EU-28 in 2010).

- The TFP evolution by country can be interpreted as an indicator of the evolution of the joint technical efficiency of its growth model. TFP increases in situations of full use of productive factors would indicate improvements in the technical efficiency of a country's production processes, since they identify a cheapening in terms of joint physical units of production factors.
- At the same time, the TFP distance between countries can be interpreted as an indicator of distance in the joint technical efficiency of the production models between two countries, and therefore, an increase in the distance between two countries would indicate a relative rise in terms of technical efficiency in the production process of the country that loses relative TFP.

Joint productivity of the factors has a relatively homogeneous behaviour across the compared economies throughout the economic cycle, in the sense that in 30 of the 37 countries the TFP tends to increase during the expansive phases - between 2000 and 2007 and 2009 and 2016- and it is reduced in the most intense years of the crisis between 2007 and 2009.

Thus, in 34 of the 37 compared economies the 2000-07 economic growth was accompanied by an increase in TFP (only Spain, Italy and Mexico overcome these years of growth with a TFP reduction). The economic crisis reverses this situation and between 2007-09 all economies (except Iceland) experience a fall in TFP. From 2010 onwards -when most economies start a recovery process of the economic activity-, 35 of the 37 countries do it again with TFP increases, although, in general -in 25 of the 35 countries-, at lower rates than those previous to the crisis.

The growth model of the Catalan economy shows one of the poorest profiles with regard to the evolution of the joint productivity of the factors among the compared countries. Between 2000 and 2016, TFP increases at a rate of 0.20% a. ac., an evolution that is clearly below the EU-28 aggregate -with a TFP growth of 0.52% a. ac.-, of the EU19 -with a growth of 0,34% a. ac.-, and the United States -with a growth of 0.70% a. ac.-.

During the years 2000-07, the Catalan economic growth is accompanied by a poor growth of the TFP, at rates of 0.16% a. ac., an evolution that falls below 33 of the 37 compared countries. The impact of the crisis causes a reduction in TFP at rates of -0.48% a. ac. (2007-2013), evolving below 25 of the 37 compared countries. As economy begins to recover, the TFP increases sharply, at rates of 1.69% a.c. (2014-2016), evolving over 30 of the 37 compared economies. However, as already mentioned, both the TFP fall during the crisis years and its subsequent recovery are affected by the evolution of the installed capacity degree of use, and the comparison with others economies is also affected by the different rhythms of the economic cycle caused by the crisis. These elements are further diluted when comparing evolution over the longer period between 2007 and 2016.

Between 2007 and 2016, in which the Catalan economy has recovered pre-crisis levels of production - although it may not have yet recovered the use of all its installed capital capacity -, TFP has modestly

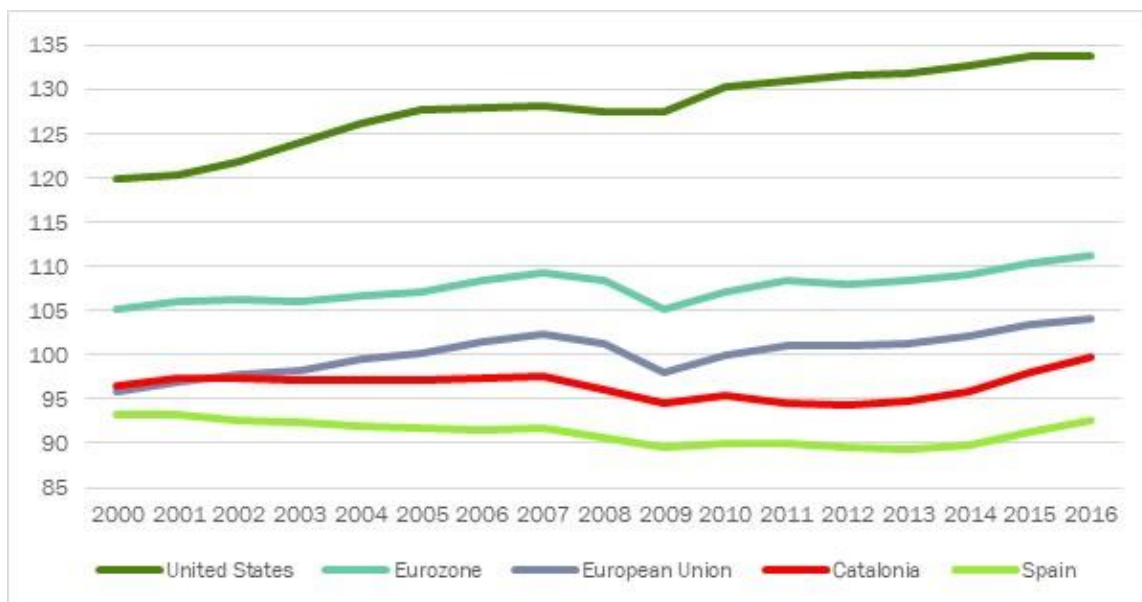
improved its growth rate, at a rate of 0.23% a. ac., evolving in these years over 25 of the 37 compared economies.

However, for the whole of the seventeen years (2000-16), in which the effect of the use of installed capital capacity is even more diluted, the increase in economic activity has been accompanied by an increase in TFP of 0.20% a. ac., an evolution that falls below 29 of the 37 compared economies.

This behaviour has resulted in a relative loss of TFP levels in the Catalan economy with respect to EU-28 and EU19 aggregates, and with respect to the United States.

Thus, in 2016 Catalonia maintains a TFP level below 19 of the 37 compared countries, and is 25.5% lower than the productivity of the United States, 10.3% lower than the EU-19 aggregate, 4.3% lower than the EU-28 aggregate, while it remains 7.8% above that of Spain.

CHART 5. Comparison of the joint productivity level of productive factors (TFP) in Catalonia, at 2010 prices, in different fields. 2000-2016



Units: TFP relative index UE28 year 2010 = 100.

Source: own elaboration based on AMECO data. For Catalonia, INE data for GDP have been used, and the series of capital stock charged according to the value estimated by IVIE in 2010, corrected by the bias between the estimates of AMECO and IVIE in the same concept, and prolonged for the rest of the years according to the actual variations estimated by Idescat.

Decomposition of the growth model of the Catalan economy

The evolution of the Catalan economy in the years 2000-2016 shows a model of economic growth that is produced, mainly, through the increase of the production factors, without significant advances in their joint productivity.

This growth, relatively extensive in factors, has taken place with a greater increase in the capital factor than in the labour factor - with an increase in the labour-capital ratio-; although it translates into increases in apparent labour productivity, at the same time, they are largely offset by reductions in capital productivity. The model is characterized by a difficulty in translating the labour-capital ratio increases into significant increases in the combined factors productivity, which slows down the technical efficiency of the economy as a whole. This way of growing makes the level of well-being evolution, expressed through the GDP per capita, more dependent on the evolution of the joint endowment level of productive factors per capita -especially of the evolution of the population employment rate- than on the productivity increase of these factors.

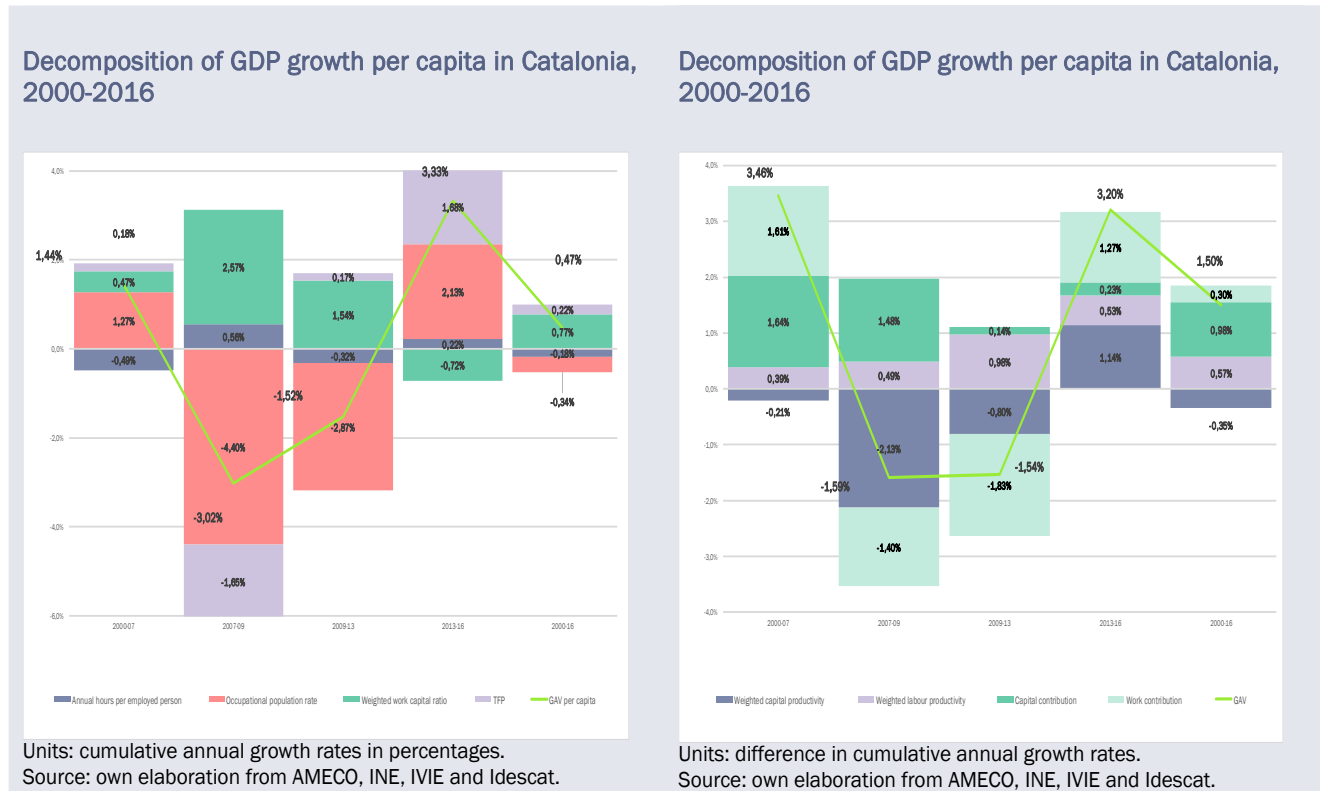
The evolution of these variables throughout the economic cycle allows us to identify some features about how growth is taking place.

During the first years of expansion (2000-2007), GDP growth (3.46% a. ac.) was sustained by the widespread use of production factors (3.28% a. ac.), which contribute virtually to the entire GDP increase, and that is broken down into a relatively similar contribution of the labour factor (1.61% a. ac.) and the capital factor (1.64% a. ac.). This extensive growth means a very modest contribution to the evolution of the joint productivity of the factors, which during these years grows by 0.18% a. ac. This behaviour is also reflected in the GDP per capita evolution (1.44% a. ac.), which substantially grows because of the increase in the joint endowment of factors per inhabitant (1.25% a. ac.) - and that basically responds to the intense increase of the population employment rate (1.27% a. ac.) and, to a lesser extent, to the increase in the labour capital ratio (0.47% a. ac.), elements that are partly offset by the reduction in annual hours per employed person (-0.49% a. ac.) -.

The impact of the crisis, which is differentially extended until 2013, translates into the Catalan economy in the fact that the adjustment to the demand deterioration concentrates on the reduction of the labour factor, which is reduced with strong intensity over all these years (-2.94% a. ac.), while net capital stock continues to increase during all the crisis years - albeit at a smaller rate of 1.38% a. ac.-. The consequence of this evolution explains that in the two sub-periods of the crisis (2007-2009, and 2009-2013) the Catalan GDP reduction is mainly due to a negative contribution of the labour factor, whereas the capital factor continues to make a positive contribution to the GDP evolution. At the same time, largely related to the underutilization of productive capacity and the sharp reduction in labour,³ we see a positive contribution of labour productivity and a very negative contribution of capital productivity. This behaviour is also reflected in the negative GDP per capita evolution during the crisis years, which falls mainly due to the sharp reduction in the population employment rate, while both the negative TFP contribution during the first crisis years and the contribution associated with the increase in the labour-capital ratio collect, in part, the effect of the productive capacity underutilization.

³ See section 2.1.1.2.

CHART 6. The Catalan growth model, 2000-2016



Generally speaking, the growth in most economies in the 37 report countries - such as the Eurozone, the EU-28, or the US economy aggregates - is also characterized by an extension in the use of factors, which is associated with an increase in the labour-capital ratio and results in a labour productivity increase, which is relatively higher than the capital productivity reduction, although the decline in the capital productivity is clearly more moderate than in the case of the Catalan economy, which means that in most countries the growth in the joint productivity of the factors over the seventeen years has been more intense.

In addition, it should be borne in mind that this evolution occurs in a context in which the Catalan economy has a capital endowment per inhabitant and a labour-capital ratio which are relatively high, and this places it in the group of medium-high capital endowment in the set of the compared countries - just above the Eurozone aggregate and clearly higher than the EU-28 aggregate -. As for the combination of productive factors, Catalonia is ranked in the group of medium low joint productivity of the factors (TFP) -below the EU-28 aggregate and clearly below the Eurozone -since this same combination of factors places it in the group with the lowest capital productivity -far from both the Eurozone and especially of the EU-28-, and in the group of medium low labour productivity -with a similar level to the EU-28 aggregate, but clearly below the Eurozone-.

Comparison of the GDP per capita level of Catalonia by components

Joint productivity of the factors plays a key role in explaining Catalonia's well-being distances with respect to the compared economies and its evolution over time.

In general, it is also found that the existence of a high advantage in TFP is associated with an advantage in the endowment of factors per inhabitant, and that a disadvantage in TFP is associated with a

disadvantage in the endowment of productive factors per inhabitant. Therefore, these two elements reinforce themselves to explain the distances in well-being.

Catalonia has maintained, over the years 2000-2016, the constituent elements of its GDP per capita distance regarding the EU19 aggregate (Eurozone) relatively stable. The lower overall productivity of the productive factors far exceeds the relative advantage over the whole period in terms of the joint endowment of factors per inhabitant, indicating that the constituent element of the disadvantage in the welfare level with respect to the EU19 is associated with the lower productivity.

In addition, over the years this element has intensified, losing relative disadvantage in terms of TFP and losing relative advantage in terms of the joint endowment of factors per inhabitant. At the same time, the sustaining - as an explanatory element of the distance in well-being - of the relative advantage in the endowment of factors per inhabitant, has taken place with a change in its composition. On the one hand, the positive distance is maintained throughout the period in terms of annual hours per employed person. On the other hand, while the relative disadvantage in terms of the labour-capital ratio is reduced over the years, the relative advantage in terms of the population employment rate has been significantly reduced.

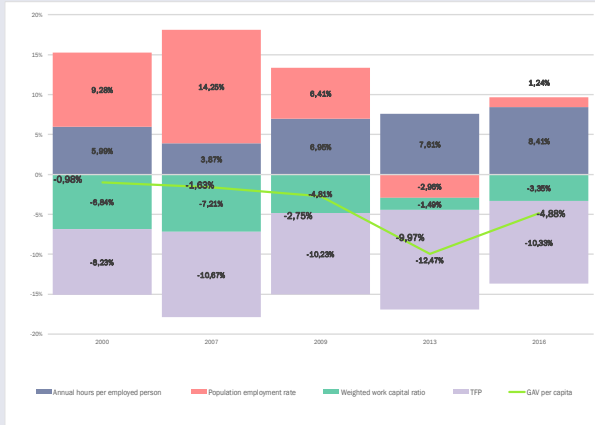
Compared to the United States economy, Catalonia's lower GDP per capita is explained during the period mainly as a result of the relative disadvantage in joint productivity of productive factors. To this first component is added the fact that Catalonia maintains a relatively lower joint endowment of productive factors per inhabitant.

The relative disadvantage of the joint endowment of factors per inhabitant is, in most years, a consequence of a more intensive use of the labour factor by the US economy, while Catalonia maintains a slightly higher labour capital ratio. Thus, both the number of annual hours per employed person and the volume of employed persons per capita are below those in the United States. Counteracting, in part, the two previous effects, Catalonia has a moderately higher level of capital per worker than the United States. Therefore, in aggregate terms, the Catalan economy, despite having a relatively similar level of endowment per inhabitant, although below the United States, cannot transform it into a such high joint productivity of the factors; so productivity is the differential element that explains the distance in GDP per capita from the US economy.

The following graphs show the decomposition of the GDP per capita distance with respect to the EU19 aggregate and to the United States economy.

CHART 7. Decomposition of the GDP per capita distance of Catalonia with respect to the EU19 and the United States, 2000-2016

Decomposition of the GDP per capita distance between Catalonia and the EU19 (Eurozone), 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and the United States, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

With respect to the economies with a higher relative level of well-being than Catalonia, this distance is mainly due to a relative disadvantage in productivity of the factors, although, regarding these economies, Catalonia also maintains a lower endowment of factors per inhabitant -which varies between countries and in some cases is higher. Catalonia has, regarding most of these economies, a relative disadvantage in the labour capital ratio and in the employment per inhabitant rate, whereas it maintains a relative advantage in working hours per employed person.

The following graphs show the decomposition of the GDP per capita distance with respect to the richest countries and with similar population dimensions to those of Catalonia.

CHART 8. Decomposition of the GDP per capita distance of Catalonia with respect to richer countries and with similar population dimensions to Catalonia, 2000-2016

Decomposition of the GDP per capita distance between Catalonia and Norway, 2000-2016



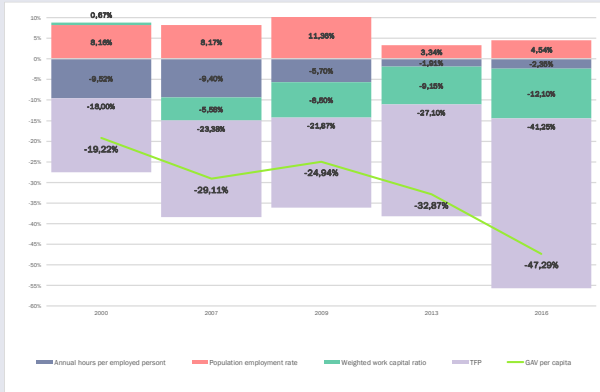
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Switzerland, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Ireland, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Denmark, 2000-2016



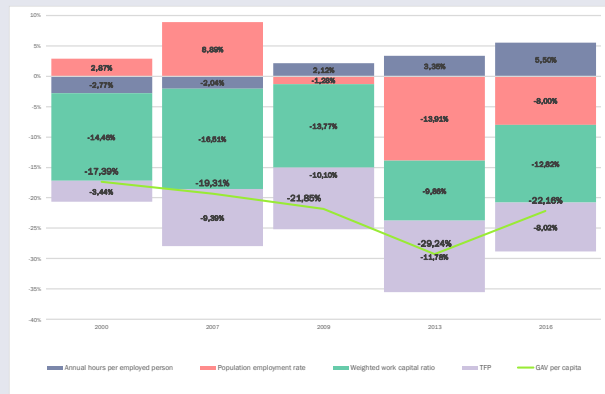
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Sweden, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Austria, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Finland, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Belgium, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

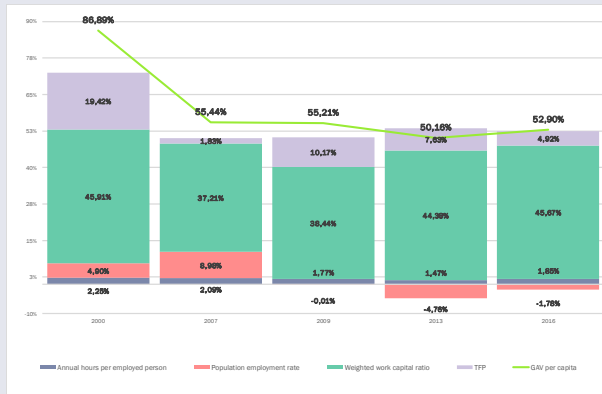
The comparison with the economies with respect to which Catalonia maintains a relative GDP per capita advantage suggests that, in general, this advantage is obtained, more intensively, from the higher endowment of factors per inhabitant than from the advantage of their joint productivity of the factors.

The relative advantage in the endowment of factors per inhabitant is explained mainly by the high positive distance in the labour capital ratio of the Catalan economy, while the relative advantage in terms of employment rate per inhabitant is offset, with respect to most countries, by a relative disadvantage in terms of hours per employed person -indicating that in the Catalan economy the working time is shorter and/or the weight of part-time work is higher- .

The following graphs show the decomposition of the GDP per capita distance with respect to those countries with lower GDP per capita and with similar population dimensions to those of Catalonia, and with respect to Spain.

CHART 9. Decomposition of the Catalan GDP per capita distance with respect to poorer countries and with similar population dimensions to Catalonia, 2000-2016

Decomposition of the GDP per capita distance between Catalonia and Slovenia, 2000-2016



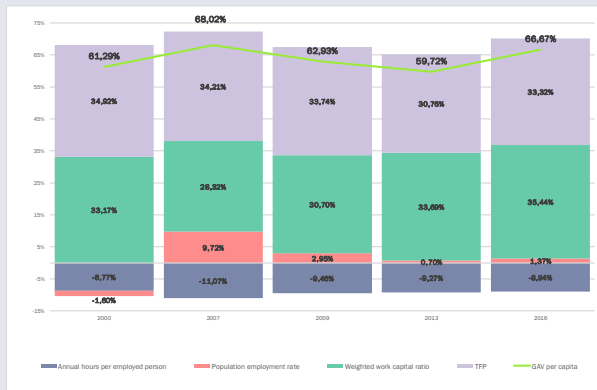
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Greece, 2000-2016



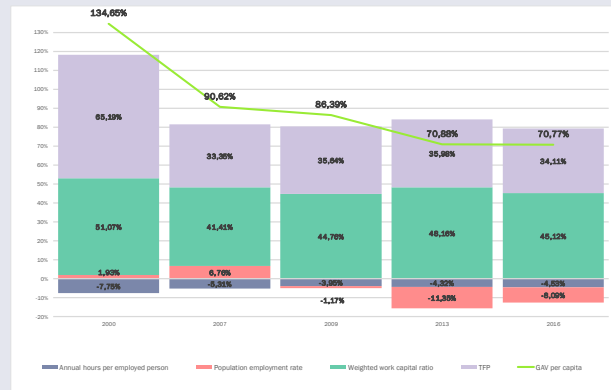
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Portugal, 2000-2016



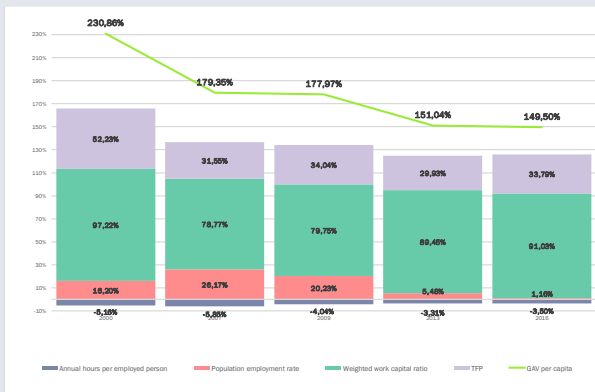
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and the Czech Republic, 2000-2016



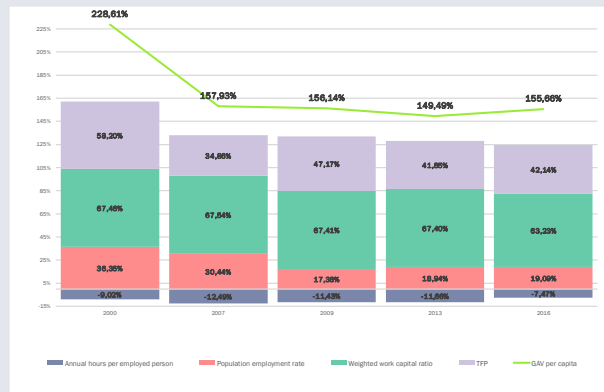
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Hungary, 2000-2016



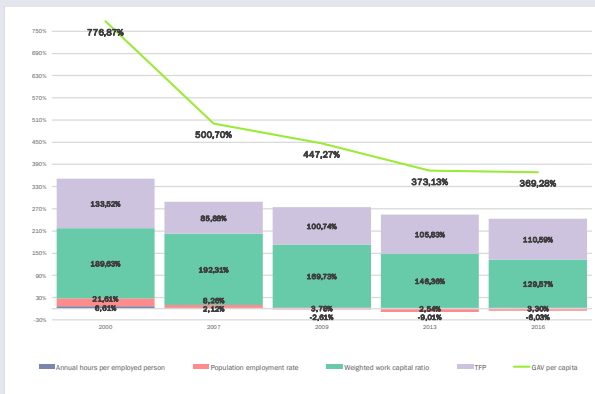
Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Croatia, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Bulgaria, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

Decomposition of the GDP per capita distance between Catalonia and Spain, 2000-2016



Units: distance in percentages.
Source: own elaboration from AMECO, INE, IVIE and Idescat.

The factors that explain the distances in well-being, both with respect to the economies with higher GDP per capita and those with lower GDP per capita, have remained relatively stable over time, although the growth model of the Catalan economy over the analyzed years has been carried out by widening the disadvantages and reducing the advantages, especially in relation to the joint productivity of the factors.

1.2. PRODUCTIVITY AND PRODUCTION MODEL: THE IMPACT ON PRODUCTIVITY OF THE SECTORIAL PRODUCTIVE SPECIALIZATION, THE COMPANY DIMENSION AND THE BUSINESS ADJUSTMENT PROFILE TO THE ECONOMIC CYCLE CONDITIONS. MICROECONOMIC APPROACH, 2001-2013

The second part of the study analyzes the evolution of the Catalan productivity of the production model from a microeconomic approach, through the individual information of Catalan companies with registered office in Catalonia. The analysis is carried out from the accounting data deposited in the Mercantile Registry - exploited by the SABI database - with a total of 1,068,568 observations in the whole period, 2001-2013. This volume of information represents an annual statistical base that on average stands at 77,183 companies per year. In this way, from this exhaustive sample, the evolution of the average apparent productivity of each of the factors is analyzed.

It should be borne in mind that in this part of the analysis:

- The study period is 2001-2013 -so the years of economic recovery from 2014 onwards are left out-
- The data of companies with registered office in Catalonia are analyzed -therefore, the activity of companies with productive units in Catalonia, but with the registered office outside of Catalonia is out of the analysis.
- The activity of the productive units with a corporate form is analyzed -therefore the activity of individual entrepreneurs or of self-employed workers is excluded from the analysis.
- The activity of companies that have the obligation to deposit their accounts and balance sheets in the Mercantile Registry is analyzed - therefore, the activity of the sub-branch of financial intermediation activity (banking), and the activity of the public sector through the Public Administration are excluded from the analysis.
- Therefore, in the branch analysis, although for methodological reasons it is kept in the report, the data from branch 22.Public administrations are not representative of the sector; data from branch 19. Financial and insurance activities are only representative of the insurance sub-branch; while the data in branches 1. Agriculture, livestock, forestry and fisheries (due to the high weight of the autonomous workers) and 23. Other services (because it includes health and public education, which are not covered by the SABI database, and due to the high weight of the self-employed workers in this aggregate of other services) have a low coverage.

The study in the business sector allows us to analyze the impact that the business dimension and the specialization by activity branches of the Catalan productive fabric have on productivity. It also allows to analyze if changes in productivity are derived either from the internal dynamics of each company or respond more to a selection phenomenon led by the inputs or outputs of agents in the market.

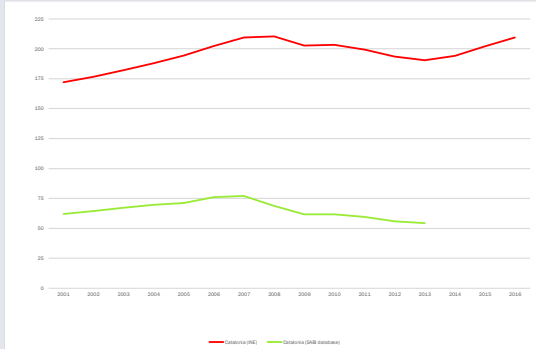
Comparison of the productivity of the Catalan productive fabric of the SABI sample and the national accounting figures of the first part of the report

In general, the aggregate behaviour of the activity and use of productive factors in the Catalan productive fabric of the SABI sample reproduces, with a more pronounced impact of the economic cycle, the GDP and the productive factors evolution obtained in the macroeconomic analysis of the first part of the study (carried out with national accounting data, based on the regional accounts of INE, IVIE and Idescat).

- The Catalan productive fabric represented by the SABI sample has a similar growth to the economy aggregate between 2001-2007, and a clearly more sharp decline during the crisis years, until 2013, which places the GVA levels below the initials in 2001 (whereas in the macroeconomic data the GDP reduction never falls below the levels of 2001).
- The capital accumulation in the SABI sample evolves in a similar way as the net capital stock of the economy as a whole until 2007 -with a relatively sharper increase- whereas it decreases, with more intensity, during the crisis years, placing net capital stock levels below 2007 levels (in aggregate capital stock data from IVIE and Idescat, the crisis slows growth but does not reduce the aggregate capital stock).
- The employment level of the SABI sample also has a more accentuated behaviour in the economic cycle, with a higher growth until 2007 and a sharper decrease during the crisis years in comparison with the INE regional accounting data for Catalonia, which places employment levels below the initial levels in 2001 (whereas in the macroeconomic data the reduction in employment and contracted hours does not fall below 2001 levels) .

CHART 10. Comparison of the evolution of the economic activity level, the capital stock and the labour factor of Catalonia between the data on the Catalan productive fabric of the SABI sample and the macroeconomic data of INE, IVIE and Idescat. Catalonia, 2001-2013

Comparison of the Catalan GDP evolution at 2010 prices (INE) and VAB cf. of the Catalan productive fabric at 2007 prices (SABI database), 2001-2016



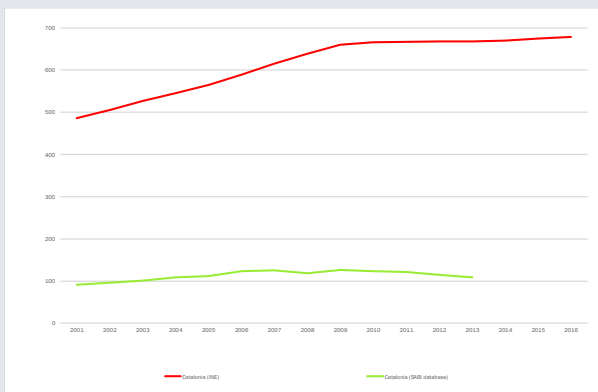
Units: thousands million euros.
Source: own elaboration from INE and SABI database.

Comparison of the Catalan GDP evolution at 2010 prices (INE) and VAB cf. of the Catalan productive fabric at 2007 prices (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE and SABI database.

Comparison of the Catalan capital stock evolution at 2010 prices (INE) and Catalan capital stock of the productive fabric at 2007 prices (SABI database), 2001-2016



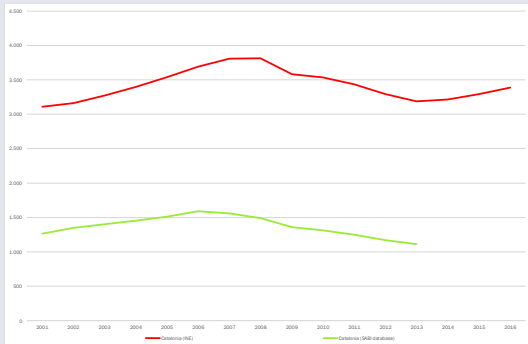
Units: thousands million euros.
Source: own elaboration from INE, AMECO, SABI database, IVIE and Idescat.

Comparison of the Catalan capital stock evolution at 2010 prices (INE) and Catalan capital stock of the productive fabric at 2007 prices (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE, AMECO, SABI database, IVIE and Idescat.

Comparison of the evolution of the number of employed persons in Catalonia (INE) and the number of employed persons in the productive fabric of Catalonia (SABI database), 2001-2016



Units: thousands of people.
Source: own elaboration from INE and SABI database.

Comparison of the evolution of the number of employed persons in Catalonia (INE) and the number of employed persons in the productive fabric of Catalonia (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE and SABI database.

Comparison of the worked hours evolution in Catalonia (INE) and the number of employed persons in the productive fabric of Catalonia (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE and SABI database.

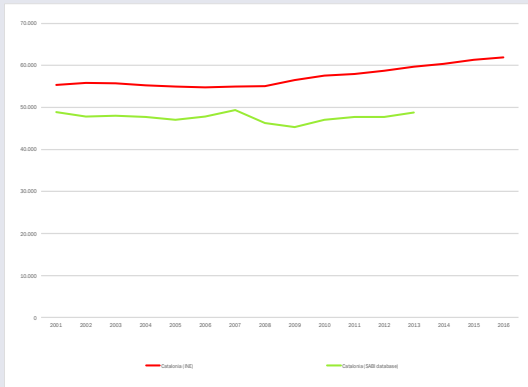
The evolution of productivity per employed person of the SABI database aggregate also shows a similar behaviour to the labour productivity of the economy as a whole of the first part of the study. It remains relatively stable during the years of growth -with a slight increase-, it shrinks until 2009 and thereafter it recovers. However, in the balance for the whole period, the productivity level in terms of work in 2013 is in a similar value to that of 2001 -slightly below.

Productivity in terms of capital also has a similar behaviour to that obtained with macroeconomic data, although with a more pronounced evolution throughout the economic cycle. With a decline during the years of growth until 2007, a sharp fall until 2009 and a relative stability between 2010 and 2013. In the 12-year balance, productivity in terms of capital of the SABI sample aggregate is reduced more strongly than with the macroeconomic data.

Finally, the joint productivity of the productive factors, as a consequence of the labour and capital productivity evolution, shows a sharper reduction during the period than with the macroeconomic data. With a reduction until 2007, a sharp fall until 2009 and a relative recovery until 2013, which puts the joint productivity level below that of 2001.

CHART 11. Comparison of the productivity level evolution in terms of labour, in terms of capital and of the joint productivity of the production factors (TFP) of Catalonia between the data of the Catalan productive fabric of the SABI sample and the macroeconomic data of INE, IVIE and Idescat. Catalonia, 2001-2013

Comparison of the labour productivity evolution (by employed person) of Catalonia at 2010 prices (INE) and the labour productivity (by employed person) of the productive fabric of Catalonia at 2007prices (SABI database), 2001-2016



Units: thousands of people.
Source: own elaboration from INE and SABI database.

Comparison of the labour productivity evolution (by employed person) of Catalonia at 2010 prices (INE) and the labour productivity (by employed person) of the productive fabric of Catalonia at 2007prices (SABI database), 2001-2016



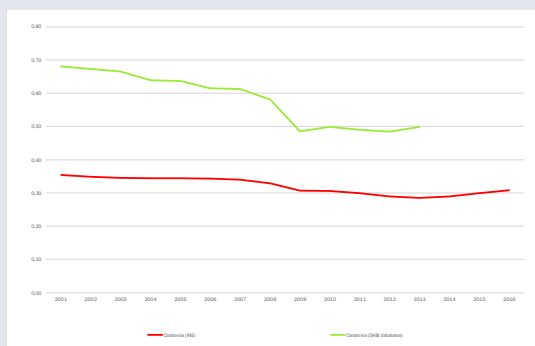
Units: index numbers, 2001 = 100.
Source: own elaboration from INE and SABI database.

Comparison of the labour productivity evolution (per hour) of Catalonia at 2010 prices (INE) and the labour productivity (by employed person) of the productive fabric of Catalonia at 2007prices (SABI database), 2001-2016



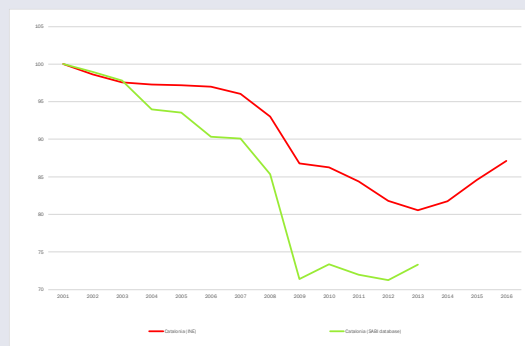
Units: index numbers, 2001 = 100.
Source: own elaboration from INE, SABI database.

Comparison of the capital productivity evolution of Catalonia at 2010 prices (INE) and the capital productivity of the productive fabric of Catalonia at 2007 prices (SABI database), 2001-2016



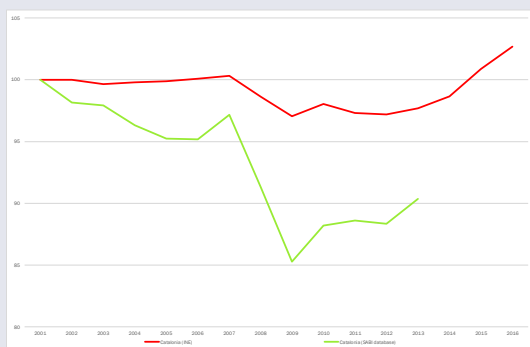
Units: euros per capital unit.
Source: own elaboration from INE, AMECO, SABI database, IVIE and Idescat.

Comparison of the capital productivity evolution of Catalonia at 2010 prices (INE) and the capital productivity of the productive fabric of Catalonia at 2007 prices (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE, AMECO, SABI database, IVIE and Idescat.

Comparison of the joint productivity evolution of the productive factors (TFP) of Catalonia at 2010 prices (INE) and the joint productivity of the productive factors (TFP) of the productive fabric of Catalonia at 2007 prices (SABI database), 2001-2016



Units: index numbers, 2001 = 100.
Source: own elaboration from INE, AMECO, SABI database, IVIE and Idescat.

The impact on productivity of specialization by sectors and activity branches of the Catalan productive fabric

The productive structure of the SABI sample identifies a productive fabric relatively oriented towards service activities, which in 2013 concentrates the majority of production units (69.2% of companies) and production factors (64.8% of employment and 60.4% of installed capacity) and where the main part of economic activity is generated (58.3% of GVA).

Manufacturing activities rank second in importance, with 16.6% of productive units, 25.6% of employed people, 28.0% of installed capital and 31.4% of GVA.

Construction activities appear below. In 2013 they account for 11.0% of companies; they occupy 4.9% of work and 6.0% of installed capital, and generate 4.3 % of GVA.

Energy activities (extractive activities and energy, gas, water, and waste recycling activities) have a smaller weight and, despite being the sector with the lowest percentage of productive units (0.8% of the total), in 2013 they accumulate in the sample 3.7% of the employed people, 4.6% of the installed capital, and generate 4.3% of the GVA.

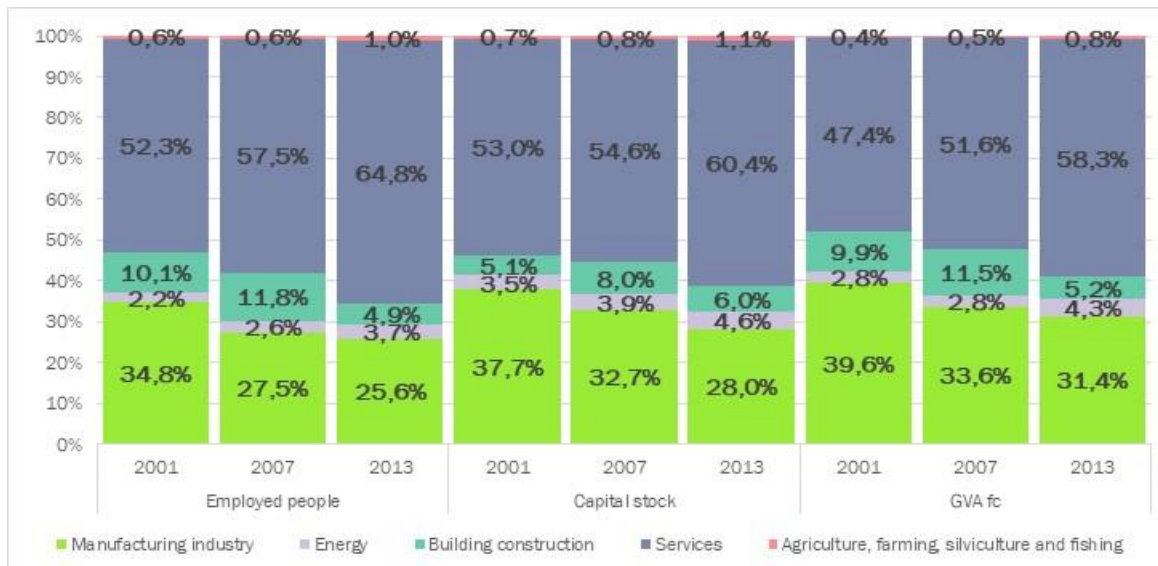
Finally, the agriculture, livestock and fishing activities are those that carry the least weight, with 2.4% of companies, 1.0% of the employed persons, 1.1% of installed capital, and 0.8% of generated GVA.

The Catalan productive fabric shows, over the thirteen years, a clear tendency to a relative specialization of its activity towards the service sector, to a lesser extent towards the energy sector, and a relative stability of the agriculture sector, whereas the activities of the manufacturing and construction industries are losing relative weight.⁴

Between 2001 and 2013, there are increases in the services sector, the energy sector and the agriculture sector, both of the operating companies, of the installed capital, of employment, and of the generated GVA.

This evolution has been detrimental to the activity of the manufacturing and construction sectors, where there is a drop in absolute terms in production units, employment and generated GVA. Installed capital has also fallen in industrial activity as a whole, whereas in construction activity, despite losing employment and generated GVA, the capital stock increases between 2001 and 2013.

CHART 12. Distribution of the number of employed persons, capital stock and GVA generated by large sectors of activity. Sample of the productive fabric of Catalonia (SABI database), 2001, 2007 and 2013



Units: percentages (weight over the total).
Source: own elaboration from the SABI database.

- Productivity levels by sectors of economic activity

⁴ It should be borne in mind that part of the weight loss of the manufacturing industry responds to the outsourcing process to service branches.

Throughout the years 2001-2013, the manufacturing industry shows joint productivity levels of the productive factors clearly above the rest of the productive sectors (around 16% above the average of the SABI sample of the productive fabric). In general, as a result of a higher level of labour productivity than in the rest of the sectors (about 21.5% above the average of the productive fabric) and a capital productivity which is around 5% above average.

The construction sector also shows high levels of joint productivity of the productive factors with respect to other activities, albeit with much more pronounced variability over time (at around 13.6% above the average of the productive fabric of the SABI sample). In general, the construction sector maintains a labour productivity level of about 2.1% above the average, whereas its capital productivity, much higher than in other sectors during the years of growth (around 71%) has declined sharply during the crisis years (period over which it is around 13% above average).

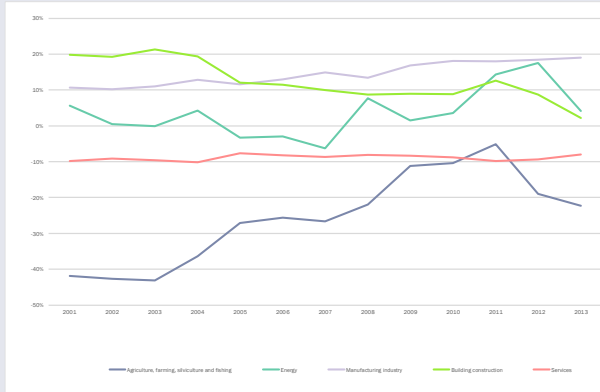
The energy sector shows lower TFP levels, about 3.9% above the economy average, also with relative variability over time. While its labour productivity is in average terms around 19.6% above average, capital productivity is around 18.5% below, with a clear tendency to improve its relative position during the crisis years.

The service sector maintains lower productivity levels than the rest of the sectors (around 9% below the average for the SABI sample of the production fabric) throughout the period, a relatively stable distance over time. In this case, as a result of a labour productivity level around 11% below the average of the economy and a capital productivity level around 6.5% below the average of the economy.

Meanwhile, the agriculture sector maintains a significantly lower level of joint productivity than the rest of the sectors during the whole period (about 30% below the average of the productive fabric of the SABI sample).

CHART 13. Evolution of the relative position of the joint productivity level of productive factors (TFP), of productivity in terms of labour and productivity in terms of capital in relation to the sample average, by activity sectors. Sample of the productive fabric of Catalonia (SABI database), 2001-2013

Joint productivity of the factors by activity sectors. Sample of the productive fabric of Catalonia (SABI database), 2001-2013



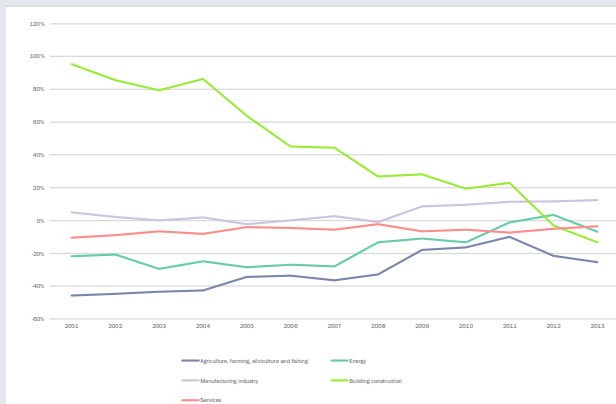
Units: percentages in relation to the total for each year.
Source: own elaboration from the SABI database.

Productivity in terms of labour by activity sectors. Sample of the productive fabric of Catalonia (SABI database), 2001-2013



Units: percentages in relation to the total for each year.
Source: own elaboration from the SABI database.

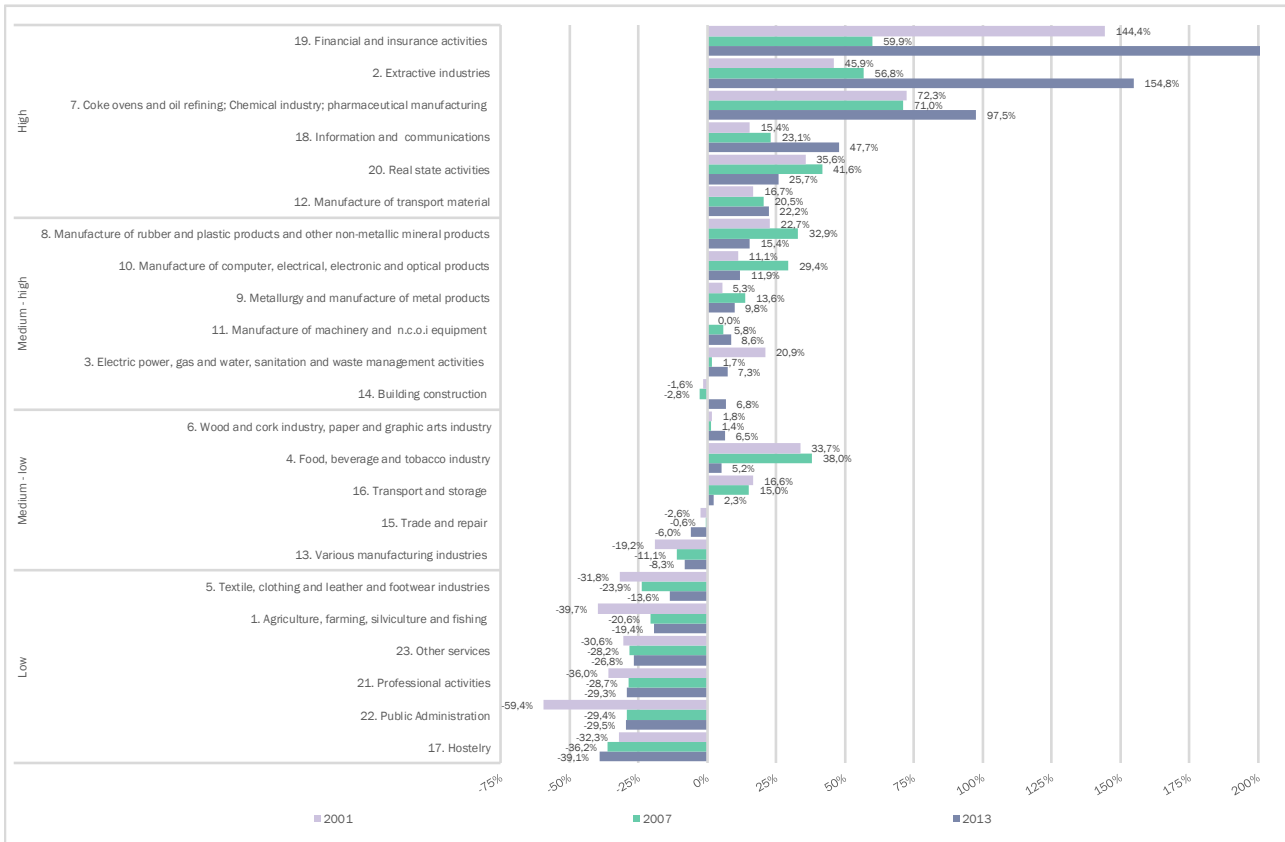
Productivity in terms of capital. Sample of the productive fabric of Catalonia (SABI database), 2001-2013



Units: percentages in relation to the total for each year.
Source: own elaboration from the SABI database.

The following graphs classify activity branches by their level of labour productivity, capital productivity and joint productivity of productive factors (TFP), grouped into 4 groups delimited by the 75th, 50th, and 25th percentile values of the productivity levels.

CHART 14. Evolution of the relative position of the productivity level in terms of labour in relation to the sample average, by branches of economic activity and large sectors. Sample of the productive fabric of Catalonia (SABI database), 2001, 2007 and 2013

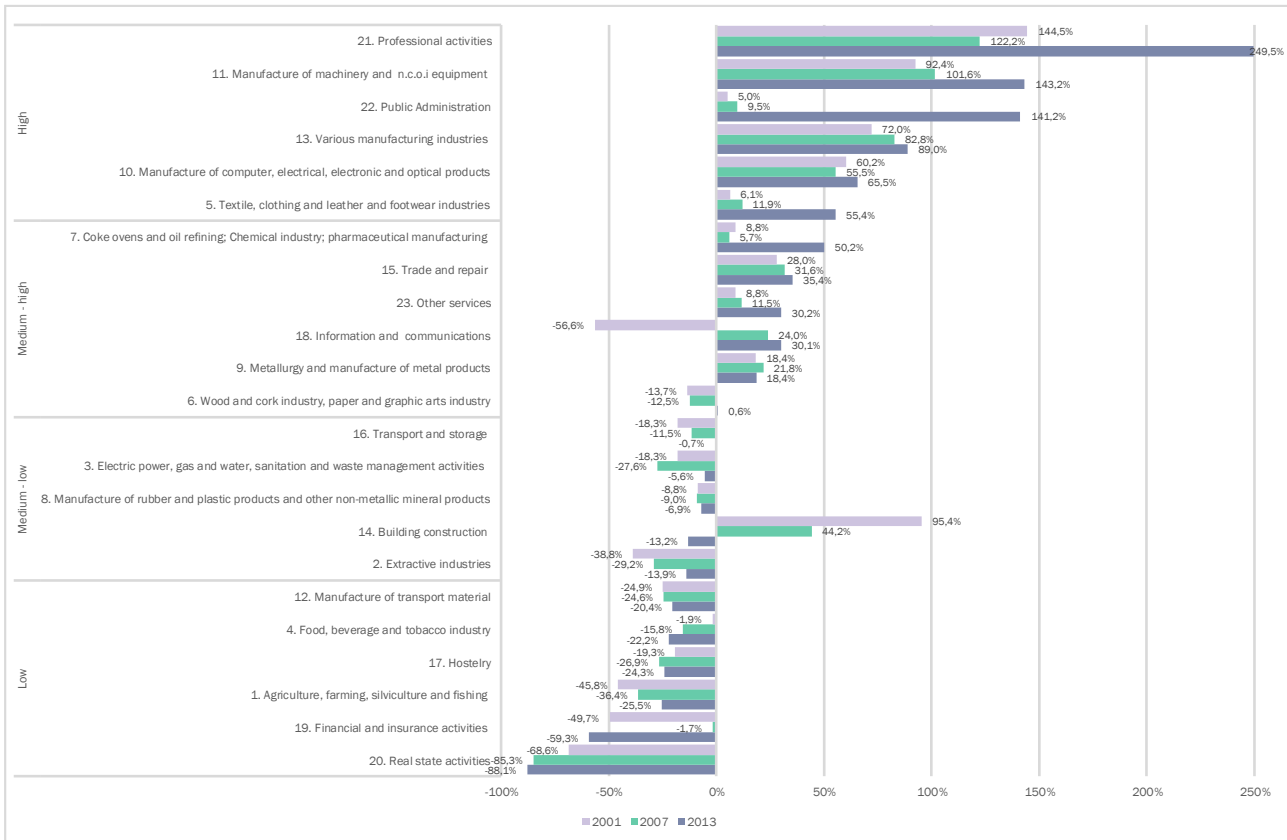


Units: percentages in relation to the total and euros per employed person at 2007 prices.

Note: the data from branch 22. Public administrations are not representative of the sector, although for methodological reasons they are kept in the report; data from branch 19. Financial and insurance activities are only representative of the insurance sub-branch; while the data in branches 1. Agriculture, livestock, forestry and fishing (due to the high weight of self-employed workers) and 23. Other services (because it includes health and public education, that are not included in the SABI database, and due to the high weight of self-employed workers in this aggregate of the other services) have a low coverage.

Source: own elaboration from the SABI database.

CHART 15. Evolution of the relative position of the productivity level in terms of capital, in relation to the sample average, by branches of economic activity and large sectors. Sample of the productive fabric of Catalonia (SABI database), 2001, 2007 and 2013

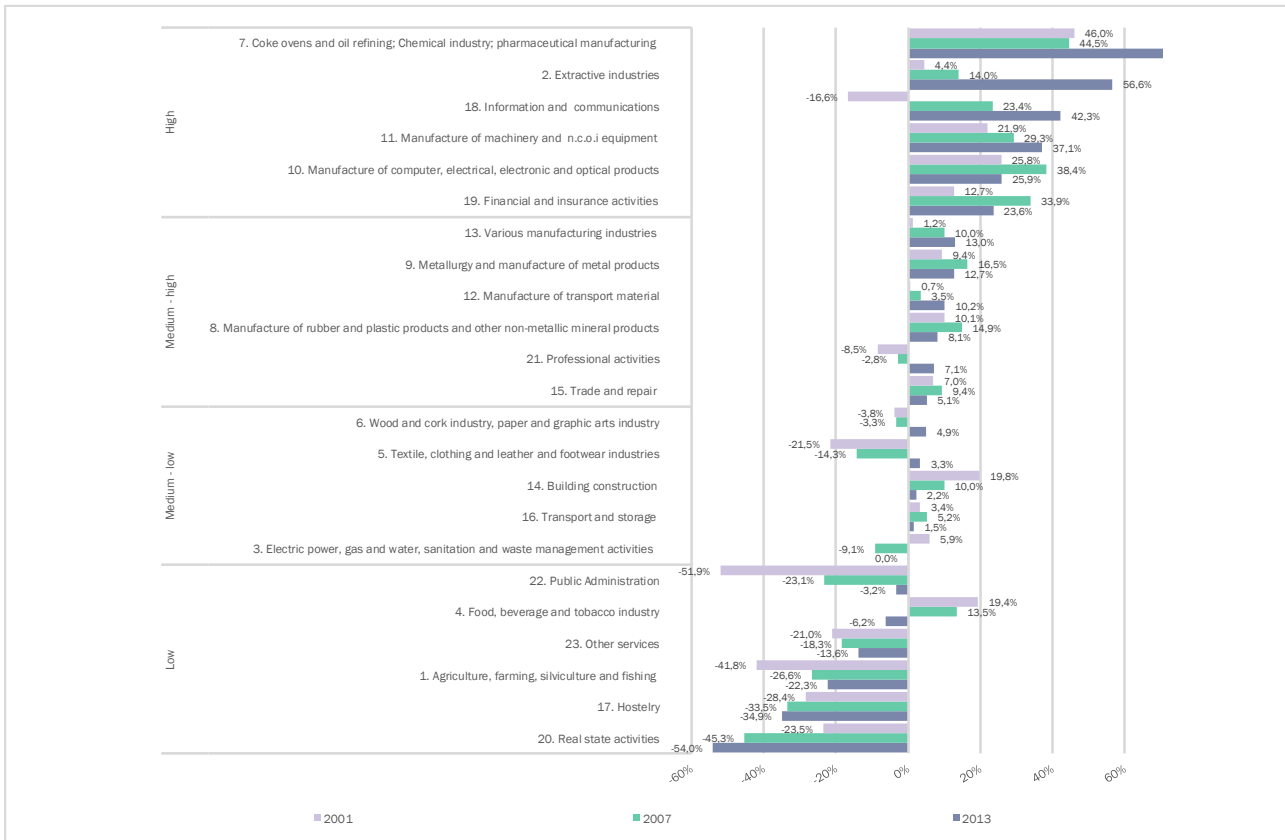


Units: percentages (distance in relation to the sample aggregate for each year).

Note: the data from branch 22. Public administrations are not representative of the sector, although for methodological reasons they are kept in the report; data from branch 19. Financial and insurance activities are only representative of the insurance sub-branch; while the data in branches 1. Agriculture, livestock, forestry and fishing (due to the high weight of self-employed workers) and 23. Other services (because it includes health and public education, that are not included in the SABI database, and due to the high weight of self-employed workers in this aggregate of the other services) have a low coverage.

Source: own elaboration from the SABI database.

CHART 16. Evolution of the relative position of the joint productivity level of the productive factors (TFP) in relation to the sample average, by branches of economic activity and large sectors. Sample of the productive fabric of Catalonia (SABI database), 2001, 2007 and 2013



Units: percentages (distance in relation to the sample aggregate for each year).

Note: the data from branch 22. Public administrations are not representative of the sector, although for methodological reasons they are kept in the report; data from branch 19. Financial and insurance activities are only representative of the insurance sub-branch; while the data in branches 1. Agriculture, livestock, forestry and fishing (due to the high weight of self-employed workers) and 23. Other services (because it includes health and public education, that are not included in the SABI database, and due to the high weight of self-employed workers in this aggregate of the other services) have a low coverage.

Source: own elaboration from the SABI database.

- Evolution of labour productivity, capital productivity and joint productivity of productive factors (TFP) by major sectors of activity.

The SABI sample identifies a virtual stagnation (-0.02 % a. ac.) of productivity measured in labour terms in the whole of the years 2001-2013, with a slight growth (0.16% a. ac.) during the 2001-2007 years, offset by its reduction (-0.22%) during the 2007-2013 crisis.

In the construction sector, the strong growth of the expansion years and the impact of the crisis have left -as happens at an aggregate level- an installed capacity higher than that of 2001, although with employment and generated GVA levels clearly lower than those of the beginning period. This evolution is accompanied by a strong increase in the capitalization of the productive process (+9.7% a. ac.) while capital productivity is intensively reduced (-8.3% a. ac.) and, to a lesser extent, labour productivity increases (+0.6% a. ac.), which is translated into a reduction in the joint productivity of the factors (-2.1% a. ac.).

In the case of the manufacturing industry aggregate, a more modest increase in activity and installed capacity - together with a reduction in employment - during the growth years has also been strongly offset by a rollback in all these variables during the crisis years. This means to have in 2013, compared to 2001, an increase in the production process capitalization (+2.4% a. ac.), and a drop in capital produc-

tivity (-1.8% a. ac.) which is clearly more intense than the increase in productivity measured in labour terms (+0.6% a. ac.) and that means a reduction in the joint productivity of the factors (-0.2% a. ac.).

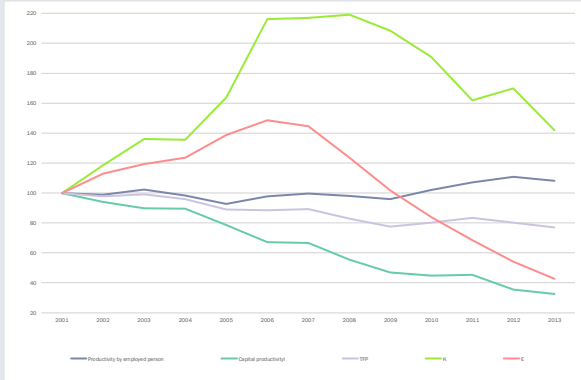
The service companies aggregate of the SABI sample also experiences an increase in its activity and in the use of production factors during the growth period, which is partially offset by its rollback during the crisis years. But, in this case, in 2013 it shows GVA as well as installed capacity and employment levels higher than those in 2001. This growth in the whole period occurs with an increase in the capitalization of the productive process (1.7% a. ac.), while productivity measured in terms of capital is reduced (-1.8% a. ac.) more sharply than the rollback experienced by productivity measured in labour terms (-0.1% a. ac.), which results in a reduction in the joint productivity of the factors (-0.7% a. ac.).

In the case of the aggregate of the companies in the energy sector, it experiences an increase in the activity and use of production factors both in the growth years and in the crisis years. The more modest capitalization process of the production process between 2001 and 2013 (0.5% a. ac.) was accompanied by a more intense reduction in capital productivity (-1.6% a. ac.) than the reduction in labour productivity (-0.5% a. ac.), which is translated into a reduction in the joint productivity of the production factors (-1.0% a. ac.).

Finally, the agricultural sector -also with an increase in the activity and in the use of production factors both in the growth years and in the crisis years- is the only sector that in the whole period accompanies the capitalization process of its productive fabric (+2.2% a. ac.) with an increase in the capital productivity (+0.1% a. ac.) which, in turn, shows an increase in productivity measured in labour terms (+2.2% a. ac.). These two increments are translated into an increase in the joint productivity of production factors (+1.6% a. ac.). It should be borne in mind that the SABI sample collects a relatively small percentage of the branch activity and, therefore, that these results may not be representative of the sectoral aggregate.

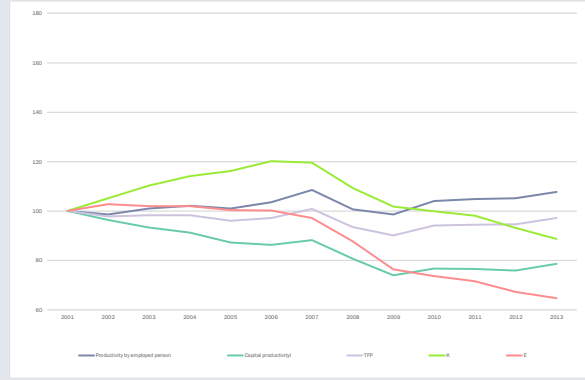
CHART 17. Evolution of labour productivity (per employed person), productivity in terms of capital, joint factor productivity (TFP), employed persons and capital stock by major sectors of activity. Sample of Catalonia's productive fabric (SABI database), 2001-2013

Construction. Sample of Catalonia's productive fabric (SABI database), 2001-2013



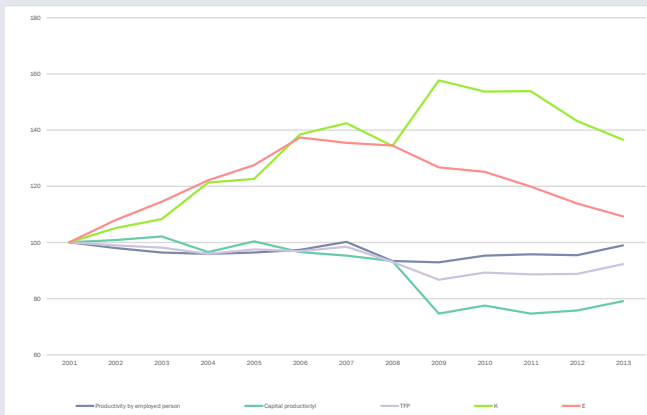
Units: index numbers 2001 = 100 of the values at 2007 prices.
 Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
 Source: own elaboration from the SABI database.

Manufacturing industry. Sample of Catalonia's productive fabric (SABI database), 2001-2013



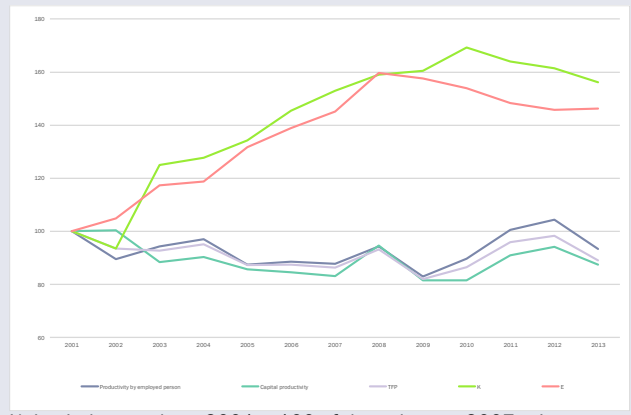
Units: index numbers 2001 = 100 of the values at 2007 prices.
 Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
 Source: own elaboration from the SABI database.

Services. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Units: index numbers 2001 = 100 of the values at 2007 prices.
 Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
 Source: own elaboration from the SABI database.

Energy. Sample of Catalonia's productive fabric (SABI database), 2001-2013



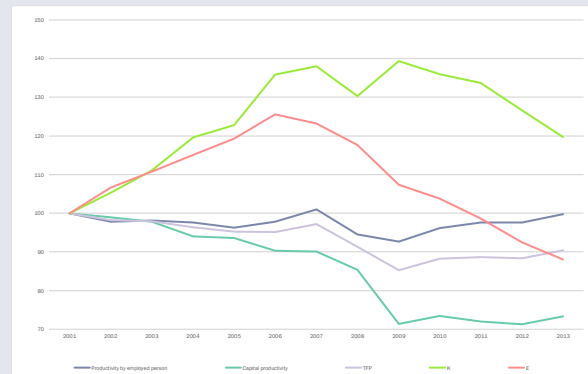
Units: index numbers 2001 = 100 of the values at 2007 prices.
 Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
 Source: own elaboration from the SAP database.

Agriculture, livestock, forestry and fishing. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
Source: own elaboration from the SABI database.

Total economy. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Units: index numbers 2001 = 100 of the values at 2007 prices.
Note: TFP = Joint Factor Productivity, K = Capital Stock; and E: Employed persons.
Source: own elaboration from the SABI database.

- The evolution of capital productivity by activity branches

One of the featured elements in the sample is the negative evolution of capital productivity, not only during the crisis years - where despite the disinvestment caused by the loss of many productive units, a certain reduction in capital productivity is to be expected, associated with an underutilization of installed capital as a consequence of the decrease in demand - but also during the economic growth years.

The relatively intense drop in capital productivity (-26.7%) in the whole 2001 to 2013 period responds fundamentally to the negative impact of the rollback in GVA per installed capital unit in most activity branches (16 of 22 industries) that in the shift-share analysis is identified with an intra-sectoral negative effect of -18.5%.

Sectoral specialization has helped to intensify this fall (negative structural effect of -8.2%), both due to a relative tendency of installed capital to gain weight in those branches with a lower level of capital productivity (negative static structural effect of -3.2%), and to a relative tendency for capital productivity to drop more intensely in the branches where it gains weight (negative dynamic structural effect of -4.9%).

The evolution of the productive fabric throughout these thirteen years is characterized by a relative concentration of the productive factors -especially the capital factor- towards the groups of medium-low and low productivity of capital, where the capital accumulation process is more intense, going from concentrating 47.4% of the installed capital in 2001 to concentrate 55.6% in 2013 and where the weight of employment also increases, albeit to a lesser extent, from 30,1% to 32.1%, while the activity generated by these two groups remains relatively stable, going from 34.2% of the total GVA to 34.0%.

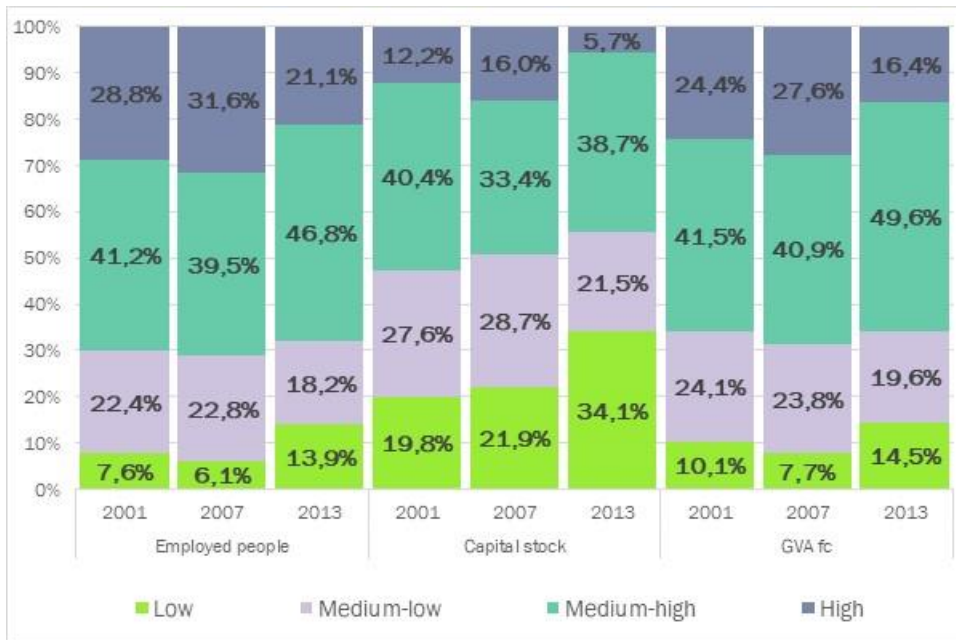
This behaviour occurs both in the years of expansion - with some nuance - and in those of crisis.

Between 2001-2007, in a context where installed capital grew with intensity (38.8%) in the vast majority of branches (20 out of 23), the rollback in GVA per capital unit (from -9.9%) is mainly explained by the drop in this productivity in 19 of the 23 activity branches (negative intrasectoral effect of -6.0%). At the same time, the sectoral capital specialization contributes to the productivity fall (negative sectoral

effect of -3.9%) as a result of two opposite effects. During these years, there is a relative tendency for capital to concentrate on the branches with the highest productivity (positive static structural effect of 5.1%), although this effect is more than offset by the tendency that the branches that win more weight are those where the fall in capital productivity is higher or its growth is minor (negative dynamic structural effect of -9.0%).

During the crisis years, with a drop in installed capital of 13.2%, which takes place in most branches (18 of the 23 branches), there is a more intense rollback in capital productivity, from 18.6%, mainly dominated by the drop in productivity in 18 of the 23 activity branches (negative intrasectoral effect of -12.6%). In these years, the sectoral specialization effect of capital also contributes to lower productivity (negative structural effect of -6.0%), both due to a relative capital specialization –because of a lesser adjustment than that of the economy average- towards those branches with lower productivity (negative static structural effect of -2.0%), and to the fact that the sectors where installed capital increases its relative weight are those where capital adjustment is highest (negative dynamic structural effect, -4.0%).

CHART 18. Distribution of the number of employed persons, capital stock, and GVA in fc by branches of activity grouped by capital productivity levels. Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013



Units: percentages (weight over the total).
Source: own elaboration from the SABI database.

- Labour productivity evolution by branches of activity

Labour productivity shows a relative stagnation in the aggregate of the productive fabric throughout all these years (with a slight reduction), as a consequence of a modest growth in the expansion years and a slight reduction in the crisis years.

The slight reduction in labour productivity (-0.3%) in the period as a whole is mainly a consequence in the evolution of specialization by activity branches of the labour factor (which the shift-share analysis identifies with a negative structural effect of -2.9%). This relative specialization towards lower productivity branches or worse relative behaviour of labour productivity more than compensates the increase in labour productivity that takes place in 15 of the 23 activity branches (positive intrasectoral effect of 2.6 %).

The evolution of the productive fabric of the sample throughout these thirteen years is characterized by a relative concentration of the productive factors and the generated GAV towards the groups of branches of low and medium-low labour productivity. The volume of employed persons concentrated on branches of low and medium-low labour productivity in 2013 is 0.9% higher than in 2001, rising from 63% in 2001 to 73.2% in 2013. At the same time, the capital accumulation process, with a growth in the capital stock of 44.3% between 2001 and 2013, is directed more intensely towards this group of branches, which goes from concentrating 39.9% of the installed capital of the sample in 2001 to concentrate 48.1% in 2013, while, with a modest growth of 1.7% of the GVA of all the sample, these branches go from generating 53.8% of GVA to generate 62.4 %.

The negative impact of the sectoral specialization evolution on labour productivity has been clearly more intense in the years of economic growth than in those of crisis.

During the 2001-2007 years, in a growth context of 23.1% of employment, labour productivity experienced a slight growth of 1.0%. In 18 of the 23 branches, labour productivity increases (with a positive intrasectoral effect of 3.6%). This growth is largely offset by the negative impact of the evolution of the sectoral labour specialization (negative sectoral effect of -2.6%), both due to the tendency of the labour weight to grow in branches of lower productivity (negative static sectoral effect of -2.3%), as, to a lesser extent, by the fact that the branches where the weight of labour grows more experience less growth in productivity or its reduction (negative dynamic sectoral effect of -0, 8%).

The economic growth during these years (2001-2007) is characterized by a relative concentration of productive factors towards the groups of medium-low and low productivity branches, where the employment weight increases from 63.8% to 68.3%, and where the capital accumulation process is most intensely directed, going from concentrating 39.9% of installed capital to concentrate 44.9%, while the activity generated by these branches goes from 53.8% of total GVA to 59.1%.

During the crisis, the productivity fall (-1.2%) responds more intensely to the increase in the number of branches where labour productivity falls; productivity falls in 10 of the 23 branches (with a negative intrasectoral effect of -1.2%).

In these years, with an adjustment of the labour factor of 28.5%, the impact of the evolution of the employment sectoral specialization, although negative, becomes practically null (slightly negative structural effect of -0.02%), with a slight increase in the labour weight in the least productive branches (slightly negative static structural effect of -0.5%), offset by a slight growth, more intense in the branches that gain weight (slightly positive dynamic structural effect of 0.5 %).

CHART 19. Distribution of the number of employed persons, capital stock, and GVA in fc by branches of activity grouped by labour productivity levels. Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013



Units: percentages (weight over the total).
Source: own elaboration from the SABI database.

- Evolution of the joint productivity of production factors (TFP) by activity branches.

As a result of the evolution in labour and capital productivity, the joint productivity of the factors (TFP) has decreased over the period by 9.6% (-0.84% a. ac.), with a decrease of 2.8% (-0.48% ac.) during the growth years, which intensifies itself during the crisis years, with a fall of 7.0% (-1.20% a. ac.) -in part associated with the underutilization of productive capacity-.

The economic balance of the thirteen analyzed years shows a productive fabric that despite having an installed capital of 19.7% (1.51% a. ac.) higher than in 2001, the impact of the crisis leaves in 2013 with an economic activity 12.2% (-1.08% a. ac.) lower than that generated in 2001 and which at the same time occupies a labour volume of 12.0% (-1, 06% a. ac) lower, with an intense reduction in capital productivity (-2.55% a. ac.) and, to a lesser extent, with a stagnation or reduction in labour productivity (-0,02% a. ac.), which is translated into a reduction in TFP (-0.84% ac).

The analysis by activity branches shows how this general behaviour, although it is identified with the behaviour of most manufacturing, construction, and service branches, cannot be generalized to all productive activities.

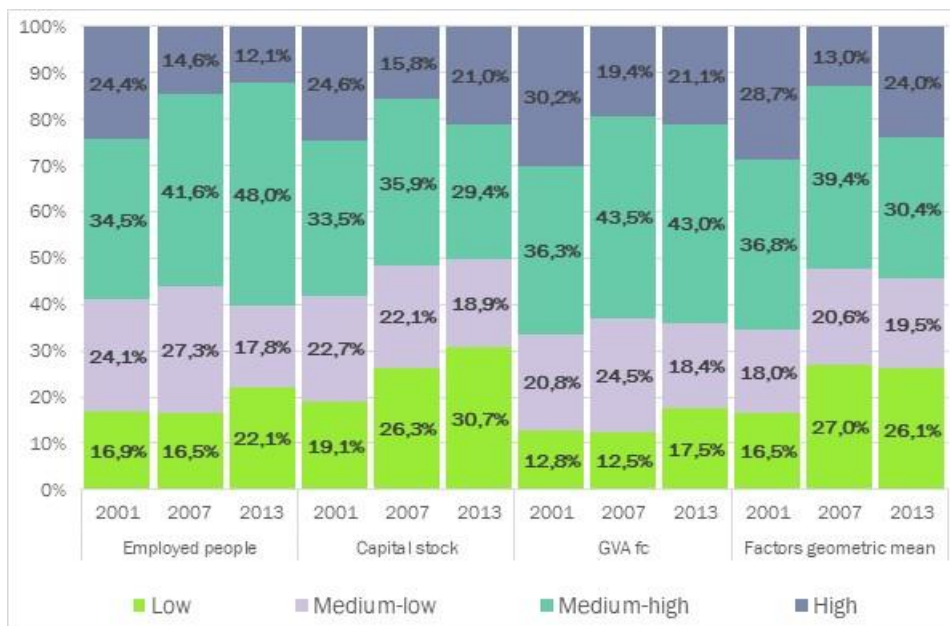
The reduction in the joint productivity of production factors occurs in 14 of the 23 activity branches: in the aggregate of the manufacturing industry branches (in 6 of the 10 industrial branches), in the aggregate of the services branches (in 6 of the 9 service branches), in construction and in the aggregate of the energy branches (in 1 of the 2 energy branches).

The evolution of the productive fabric of the sample over these thirteen years is characterized by a relative concentration of the capital factor and the generated GAV towards the group of low and medium-low joint productivity of the factors, while the labour factor maintains its distribution relatively more stable. In 2013, the volume of employed persons was 12.0% lower than in 2001 and concentrates 39.9% in branches with low and medium-low joint productivity, while in 2001 this percentage was 41.0%. At the same time, the capital accumulation process, with a growth in the capital stock of 19.7% between

2001 and 2013, is directed more intensely towards this group of branches, which goes from concentrating 41.8% of installed capital from the sample in 2001 to concentrate 49.6% in 2013. This makes that the weighted aggregate of production factors goes from having a weight of 34.5% in 2001 to 45.7% in 2007 in the low and medium low TFP branches, while, with a 12.2% reduction in the GAV of all samples, these branches go from generating 33.5% of GAV to generate 35.9%.

Thus, the reduction in technical efficiency of the Catalan productive fabric as a whole between 2001 and 2013 is produced both by a reduction in TFP in most branches of activity (in 14 of the 23 branches), as well as by a relative sectoral specialization of the production factors towards activities of low or medium low productivity, especially the capital factor.

CHART 20. Distribution of the number of employed persons, capital stock, GVA in fc and weighted factors by branches of activity grouped by joint productivity levels of the productive factors (TFP). Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013



Units: percentages (weight over the total).
 Source: own elaboration from the SABI database.

The following table identifies the behaviour by activity branches (and the sectoral aggregates) of labour productivity, capital productivity and the joint productivity of productive factors throughout the years 2001-2013.

TABLE 1. Classification by activity branches of the productive fabric according to the productivity growth model. Sample of Catalonia's productive fabric (SABI database), 2001-2013

	TFP Reduction		TFP Increase	
	Reduction of labour productivity and capital productivity	Increase in labour productivity smaller than capital productivity reduction	Increase in labour productivity greater than capital productivity reduction	Increase of labour productivity and capital productivity
GAV reduction	Total 4. Food, beverage and tobacco industry 8. Manufacture of rubber and plastic products and other non-metallic mineral products 15. Trade and repair 16. Transport and storage 20. Real state activities	Manufacturing industry 6. Wood and cork industry, paper and graphic arts industry 9. Metallurgy and manufacture of metal products 10. Manufacture of computer, electrical, electronic and optical products 12. Manufacture of transport material 14. Building construction	11. Manufacture of machinery and n.c.o.e.i equipment 13. Various manufacturing industries	5. Textile, clothing and leather and footwear industries
GAV increase	Energy Services 3. Electric power, gas and water, sanitation and waste management activities 17. Hostelry	19. Financial and insurance activities 23. Other services		1. Agriculture, farming, silviculture and fishing 2. Extractive industries 7. Coke ovens and oil refining; Chemical industry; pharmaceutical manufacturing 18. Information and communications 21. Professional activities 22. Public Administration

Note: branch 22. Public administration is not representative of the sector, although it is kept in the study for methodological reasons.
 Source: own elaboration from the SABI database.

During the growth years (2001-2007), a more intense increase occurs in the installed capacity (5.5% a.ac) than in employment (3.5% a. ac.), with an increase in the labour productivity (0.16% a. ac) and a reduction in capital productivity (-1.72% a. ac.) that is translated into a reduction in the joint productivity of the production factors (-0.48% a. ac).

The TFP reduction takes place in 10 of the 23 activity branches: in the service branches aggregate (in 4 of the 9 service branches), in construction, in the energy aggregate (in 1 of the 2 energy branches) and 4 of the 10 branches of the manufacturing industry. Meanwhile, in most activity branches (in 13 of the 23) there is an increase in the joint productivity of the factors: in agriculture, livestock and fishing, in 1 energy branch, in the industry manufacturing aggregate branches (in 6 of the 10 industrial branches), and in 5 of the 9 service branches.

The evolution of the sample productive fabric between 2001 and 2007 is characterized by a relative concentration of the production factors and the generated GAV towards the group of low and medium-low labour productivity branches. In 2001 employment, with a growth of 23.1% between 2001 and 2007, concentrated a 41.0% in branches of low and medium-low labour productivity, while in 2007 this percentage was 43.7%. At the same time, capital accumulation process, with a growth of 38.0% in capital stock between 2001 and 2007, is directed more intensely towards this group of branches, which moves from concentrating 41.8 % of capital installed from the sample in 2001 to concentrate a 48.4% in 2007. This makes that the weighted aggregate of the productive factors goes from having a weight of 34.5% in 2001 to 47.6% in 2007 in the low and medium low TFP branches while, with a growth of 24.4% of the GAV of all samples, these branches go from generating 33.5% of GVA to generate 37.1%.

Therefore, the rollback in the technical efficiency of the aggregate of the productive fabric during the growth years responds more to a composition effect associated with a relative sectoral specialization of the production factors towards activities of low or medium low productivity than to the TFP reduction in each activity branch, which as we have seen increases in most branches.



The following table identifies the behaviour by activity branches (and the sectoral aggregates) of labour productivity, capital productivity, and the joint productivity of productive factors throughout the years 2001-2007.

TABLE 2. Classification by activity branches of the productive fabric according to the model of productivity growth. Sample of Catalonia's productive fabric (SABI database), 2001-2007

	TFP Reduction		TFP Increase	
	Reduction of labour productivity and capital productivity	Increase in labour productivity smaller than capital productivity reduction	Increase in labour productivity greater than capital productivity reduction	Increase of labour productivity and capital productivity
GAV reduction		12. Manufacture of transport material	5. Textile, clothing and leather and footwear industries 10. Manufacture of computer, electrical, electronic and optical products	19. Financial and insurance activities (labour productivity reduction)
GAV increase	Energy 3. Electric power, gas and water, sanitation and waste management activities 14. Building construction 16. Transport and storage 17. Hostelry	Total Services 4. Food, beverage and tobacco industry 6. Wood and cork industry, paper and graphic arts industry 7. Coke ovens and oil refining; Chemical industry; pharmaceutical manufacturing 15. Trade and repair 20. Real state activities	Manufacturing industry 8. Manufacture of rubber and plastic products and other non-metallic mineral products 9. Metallurgy and manufacture of metal products 11. Manufacture of machinery and n.c.o.e.i equipment 13. Various manufacturing industries 21. Professional activities 23. Other services 22. Public administration	1. Agriculture, farming, silviculture and fishing 2. Extractive industries 18. Information and communications

Note: branch 22. Public administration is not representative of the sector, although it is kept in the study for methodological reasons.
Source: own elaboration from the SABI database.

Finally, in the crisis years (2007-2013) a more intense reduction takes place in employment (-5.44% a. ac.) than in installed capital capacity (-2.34% a. ac.), with an intense reduction of productivity in capital terms (-3.38% a. ac.) and to a lesser extent of labour productivity (-0.21% a. ac.), which is translated into a significant rollback in the joint productivity of production factors (-1.20% a. ac.).

This evolution also occurs in most of the manufacturing and service industry branches. And a reduction in the joint productivity of the productive factors is observed in most activity branches (15 of the 22): in 7 of the 10 manufacturing industry branches, in construction, in 6 of the 9 services branches and in agriculture, livestock, forestry and fishing.

During the crisis years, the productive fabric of the sample is characterized by a relative stability in the distribution of the production factors and the generated GVA in the classification of the branches according to the TFP levels. Thus, employment is reduced a 28.5%, going from a concentration of 43.7% in branches of low and medium-low labour productivity in 2007 to 39.9% in 2013. At the same time, the capital accumulation process, with a 13.2% reduction in the capital stock between 2007 and 2013, changes from concentrating a 48.4% of the sample capital in 2007 in these branches to concentrate the 49.6% in 2013. This makes the weighted aggregate of productive factors go from having a weight of 47.6% in 2007 to 45.6% in 2013 in groups of branches of low and medium low TFP, while with a 29.4% reduction in the GVA of all samples, these branches go from generating 37.1% of GVA to generate 35.9%.

Therefore, the aggregate reduction in the technical efficiency of the productive fabric during the crisis years occurs, fundamentally, due to its evolution within each branch, while no significant change in the composition of the productive fabric is detected.

The following table identifies the behaviour by activity branches (and of the sectoral aggregates) of labour productivity, capital productivity, and the joint productivity of the productive factors throughout the years 2007-2013.

TABLE 3. Classification by activity branches of the productive fabric according to the model of productivity growth. Sample of Catalonia's productive fabric (SABI database), 2001-2013

	TFP Reduction		TFP Increase	
	Reduction of labour productivity and capital productivity	Increase in labour productivity smaller than capital productivity reduction	Increase in labour productivity greater than capital productivity reduction	Increase of labour productivity and capital productivity
GAV reduction	Total Manufacturing industry Services 4. Food, beverage and tobacco industry 8. Manufacture of rubber and plastic products and other non-metallic mineral products 9. Metallurgy and manufacture of metal products 10. Manufacture of computer, electrical, electronic and optical products 15. Trade and repair 16. Transport and storage 17. Hospitality 20. Real state activities	11. Manufacture of machinery and n.c.o.e.i equipment 12. Manufacture of transport material 13. Various manufacturing industries 14. Building construction 23. Other services	2. Extractive industries 6. Wood and cork industry, paper and graphic arts industry	5. Textile, clothing and leather and footwear industries 7. Coke ovens and oil refining; Chemical industry; pharmaceutical manufacturing 21. Professional activities (labour productivity reduction)
GAV increase		1. Agriculture, farming, silviculture and fishing 19. Financial and insurance activities	18. Information and communications	Energy 3. Electric power, gas and water, sanitation and waste management activities 22. Public administration (labour productivity reduction)

Note: branch 22. Public administration is not representative of the sector, although it is kept in the study for methodological reasons. Source: own elaboration from the SABI database.

The incidence of the company dimension on productivity

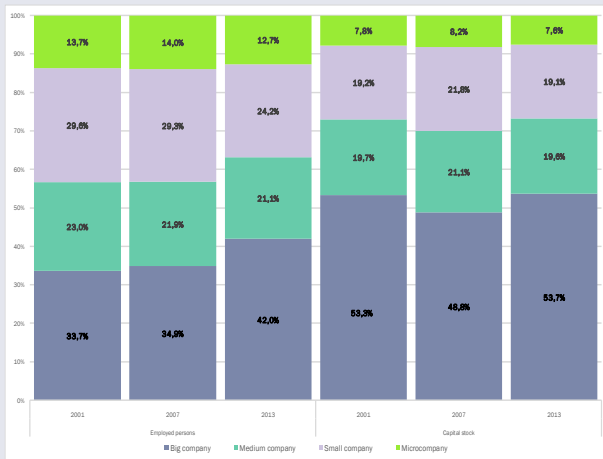
The smallest production units have a clearly predominant weight in the Catalan production fabric of the SABI sample. Not only because of the relative importance of microenterprise and small business, but also because of the relatively small average size within each group compared to the limits set by standard definitions.

However, the large company is the dimension that concentrates the most important volume of both the generated activity and the productive factors throughout the entire period - between 30% and 50% - followed by small and medium-sized companies, each concentrating a similar weight of both productive activity and productive factors -between 20% and 30% -, while microenterprises, despite having the largest volume of productive units, concentrate throughout the period between 15% and 7% of both productive activity and production factors.

- While during the years of growth the distribution of activity and production factors among company dimensions remains relatively stable -with similar growth in activity, employment and installed capital in the different dimensions -, from the crisis period the productive fabric of the sample identifies a more intense adjustment of the production factors and activity in the smallest dimensions and a greater resilience of the large company to the crisis impact - which in 2013 began to generate 48,7% of the activity, and concentrates 53.7% of the productive capacity, as well as 42.0% of employment. At the same time, in the other three dimensions there is a slight relative loss of weight both in terms of GVA, installed capital, and contracted employment.

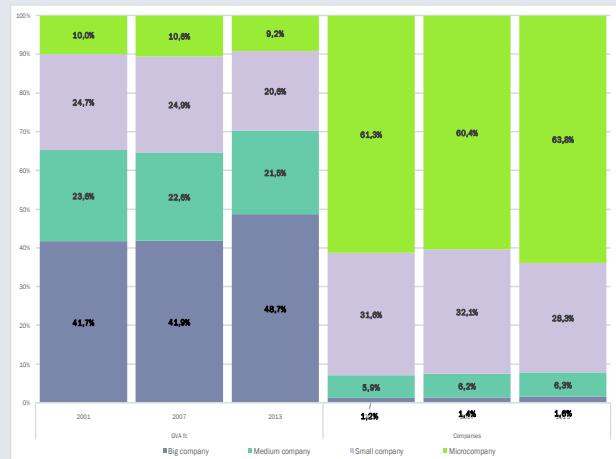
CHART 21. Distribution of the number of employed persons, capital stock, generated GVA at factor cost and number of companies by company size. Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013

Distribution of employed persons and capital stock by company size. Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013



Units: percentages (weight on the total).
Source: own elaboration from the SABI database.

Distribution of GVA cf and companies by company size. Sample of Catalonia's productive fabric (SABI database), 2001, 2007 and 2013



Units: percentages (weight on the total).
Source: own elaboration from the SABI database.

The analysis of the productive fabric of the SABI sample by company size identifies, in general terms, that:

- The productivity level in terms of labour increases with the company size.

Throughout the 2001-2013 years, the labour productivity of large companies remains between 15% and 26% above the total sample of the Catalan productive fabric; that of the medium-company remains between 1% and 5% above; that of the small company remains between 13% and 17% below; and the work productivity of the microenterprise is between 24% and 30% below.

The productivity level in terms of capital decreases with the company dimension.

Throughout the 2001-2013 years, the capital productivity of large companies remains between 9% and 29% below the average of the sample of the Catalan productive fabric; medium-sized companies are between 6% and 20% above; small companies are between 7% and 29% above; and the microenterprise capital productivity is between 21% and 31% higher.

- At the same time, the labour capital relationship with the company dimension also increases.
- Throughout the 2001-2013 years, large companies remain between 55% and 27% above the labour capital ratio of the entire sample of the Catalan productive fabric; medium companies are between 2% and 15% below; small companies are between 20% and 36% below; and microenterprises are between 38% and 44% below.

- The combination of these elements means that in the Catalan productive fabric of the SABI sample the joint productivity level of the productive factors (TFP) increases with the company size.

The joint productivity of the productive factors is higher in the large company, keeping its values in average terms for the period as a whole between 6% and 9% higher than the average joint productivity of the entire sample. The medium-sized company also shows a level of technical efficiency clearly above the sample mean, with its level of joint productivity of production factors being between 5% and 6% higher than those of the sample as a whole, while the joint productivity indicator for small companies identifies a level of technical efficiency between 6% and 9% lower in relation to the sample mean. And in the case of micro-enterprises, the data from the SABI sample indicate that it is the company dimension with the least relative efficiency, where the indicator of joint productivity is between 14% and 18% lower than the set of companies in the sample.

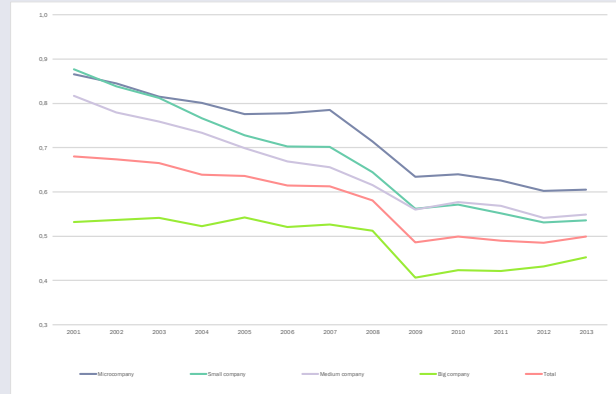
CHART 22. Comparison of the labour productivity levels (per employed person), the capital productivity, the labour capital ratio (per employed person) and the joint productivity of productive factors (TFP) by company size. Sample of Catalonia's productive fabric (SABI database), 2001-2013

Labour productivity levels (per employed person) by company size. Sample of Catalonia's productive fabric (SABI database), 2001-2013



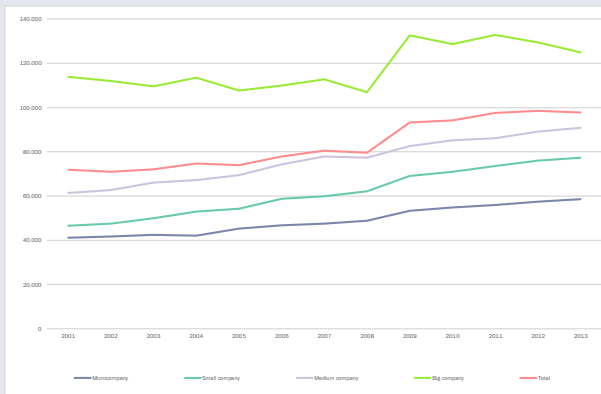
Units: euros per employed person at 2007 prices.
Source: own elaboration from the SABI database.

Levels of capital productivity by company size. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Units: euros per employed person at 2007 prices.
Source: own elaboration from the SABI database.

Levels of the working capital ratio (per employed person) by company size. Sample of Catalonia's fabric of Catalonia (SABI database), 2001-2013



Units: euros per employed person at 2007 prices.
Source: own elaboration from the SABI data base.

Levels of joint productivity of productive factors (TFP) by company size. Sample of Catalonia's fabric of Catalonia (SABI database), 2001-2013



Units: TFP relative index. Catalonia 2007=100.
Source: own elaboration from the SABI database.

- In parallel, broadly speaking, the four company dimensions lose technical efficiency throughout the analyzed period and maintain their relative position in terms of joint productivity (TFP).
- The analysis by company size reinforces the argument according to which the loss of technical efficiency related to the productive fabric of the sample - associated with the sharp fall in capital productivity and the stagnation or modest growth in productivity in labour terms- answers, in general terms, to characteristics affecting the different company types, regardless of their size, although a less intense reduction in TFP is detected in large companies, mainly because it is where capital productivity has decreased the least.

In the SABI sample, micro, small and medium-sized companies follow a relatively similar productivity profile throughout the economic cycle:

In the growth years, the increase in economic activity is accompanied by a more pronounced increase in capital accumulation than in employment, with an intense growth in the labour capital ratio in the three company dimensions. This evolution occurs with a modest growth in productivity measured in labour terms, which is strongly offset by the reduction in productivity in capital terms. The combination of these elements results in a slight drop in technical efficiency in the three company dimensions.

The impact of the crisis intensifies the rollback in TFP in these three company dimensions, and is reflected in a sharp reduction in both the capital stock and, more intensely, in employment. Thus, there is a continuous increase in the capital-labour ratio during the crisis, which partly reflects the effect of the underutilization of the installed productive capacity in each of these dimensions. As a consequence of this evolution, the joint productivity of the production factors is reduced in the three company dimensions.

The balance over 2001-2013 for these three company dimensions is a productivity stagnation in labour terms and a reduction in productivity in capital terms, which is translated into a reduction in joint productivity of the factors.

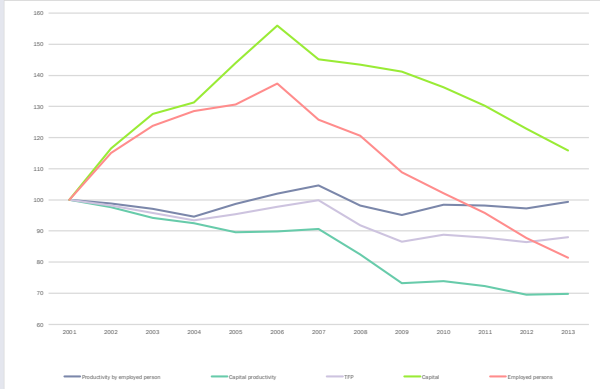
Large companies differ relatively from this time profile, in the sense that during the growth years they maintain a similar increase in the capital stock and employment, so that the labour capital ratio remains relatively stable. At the same time, unlike the other three dimensions of the company, it reduces productivity in terms of labour and also reduces - albeit less intensely than in the other dimensions - productivity in terms of capital. The combined effect of these elements is translated into a less pronounced reduction in the joint factor productivity.

Large companies show a higher resilience to the crisis impact, although they reduce employment -they do so with less intensity than the other dimensions, and maintain in 2013 a higher level of occupation than in 2001-. During these years of crisis, they continue increasing the installed capital capacity -at a slower pace -, with an increase in the labour capital ratio. At the same time, they reduce productivity measured in terms of labour and in terms of capital, elements that are translated into a reduction -also a less intense one than in the other dimensions- of the joint productivity related to the productive factors.

Throughout 2001-2013, large companies also lose technical efficiency, albeit at a slower pace: productivity measured in labour terms is reduced more than in the other three dimensions of the company, while productivity in terms of capital is reduced with less intensity.

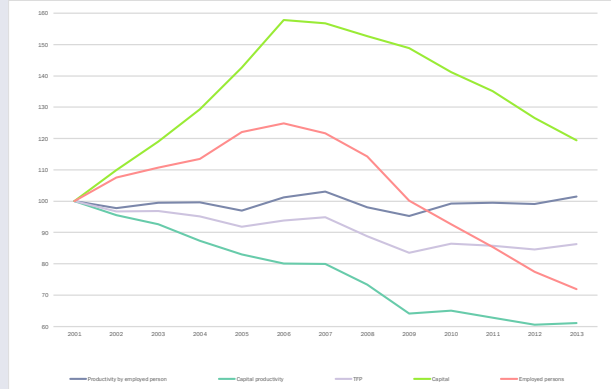
CHART 23. Evolution of labour productivity (per employed person), productivity in terms of capital, joint productivity of productive factors (TFP), employed persons and capital stock by company size. Sample of Catalonia's productive fabric (SABI database), 2001-2013

Microcompany. Sample of Catalonia's productive fabric (SABI database), 2001-2013



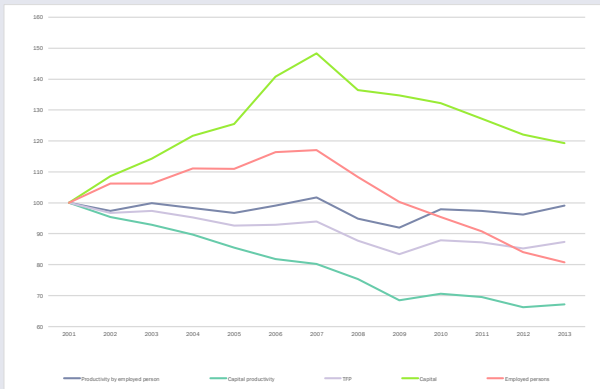
Units: index numbers 2001 = 100.
 Note: TFP = Joint factor productivity.
 Source: own elaboration from the SABI database.

Small company. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Units: index numbers 2001 = 100.
 Note: TFP = Joint factor productivity.
 Source: own elaboration from the SABI database.

Medium company. Sample of Catalonia's the productive fabric (SABI database), 2001-2013



Units: index numbers 2001 = 100.
 Note: TFP = Joint factor productivity.
 Source: own elaboration from the SABI database.

Big company. Sample of Catalonia's productive fabric (SABI database), 2001-2013



Units: index numbers 2001 = 100.
 Note: TFP = Joint factor productivity.
 Source: own elaboration from the SABI database.

Incidence of the internal dynamics of each company and the process of entry and exit of productive units in the market on productivity.

- The Catalan productive fabric of the SABI sample points to an adjustment of companies to economic conditions more through external flexibility than internal flexibility of productive units. The increase and subsequent reduction in the use of productive factors occurs more intensively through the processes of entry and exit of productive units in the sample than within those that

are maintained throughout the period. This characteristic of the evolution of the productive fabric occurs with more intensity in the adjustment of the labour factor than in the capital factor.

In the analysis of the adjustment process to the economic cycle of the Catalan productive fabric we observe that:

The 12.0% drop in employment between 2001 and 2013 is the result of a contribution of 5.7 percentage points of the increase in the labour factor in the productive units remaining in the sample throughout the entire period; of the loss of employment of those companies that disappear from the sample (a fall of 44.9% compared to initial employment); and the increase in employment of those companies that are incorporated throughout the period, which represents 27.2% of initial employment.

The increase in installed capital capacity of 19.2% between 2001 and 2013 is the result of the contribution of 23.0 percentage points of the capital increase in the companies that remain in the sample throughout the entire period; from the drop in installed capacity of 39.8% in the companies that disappear from the sample; and the 36.5% increase in installed capacity in the companies joining the sample.

This evolution throughout the economic cycle -where entry and exit process of the productive units in the market is more relevant than the adjustment of the companies that are still active-, is reproduced in the micro-company, in the small company and in the medium company. And it happens both in the economic growth years (2001-2007) -where the increase in labour and capital is explained, mainly, in these dimensions due to the entry of new companies into the productive fabric, and during the crisis years (2007-2013) -where the reduction in employment and the installed capital stock mainly explains the exit of productive units from the sample of the productive fabric.

Large companies show a higher internal adjustment capacity -of the companies that remain active throughout the period-, both in relation to the labour factor and the capital factor. This characteristic occurs, fundamentally, as a consequence of their behaviour during the growth years -where the increase in employment and installed capital happens, with more intensity, within the companies that remain active during these years-. While in the crisis years, large companies mainly channel the employment reduction and capital stock through the exit of productive units from the sample of the productive fabric -as happens in the other dimensions, while the ones that remain active show relative stability both in employment and in installed capital.

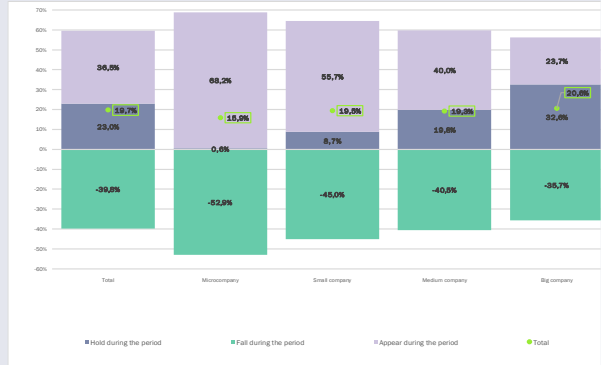
CHART 24. Contribution to the evolution of the volume of employed persons and capital stock (at 2007 prices) of the companies that remain in the sample, those that leave and those that enter between the years 2001-2013, 2001-2007 and 2007-2013 by company size. Sample of Catalonia's productive fabric (SABI database)

Employed persons (2001-2013). Sample of Catalonia's productive fabric (SABI database)



Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

Capital stock (2001-2013). Sample of Catalonia's productive fabric (SABI database)



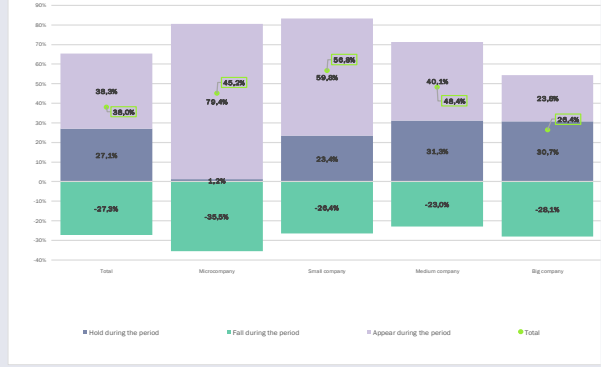
Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

Employed persons (2001-2007). Sample of Catalonia's productive fabric (SABI database) período 2001-2007.



Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

Capital stock (2001-2013). Sample of Catalonia's productive fabric (SABI database)



Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

Employed persons (2007-2013). Sample of Catalonia's productive fabric (SABI database)



Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

Capital stock (2007-2013). Sample of Catalonia's productive fabric (SABI database)



Units: contribution to the total variation in percentages.
Source: own elaboration from the SABI database.

- In general terms, the loss of technical efficiency of the productive fabric as a whole responds to the fact that, although the least efficient companies disappear from the sample, those that remain lose productivity, both in terms of capital and labour, and those joining the sample do it with lower productivity levels of the factors than the initial companies.

In a context of production fabric adjustment towards more capital-intensive production processes - which occurs in all company dimensions - it is observed that:

- The 26.7% reduction in capital productivity is produced both by the reduction in capital productivity in the companies that remain in the sample, with a drop of 21.9%, and by the fact that those that join the sample do it with an average capital productivity that is 31.5% lower than the initial one, and also by the fact that the productive units leaving the sample have in average terms a productivity that is 5.0% higher than that of initial average productivity.

The practical stagnation in the labour productivity evolution, with a 0.3% slight drop, occurs because the companies remaining in the sample reduce productivity by 2.3%, while those joining it do so with a productivity 7.9% lower than the initial one. In part, these two falls are offset by the fact that the productive units leaving the sample are those with the lowest productivity in 2001, 6.8% lower than the average productivity of that year.

This behaviour of the productive fabric aggregate occurs in the four dimensions of the company, although with different intensities. With the nuance that in the large company, the companies that leave the sample have lower capital productivity than the initial ones.

At the same time, this behaviour is also observed in the two analyzed periods, both in the growth years (2001-2007) and in the crisis years (2007-2013):

The joining companies have in both periods an average productivity level of capital lower than that of the beginning of each period, while, in general, their labour productivity is also lower than the initial one.

Only in the case of large companies we observe that the labour productivity of those who join in each period is higher than in the initial period, although in this case this is partially compensated by the fact that the companies that leave the sample initially have higher levels of labour productivity.

CHART 25. Variation in labour productivity and capital (at 2007 prices) of the companies that remain in the sample, those that leave and those that enter by company size and periods. Sample of Catalonia's productive fabric (SABI database)

Capital productivity (2001-2013). Sample of Catalonia's productive fabric (SABI database)



Units: percentages.
Source: own elaboration from the SABI database.

Labour productivity (2001-2013). Sample of Catalonia's productive fabric (SABI database) del treball període 2001-2013.



Units: percentages.
Source: own elaboration from the SABI database.

Capital productivity (2001-2007). Sample of Catalonia's productive fabric (SABI database)



Units: percentages.
Source: own elaboration from the SABI database.

Labour productivity (2001-2007). Sample of Catalonia's productive fabric (SABI database)



Units: percentages.
Source: own elaboration from the SABI database.

Capital productivity (2007-2013). Sample of Catalonia's productive fabric (SABI database)



Units: percentages.
Source: own elaboration from the SABI database.

Labour productivity (2007-2013). Sample of Catalonia's productive fabric (SABI database)



Units: percentages.
Source: own elaboration from the SABI database.