

The drought in Andalusia: Analysis of the economic impact and evaluation of the SOS Plan

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Abstract

Droughts is currently a topic of special relevance and interest worldwide. According to the Environmental Portal of Andalusia, droughts are a major risk in the region. This natural phenomenon can be direct and/or indirect. Direct effects are those specific to a sector, with changes in production, added value or employment focused on activities that use water as a critical or important part of the production process, such as the public water supply, agriculture or electricity. Indirect effects are derived from the former, that is, a reduction in supply can affect the productivity of a company and, therefore, the flow of goods and services through sectoral interconnections and supply chains. Both factors motivate this research, as severe droughts affect the demand for goods and impact the main economic aggregates.

The objective of this study is to estimate the impact of the drought in which the region finds itself and the SOS Plan launched by the Junta de Andalucía to address the water shortage on the Andalusian economy. For this, we use input–output methodology and the Social Accounting Matrix of Andalusia database. We carry out two simulations: the first takes into account only the effect of the drought, and the second further includes the injection of money from the public administration.

The results obtained reveal notable consequences of the drought on the economy (-6.2% in terms of income and -7.4% in terms of GDP) that could be reduced in the event of good execution of the aforementioned plan (-3.2% in terms of income and -3.9% in terms of GDP). In addition to economic problems, other issues such as social or political concerns may arise. Due to the essentiality of water itself, there is a serious problem to tackle in the coming years with some possible solutions such as technological changes or restructuring production structure.

Keywords: Social accounting matrix, drought, Andalusia

JEL codes: C67, C68, D57, D58, Q25, Q54

1. INTRODUCTION

Drought is a recurring feature of the climate that is characterized by the temporary shortage of water in relation to the normal supply in a given period of time (droughts can affect regions for weeks, months or years) and can cause serious impacts on the environment, society and the economy (Espinosa-Tasón et al., 2022; Stahl et al., 2016). A distinction is made between drought mainly caused by a lack of rainfall in a certain region for a certain time and drought caused by water shortages that occur when reservoir flow rates and storage levels fall below normal (Canto, 2001) and limit the demand for water for human consumption and by industry.

Jenkins et al. (2021) state that the effects of this natural phenomenon can be direct and/or indirect. Direct effects are those specific to a sector, with changes in production, added value or employment focused on activities that use water as a critical or important part of the production process, such as the public water supply, agriculture or electricity (Freire-González et al., 2017a). Indirect effects are derived from the former, that is, a reduction in supply can affect the productivity of a company and, therefore, the flow of goods and services through sectoral interconnections and supply chains. Both factors motivate this research, as severe droughts affect the demand for goods and impact the main economic aggregates.

According to the Environmental Portal of Andalusia, droughts are a major risk in the region. The Environmental Information Network of Andalusia (REDIAM, acronym in Spanish), which belongs to the Ministry of Sustainability, Environment and Blue Economy of the Junta de Andalucía prepares monthly reports (Junta de Andalucía, 2022) of the incidence of droughts by agricultural region based on the joint study of precipitation and vegetation stress, and forecasts are established with regard to the persistence of the phenomenon in the coming months.

Public participation is one of the guiding principles that governs the actions derived from Law 8/2018, of October 8, on measures against climate change and for the transition towards a new energy model in Andalusia. The law defines two bodies for participation in matters of climate change: the Interdepartmental Commission on Climate Change and

the Andalusian Climate Council. Both commissions work in the fight against climate change. At the end of 2021, the Hydrographic Confederation of the Guadalquivir (CHG), an agency under the Ministry for the Ecological Transition and the Demographic Challenge (MITECO, acronym in Spanish), decreed a drought in 80% of the basin, highlighting the exceptional situation in the reservoirs of the community, an event that was not seen since the drought of 2008 (CHG, 2021).

This natural phenomenon is currently a topic of special relevance and interest worldwide. Numerous studies have analysed the impact of drought in different countries, such as Mexico (Baja California Sur and northwest), Venezuela, Peru and Uruguay, based on climatic indicators and focused on ecological, agricultural and hydraulic applications (Troyo et al., 2014; Cruz et al., 2014; Sosa, 2016; Olivares and Zingaretti, 2018). At the regional level, there are also previous studies that have analysed this problem, for example, a comparative analysis of drought indices in Andalusia for the period 1901-2012 (Gallardo et al., 2016); climate change and drought in Andalusia (Vargas, 2013); the socioeconomic impact of drought in the agricultural sector in the period 2005-2008 (Espinosa-Tasón et al., 2022); and an analysis of the evolution of water use in agriculture in the period 2004-2012 in the Guadalquivir basin through System of Environmental Economic Accounting – Water (SEE-W) tables (Borrego-Marín et al., 2015). The aim of this study is to estimate the economic impact of the drought in Andalusia and of the SOS Plan (Solutions and Works against Drought) proposed by the Junta de Andalucía to address the situation of water scarcity in the Autonomous Community. To achieve this objective, multisectoral modelling based on social accounting matrices applied to Andalusia is used.

This paper is divided into the following sections. In section two, the methodology used is explained. Then, in section three, the database used is detailed, and the simulations carried out are explained. In section four, the results obtained are presented. Finally, in section five, the main conclusions drawn from this study are presented.

2. METHODOLOGY

The theory of general equilibrium initiated by Walras (1874) has been put into practice thanks to the development in principle of input–output tables that were later completed with a social accounting matrix (SAM).

The input–output analysis proposed by Leontief (1936, 1941) marks the beginning of general equilibrium models using a multisectoral approach; however, his model ignores economic relations as a whole and does not take into account final demand decisions in prices. Kantorovich (1939) and Koopmans (1951) introduced optimization to traditional input–output analysis and improved the conductive technique towards a general equilibrium model.

The information contained in a SAM describes the economic relations of a region and, in turn, is taken as a database for the construction of economic models. Linear models are

part of this group of SAM-based models, allowing the analysis of the capacity of the different agents of the economy to generate and absorb increases in income.

Linear SAM models are based on obtaining a multiplier matrix that incorporates the set of interdependence effects between all endogenous sectors of the model. They are an extension of the input–output models and include the relations between the productive sectors and the flows that are produced from the agents receiving income from the productive sectors. In addition, they allow the endogenization of households and treat them in a manner analogous to the productive sectors. Thus, intersectoral relationships analysed, as are the links between household income and spending. The public sector, investment or the foreign sector can also be endogenized (Sánchez et al., 2014). In summary, the advantage of using a SAM is that it includes all the information reflected in the input–output table plus the flows between added value and final demand. In this way, in a SAM, the circular flow of income of an economy is perfectly reflected. A SAM have been applied to conduct impact analyses of European countries, for example, the study by Campoy-Muñoz et al. (2017), and water price analyses at a regional level, for example, the study by Cardenete and Hewings (2011).

For the matrix equation, following Stone (1978) and Pyatt and Round (1979), the exogenous accounts determined outside the economic system and the endogenous accounts are defined, a change in these exogenous accounts is introduced, and the change presented in endogenous accounts is analysed. Next, a matrix of average propensities to spend is constructed; the payments made to account i for each unit of income of j is calculated as follows:

$$a_{ij} = \frac{Y_{ij}}{Y_j}, \quad i, j = 1, \dots, n$$

Next, a vector of exogenous components is added, represented by X_A, X_F, X_P and X_K ; a vector representing the income level of endogenous accounts is added, represented by Y_A, Y_F, Y_P and Y_K ; and a vector of payments from endogenous to exogenous accounts is added, represented by P_A, P_F, P_P and P_K .

Based on this, the following is obtained:

$$Y_i = \sum_{j=1}^n \left(\frac{Y_{ij}}{Y_j} \right) Y_j = \sum_{j=1}^m a_{ij} Y_j + \sum_{j=m+1}^{m+k} ; \quad n = m + k$$

where m and k represent the endogenous and exogenous accounts, displayed as a matrix below:

$$\begin{bmatrix} Y_A \\ Y_F \\ Y_P \\ Y_K \end{bmatrix} = \begin{bmatrix} C_I & 0 & C_F & I \\ W & 0 & 0 & 0 \\ 0 & R & T & 0 \\ 0 & 0 & S & 0 \end{bmatrix} \cdot \begin{bmatrix} Y_A \\ Y_F \\ Y_P \\ Y_K \end{bmatrix} + \begin{bmatrix} X_A \\ X_F \\ X_P \\ X_K \end{bmatrix}$$

The matrix is divided into four submatrices: A_{mm}, A_{mk}, A_{km} and A_{kk} , as follows:

$$Y_m = A_{mm}Y_m + A_{mk}Y_k$$

where Y_m and Y_k represent total income, both from endogenous and exogenous accounts and A_{mm} corresponds to the productive activities, which are the technical coefficients obtained with the input–output analysis.

Finally, it clears Y_m , leaving the matrix equation as follows:

$$Y_m = (I - A_{mm})^{-1} \cdot A_{mk} \cdot Y_k$$

$$Y = M \cdot X_m$$

where $(I - A_{mm})^{-1}$ is presented as M and is the matrix of linear multipliers. This matrix is interpreted as the impact generated by a unit increase in the exogenous accounts on the income of each of the endogenous accounts. $A_{mk} \cdot Y_k$ as X_m represents the income injections issued by the exogenous accounts and received by the endogenous ones. Based on the SAM of Andalusia in 2016 (IECA, 2021), a linear model was developed following the classic criteria of endogeneity. Matrix M indicates the accounts that generate the greatest expansionary effects on the income of the economy.

3. DATABASE AND SIMULATIONS

The database used in this model is the SAM built for Andalusia from the input–output table published by the Institute of Statistics and Cartography of Andalusia (IECA, 2020) for 2016. The SAM is composed of 81 sectors and describes the flows in the Andalusian economy for that year. A SAM has been chosen over the input–output table because it allows the homogenization and completion of the microeconomic information on the circular flow of income, production and expenditures. That is, in addition to the productive sectors, a SAM identifies capital and labour as productive factors and a savings–investment account, the government and consumers as institutional sectors, disaggregates different taxes and includes the foreign sector.

Spain has officially settled into a drought. Because of the scarcity of water resources, among the Autonomous Communities, Galicia, Castilla y León, Extremadura, Andalusia, Catalonia and Navarra are in a more serious situation (Hydrological Bulletin of the Ministry of Ecological Transition, 2022). Andalusia has experienced one of the driest hydrological moments in the last 25 years. According to information provided by the Guadalquivir Hydrographic Confederation, in the fourth quarter of 2022, swamps are already at 28% capacity, 11% less than the national average. Given that the reservoirs, both Spanish and Andalusian, are always below their capacity, 100% is not the starting point for full capacity. For this reason, instead of applying a 72% drought forecast, the forecast is estimated at 60%. To carry out the calculations, we apply a weighting percentage, calculated based on the water use of each sector according to the information obtained through the satellite water account for Spain (INE, 2014) and subsequently extrapolated to Andalusia for the total output to obtain the total weighted output.

Despite being one of the driest regions in Spain, Andalusia is experiencing a historical drought situation. For this reason, at the end of October 2022, the Junta de Andalucía announced a plan to combat this phenomenon that required a total of 4,047 million euros distributed in eight main axes: purification and sanitation; high supply; drought; irrigation; reclaimed waters; new water resources, transport infrastructure and digitalization of water (desalination); flood risk mitigation, restoration and renaturation of rivers and streams; protection and recovery of groundwater masses; and awareness campaigns. This plan, called the SOS Plan, will promote crucial works and measures until 2027 (Junta de Andalucía, 2022).

We investigate two scenarios: the decrease to 60% for the drought estimate and the injection, also weighted, of 4,000 million euros into the economy through the SOS Plan of the Junta de Andalucía.

Detailed information on the calculation of the impact vectors for the economic sectors can be seen in the annex. Notably, 90% of water use is attributed to the agricultural sector. As Dietzenbacher and Velázquez (2007) indicate, Andalusian agricultural sectors are relatively small, but they account for 90% of annual water consumption.

4. RESULTS

Table 1 presents the simulation results. The most affected sector is agriculture, livestock and hunting (1), with a decrease of 52.63% in GDP. This sector shows the greatest reduction because it accounts for the most intensive water use; therefore, the impact is more striking in this sector, as it causes production losses.

Next are the food and tobacco industries (11), with a reduction of 15.48% in GDP due to the need for water during production processes. The veterinary activities sector (62) is also affected through its relationship with agriculture, livestock and hunting (1), with a decrease of 14.56%. The water collection, purification and distribution (37) and production, transportation and distribution of electricity (35) sectors are also affected but to a lesser extent, reporting reductions of 13.73% and 6.54%, respectively.

Table 1. Sectors most affected by the impact in terms of income and GDP (thousands of euros).

No.	Sector	Production/income		GDP	
		ABS	%	ABS	%
1	Agriculture, livestock and hunting	-8,783,389.89	-52.63	-5,594,760.14	-52.63
11	Other food industries. Tobacco	-617,217.41	-15.48	-31,795.05	-15.48
62	Veterinary activities	-23,475.33	-14.56	-4,572.96	-14.56
37	Collection, purification and distribution of water	-236,657.54	-13.73	-113,027.88	-13.73

35	Production, transmission and distribution of electrical energy	-540,468.15	-6.54	-195,000.13	-6.54
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Source: Own elaboration.

These results are consistent with those obtained by Alonso (2003), whose work indicated that the agricultural sectors consume much more water directly than do the industrial and service sectors. These findings confirm that agriculture in Andalusia is the largest consumer of water resources.

Table 2 shows the aggregate impact in terms of income and GDP. According to the estimated model, the impact on the Andalusian economy as a result of the drought will be a decrease of 6.29% in income and 7.3% in GDP.

Table 2. Summary of the impact the impact in terms of income and GDP (thousands of euros).

	Production/income		GDP	
	ABS	%	ABS	%
Drought	-21,183,831.62	-6.29	-10,673,576.62	-7.39

Source: Own elaboration.

Table 3 provide data regarding the impact of the drought offset by the monetary injection proposed in the SOS Plan. The most affected sectors are similar to those in the previous simulation; however, the decrease is less due to the investment foreseen through the SOS Plan. For example, the decrease in the agricultural sector would lessen by approximately 20%, i.e., from 52% to less than 30%. For the remaining four sectors, the impact would decrease by approximately 50%.

Table 3. Sectors most affected by the impact in terms of income and GDP (thousands of euros).

No.	Sector	Income		GDP	
		ABS	%	ABS	%
1	Agriculture, livestock and hunting	-4,884,953.78	-29.27	-3,111,571.39	-29.27
11	Other food industries. Tobacco	-315,552.41	-7.91	-16,255.22	-7.91
37	Collection, purification and distribution of water	-123,324.97	-7.15	-58,900.13	-7.15
62	Veterinary activities	-11,299.06	-7.01	-2,201.04	-7.01
35	Production, transmission and distribution of electrical energy	-279,368.46	-3.38	-100,795.74	-3.38

Source: Own elaboration.

Finally, the total impact on the Andalusian economy would also be less. Specifically, there would be a decrease of 3.2% in income and 3.9% in GDP, as shown in Table 4.

Table 4. Summary of the impact in terms of income and GDP (thousands of euros).

	Income		GDP	
	ABS	%	ABS	%
Drought + SOS Plan	-10,851,703.11	-3.22	-5,611,641.03	-3.89

Source: Own elaboration.

Therefore, although drought is a high-impact phenomenon in the Andalusian region, translated into an impact of 7.39% in terms of GDP, the SOS Plan would help alleviate the consequences in the most important sectors affected, reducing the impact to 3.89% in terms of GDP. However, this decrease would only occur if the other factors that affect the current regional conditions remain constant.

In terms of jobs, the simulation of the impact of the drought reflects a loss of approximately 122,000 jobs, decreasing to 63,550 with the effective implementation of the SOS Plan of the Junta de Andalucía.

Table 5. Summary of the impact in terms of jobs (thousands of euros).

	Drought impact		Drought impact + SOS Plan	
	ABS	%	ABS	%
Loss of jobs	-122,032	-4.0	-63,557	-2.1

Source: Own elaboration.

As seen in the previous results, drought affects production, sales and commercial operations in the markets; that is, it generates direct economic impacts. In turn, it generates impacts as a result of the interactions between the different sectors. However, in addition, it generates environmental and social impacts that are not accounted for in this simulation (Ding et al., 2011).

5. CONCLUSIONS

From the simulations carried out and with the results obtained, we conclude that Andalusia has a serious present and future problem that must be faced to try to reduce the damage that could be caused to the entire economy at the regional level.

According to our model, the impact on the Andalusian economy of a 60% drought will be approximately 7% in terms of income and GDP. However, the SOS Plan of the Junta de Andalucía, if well executed, would reduce the impact by almost half. The most affected sector is agriculture, livestock and hunting because it accounts for the most intensive use of this natural resource.

In addition to the quantitative results and methodological aspects, other interesting conclusions are raised. Beyond the economic impact, other types of issues will also arise,

such as social or political concerns. On a social level, due to the drought situation in Seville (capital province of Andalusia) and its metropolitan area, the municipalities supplied by EMASESA (acronym in Spanish of Empresa Metropolitana de Abastecimiento y Saneamiento de Agua de Sevilla, SA) have published municipal bulletins placing certain limitations on the use of water. Specifically, the use of drinking water for the irrigation of gardens, meadows, green areas and sports fields, of a public or private nature, is prohibited; the irrigation or flushing of roads, streets, paths and sidewalks, of a public or private nature, is prohibited; hose use to wash vehicles, except if the washing is carried out by a company dedicated to this activity, is prohibited; the filling of swimming pools, ponds and fountains, private or public, that do not have a closed circuit recovery system or fountains for human consumption that do not have automatic closing elements, is prohibited. These measures are intended to achieve the so-called 90 target, that is, 90 litres per person per day.

At the political level, if those responsible intend to change this situation to reach a more sustainable economy that uses scarce resources in a less intensive way, there are several options, as already indicated by Dietzenbacher and Velázquez (2007). The first option is technological changes. By investing in research and development, new techniques could be developed (for example, irrigation systems) that reduce the direct coefficients of water, and additional investments would allow their implementation.

The second possible option, which is usually not taken into account, is restructuring the production structure. In other words, the possibility of a change in production specialization should be considered given that Andalusia, despite being a region with water scarcity, has an economic structure specialized in water-consuming sectors.

The third option is to increase the current price of water. On the one hand, this action saves water because it encourages producers to use water more efficiently, for example, by reducing water deterioration. On the other hand, it will increase the prices of products and, in particular, the prices of water-intensive products. In turn, this will reduce the demand for these products and thus lead to water savings. Although this measure is presented as an option, a next step would be to quantify the economic and social impacts.

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ANNEX

Table 1. Calculation of the impact vector and simulation with a 60% drought forecast.

No.	Sector	Total output	Weighting	Weighted total output		Impact	
				Drought	SOS plan	Drought	SOS plan
1	Agriculture, livestock and hunting	15,194,505.00	91.05%	13,834,038.27	3,641,852.96	-8,300,422.96	-4,658,570.00
2	Silviculture and logging	325,811.00	3.09%	10,055.46	123,451.44	-6,033.28	117,418.17
3	Fishing and aquaculture	801,577.00	0.00%	0	0	0	0
4	Extractive Industries	9,590,969.00	0.02%	2,214.15	923.43	-1,328.49	-405.06
5	Processing and preserving of meat and production of meat products	3,773,264.00	0.07%	2,647.60	19,602.53	-1,588.56	18,013.97
6	Processing and conservation of fish, crustaceans and molluscs	1,174,737.00	0.02%	256.62	19,602.53	-153.97	19,448.55
7	Preparation and preservation of fruits and vegetables	2,391,410.00	0.04%	1,063.47	19,602.53	-638.08	18,964.44
8	Manufacture of fats and oils	7,622,820.00	0.14%	10,805.59	19,602.53	-6,483.36	13,119.17
9	Manufacture of dairy products	1,554,178.00	0.03%	449.18	19,602.53	-269.51	19,333.02
10	Manufacture of milling, bakery and pasta products	2,494,301.00	0.05%	1,156.95	19,602.53	-694.17	18,908.36
11	Other food industries, Tobacco	3,980,551.00	0.07%	2,946.48	19,602.53	-1,767.89	17,834.64
12	Manufacture of beverages	3,362,024.00	0.06%	2,101.93	19,602.53	-1,261.16	18,341.37
13	Textile industry, garment manufacturing, leather and footwear industry	4,007,362.00	0.05%	1,938.47	1,934.91	-1,163.08	771.83
14	Wood and cork industry	901,332.00	0.01%	56.62	251.26	-33.97	217.29
15	Paper industry	1,519,542.00	0.06%	939.23	2,472.39	-563.54	1,908.86

16	Graphic arts and reproduction of recorded media	457,268.00	0.02%	97.39	851.96	-58.44	793.52
17	Coke plants and petroleum refining. Chemical manufacturing	17,573,915.00	0.26%	45,882.73	10,443.37	-27,529.64	-17,086.27
18	Manufacture of paints, cleaning supplies, perfumes, cosmetics and other chemical products	3,170,338.00	0.29%	9,169.05	11,568.54	-5,501.43	6,067.11
19	Manufacture of pharmaceutical products	3,270,700.00	0.14%	4,693.81	5,740.44	-2,816.29	2,924.15
20	Manufacture of rubber and plastic products	2,412,028.00	0.03%	699.28	1,159.66	-419.57	740.09
21	Manufacture of cement, lime, gypsum and its derivatives	1,176,630.00	0.02%	268.85	2,010.08	-161.31	1,848.77
22	Manufacture of ceramic products, tiles, bricks and other fired earth for construction	430,896.00	0.01%	36.06	2,010.08	-21.63	1,988.44
23	Glass and stone industries	980,231.00	0.02%	186.59	2,010.08	-111.95	1,898.12
24	Metallurgy Manufacture of iron, steel and ferro-alloy products	6,936,837.00	0.10%	7,184.19	4,142.63	-4,310.51	-167.88
25	Manufacture of metal products, except machinery and equipment	3,351,379.00	0.10%	3,477.96	4,151.08	-2,086.77	2,064.30
26	Manufacture of computer, electronic and optical products	2,432,293.00	0.05%	1,107.04	1,820.56	-664.22	1,156.34
27	Manufacture of electrical material and equipment	3,040,040.00	0.05%	1,581.94	2,081.47	-949.16	1,132.31
28	Manufacture of machinery and equipment	3,249,166.00	0.01%	341.9	420.91	-205.14	215.77
29	Manufacture of motor vehicles, trailers and semi-trailers	4,439,247.00	0.04%	1,947.16	1,754.49	-1,168.29	586.2
30	Shipbuilding	290,416.00	0.05%	132.53	1,825.39	-79.52	1,745.87

31	Manufacture of other transport material, except shipbuilding	3,385,823.00	0.01%	270.87	320.01	-162.52	157.48
32	Furniture manufacturing	1,474,341.00	0.01%	182.79	495.93	-109.68	386.26
33	Other manufacturing industries	1,760,862.00	0.00%	0	0	0	0
34	Repair and installation of machinery and equipment	2,550,386.00	0.01%	304.06	476.89	-182.44	294.45
35	Production, transmission and distribution of electrical energy	8,094,425.00	0.14%	11,555.38	6,700.25	-6,933.23	-232.98
36	Gas, steam and air conditioning supply	1,403,281.00	0.02%	347.3	6,700.25	-208.38	6,491.87
37	Collection, purification and distribution of water	1,723,807.00	0.15%	2,545.06	5,905.67	-1,527.04	4,378.63
38	Collection and treatment of wastewater; collection, treatment and disposal of waste; valuation; decontamination activities and other waste management services	2,587,670.00	0.45%	11,517.01	17,802.91	-6,910.21	10,892.70
39	Construction	18,854,302.00	0.05%	8,604.11	1,825.39	-5,162.46	-3,337.08
40	Sale and repair of motor vehicles and motorcycles	3,681,342.00	0.07%	2,565.35	2,787.41	-1,539.21	1,248.20
41	Wholesale trade and trade intermediaries, except motor vehicles and motorcycles	13,599,478.00	0.29%	39,253.95	11,545.72	-23,552.37	-12,006.65
42	Retail trade, except of motor vehicles and motorcycles	12,995,987.00	0.22%	27,974.55	8,610.21	-16,784.73	-8,174.52
43	Land and pipeline transportation	9,248,417.00	0.13%	12,328.77	5,332.27	-7,397.26	-2,064.99
44	Maritime and inland waterway transport. Air transportation	1,294,031.00	0.03%	361.18	1,116.43	-216.71	899.73
45	Storage and activities related to transport	5,358,270.00	0.14%	7,271.79	5,428.46	-4,363.07	1,065.39

46	Postal and postal activities	564,167.00	0.01%	81.89	580.59	-49.13	531.46
47	Accommodation services	4,130,033.00	0.06%	2,585.98	11,151.94	-1,551.59	9,600.35
48	Food and beverage services	14,259,537.00	0.22%	30,826.88	11,151.94	-18,496.13	-7,344.19
49	Printing	774,457.00	0.03%	207.44	1,071.43	-124.47	946.97
50	Cinematographic, video and television program activities, sound recording and music publishing; radio and television programming and broadcasting activities	735,290.00	0.03%	224.3	1,220.20	-134.58	1,085.62
51	Telecommunications	4,616,970.00	0.08%	3,757.84	3,255.67	-2,254.70	1,000.97
52	Programming, consultancy and other computer-related activities; information services	2,389,326.00	0.09%	2,174.23	3,639.90	-1,304.54	2,335.36
53	Financial services, except insurance and pension funds	5,037,126.00	0.10%	5,083.05	4,036.47	-3,049.83	986.64
54	Insurance, reinsurance and pension funds, except mandatory Social Security	2,210,500.00	0.05%	1,081.98	1,957.89	-649.19	1,308.70
55	Auxiliary activities to financial services and insurance	2,235,750.00	0.04%	882.29	1,578.51	-529.37	1,049.14
56	Real estate activities	24,715,561.00	0.38%	93,530.88	15,137.16	-56,118.53	-40,981.36
57	Legal and accounting activities; activities of the headquarters; business management consulting activities	4,636,880.00	0.11%	4,986.18	4,301.33	-2,991.71	1,309.62
58	Architectural and engineering technical services; technical tests and analyses	3,141,506.00	0.07%	2,226.05	2,834.38	-1,335.63	1,498.74
59	Research and development	2,132,798.00	0.04%	954.91	1,790.90	-572.94	1,217.96
60	Advertising and market research	2,437,896.00	0.04%	1,040.53	1,707.26	-624.32	1,082.94

61	Other professional, scientific and technical activities	1,008,301.00	0.03%	284.39	1,304.79	-170.63	1,134.16
62	Veterinary activities	157,848.00	0.00%	6.97	1,304.79	-4.18	1,300.61
63	Rental activities	2,229,909.00	0.04%	826.06	1,481.79	-495.64	986.15
64	Employment-related activities	462,114.00	0.01%	65.39	566.02	-39.23	526.78
65	Activities of travel agencies, tour operators, reservation services and related activities	1,552,837.00	0.04%	645.09	1,661.70	-387.05	1,274.65
66	Security and investigation activities	929,436.00	0.12%	1,155.11	4,971.21	-693.06	4,278.15
67	Services to buildings and gardening activities	2,361,279.00	0.02%	546.51	7,014.99	-327.91	6,687.08
68	Administrative office activities and other auxiliary activities to companies	1,597,147.00	0.02%	250.03	7,014.99	-150.02	6,864.97
69	Public administration and defense; compulsory social security, Extraterritorial organizations	13,933,781.00	0.14%	19,030.10	7,014.99	-11,418.06	-4,403.07
70	Market education	3,300,378.00	0.05%	1,635.11	6,246.81	-981.06	5,265.75
71	Non-market education	7,103,132.00	0.11%	7,573.88	6,246.81	-4,544.33	1,702.49
72	Health activities market	4,417,763.00	0.07%	3,151.47	7,740.78	-1,890.88	5,849.90
73	Non-market health activities	7,566,641.00	0.12%	9,245.16	7,740.78	-5,547.09	2,193.68
74	Market social services activities	1,457,972.00	0.02%	351.23	2,186.41	-210.74	1,975.67
75	Non-market social service activities	1,850,127.00	0.03%	565.58	2,186.41	-339.35	1,847.06
76	Creative, artistic and entertainment activities; activities of libraries, archives, museums and other cultural activities; gambling and betting activities	2,416,220.00	0.04%	1,071.91	1,774.52	-643.15	1,131.38

77	Sports, recreational and entertainment activities	2,249,474.00	0.05%	1,021.16	1,815.83	-612.7	1,203.13
78	Associative activities	1,678,575.00	0.03%	522.46	1,245.01	-313.48	931.53
79	Repair of computers, personal effects and household items	638,052.00	0.01%	56.13	351.9	-33.68	318.22
80	Other personal services	2,448,466.00	0.04%	859.57	1,404.26	-515.74	888.52
81	Household activities as employers of domestic staff or as producers of goods and services for their own use	1,302,160.00	0.02%	321.85	988.67	-193.11	795.56

Source: Own elaboration