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TITLE: Causes of Social mobility in Spain by regions

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Abstract and keywords

In this paper, I will study the different levels of social intergenerational mobility in Spain between 1998 and 2016 by autonomous communities and the reason behind these differences. I will start by defining basic concepts about social mobility and explaining the recent tendencies of intergenerational mobility in Spain. Then I will analyze why social mobility in Spain is not uniform and why certain regions of the country have more mobility than others using data collected mainly from the Atlas of Opportunity of the COTEC foundation alongside other sources such as the National Statistics Institute (INE) and the Ministries of Education and Sciences. I will also analyze the possible causes for this heterogeneity in terms of public policies such as expenditure on education, weight of the industry or the services sector, unemployment rates, and quantity of tourism among others. Finally, I will propose some measures to fight against this heterogeneity.

Keywords: Social mobility, economic inequality, intergenerational mobility.

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1. Introduction and definitions

1.1 Introduction

Social Mobility is defined as "the transition that an individual makes from one social position to another" (Atlas de Oportunidades, n. d.), in other words, the ability that a person has to ascend or descend of social class. Social classes can be defined in multiple ways, but one of the most common ways is to classify them by using the level of income that a person has as a reference and creating categories depending on how much wealth they own such as "rich", "poor", "middle class", etc.

One of the most common ways to study social mobility is to research if the quantity of wealth, in societies where economic inequality is notable and therefore the amount of money people have varies from person to person, affects the capacity to move to a new socioeconomic class. This can be analyzed in intragenerational terms, by investigating if the amount of income that a person has at a certain time will affect the amount of income that the same person will have in the future, or intergenerational terms, by investigating if the amount of income that the previous generation of a person had in the past will affect the amount of income they have in the future.

Research about intergenerational social mobility has led to discoveries such as the Great Gatsby Curve, which is the theory that relates economic inequality and intergenerational mobility by arguing that there is a strong relationship between the two factors, which means that the more economic imbalance a country has, the fewer possibilities of intergenerational mobility the same country will also have (Durlauf S.N et al, 2022). Economic inequality, which is shown in the horizontal axis, is measured with the Gini coefficient, by assigning a country a value between 0 and 1 (the higher the value, the more unequal the distribution of wealth in a country is) and intergenerational mobility, which is shown in the vertical axis, is measured with the Intergenerational Elasticity of Income (IGE), by assigning a country a value also between 0 and 1 (the lower the value, the more elastic the level of intergenerational mobility of country is, which means that the more probabilities children have to ascend of social class in the future) (Corak M, 2013).

In 2016, Spain had a Gini coefficient of 34,5, which means that the level of social mobility it had was partially affected by the level of inequality it had. This inequality in social mobility can also happen at a regional level if different regions of a country have diverse income levels. In the case of Spain, intergenerational social mobility has been recorded in the Atlas of Opportunity, a website made by the COTEC foundation, whose mission is to study social mobility with a unique dataset (Atlas de Opportunides, n. d.). This project collects data about Spanish social mobility between 1998 and 2016 and analyses the heterogeneity of the ability of young people to ascend social class by sex, level of family wealth, territory such as autonomous communities, cities, zip codes, etc.

My net contribution to this field of research is to learn the patterns of these heterogeneous levels of social mobility across Spain and investigate the possible causes by cross-researching mainly indicators of public policies such as the labor market and education.

1.2 Definitions

The following definitions have been extracted from the Atlas of Opportunity website (Atlas of Opportunity, n. d.):

Social mobility: The Organization for Economic Cooperation and Development (OECD) defines social mobility as any transition that an individual makes from one social position to another. The movement can be upward or downward depending on the direction in which the transition is made between the source class and the destination class and can occur individually or in a group. Changes between social strata are reflected in changes in both income and schooling as well as wealth, and, due to the inherent temporal dimension of mobility, it can be analyzed dynamically depending on the time elapsed to move from one social stratum to the other.

Economic inequality: According to the Organization for Economic Cooperation and Development (OECD), economic inequality occurs due to the unequal distribution of economic resources between individuals, social groups, or countries, and their concentration in segments of the population. Traditionally, the phenomenon is quantified with the GINI, an index that calculates the income dispersion of the entire population. This index varies between 0 and 1; The value 0 corresponds to perfect equality, where all individuals have the same income, and the value 1 corresponds to perfect inequality, where only one person has all the income.

Absolute mobility is the result of changes in the income of individuals which generate variations in the number of individuals belonging to different classes - what we call the size of the classes - over time. This measure indicates how changes in relative class size affect rates of social mobility.

Relative mobility incorporates the concept of equality of opportunity and refers to the difference in opportunity that a person from a certain class of origin has, compared to people with another origin, to access a class of destination compared to other destinations, controlled by the change in the size of these classes. Therefore, relative mobility allows us to know the levels of accessibility of different types of destinations for different types of origin.

Intragenerational mobility corresponds to changes in the social position of an individual throughout their life, which makes it possible to evaluate the stability of a person's income. On the other hand, intergenerational mobility occurs between generations and analyzes the degree of 'inheritance' between the characteristics of parents and children in dimensions such as schooling, income, or wealth. Therefore, intergenerational mobility provides information about the effects of social circumstances of origin on the economic and social destiny of people.

2. Hypothesis

The hypothesis that I will try to verify in this research paper is if the levels of social mobility in Spain differ by national territory and in case the answer is affirmative, by which areas do they differ and why. My initial theory is that the northeast has higher social mobility than the south because of the industrialization process that happened in the 2nd half of the 20th century in Spain (Centro de Estudios del Cambio Social, 2012), leaving the rural areas of the south depopulated and the areas around Madrid and the north-east of Spain with an increase of population, due to the newer work opportunities that arose in those areas. An increase in population and a diversification of the sectors means a more active economy, higher quality of life, and therefore higher education and more opportunities to ascend the social class, which are still maintained today.

3. Sources of data employed to conduct the study

COTEC opportunity atlas: According to their website (Atlas de Oportunidades, n. d.), this project wants to focus on this phenomenon [social mobility] with a unique data set in Spain. They have followed 2.7 million young people and for each of them, they obtained their current income and the income of their parents' home in 1998, thanks to the information from the State Tax Administration Agency. In addition, they have located each of these homes by province, city, and zip code.

National Statistical Institute (INE): According to their website (INE, n. d.), the National Statistics Institute is an autonomous administrative body, with legal personality and its assets, attached to the Ministry of Economy, Commerce and Business through the Secretary of State for Economy and Business Support. The Law assigns the National Institute of Statistics a prominent role in public statistical activity, expressly entrusting it with carrying out large-scale statistical operations (demographic and economic censuses, national accounts, demographic and social statistics, economic and social indicators, coordination and maintenance of company directories, formation of the Electoral Census...).

Ministry of Education, Professional Training and Sports: According to their website (Ministerio de Educación, Formación Profesional y Deportes, n. d.), the Ministry of Education, Vocational Training and Sports is responsible for proposing and executing the Government's policy on education and vocational training in the educational system and for employment. They offer statistics on topics related to education such as the expenditure on education, among other things.

Ministry of Sciences, Innovation, and Universities: According to their website, (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.) the Ministry of Science, Innovation, and Universities is the Department of the General Administration of the State in charge of the execution of the Government's policy on scientific and technical research, technological development, and innovation in all sectors, including the management of international relations in this matter and the Spanish representation in programs, forums and organizations of the European Union and international organizations within its jurisdiction. They offer statistics on topics related to college education such as scholarships and study grants, public university prices, and academic performance, among other things.

OCED.stat: According to their website, (OECD.stat, n. d.) OECD.Stat is the statistical online platform of the OECD where users can search and access the OECD's statistical databases. It includes data and metadata for OECD countries and selected non-member economies.

It is important to know some modifications I made when using the data obtained from these sources:

- Most variables regressed against the data from the Atlas of Opportunity are about public policies because I want to analyze how the measures the Spanish population takes as a

society (i.e. policies of employment, education, etc.) affect the level of social mobility in the country.

- To analyze variables of higher education, I have used data that analyzed public universities and bachelor's degrees instead of total universities and total higher education. The reason I have used data from bachelor's degrees is because it is the most common type of tertiary education. The reason I have chosen data from public universities is that since I want to analyze how public policies affect the level of social mobility in Spain, data regarding tertiary education offered by private institutions is out of this project's scope. In some cases, I was not able to differentiate data related to the bachelor's degree from other types of tertiary education, so whether I have used data related to the bachelor's degree or total tertiary education will be mentioned in each section.

4. Methodology

4.1 Definitions

These definitions are taken from the statistical program JMP (JMP Help, n. d.):

The P-value is a number that indicates if including the independent variable in the prediction model significantly improves the capacity to predict the values of the dependent variable. If the independent variable is significant to calculate the dependent variable, the P-value tends towards zero.

The Pearson product-moment correlation coefficient measures the strength of the linear relationship between two variables. For response variables X and Y, it is denoted as r and computed as follows:

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2} \sqrt{\sum (y - \bar{y})^2}}$$

If there is an exact linear relationship between two variables, the correlation is 1 or −1, depending on whether the variables are positively or negatively related. If there is no linear relationship, the correlation tends towards zero.

The R Square is a number that indicates the proportion of the variance in the dependent variable that the model explains. The R-squared value can range from 0 to 1. A model with an R-squared value of 0 has no explanatory power. A model with an R-squared value of 1 predicts the response perfectly.

4.2 Atlas of Opportunity

The Atlas of Opportunity's objective is to "study social mobility in Spain based on a unique data set". To do so, it has used income tax information for 2.7 million parents and children, separated by a time interval of 18 years, and with geographic information about where they lived when the children were young. The parents' income was observed in 1998 and the children's income in 2016, when they were between 26 and 32 years old. (Atlas de Oportunidades, n. d.).

This data was obtained by identifying the children in the declarations of 2003 who were born between 1984 and 1990, recovering the income tax returns of their parents in 1998 alongside their localization and zip code, and searching for the gross income statements of the children in 2016.

After obtaining this data the methodology that it used is described in the next steps:

1. Identifying and modifying the data of the households of 1998 and 2016. This data includes household identifiers, income data, and geographic data such as zip code, municipal code, and treasury delegation, among others.

2. Uniting the data of parents and children through the household identifier and selecting the data of the children born between 1984 and 1990 so the remaining children are the ones that were between 8 and 14 years old in 1998 and had more probabilities of still living with their parents.

   After that, the income centiles are created using the methodology of Chetty et Al by calculating the percentage of income in 2016 with respect to the rest of the children of that age (the same is done for the parents). A child in the 20th centile means that they are among the 20% of people their age with the lowest income in Spain and a child in the 80th centile means that they are among the 20% of people their age with the highest income.

3. Creating national, regional[1], state, and large city datasets. Tables are constructed by calculating the income percentile of each child within each age group and calculating the income percentile of the parents within each age group of children.

4. Calculating, for each percentile of parents, the average percentage of the children (using both the mean and the median) and building a curve with the percentiles of parents on the X axis and those of children on the Y axis.

4.3 Own research

This study has been conducted with the statistical program JMP. The methodology that I used is described in the next steps:

1. Calculating for each autonomous community the average income percentile the total children had in 2016. The minimum centile in the parents' data set is 1 but the minimum centile in the children's data set is 30 (the maximum centiles are 100 and 86 respectively). This means that, when calculating the average income centile that the total children had in an autonomous community in 2016, if that centile is below 50, the average income they earned is below the average income that the parents earned in that region and vice versa. In other words, the higher the centile is for each autonomous community, the more income the children earn compared to their parents and vice versa, therefore the more (or less) social mobility they have.

2. Rearranging the numerical variable that I want to analyze so that it is classified by autonomous communities throughout the period desired (usually the year 2016, but for variables related to higher education I have used a different period, which will be explained in the notes).

3. Adjusting the autonomous community as an independent variable and the selected numerical variable as a dependent variable to learn which autonomous communities have a higher or lower value of the numerical variable and be able to detect patterns and formulate hypotheses without running the correlation.

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[1] The COTEC opportunity atlas does not have access to the data of either Basque Country or Navarra, so they have been omitted throughout the study.

4. Using the multivariate tool inside the analysis category, run a correlation between the selected numerical variable and the average income centile of each region to check if there is a correlation between the two variables and in case there is one if it is positive or negative. I have done this by looking at the probability of correlation (which is explained by the P-value) and the actual correlation (which is explained by the Pearson product-moment correlation coefficient).

When analyzing the data obtained using this methodology some factors need to be considered:

- The numerical ordinal variables taken from datasets that are not the Atlas of Opportunity were transformed into numerical continuous variables so I would be able to run the correlations using the multivariate tool.
- I have considered that the p-value is sufficiently low to indicate a high probability of correlation when it is less than 0,05, therefore, when there is a probability of correlation of 95%. I have also considered that there is a high correlation when the correlation value exceeds 0,35 (positively or negatively).
- To analyze the variables related to higher education, I have used the period where the children that have their income analyzed in 2016 (who were between 26 and 32 years old) were more likely to be studying in university (when they were between 18 and 22 years old). In this case, assuming they studied degrees with four years of duration, they would have enrolled between 2002 and 2008 and graduated between 2006 and 2012. If they have studied for a master's degree, the enrollment period would have been between 2006 and 2012, and the graduation period between 2007 and 2013, which just adds a year to the graduation period. To account for the possible university dropouts, I have used the average of graduation years, on most occasions. On data about enrollment, I have used the average of the enrollment years, including the ones for masters. Whether I have used the enrollment period or the graduation period will be mentioned in every section.
- The population census (and all other analyses that use this data) has as a reference date the 1st of January 2016 instead of the average for the whole year.

5. Analysis of results

5.1 Atlas of Opportunity Analysis

Analyzing the data provided by the Atlas of Opportunity, they have found out that there is an inequality in the capacity of social mobility that children have at a national level which is caused by the quantity of income of their parents: according to their study (Atlas de Oportunidades, n. d.), on average children coming from poor families (with an income lower than the 20th centile) will grow up to have an income centile of around 40, while children coming from richer families (with an income higher than the 80th centile) will have an income centile of around 60. Considering that the lowest centile that appeared for children in this dataset was 30 and the highest was 82, this means that children belonging to poor families in 1998 have more probability of ending up among the poorest young people their age at a national level in 2016 and vice versa.

When analyzing this data at a national level, they have also observed that there is an inequality in the capacity of social mobility that children have at a regional level caused by the autonomous community their family lived in: young people who live in regions such as Catalonia or Madrid generally have higher income centiles compared to their parents, while young people who lived in the regions such as Andalucía or Canarias have lower income centiles compared to their parents. In general, the trend that I have identified from this study is that the regions where children can ascend to higher socioeconomic classes more easily are located in the north-east of Spain, while the regions where children have more problems ascending to higher socioeconomic classes are located in the south of Spain.

This trend is further confirmed by the maps provided by the Atlas of Opportunity portal, which shows the relative economic position of children for the median rent at a national level in comparison to their parents' economic position for parents with low (20th percentile), medium (50th percentile), and high (80th percentile) level of income. The provinces that have a greener hue are provinces where children have a better economic position in comparison to their parents, and the ones that have a redder hue are the ones where they have a worse one.
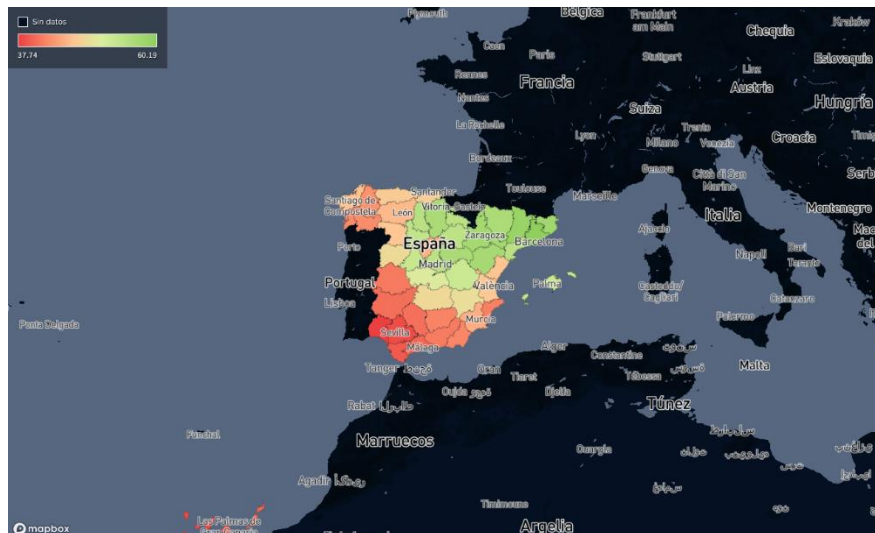
Figure 1: Map of opportunities by provinces for parents with medium earnings. Source: Atlas de Opportunidades, no date.

5.2 JMP analysis

The following analysis has been made with the statistical tool JMP.

5.2.1 Atlas of Opportunity

Using the dataset by autonomous communities provided by the Atlas of Opportunity I have observed that the four autonomous communities where people between 26 and 32 years old have higher average relative income positions in comparison to their parents are:

- Catalonia, with an average income centile of 58,837
- Aragón, with an average income centile of 57,056
- La Rioja, with an average income centile of 56,395
- Madrid, with an average income centile of 55,891

On the other hand, the four autonomous communities where the same group of people have lower average relative income positions in relation to their parents are:

- Canarias, with an average income centile of 43,293
- Andalucía, with an average income centile of 43,786
- Extremadura, with an average income centile of 44,846
- Murcia, with an average income centile of 47,638

These results reaffirm the idea that the regions with higher social mobility are in the northeast of Spain while the regions with lower social mobility are in the south.

When running regressions within the Atlas of Opportunity datasets, I have found out that the P-value between the parents' income centile and their children's income centile (both for autonomous communities and the whole country) is less than 0,0001 percent and the correlation coefficient is 0,5515 (for autonomous communities) and 0,8553 (for the country), so I can safely conclude that there is a positive correlation between the level of income that parents

had in 1998 and that their children have in 2016. Calculating the ANOVA of the children's income centile for the autonomous communities I have found out that the R-Square value is 0,37, which means that the autonomous communities that the parents of a child lived in (without considering house moves) can explain 37% of the children's income centile results. I consider this a low number, given the differences in the level of social mobility that regions have based on their location as has been explained above.

5.2.2 Own research

This section's objective is to analyze variables that could explain the difference in the levels of social mobility that Spain has like industrial production, level of employment, expenditure on education, etc., and check if they are relevant to this phenomenon.

5.2.2.1 Industrial Production Index

The Industrial Production Index (IPI) is an economic indicator that shows the monthly evolution of the productive activity of industrial branches, excluding construction, contained in the National Economic Activity Classification 2009 (CNAE-2009). (INE, n. d.)

Autonomous community	Industrial production index	Income centile
Andalucía	99,79	43,79
Aragón	99,26	57,06
Asturias, Principado de	93,99	50,51
Balears, Illes	100,89	54,94
Canarias	98,66	43,29
Cantabria	100,68	51,02
Castilla - La Mancha	102,21	52,13
Castilla y León	99,10	53,35
Cataluña	103,05	58,84
Comunitat Valenciana	103,07	48,71
Extremadura	98,11	44,85
Galicia	102,28	48,51
Madrid, Comunidad de	104,03	55,89
Murcia, Región de	97,11	47,64
Rioja, La	95,62	56,39

Table 1: Average industrial production index.

Before running the correlation, I did not observe a positive correlation since the four autonomous communities with the highest indexes of industrial production in comparison with the rest of the regions are Madrid, Valencia, Catalonia, and Galicia while the four autonomous communities with the lowest index are Asturias, La Rioja, Murcia and Extremadura. This ranking shows no overlap with the social mobility regional ranking.

After running the correlation, the P-value is 0,4413 and the correlation coefficient is 0,2151, so I can confirm that there is almost no correlation between these two variables.

5.2.2.2 Services sector Activity Index

The Service Sector Activity Indicators (IASS) measure the short-term evolution of the activity of companies belonging to the non-financial market services through two variables: turnover and

employed personnel. The turnover includes imports invoiced by the company for the provision of services and sale of goods. Employed personnel include both paid and unpaid personnel. (INE, n. d.)

Autonomous community	Services sector activity inde	Income centile
01 Andalucía	98,33	43,79
02 Aragón	95,80	57,06
03 Asturias, Principado de	96,84	50,51
04 Balears, Illes	101,20	54,94
05 Canarias	103,94	43,29
06 Cantabria	97,72	51,02
07 Castilla y León	99,48	53,35
08 Castilla - La Mancha	95,65	52,13
09 Cataluña	95,81	58,84
10 Comunitat Valenciana	94,69	48,71
11 Extremadura	97,34	44,85
12 Galicia	96,45	48,51
13 Madrid, Comunidad de	95,96	55,89
14 Murcia, Región de	92,09	47,64
17 Rioja, La	96,26	56,39

Table 2: Average services sector index

Before running the correlation, I observed that the four autonomous communities with the highest services sector activity index are Canarias, the Baleares Islands, Andalucía, and Castilla y León, while the four autonomous communities with the lowest index are Murcia, Valencia, Castilla la Mancha, and Aragón. This ranking shows no overlap with the social mobility regional ranking.

After running the correlation, the P-value is 0,3861 and the correlation coefficient is –0,2414, so I can confirm that there is almost no correlation between these two variables.

5.2.2.3 Unemployment rate for people between 25 and 54 years

The unemployment rate has been calculated by using the results from the Active Population Survey. The Active Population Survey (EPA) has been carried out since 1964, with the current methodology being that of 2005. This is a continuous, quarterly investigation aimed at families, whose main purpose is to obtain data on the labor force and its various categories (employed, unemployed), as well as the population outside the labor market (inactive). (INE, n. d.)

Autonomous community	Unemployment rate	Income centile
01 Andalucía	27,31%	43,79
02 Aragón	14,00%	57,06
03 Asturias, Principado de	17,54%	50,51
04 Balears, Illes	12,41%	54,94
05 Canarias	23,89%	43,29
06 Cantabria	15,07%	51,02
07 Castilla y León	15,17%	53,35
08 Castilla - La Mancha	21,35%	52,13
09 Cataluña	14,22%	58,84
10 Comunitat Valenciana	18,85%	48,71
11 Extremadura	25,88%	44,85
12 Galicia	16,65%	48,51
13 Madrid, Comunidad de	14,05%	55,89
14 Murcia, Región de	17,23%	47,64
17 Rioja, La	12,81%	56,39

Table 3: Unemployment rate for people between 25 and 54 years old

Before running the correlation, I observed that the four autonomous communities with the highest unemployment rate are Andalucía, Extremadura, Canarias, and Castilla la Mancha, while the four autonomous communities with the lowest rate are the Baleares Islands, La Rioja, Madrid, and Aragón. This ranking almost aligns perfectly with the regional social mobility ranking.

After running the correlation, the P-value is less than 0,001 and the correlation coefficient is – 0,8523 so I can safely confirm that there is a strong negative correlation between the rate of unemployment in a region and the level of social mobility it has.

A possible explanation for this correlation is that if people can find a job more easily, they will have more opportunities to acquire economic stability and ascend the social ladder.

5.2.2.4 Average number of tourists

The average number of tourists has been calculated by using the results of the Hotel Occupancy Survey. The Hotel Occupancy Survey offers information on travelers, overnight stays, and average stay, distributed by country of residence for foreign travelers or autonomous community of origin for Spanish travelers, as well as the category of the establishments they occupy. It also provides estimates of the number of open establishments, places, level of occupancy, and employment in the sector, according to establishment category. (INE, n. d.)

Autonomous communities	Number of tourists	Income centile
Andalucía	1489051,25	43,79
Aragón	224046,50	57,06
Asturias, Principado de	141762,83	50,51
Balears, Illes	823225,83	54,94
Canarias	779307,83	43,29
Cantabria	97346,83	51,02
Castilla y León	398396,50	52,13
Castilla - La Mancha	176994,17	53,35
Cataluña	1591198,33	58,84
Comunitat Valenciana	689585,08	48,71
Extremadura	110157,92	44,85
Galicia	360533,42	48,51
Madrid, Comunidad de	957442,58	55,89
Murcia, Región de	101606,83	47,64
Rioja, La	48478,83	56,39

Table 4: Average number of tourists

Before running the correlation, I observed that the autonomous communities that have the highest average tourists per year are Catalonia and Andalucía, followed by Madrid, the Baleares Islands, and the Canary Islands. This does not exactly coincide with the regional social mobility ranking since some of the regions with the lowest social mobility are also the ones with the highest number of tourists like Andalucía.

After running the correlation, the P-value is 0,8546 and the correlation coefficient is 0,0518 so I can confirm that there is almost no correlation between these two variables.

5.2.2.5 Annual salary by employee

The annual salary by employee has been obtained by taking the results from the Annual Labor Cost Survey. The Annual Labor Cost Survey (EACL) is an annual statistical operation that completes the results obtained in the quarterly labor cost survey (ETCL), thus offering an annual perspective of the same. Its fundamental objective is to know the annual levels of the average labor cost per worker, detailing its main components. The EACL obtains estimates of labor costs by autonomous communities, economic activity according to the CNAE-09 classification, and unit sizes. (INE, n. d)

Autonomous community	Annual salary per employee	Income centile
Andalucía	20.401,08 €	43,79
Aragón	21.530,90 €	57,06
Asturias, Principado de	23.205,03 €	50,51
Balears, Illes	21.117,91 €	54,94
Canarias	19.085,47 €	43,29
Cantabria	21.694,42 €	51,02
Castilla y León	20.628,54 €	53,35
Castilla - La Mancha	20.048,85 €	52,13
Cataluña	24.215,66 €	58,84
Comunitat Valenciana	20.215,60 €	48,71
Extremadura	18.711,12 €	44,85
Galicia	19.859,60 €	48,51
Madrid, Comunidad de	27.315,84 €	55,89
Murcia, Región de	20.694,77 €	47,64
Rioja, La	21.035,06 €	56,39

Table 5: Average annual salary per employee

Before running the correlation, I observed that the autonomous communities that had the highest annual salaries in comparison to the rest (Madrid, Catalonia, and Asturias as the exception), are also the ones who have the highest levels of social mobility and vice versa, the regions that had the lowest annual salaries (Extremadura, Canarias, and Galicia as the exception) also have low levels of social mobility.

I have run the correlation; the P-value is 0,0123 and the correlation coefficient is 0,6271, so I can affirm safely that there is a positive correlation between the highness of the salary of a region and the level of social mobility it has.

A possible explanation for this correlation could be that regions with higher salaries allow the population to have a higher level of income in comparison to the rest of Spain and, therefore, more chances to ascend the social ladder by accumulating more wealth than their parents.

5.2.2.6 Grade to access college education (2016)

The degree access grade is the grade that allows students access to college education. The average grade for access to the degree is calculated only for students with a grade between 5 and 10. (Ministerio de Educación, Formación Profesional y Deportes, n. d.)

Autonomous community	Grade to access college education	Income centile
Andalucía	7,1	43,79
Aragón	6,98	57,06
Asturias (Principado de)	6,82	50,51
Balears (Illes)	6,67	54,94
Canarias	7,22	43,29
Cantabria	6,87	51,02
Castilla La Mancha	6,99	52,13
Castilla y León	6,87	53,35
Cataluña	6,93	58,84
Comunitat Valenciana	6,89	48,71
Extremadura	7,16	44,85
Galicia	6,86	48,51
Madrid (Comunidad de)	6,93	55,89
Murcia (Región de)	7,11	47,64
Rioja (La)	6,91	56,39

Table 6: Average grade to access college education in 2016

Before running the correlation, I observed that the 4 autonomous communities with the best grades to access college education are Canarias, Extremadura, Murcia, and Andalucía, which are also the communities that have lower social mobility.

After running the correlation, the P-value is 0,0155 and the correlation coefficient is –0,6111 so I can safely affirm that there is a negative correlation between the average grade to access tertiary education in an autonomous community and the level of social mobility it has.

A possible explanation for this correlation is that young people who live in regions with less equality of opportunities put more effort into their studies knowing that the opportunities to ascend the social and economic ladder are low.

5.2.2.7 Expenditure on education per capita

Expenditure on education per capita is understood as the amount of euros the regional government spends per person. (Ministerio de Educación, Formación Profesional y Deportes, n. d.)

Autonomous community	Expenditure on education	Income centile
Andalucía	14,97 €	43,79
Aragón	18,54 €	57,06
Asturias, Principado de	19,07 €	50,51
Balears, Illes	6,92 €	54,94
Canarias	11,87 €	43,29
Cantabria	17,64 €	51,02
Castilla - La Mancha	8,52 €	52,13
Castilla y León	19,30 €	53,35
Cataluña	18,36 €	58,84
Comunitat Valenciana	19,77 €	48,71
Extremadura	9,68 €	44,85
Galicia	17,81 €	48,51
Madrid, Comunidad de	22,56 €	55,89
Murcia, Región de	13,51 €	47,64
Rioja, La	11,98 €	56,39

Table 7: Expenditure on education per capita

Before running the correlation, I observed that the 4 regions that have spent the most euros on education per person are Cantabria, Extremadura, Andalucía, and Murcia, which are also the ones that have the lowest level of social mobility, so it appears that there is an inverse correlation. It is also noteworthy to mention that Madrid, one of the regions with the highest social mobility, is the region that spent less money on education per person in 2016.

After running the correlation, the P-value is 0,1918 and the correlation coefficient is –0,3567, so I can confirm that there is a weak correlation between these two variables.

5.2.2.8 Expenditure on college education per number of people enrolled in university

Expenditure on college education is understood as the amount of euros the regional government spends per person enrolled in university. (Ministerio de Educación, Formación Profesional y Deportes, n. d.)

Autonomous community	Expenditure on education per enrolled student	Income centile
Andalucía	6,43 €	43,79
Aragón	7,66 €	57,06
Asturias, Principado de	6,81 €	50,51
Balears, Illes	5,93 €	54,94
Canarias	6,42 €	43,29
Cantabria	9,23 €	51,02
Castilla - La Mancha	7,58 €	52,13
Castilla y León	6,67 €	53,35
Cataluña	8,38 €	58,84
Comunitat Valenciana	7,90 €	48,71
Extremadura	5,57 €	44,85
Galicia	6,80 €	48,51
Madrid, Comunidad de	7,51 €	55,89
Murcia, Región de	6,75 €	47,64
Rioja, La	6,58 €	56,39

Table 8: Average expenditure on college education per number of people enrolled in university

Before running the correlation, I observed that the four autonomous communities with the highest average expenditure in college education per number of people enrolled in university (for all types of college education) are Cantabria, Catalonia, Valencia, and Aragón, while the four autonomous communities with the lowest average are Extremadura, the Baleares islands, Canarias and Andalucía. This ranking of regions seems to share more similarities with the regional social mobility ranking in Spain except for the Baleares islands.

After running the correlation, the P-value is 0,1303 and the correlation coefficient is 0,4088, so I can confirm that there is a weak correlation between these two variables.

5.2.2.9 Rate of graduation of bachelor's degree[2]

The rate of graduation represents the percentage of students that finish their degree in the time predicted or one year later. (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	Rate of graduation	Income centile
Andalucía	40,45%	43,79
Aragón	46,61%	57,06
Asturias, Principado de	40,67%	50,51
Balears, Illes	42,94%	54,94
Canarias	35,00%	43,29
Cantabria	40,71%	51,02
Castilla - La Mancha	43,24%	52,13
Castilla y León	55,06%	53,35
Cataluña	53,97%	58,84
Comunitat Valenciana	48,78%	48,71
Extremadura	42,92%	44,85
Galicia	46,73%	48,51
Madrid, Comunidad de	49,50%	55,89
Murcia, Región de	45,82%	47,64
Rioja, La	54,26%	56,39

Table 9: Average rate of graduation of bachelor's degree

Before running the correlation, I observed that the three autonomous communities with the highest graduation rate are Castilla y León, Catalonia, and La Rioja, while the three with the lowest rate are Canarias, Asturias, and Andalucía. These regions do not exactly overlap with the three top and bottom ones of the regional social mobility ranking.

After running the correlation, the P-value is 0,0054 and the correlation coefficient is 0,6787, so I can safely conclude that there is a positive correlation between the rate of graduation in a region and its level of social mobility

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[2] This data only represents the section of children that are 26 and 27 years old, since I am assuming that they graduated when they were 22.

A possible explanation for this correlation is that a region where people finish their degree in time has less abandonment and stronger educational programs, which means that students are more prepared to find a high-quality job that will offer them economic stability.

5.2.2.10 Rate of affiliation to Social Security[3]

This rate measures the percentage of people who affiliate with the Social Security system in Spain between 1 and 4 years after they graduate out of the total of people who graduate with a bachelor's degree. (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	Rate of afilliation to social security	Income centile
Andalucía	45,33%	43,79
Aragón	58,05%	57,06
Asturias, Principado de	48,18%	50,51
Balears, Illes	57,36%	54,94
Canarias	48,24%	43,29
Cantabria	52,67%	51,02
Castilla - La Mancha	48,15%	52,13
Castilla y León	49,00%	53,35
Cataluña	63,11%	58,84
Comunitat Valenciana	49,31%	48,71
Extremadura	46,47%	44,85
Galicia	47,31%	48,51
Madrid, Comunidad de	58,21%	55,89
Murcia, Región de	46,21%	47,64
Rioja, La	57,09%	56,39

Table 10: Rate of affiliation to social security between 1 and 4 years after graduating

Before running the correlation, I observed that the four autonomous communities with the highest rate of affiliation to social security between 1 and 4 years after graduating are Catalonia, Madrid, Aragón, and La Rioja, while the four autonomous communities with the lowest rate are Andalucía, Extremadura, Galicia, and Murcia. There is a strong overlap with the regional social mobility ranking.

After running the correlation, the P-value is less than 0,001 and the correlation coefficient is 0,8757, so I can safely confirm that there is a positive correlation between the rate of affiliation to social security between 1 and 4 years after graduating of a region and the level of social mobility it has.

A possible explanation for this correlation is that in Spain people affiliate with Social Security when they formalize a labor contract, so the implicit conclusion is that it is also a measure of

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[3] The periods of reference used for this rate are 2012-2013 and 2009-2010, which means that the average rate would cover all the population under 25 that graduated between the periods 2011-2012 and 2005-2006, which in this case are the children that would be between 26 and 32 years old in 2016 when they were between 23 and 26 years old after graduating.

employability: if people can find a job more easily after they graduate, they will have more opportunities to acquire financial stability and ascend the social ladder.

5.2.2.11 Average price of bachelor's degree credits[45]

The prices refer to credits registered for the first time. (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	Price of a credit	Income centile
Andalucía	11,91 €	43,79
Aragón	16,88 €	57,06
Asturias, Principado de	15,45 €	50,51
Balears, Illes	14,70 €	54,94
Canarias	10,65 €	43,29
Cantabria	12,35 €	51,02
Castilla - La Mancha	14,89 €	52,13
Castilla y León	12,65 €	53,35
Cataluña	17,30 €	58,84
Comunitat Valenciana	13,32 €	48,71
Extremadura	13,22 €	44,85
Galicia	11,50 €	48,51
Madrid, Comunidad de	16,50 €	55,89
Murcia, Región de	12,86 €	47,64
Rioja, La	15,47 €	56,39

Table 11: Average price of bachelor's degree credits

Before running the correlation, I observed that the four autonomous communities with the highest average price of bachelor's degree credits are Catalonia, Madrid, Aragón, and La Rioja, while the three autonomous communities with the lowest average price are Canarias, Andalucía, and Galicia. There is a clear overlap with the regional social mobility ranking.

After running the correlation, the P-value is less than 0,001 and the correlation coefficient is 0,8399, so I can safely affirm that there is a positive correlation between how expensive the price of a bachelor's degree credit in an autonomous community is and the level of social mobility it has.

This is counterintuitive because it would be logical to think that the more expensive college tuition is, the less accessible it becomes for people with lower income and, therefore, the fewer chances people from lower socioeconomic backgrounds have to improve their knowledge and

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[4] This data only represents the average price of university credits by region between the periods 2008-09 and 2011-12, which means that the prices that the children aged 30, 31, and 32 had to pay the year they graduated are not included in this average.

[5] The region of Extremadura did not provide its average price in 2010, so that year has been omitted when making the average.

skills and, consequently, be able to get a more qualified and higher-paying job, thus perpetuating the cycle of poverty.

5.2.2.12 Share of people who had completed tertiary education[6]

Refers to number of people who completed some form of higher education. (OECD.stat, n. d.)

Autonomous communities	Share	Income centile
Andalucía	32,8%	43,79
Aragón	42,9%	57,06
Asturias, Principado de	52,7%	50,51
Balears, Illes	32,5%	54,94
Canarias	35,4%	43,29
Cantabria	42,7%	51,02
Castilla - La Mancha	33,9%	52,13
Castilla y León	43,0%	53,35
Cataluña	45,1%	58,84
Comunitat Valenciana	38,6%	48,71
Extremadura	34,3%	44,85
Galicia	45,0%	48,51
Madrid, Comunidad de	48,1%	55,89
Murcia, Región de	34,9%	47,64
Rioja, La	43,7%	56,39

Table 12: Share of people between 25 and 34 years old who had completed tertiary education

Before running the correlation, I observed that the autonomous communities with the highest share of people who had completed their tertiary education are Asturias, Madrid, Catalonia, and Galicia, while the autonomous communities with the lowest share are the Baleares islands, Andalucía, Castilla la Mancha and Extremadura. The order of these regions does not exactly coincide with the order of the level of social mobility analyzed, although some regions are in similar placements.

After running the correlation, the P-value is 0,0646 and the correlation coefficient is 0,4885, so I can confirm that there is a weak correlation between these two variables.

5.2.2.13 Rate of people enrolled in sciences

Calculated as the number of people enrolled in sciences over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

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[6] The share of people who had completed tertiary education in 2016 is using the population of between 25 and 34 years old, to account for the level of education of young people.

Autonomous community	People enrolled in sciences	Income centile
Andalucía	7,75%	43,79
Aragón	7,19%	57,06
Asturias, Principado de	8,45%	50,51
Balears, Illes	7,61%	54,94
Canarias	4,51%	43,29
Cantabria	2,78%	51,02
Castilla - La Mancha	3,61%	52,13
Castilla y León	7,62%	53,35
Cataluña	8,60%	58,84
Comunitat Valenciana	7,47%	48,71
Extremadura	6,80%	44,85
Galicia	7,74%	48,51
Madrid, Comunidad de	8,08%	55,89
Murcia, Región de	7,74%	47,64
Rioja, La	6,44%	56,39

Table 13: Rate of people enrolled in sciences

Before running the correlation, I observed that the autonomous communities with the highest rate of people enrolled in sciences are Asturias, Catalonia, and Madrid, while the ones with the lowest rate are Canarias, Cantabria, and Castilla la Mancha. This does not coincide with the regional social mobility ranking.

After running the correlation, the P-value is 0,4647 and the correlation coefficient is 0,2045, so I can confirm that there is almost no correlation between these two variables.

5.2.2.14 Rate of people enrolled in health sciences

Calculated as the number of people enrolled in health sciences over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	People enrolled in health sciences	Income centile
Andalucía	10,23%	43,79
Aragón	12,09%	57,06
Asturias, Principado de	7,29%	50,51
Balears, Illes	6,47%	54,94
Canarias	10,84%	43,29
Cantabria	9,95%	51,02
Castilla - La Mancha	9,36%	52,13
Castilla y León	10,76%	53,35
Cataluña	11,50%	58,84
Comunitat Valenciana	8,10%	48,71
Extremadura	13,89%	44,85
Galicia	10,91%	48,51
Madrid, Comunidad de	8,36%	55,89
Murcia, Región de	11,97%	47,64
Rioja, La	4,06%	56,39

Table 14: Rate of people enrolled in health sciences

Before running the correlation, I observed that the autonomous communities with the highest rate of people enrolled in health sciences are Extremadura, Aragón, Catalonia, and Murcia, while the ones with the lowest rate are La Rioja, the Baleares islands, and Asturias. This coincides with the regional social mobility ranking.

After running the correlation, the P-value is 0,1848 and the correlation coefficient is –0,3621, so I can confirm that there is a weak correlation between these two variables.

5.2.2.15 Rate of people enrolled in humanities

Calculated as the number of people enrolled in humanities over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	People enrolled in humanities	Income centile
Andalucía	9,15%	43,79
Aragón	7,44%	57,06
Asturias, Principado de	7,28%	50,51
Balears, Illes	9,59%	54,94
Canarias	9,18%	43,29
Cantabria	4,15%	51,02
Castilla - La Mancha	9,19%	52,13
Castilla y León	9,27%	53,35
Cataluña	11,56%	58,84
Comunitat Valenciana	9,91%	48,71
Extremadura	6,03%	44,85
Galicia	7,52%	48,51
Madrid, Comunidad de	8,02%	55,89
Murcia, Región de	9,36%	47,64
Rioja, La	18,64%	56,39

Table 15: Rate of people enrolled in humanities

Before running the correlation, I observed that the four autonomous communities with the highest rate of people enrolled in humanities are La Rioja (by a notable difference of around 7%), Catalonia, Valencia, and the Baleares islands, while the ones with the lowest rate are Cantabria, Extremadura, Aragón, and Asturias. This does not coincide with the regional ranking of social mobility.

After running the correlation, the P-value is 0,1985 and the correlation coefficient is 0,3518, so I can confirm that there is a weak correlation between these two variables.

5.2.2.16 Rate of people who graduated from sciences

Calculated as the number of people graduated from sciences over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	People graduated from sciences	Income centile
Andalucía	7,26%	43,79
Aragón	7,48%	57,06
Asturias, Principado de	7,05%	50,51
Balears, Illes	7,95%	54,94
Canarias	4,41%	43,29
Cantabria	1,99%	51,02
Castilla - La Mancha	2,81%	52,13
Castilla y León	6,71%	53,35
Cataluña	9,52%	58,84
Comunitat Valenciana	7,42%	48,71
Extremadura	6,70%	44,85
Galicia	7,77%	48,51
Madrid, Comunidad de	7,41%	55,89
Murcia, Región de	6,22%	47,64
Rioja, La	7,57%	56,39

Table 16: Rate of people who graduated from sciences

Before running the correlation, I observed that the autonomous communities with the highest rate of people graduated in sciences per number of people graduated are Catalonia, the Baleares islands, Galicia, and la Rioja, while the autonomous communities with the lowest rate are Cantabria, Castilla la Mancha and Canarias. This ranking does not fully coincide with the regional social mobility ranking but (mostly) aligns with the northeast regions that have higher social mobility.

After running the correlation, the P-value is 0,2228 and the correlation coefficient is 0,3346. It is relevant to note that the correlation coefficient is bigger than the one obtained by calculating the correlation of the rate of people enrolled in sciences and the average of the children's income centile, which is 0,2045, so the correlation has gotten stronger.

5.2.2.17 Rate of people who graduated from health sciences
Calculated as the number of people graduated from health sciences over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	People graduated from health sciences	Income centile
Andalucía	12,74%	43,79
Aragón	15,38%	57,06
Asturias, Principado de	10,69%	50,51
Balears, Illes	9,95%	54,94
Canarias	14,03%	43,29
Cantabria	11,94%	51,02
Castilla - La Mancha	12,41%	52,13
Castilla y León	14,29%	53,35
Cataluña	13,13%	58,84
Comunitat Valenciana	10,86%	48,71
Extremadura	16,12%	44,85
Galicia	12,50%	48,51
Madrid, Comunidad de	9,96%	55,89
Murcia, Región de	13,50%	47,64
Rioja, La	5,89%	56,39

Table 17: Rate of people who graduated from health sciences

Before running the correlation, I observed that the autonomous communities with the highest rate of people who graduated in health sciences are Extremadura, Aragón, Castilla y León, and Canarias, while the ones with the lowest rate are La Rioja, the Baleares islands, and Madrid. This ranking partially coincides with the ranking of the rate of people enrolled in health sciences, but it does not seem to have a clear pattern compared to the one of social mobility by region.

After running the correlation, the P-value is 0,1729 and the correlation coefficient is –0,3714. In this case, the correlation coefficient is also closer to –1 than the one obtained before, so the correlation has also gotten stronger.

5.2.2.18 Rate of people who graduated in humanities
Calculated as the number of people graduated from humanities over the total number of people enrolled in university (including masters). (CIENCIA – Ministerio de Ciencia, Innovación y Universidades, n. d.)

Autonomous community	People graduated from humanities	Income centile
Andalucía	8,45%	43,79
Aragón	6,21%	57,06
Asturias, Principado de	6,01%	50,51
Balears, Illes	7,11%	54,94
Canarias	7,72%	43,29
Cantabria	4,31%	51,02
Castilla - La Mancha	7,61%	52,13
Castilla y León	7,94%	53,35
Cataluña	10,75%	58,84
Comunitat Valenciana	9,54%	48,71
Extremadura	6,20%	44,85
Galicia	11,78%	48,51
Madrid, Comunidad de	6,95%	55,89
Murcia, Región de	7,53%	47,64
Rioja, La	12,67%	56,39

Table 18: Rate of people who graduated from humanities

Before running the correlation, I observed that the autonomous communities with the highest rate of people who graduated in humanities per number of people who graduated were La Rioja, Catalonia, Galicia, and Valencia, while the autonomous communities that had the lowest rate were Cantabria, Extremadura, Asturias, and Aragón. This does not coincide with the ranking of regional social mobility.

I have run the correlation; the P-value is 0,5545 and the correlation coefficient is 0,1659. In this case, the correlation value has gotten further away from -1 in comparison with the correlation calculated with the number of people enrolled in humanities, which is −0,3621, so the correlation has gotten weaker.

Analyzing these last 3 correlations together I have observed that the rate of graduation by branch of knowledge strengths (or in the case of humanities, weakens) the correlation between the number of students that choose to study a specific branch of knowledge in a region and the social mobility in that region, so I have concluded that to analyze social mobility it is more important to analyze the type of tertiary branch of knowledge that students finish their degree with than the type that they choose.

6. Conclusion

In this study, I have focused on two kinds of variables that could predict the level of social mobility that an autonomous community could have in 2016: Variables related to the economy and labor market of Spain, such as indexes about the level of activity of the secondary and tertiary sector, average number of tourists, and rate of unemployment, and variables related to education in Spain, such as expenditure per resident or student, rate of graduation and area of education that they graduated in.

When analyzing variables related to Spain's economy, I have observed that the most relevant variables when predicting the level of social mobility that a region will have are the ones associated with the labor market such as the unemployment rate, the average annual salary, and the rate of affiliation to the Social Security system after graduation. In comparison, other variables like the industrial production index and services sector activity index had to be discarded because they didn't have a strong correlation nor were significant enough to be included in the prediction model used to calculate the average income centile that young people of a region will belong.

When analyzing variables related to Spain's education, I have observed that variables associated with the cost of education such as the expenditure in euros by people enrolled in university or the price of credits for a bachelor's degree do have a positive correlation with the average income centile that the young people of a region will have in comparison to their parents. Furthermore, the branch of education that a student graduates in is more relevant than the one they enrolled in when predicting the level of social mobility of an autonomous community. I have also observed that, counterintuitively, regions where people graduated in careers related to health sciences tend to have low social mobility while regions where people graduated in careers related to natural sciences tend to have high social mobility. Nevertheless, the variables related to the branches of higher education people pursued had to be discarded alongside other variables related to education since according to their P-value they were not relevant enough to calculate the level of social mobility a region will have. The only variables with P-values sufficiently low to prove that they were significant enough to be included in the prediction model that calculates the average income centile that young people of a region belong to are the grade necessary to access college education in 2016, the graduation rate for bachelor's degrees and the average price of bachelor's degree credits.

Based on the conclusions obtained from the data analyzed, some possible solutions that I believe could be adequate to reduce the heterogeneity between the levels of social mobility by region are:

- In terms of economic measures, to focus on reducing the unemployment of the regions that are most affected by implementing training programs, creating public job positions or encouraging businesses to offer their job positions and recruit employees from these areas, and implementing regulations to ensure that the salary is similar across all autonomous communities.

- In terms of educational measures, to reinforce tertiary education programs and create a stronger support system for students so they have both higher chances of enrolling in tertiary education and higher chances of finishing this education in an appropriate time and being able to enter the labor market as fast as possible.

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Annexes

1. Industrial Production Index
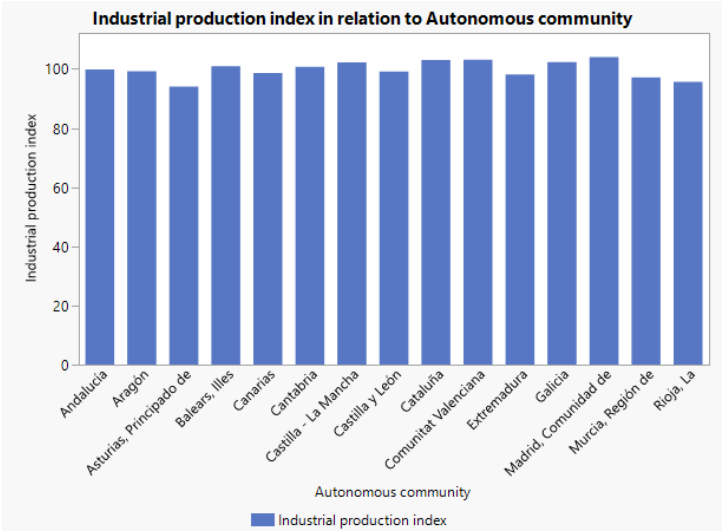
Graph 1.1: Average industrial production index
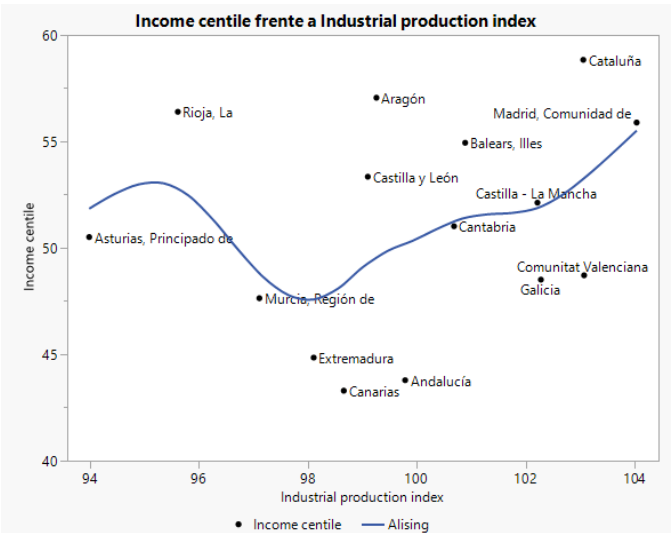
Graph 1.2: Average industrial production index correlation

2. Service sector Activity Index
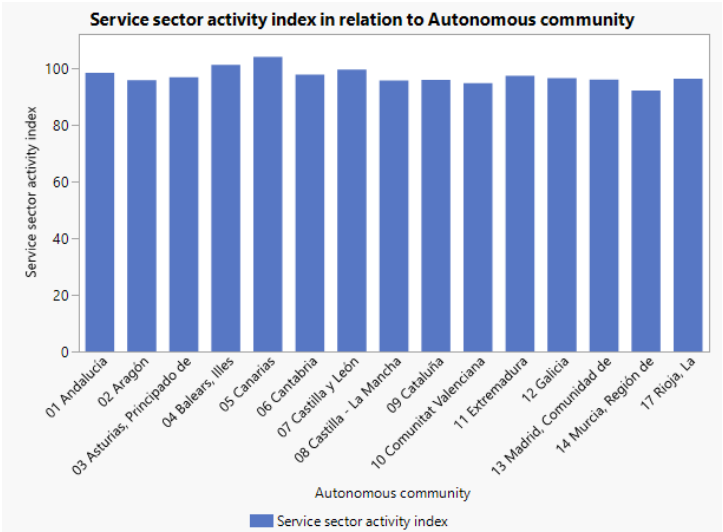
Graph 2.1: Average services sector activity index
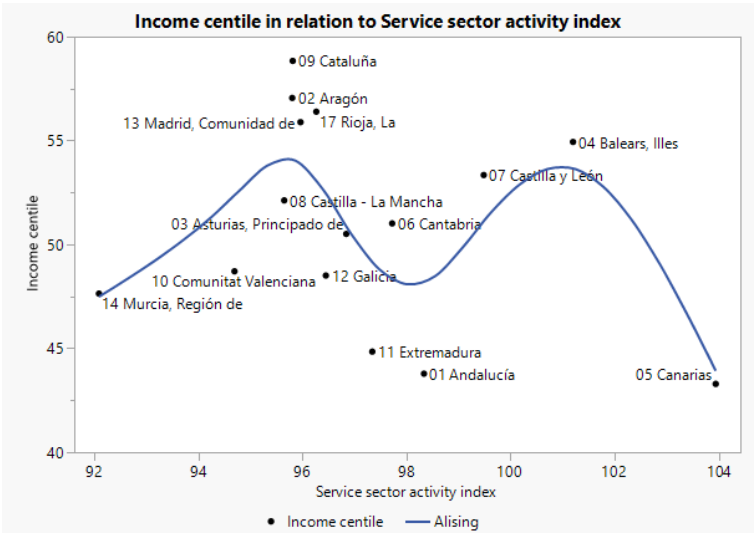
Graph 2.2: Average services sector activity index correlation

3. Unemployment rate for people between 25 and 54 years old
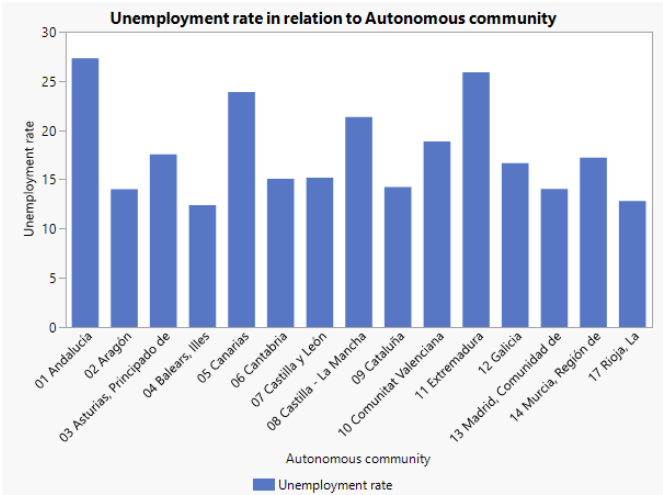
Graph 3.1: Unemployment rate for people between 25 and 54 years old
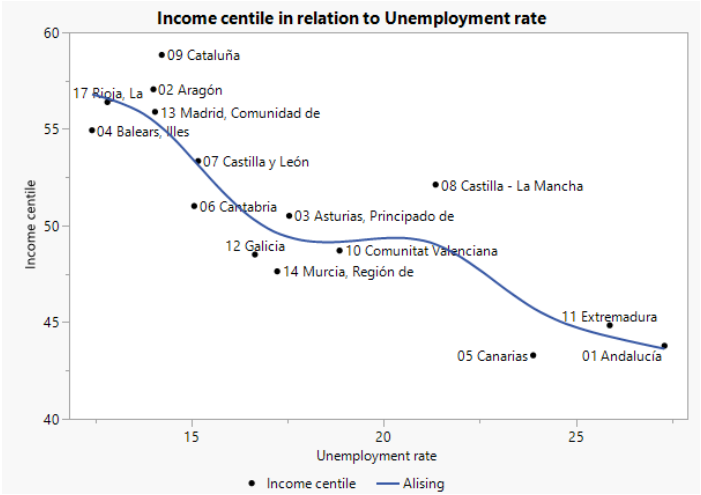
Graph 3.2: Unemployment rate for people between 25 and 54 years old

4. Average number of tourists
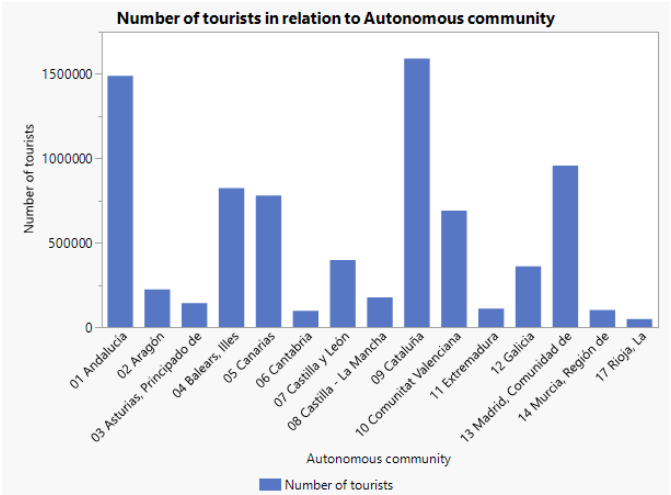
Graph 4.1: Average number of tourists
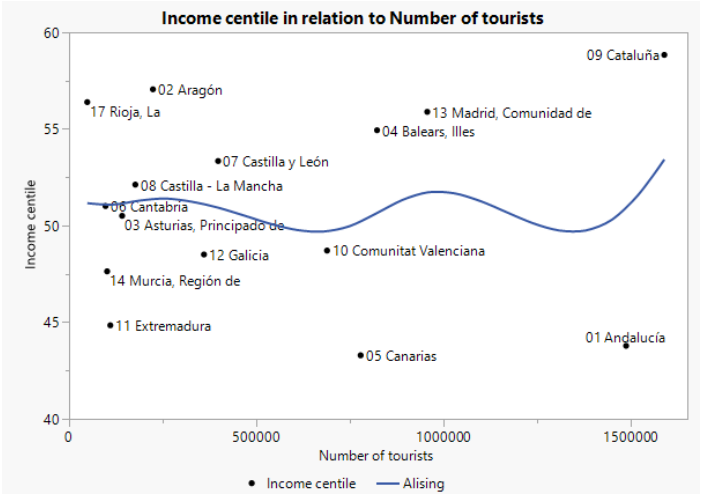
Graph 4.2: Average number of tourists correlation

5. Annual salary by employee
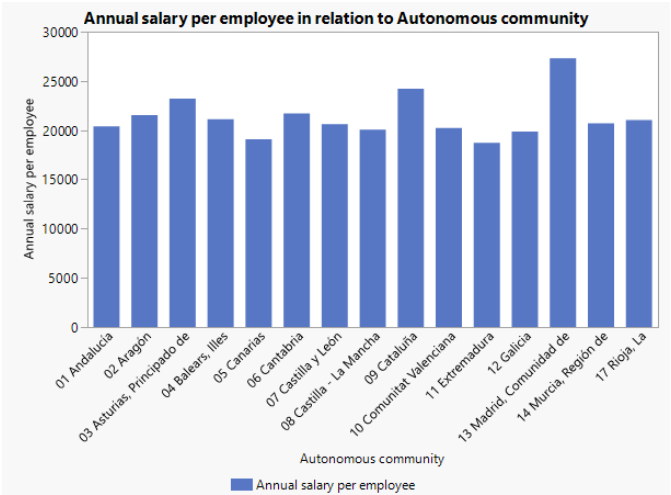
Graph 5.1: Average annual salary per employee
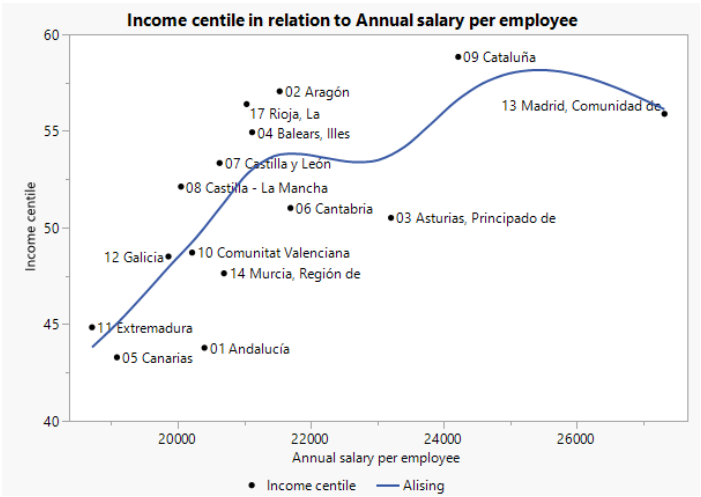
Graph 5.2: Average annual salary per employee

6. Grade to access college education (2016)
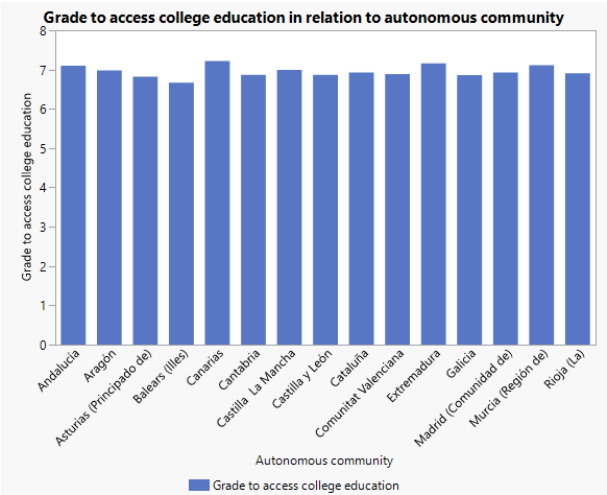
Graph 6.1: Average grade to access college education in 2016
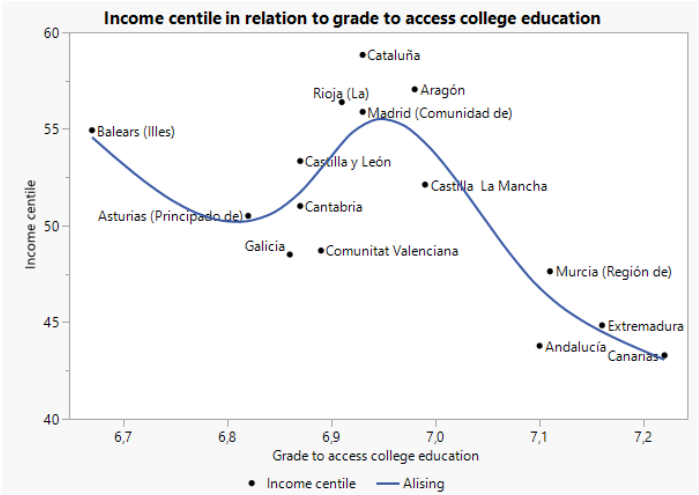
Graph 6.2: Average grade to access college education in 2016 correlation

7. Expenditure on education per capita
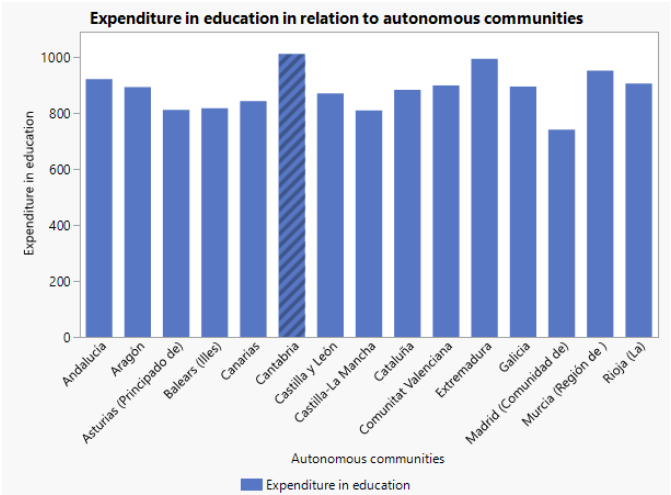
Graph 7.1: Expenditure on education per capita
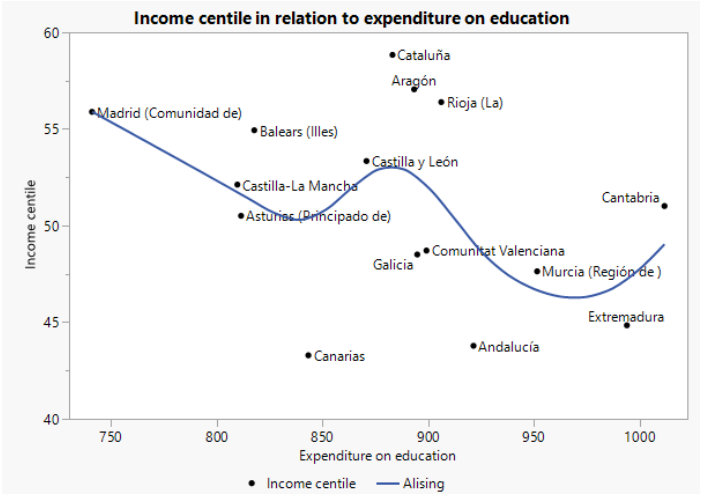
Graph 7.2: Expenditure on education per capita

8. Expenditure on college education per number of people enrolled in university
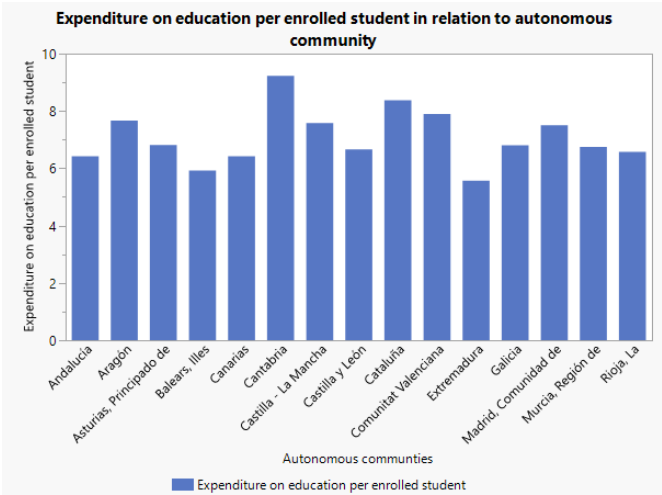
Graph 8.1: Average expenditure on college education per number of people enrolled in university
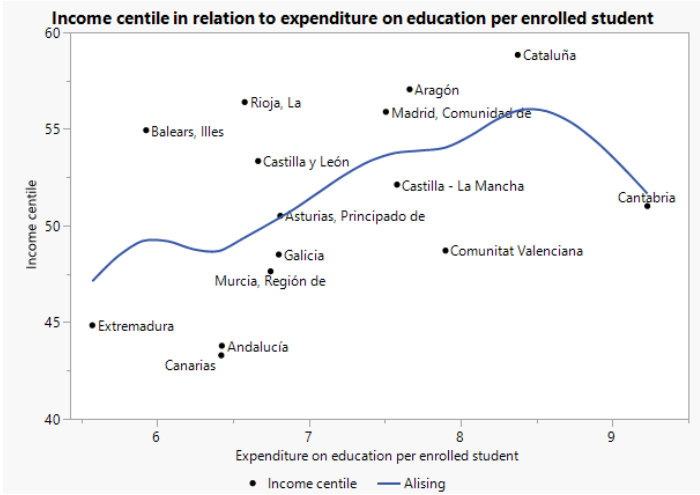
Graph 8.2: Average expenditure on college education per number of people enrolled in university correlation

9. Rate of graduation of bachelor's degree
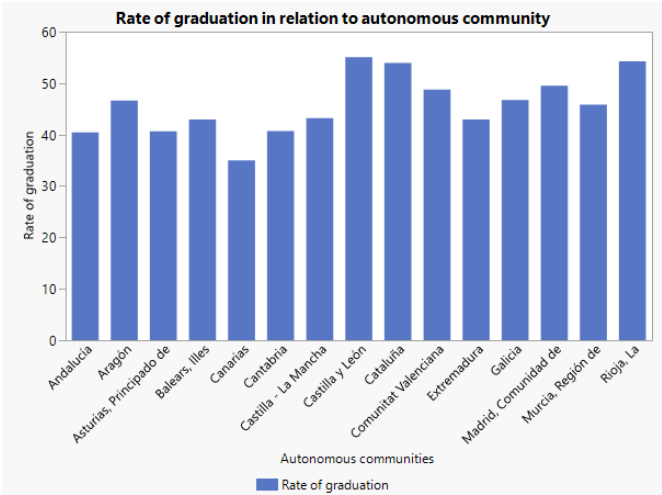
Graph 9.1: Average rate of graduation of bachelor's degree
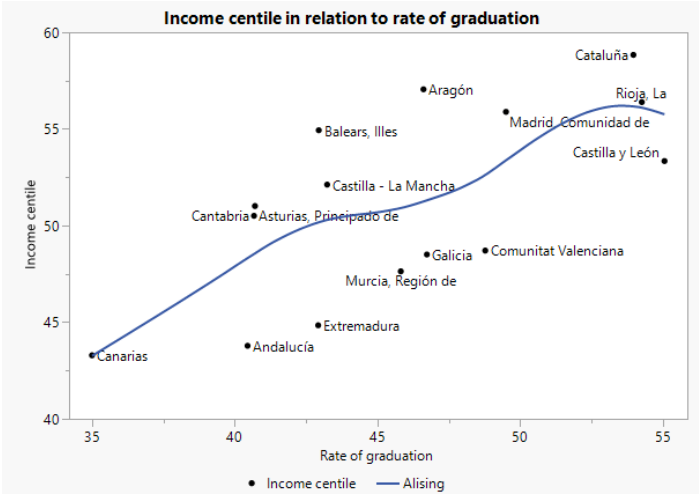
Graph 9.2: Average rate of graduation of bachelor's degree correlation

10. Rate of affiliation to Social Security
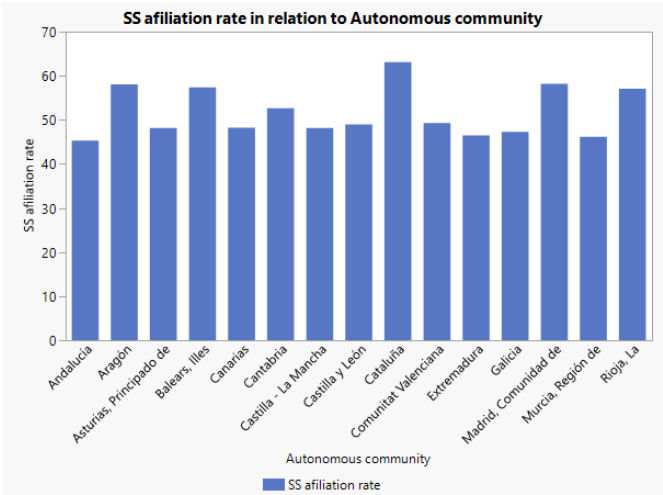
Graph 10.1: Rate of affiliation to social security between 1 and 4 years after graduating
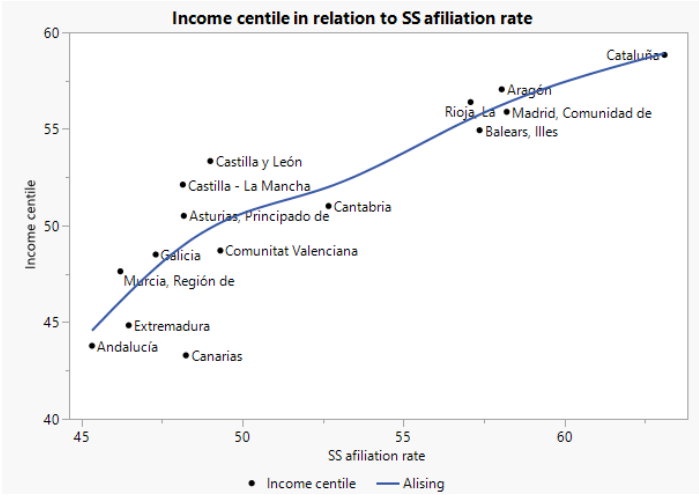
Graph 10.2: Rate of affiliation to social security between 1 and 4 years after graduating correlation

11. Average price of bachelor's degree credits
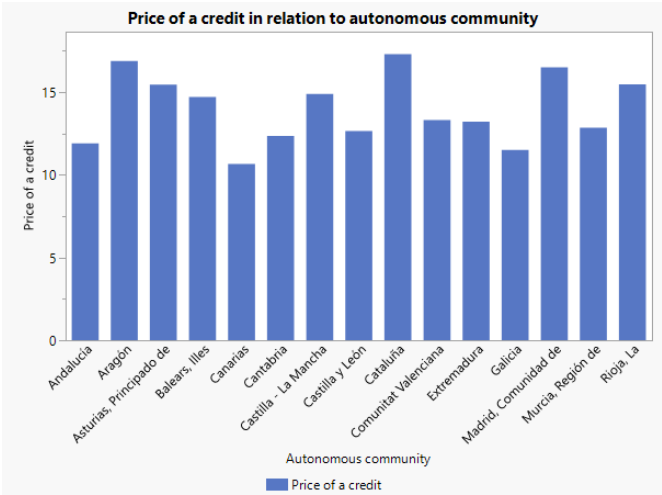
Graph 11.1: Average price of bachelor's degree credits
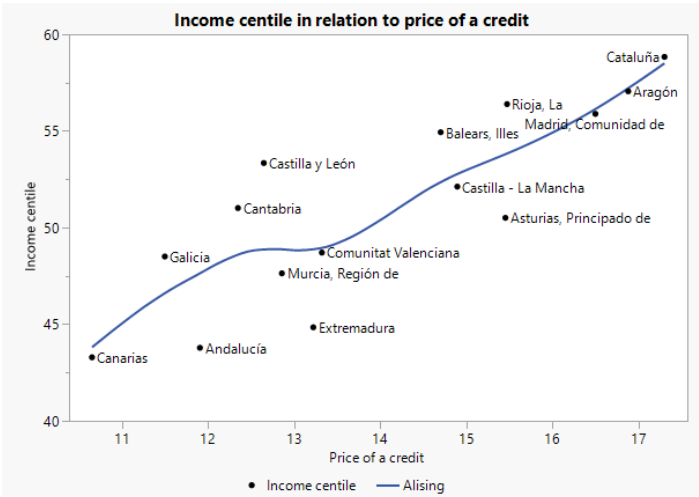
Graph 11.2: Average price of bachelor's degree credits correlation

12. Share of people who had completed tertiary education
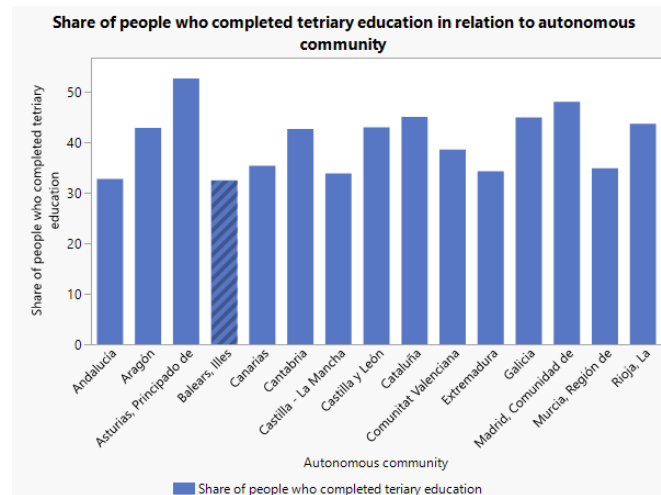
Graph 12.1: Share of people between 25 and 34 years old who had completed tertiary education
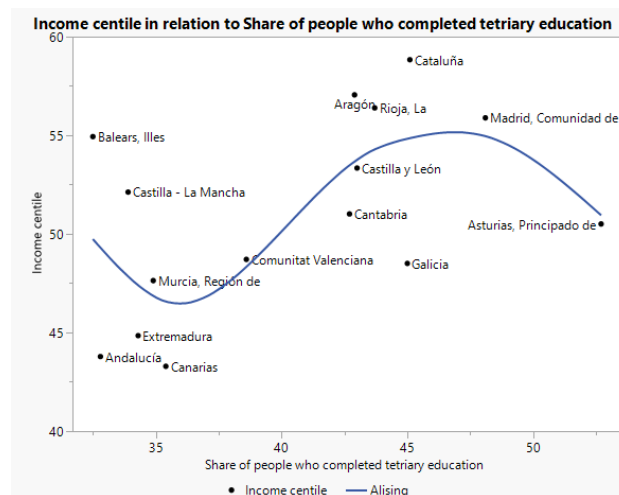
Graph 12.2: Share of people between 25 and 34 years old who had completed tertiary education

13. Rate of people enrolled in sciences
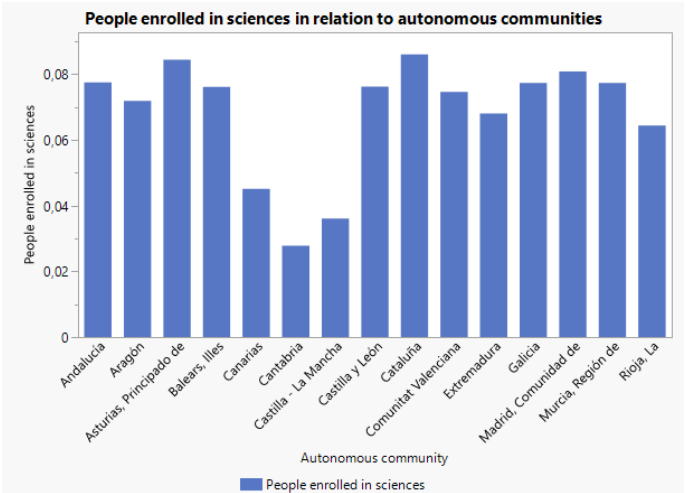
Graph 13.1: Rate of people enrolled in sciences
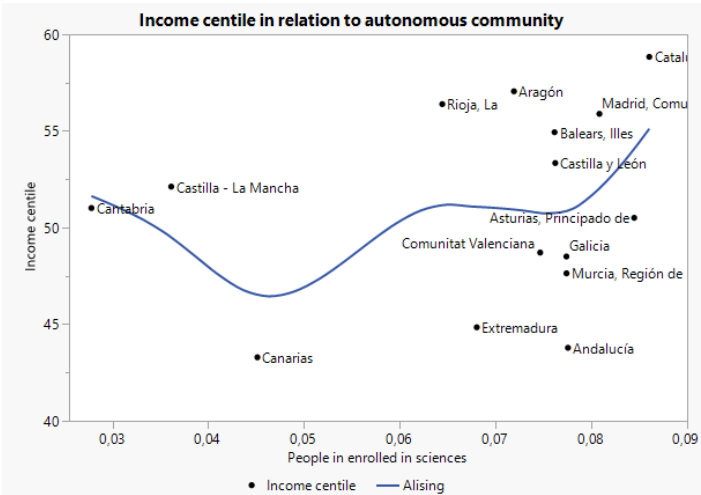
Graph 13.2: Rate of people enrolled in sciences correlation

14. Rate of people enrolled in health sciences
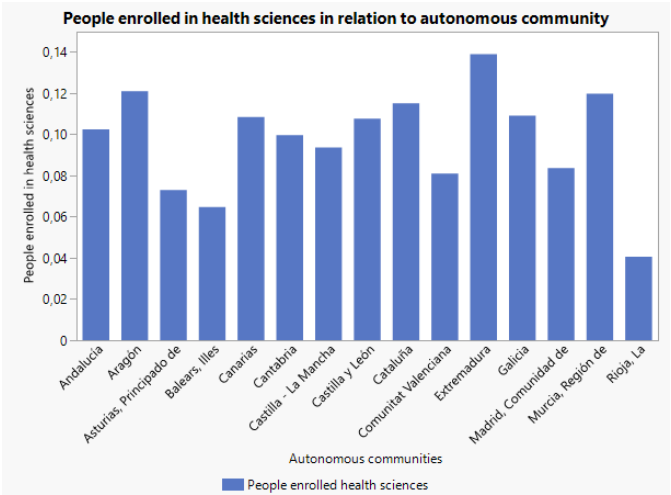
Graph 14.1: Rate of people enrolled in health sciences
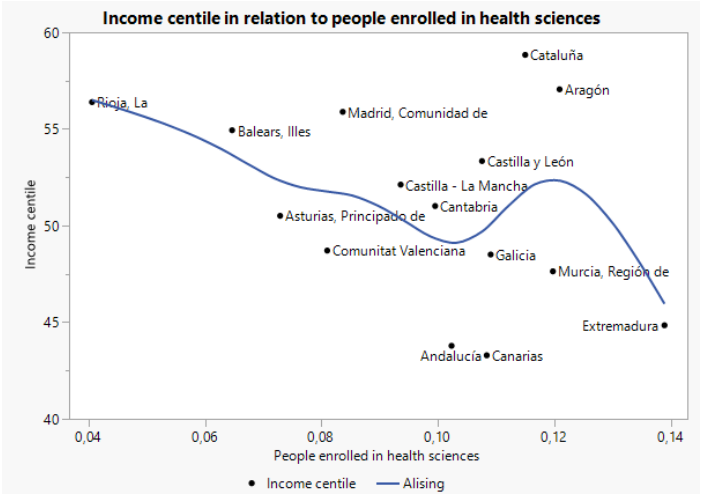
Graph 14.2: Rate of people enrolled in health sciences correlation

15. Rate of people enrolled in humanities
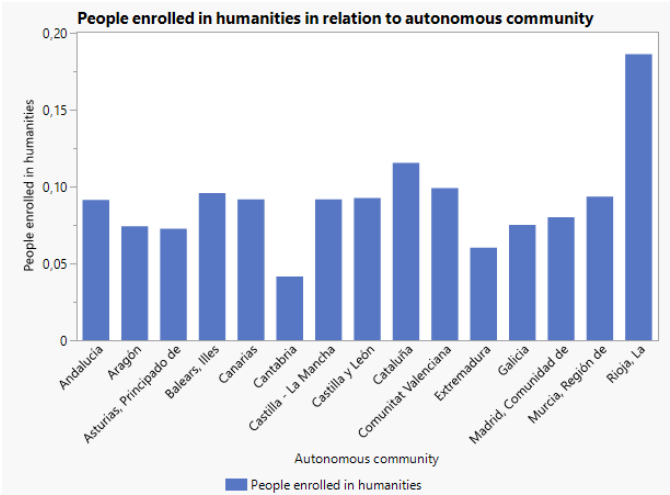
Graph 15.1: Rate of people enrolled in humanities
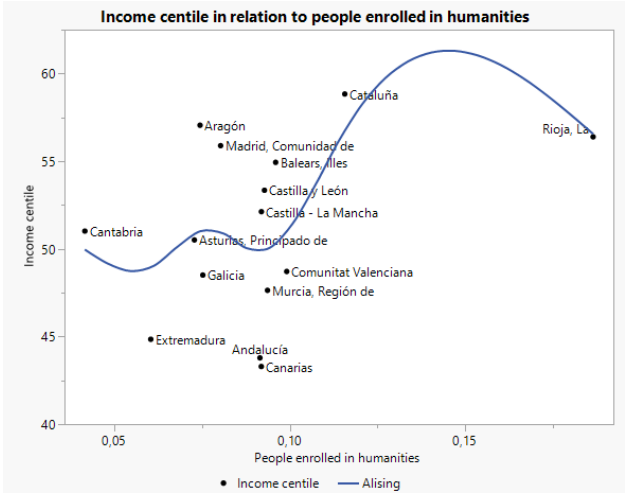
Graph 15.2: Rate of people enrolled in humanities correlation

16. Rate of people who graduated in sciences
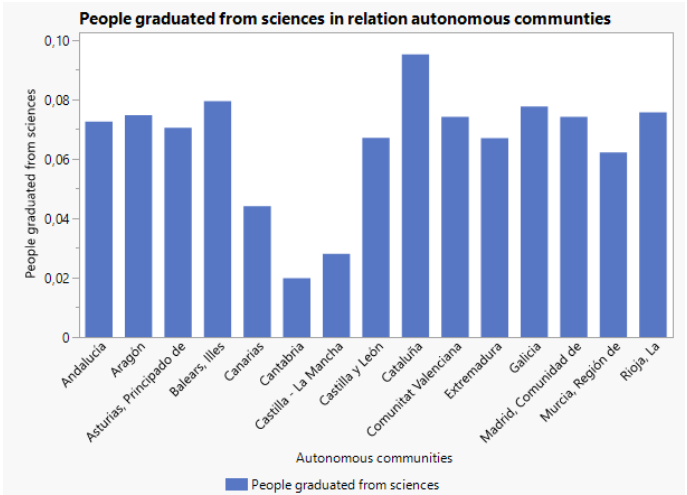
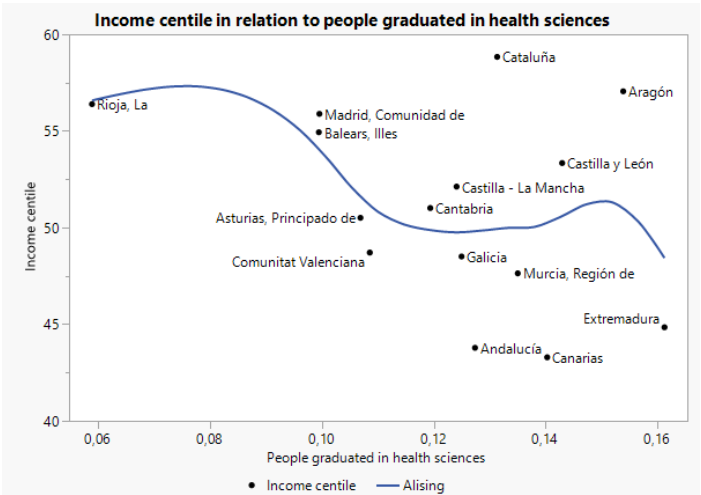Graph 16.1: Rate of people who graduated from sciences
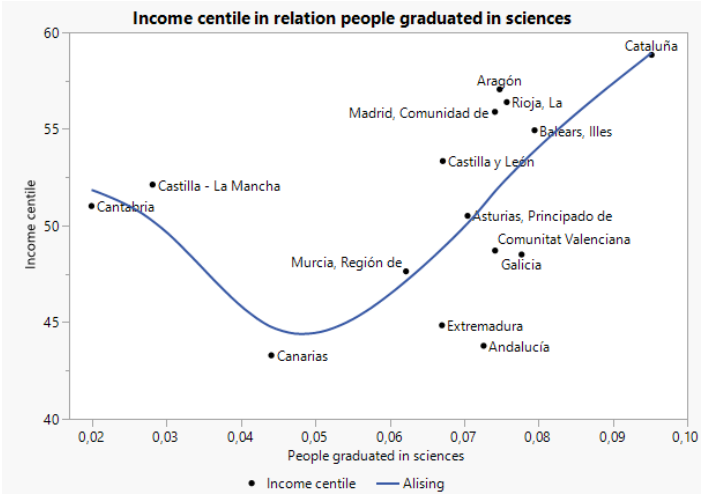
Graph 16.2: Rate of people who graduated from sciences correlation

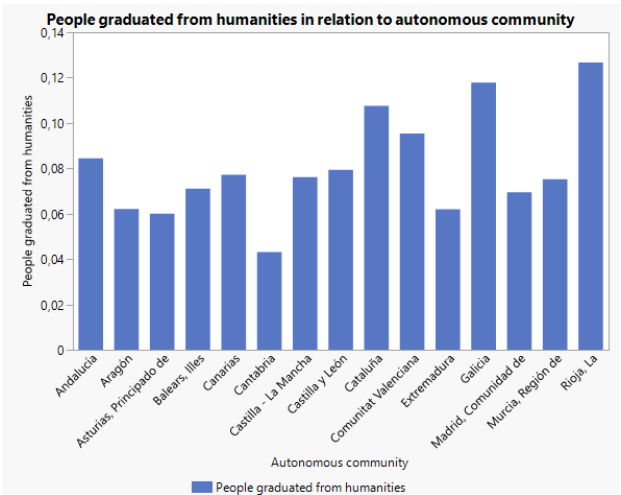## 17. Rate of people who graduated in health sciences
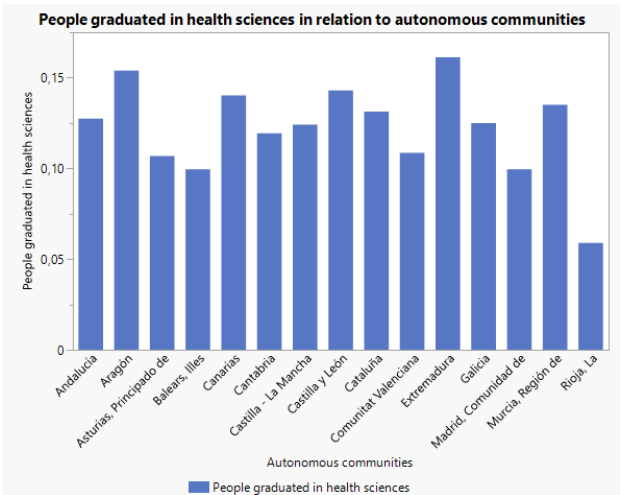
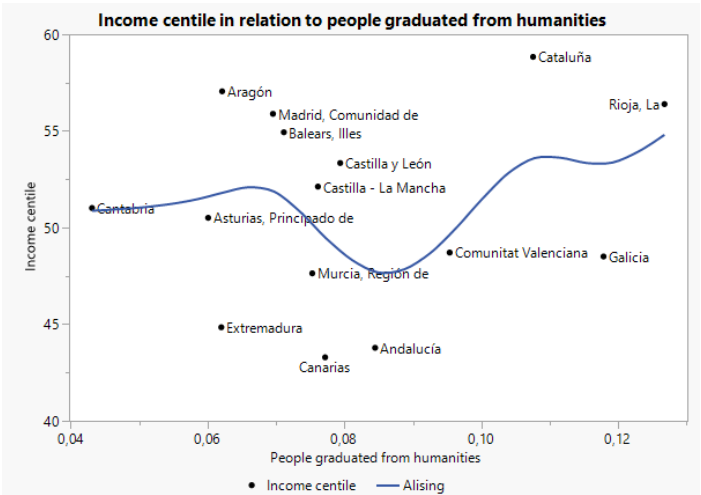Graph 17.1: Rate of people graduated from health sciences

Graph 17.2: Rate of people who graduated from health sciences correlation

18. Rate of people who graduated in humanities

Graph 18.1: Rate of people who graduated from humanities

Graph 18.2: Rate of people graduated from humanities correlation