



The performance of the agricultural sector in the Algerian economy for the period between 1974-2021

CHIKHAOUI ABDELAZIZ^{*(1)}

chikhaouia@gmail.com

Research laboratory: Quantitative methods in economic sciences and business administration sciences and their applications for sustainable development (QMESBASD), Ziane Achour University of Djelfa (Algeria)

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Abstract

This article aims to analyze and study the importance of the agricultural sector, by knowing the extent to which there are statistical differences and the degree of significance of these differences in the variables studied between the private and public sectors. This research was conducted beginning from the year 1974 until 2021. Based on annual data related to aggregates, the values of the studied variables, which are the percentages of participation of both the private and public sectors, were calculated as well as the importance of the agricultural sector in the Algerian economy was determined.

- ✓ **Keyword:** agricultural sector, production account, exploitation account, discriminate factor analysis, discriminate function, analysis into basic components.

^{*}Corresponding author:

1. INTRODUCTION

The conditions under which the Algerian economy has operated since independence until today can be described as changing conditions, multiplicity of political orientations, successive governments, conflicting economic policies. There is no doubt that this has an impact on economic performance, by influencing the results of the economic sectors. Perhaps the most important of these is the emergence - in addition to the public sector - of a private sector that is active in most fields. In this paper, we try to find out the state of the agricultural sector in Algeria by tracking the behavior of the variables of the production account and the exploitation account for the period from 1974 to 2021. Therefore, for this purpose, we will use a set of statistical methods.

Accordingly, this paper consists of three basic elements:

1. Statistical analysis of the study variables;
2. Statistical tests to find out the extent of the differences in the study variables and the measure of their significance.
3. Analysis using base compounds.

It is intended by basic components to answer the following problem: To what extent can public sector institutions be considered distinct in their performance compared to private sector institutions from the perspective of contributing to the formation of the production account and exploitation account variables for this sector?

2. Statistical analysis of the study variables

From the charts showing the evolution of the values of the study variables from Table (1) and Table (2), and the values of some statistical indicators contained in Table (3) as well as Table (4), which gives the values of the correlation coefficients for these variables among them . It enables us to draw some results that are useful in understanding the general behavior of these variables during the period of the study:

2-1 Evolution of the percentage of raw production PB of the total:

We notice from Figure (1) that the percentage of raw production in the private sector PBP ranges between the lowest value of -33.13% achieved in 1976 and the highest value of 98.26% achieved in 2006. It fluctuates in a range of up to 131.39% with an arithmetic average that amounted to 60.03% with a standard deviation of 50.08%, i.e. with a coefficient of difference of 83.42. As for the public sector, it is clear from the same figure that the percentage of raw production in the public sector (PBE) has known its lowest value of -18.71% in 1974 and its highest value of 98.26% in 2006. It fluctuates within a range of 116.97%, with a standard deviation of 49.04%, but with an arithmetic average of 35.79%, with a coefficient of difference of 116.97. It is also clear from the results of the correlation matrix that this variable is strongly and positively associated with the rest of the variables at a significant level of more than 0.01, except for the percentage of salary remuneration.

2-2 Evolution of the percentage of intermediate consumption (CI) out of the total:

It is evident from Figure (2) that the percentage of intermediate consumption in the private sector (CIP) ranges between the lowest value of 00% achieved in the years 1988 and 1989 and the highest value of 99.8% achieved in 2007, with a range of 99.8%, and an arithmetic mean of 91.60 % and a standard deviation of 20.18%, with a coefficient of variation of 22.03. As for its counterpart in the public sector CIE, this ratio has the same range, the same minimum value, and the largest value during the same year with a fixed coefficient of difference. It is also clear from the results of the correlation matrix that this variable is strongly and positively associated with the rest of the variables at a significant level of more than 0.01, except for the percentage of intermediate consumption.

2-3 Evolution of the percentage of added value VA out of the total:

We notice in Figure (3) that the percentage of added value in the private sector PAV changes between the lowest value of -578.47% recorded in 1984 and the highest value of 98.03% recorded in 1992, with a range of 676.5%, which its. The mean is -231.45% and its standard deviation is 177.23%, and its coefficient of variation is

76.57. In contrast, the percentage of added value in the public sector (VAE) has the same statistical measures and in the same year. And Its mean is 327.28% and its standard deviation is 183.82%, and its coefficient of variation is 56.16. It is also clear from the results of the correlation matrix that these variables are strongly and positively related to the rest of the variables at a significant level of more than 0.01, with the exception of the percentage of internal revenue.

2-4 Evolution of the percentage of consumption of fixed assets (CFF) out of the total:

It is evident from Figure (4) that the development of percentages of consumption of fixed assets in the CFAP private sector varies within the range of 99.90%. In the years 2018, 2020 and 2021, with an arithmetic average of 94.89% and a standard deviation of 20.03%, with a coefficient of difference of 21.10. On the contrary, the development of the percentages of consumption of fixed assets in the public sector (CFFE) ranges between the lowest value of 0.0% achieved in the years 1988 and 1989 and the highest value of 99.98 % achieved in 2006, with a mean of 94.31% and a standard deviation of 134.64%, of which the coefficient of variation reached 142.76. It is also clear from the results of the correlation matrix that this variable is strongly and positively associated with the rest of the variables at a significant level of more than 0.01, except for the percentage of internal revenue.

2-5 Evolution of the percentage of internal income (RI) out of the total:

We notice from Figure (5) that the percentage of internal income out of the total in the private sector (RIP) ranges between the lowest value of -110473.68% achieved in 1984 and the highest value of 967.61% achieved in 1980, and it fluctuates in a range that reaches 441.29%. With a mean of -2294.38% and a standard deviation of 15936.86%, i.e. a coefficient of variation of 69.46. As for the public sector, it is clear from the same figure above that the percentage of internal income out of the total in the public sector (RIE) had its lowest value of 110473.68% in 1984 and its highest value of 967.61% in 1981. It is in the same range as its predecessor and with the same standard deviation, but with an arithmetic average of 2390.21 % , i.e. a coefficient of

variation of 66.67. It is also clear from the results of the correlation matrix that these variables are strongly and positively related to all variables with a significance level of more than 0.01.

2-6 Evolution of the percentage of indirect taxes related to production out of the total:

As for Figure (6), it can be seen that the percentage of indirect taxes related to production in the private sector (ILPP) ranges between the lowest value of 0.0%, achieved in the years 1988 and 1989, and the highest value of 111.08%, achieved in 1976 and It fluctuates in a range of up to 111.08%, with a mean of 96.89% and a standard deviation of 20.64%, i.e. a coefficient of variation of 21.30. As for the public sector, it is clear from the same figure that the percentage of taxes production-related from the total ILPE ranges between the lowest values of 0.0% achieved in the years 1988 and 1989 and the highest value of 111.08% achieved in 1976. It ranges between 111.08% with a mean of 1.05% and a standard deviation. 3.04 %, i.e. a coefficient of variation of 28.9. As for the public sector, it turns out that this variable is strongly and negatively associated with the variables at a significant level of more than 0.01, except for the percentage of internal revenue.

2-7 Evolution of the percentage remuneration of employees out of the total:

It is clear from Figure (7) that the evolution of the percentages of workers' compensation from the total in the private sector, SRP varies within the range of 99.98% With a mean of 86.21% and a standard deviation of 23.27%, with a coefficient of difference of 26.99. Its coefficient of difference is 152.75. It is also clear from the results of the correlation matrix that this variable is strongly and positively associated with the rest of the variables at a significant level of more than 0.01, except for the percentage of taxes associated with production.

2-8. Evolution of the percentage of the net surplus of exploitation (NSE) from the total:

We note in Figure (8) that the curve of the percentage of the net surplus of exploitation in the private sector (NSEP) changes its values over 101521.33%,

between the minimum values -12205.44% registered in 2004 and the maximum value -89315.89% registered in 2009. Besides, that its mean is 5000.64% and its standard deviation is 20046.67%, that is, with a coefficient of difference of 400.88, which is higher than any coefficient of difference recorded on all the studied variables.

We also notice that the curve of its counterpart in the public sector, behaves oppositely. As, it recorded the lowest value of -14966.66%, in 2006, and the highest value of 89315.89% in 2009, with an arithmetic average of -4904.81%, with a range of 104282.55, a standard deviation of 20045.62, and a coefficient of difference of 408.69. It is also clear from the results of the correlation matrix that this variable is not associated with any of the study variables.

❖ **Result:** As a conclusion, based on the above analysis and by looking at the calculated values of the coefficient of variation for the public sector variables that the latter were characterized by homogeneity, unlike their counterparts in the private sector, where violent fluctuations occurred during the study period.

3. Test of the significance of differences in performance between the two sectors and the estimation of discrimination function:

In this paragraph, it is sought to test the extent to which there are differences in performance between the private sector and the public sector, and what is the significance of this difference? For which sector? What is the responsibility of each variable in this difference in the performance of the public and private sectors?

3-1 Testing the significance of differences in performance between the public and private sectors:

For this purpose, we will use a hypothesis test about two related means, because the data used in this research are considered for the same variable under two different circumstances. That is, they are for compatible pairs of states. The decision is made as follows: We test the primary hypothesis (the null hypotheses $H_0 : \bar{X}_P = \bar{X}_E = 0$): that the difference between each pair of data is zero), against the alternative hypothesis that this difference (the alternative hypotheses $H_1 : \bar{X}_P \neq \bar{X}_E \neq 0$) : it is in favor of the data with the largest mean ($\bar{X}_P$), as it indicates the average of the variable

studied in the case of the private sector, ($\bar{X}_E$) The average of the studied variable indicates the case of the public sector.

Table (5) shows the results of the treatment, considering Column 2 Sig. (2-tailed). Acceptance of the alternative hypothesis (H1), which states that there are statistically significant differences between most of the couples, the average percentage of contribution to intermediate consumption, the average percentage of contribution to fixed assets, the average percentage of contribution to production-related taxes, and the average The percentage of contribution remuneration of employees and the average percentage of contribution to added value, and this difference is in favor of the private sector with the exception of the average percentage of contribution to added value. While the averages are equal when accepting the alternative hypothesis, which states that there are no statistically significant differences between the two dyads, the average percentage of contribution to internal revenue and net surplus for exploitation is in favor of the public sector.

❖ **Result:** We conclude from this that both the public sector and the private sector contribute to the total internal income and achieve raw production and a net surplus for exploitation. However, the private sector is higher on average than the public sector in terms of average intermediate consumption, average fixed assets, average taxes related to production, and average remuneration of employees.

The explanation for this result is that the private sector uses more labor than the public sector due to its dominance over the sector.

❖ **Results of discriminant factor analysis:** One of the goals of this method is to determine the set of explanatory variables that have the ability more than those proposed in the analysis to achieve differentiation, by estimating the discriminant functions that are used to classify the new observations into one of the classes of dependent variables. In this, we aim to answer the following:

- What are the variables that are responsible for distinguishing between the public agriculture sector and the private agriculture sector, given the contribution of each of

them to the total of each of the production account and exploitation account variables occurring within the sector?

- What is the degree of intervention of each variable in this distinction?

3-2 Test of the realization of the basic hypotheses of the discriminant analysis method:

The most important assumption of this method is that the independent variables follow the normal distribution for each category of the dependent variable (Chaoubi, 1997, p. 38).

- Normal distribution test: When applying the Kolmogorov -Smirnov test, we get Table (6) divided into two parts: the public sector $disc=1$ and the private sector $disc=2$. Looking at the values of the line Sig. (2.tailed), the variables that follow the normal distribution are those that have, represented by the variable percentage contribution to the depreciation of fixed assets for the two sectors. Accordingly, it cannot be denied that all study variables follow the normal distribution. However, "discriminatory analysis gives relatively good and honest results in light of the first type error." (Abou Alaa, 2003, p. 224)

3-3-Test of equality of averages:

The statistics of table (7) indicate statistically significant differences between all the averages of the proposed study variables, i.e. 100% in the two groups, which are those variables that are accompanied by a significance level of more than 5%.

- Box test for equality of covariance in society: The statistics of Table (8) indicate that there are no significant differences in the covariance matrix for the two groups: the public sector and the private sector - that is $:(sig=1>0.05)$ Box test, and the data of Table (9) are for the purpose of determining the subgroups whose covariance matrix differs. For the rest of the other subgroups, and the results of Table (8) confirm the homogeneity of variance.

3-4 Estimating the discriminant function:

From the data in Table (10), we find that: The number of steps where the algorithm converges is sixteen steps.

The included variable in the analysis at each step is the one that leads to the maximum reduction in the value of the Lambda of Wilks statistic, where the variable percentage contribution to total added value is excluded from the analysis.

-The data in Table (11) indicate that there is only one discriminant function. It is due to the presence of two partial groups, and that the amount of proper value reached proper value = 359.541 and that the relationship between the discriminant scores and the categories of the discriminatory variables, expressed by the canonical correlation,

$$\text{reached: Corrélation canonique} = \sqrt{\frac{359.541}{1+359.541}} \approx 0.9999$$

and that the percentage of the total variance of the discriminant function is 100%. .

The amount of unexplained dispersion in the discriminatory scores is shown in the value of the coefficient lambda of Wilks = 0.003 from Table (12), and the proportionality is inversely between the value of this coefficient and the quality of the analysis results (Saad El djaidha, 2003, p. 442).

-The standard coefficients for the estimated discrimination function prove to be useful in determining the effect of each variable on this discrimination, which are the percentage contribution to total raw production, the percentage of contribution to total taxes related to production, and the percentage of contribution to total remuneration of employees are characterized by opposite behavior with the rest of the positive variables and represented by the percentage of contribution to the total consumption of the medium, the percentage contribution to the total consumption of fixed assets, the percentage of contribution to total internal income, and the percentage contribution to the total net surplus for exploitation.

From Table (13) we find the estimated legal discrimination functions:

$$Z_1 = -18.687PB + 5.840CI + 0.285CFF + 15.128RI - 1.378ILP - 0.996RS + 0.394ENE.....(éq_1)$$

The data in Table (14) indicate the coefficients of the estimated legal discriminant function. This function is used in the prediction process when new observations appear. The prediction model is formulated as follows:

$$Z_2 = -18.975 - 1.532PB + 0.331CI + 0.013CFF + 01.554RI - 0.050ILP - 0.033RS + 0.096ENE.....(éq_2)$$

The data in Table (15) indicate the coefficients of the estimated legal discriminant function. This function is used in the prediction process when new observations appear. The prediction model is formulated as follows:

$$Z_3 = 0.178PB + 0.106CI + 0.218VA - 0.023CFF + 0.236RI + 0.042ILP + 0.047RS + 0.640ENE.....(éq_3)$$

The table also shows the variables excluded from the analysis, which are those marked with the letter a.

The data in Table (16) below indicate the average discriminatory scores for each category of the discriminating variable. And the results confirm that the two categories are located in opposite directions from each other, as:

* The abscissa of the barycenter of the first group (the public sector) on the factorial axis is: **(-18.763)**

* The abscissa of the barycenter of the second group (the private sector) on the factorial axis is: **(18.763)**

From the classification statistics, we find in the data of Table (17) the two linear discrimination functions attributed to Fisher,

for the public sector:

$$FDLF_1 = -5.60 - 2.30PBE + 0.78CIE + 0.14CFFE + 1.76RIE - 0.02ILPE - 0.04RSE - 0.05ENEE....(éq_4)$$

$$FDLF_2 = -717.65 - 59.78PBP + 13.20CIP + 0.64CFFP + 60.08RIP - 1.88ILPP - 1.29RSP + 355ENEP....(éq_5)$$

In the data of Table (18), the (Original) part indicates the classification results, which indicate the quality of prediction of the classification of observations of the two categories using discriminant analysis. The total number of views, amounting to 92 views, were classified correctly by 100%. As for the Validé-croisé part of the same table, it is dedicated to the results of a statistical test (Classification by elimination; Leave-one-out classification), which aims to classify all views except for one view that is left unclassified, and then classify the left-over view later. This process is repeated until all views are left at once, and the result of this test shows how good the classification is based on this algorithm. The results can be used to estimate the quality of classification for the views if we choose a new sample (Abou Alaa, 2003, p. 226).

For the purpose of forecasting, we use the equation (3) shown, and the decision based on the location of the new degree of observation in the two fields shown in Table (19) below is as follows:

A new observation is classified in the public sector group if the estimated score is: **Score $\in$ [-21.725 ; -14.626]** with a mean for the two sectors. **(18.763)**

A new observation is classified within the private sector group if the estimated score is: **Score $\in$ [14.626 ; 21.725]**

4. Analysis using basic components:

We found in the previous analysis of this paper that the private sector contributes, on average, to a greater extent in forming the variables of the production account and the exploitation account. In this part, we try to identify the variety of variables that make up the factorial axes on the one hand, and on the other hand, we attempt to understand the behavior of this contribution evolved for each sector during the study period.

4-1. Testing the verification of factor analysis hypotheses into basic components:

A- The first hypothesis is that the absolute value of the determinant of the correlation coefficients matrix differs from zero, and it is a verified hypothesis as:

Determinant = $5.78E-015$, which indicates the integrity of the analysis data and results.

B- The second assumption for this analysis is that the value of the (K-M-O) index should not be less than 50%. This is confirmed in Table (20), where its value reached 0.737 which indicates the adequacy of the sample subject of the study. The result of the Bartlett test also shows a function, and this is an indicator of the difference of the correlation matrix from the unit matrix, meaning that there are common variances between the variables of the study that constitute the set of hidden factors, and it is revealed.

C- The third hypothesis is the adequacy of the sample for each of the study variables, verified in the results of Table (21) - Anti-Image Matrix, if we follow the numbers marked by the letter (a) in the main diagonal of the matrix of imaginary coefficients for all variables greater than 0.50 which resembles a percentage of 100%. This indicates that this percentage of variables fulfills the assumption of sample adequacy for each variable.

4-2 Quality of representation of variables:

What is required is to determine the minimum number of variables that have the ability to represent all the proposed primary variables. The question is: how good is the quality of the representation of these variables?

Table (22) shows the quality of representation of the variables based on the multiple correlation coefficients, as well as the amount of shared variances between the variables. Thus, the study variables appear to have a high quality of representation.

4-3.Extracting proper values:

proper value refers to the amount of variance explained in variables by the factor with which they are associated, in this study.

The value is found alone among the eight resulting proper values, and thus we will have a basic factor axis that has an explanatory power of 95.710% according to Table (23). As it is distributed in this factor at a rate of 71.82% of the total dispersion, corresponding to the highest eigenvalue, which is $\lambda_1 = 11.491$ and a percentage of

12.61% of the dispersion. The total is matched by a second proper value, which is $\lambda_2 = 2.019$ and a percentage of 11.27% of the total dispersion corresponds to a third proper value, which is $\lambda_3 = 1.804$.

4-4 Naming the extracted factors:

We can make an attempt to describe the factor extracted from this analysis based on the factor matrix after rotating the axes, as it is the explanation of the importance of the public agricultural sector.

We note that the factor extracted from the analysis has a much greater proper value than the proper values of the rest of the variables. Accordingly, it is possible to say that the importance of the general agricultural sector is through its contribution to production and production factors and its contribution to the financial resources resulting from the production process, as shown in Figure (09).

4-5 Summarizing the years of study in a limited number of subgroups:

Using the hierarchical classification method, we try in this paragraph to provide an answer to the following question: Is it possible to summarize the years of study in a limited number of subgroups? The aim of this is to identify a group of similar years given the study variables.

For this purpose, and based on the results obtained in the previous paragraph, we follow the hierarchical cluster analysis method, and the results are shown in the Dendrogram using Complete Linkage, Figure (12). If we accept two groups, then the first group includes all the years except for the year 1998. And if we accept three groups, then all the years are classified in the first group except for the year 1988, which is classified alone in the second group, and the year 1998 in the third group alone as well. And this is the case if there are four or five groups. Therefore, the result is that the sector's performance is the same for the study period extending from the year 1974 to the year 2021.

5- RESULTS AND DISCUSSION

From the results of the previous treatment, we conclude that:

- 1- We conclude from the previous analysis and by looking at the calculated values of the coefficients of variation for the public sector variables that the latter was characterized by heterogeneity, as it knew violent fluctuations during the study period.
- 2- We conclude from this that both the public sector and the private sector contribute to total intermediate consumption and achieve equal raw production and added value. However, the public sector is higher on average than the private sector in depreciation of fixed assets and salary remuneration. The explanation for this result is that the public sector uses more labor due to its dominance over the sector.
- 3- Despite the relatively long study period extending from 1974 to 2021, the general behavior of the agricultural sector's performance Whether the public sector or the private sector cannot be considered to have been affected by the changes witnessed by the Algerian economy.

The matrix of variation coefficients for the private sector was characterized by homogeneity, unlike the public sector, which witnessed fluctuations during the study period.

There are significant differences in favor of the private sector in all variables of the study, which explains the shift in agricultural sector activity from the public to the private sector.

Motivating farmers to grant agricultural investments to absorb the labor force, granting investment loans to farmers, and following up on their implementation.

7. APPENDIX:

Tab1: Percentage of public sector contribution of the sum

ENEE	RSE	ILPE	RIE	CFFE	VAE	CIE	PBE	ANNEE	ENEE	RSE	ILPE	RIE	CFFE	VAE	CIE	PBE	ANNEE
-0,14	0,88	15,18	0,01	85,72	0,28	2,70	0,72	1998	1,20	53,75	66,90	22,48	61,18	25,32	54,95	33,74	1974
-0,16	1,20	25,29	0,05	91,43	0,40	3,78	1,03	1999	11,21	55,04	58,41	22,29	59,92	24,29	43,01	29,33	1975
-0,15	1,24	27,41	0,09	88,58	0,45	3,79	1,07	2000	19,28	60,25	69,47	28,44	60,60	30,10	45,17	33,95	1976
0,09	1,64	2,73	0,33	62,78	0,40	3,25	0,92	2001	7,96	59,73	68,09	21,49	60,13	23,72	42,33	28,68	1977
0,09	1,22	2,37	0,26	56,18	0,31	2,39	0,69	2002	10,83	54,01	69,22	24,47	59,19	26,20	43,37	30,59	1978
0,07	1,03	1,03	0,20	48,16	0,24	1,74	0,52	2003	7,45	50,61	67,40	22,63	60,59	24,33	36,82	27,25	1979
0,05	0,68	1,55	0,14	38,45	0,16	1,18	0,35	2004	-1,87	53,96	73,38	19,87	53,94	21,17	42,62	26,09	1980
0,05	0,65	1,05	0,13	39,22	0,16	1,20	0,36	2005	-2,09	51,16	73,39	18,12	51,27	19,35	39,20	23,52	1981
0,05	0,61	1,03	0,13	36,90	0,16	1,08	0,33	2006	-0,56	42,59	74,51	16,02	47,07	17,12	34,61	20,62	1982
-0,03	3,25	1,76	0,41	44,88	0,45	0,80	0,52	2007	-0,24	45,30	73,34	15,35	45,43	16,38	34,95	20,42	1983
-0,05	2,88	10,89	0,43	54,78	0,49	0,98	0,59	2008	-2,29	72,05	100,00	23,86	55,52	25,02	36,74	27,77	1984
-0,26	2,75	2,05	0,12	35,69	0,15	1,78	0,47	2009	-5,98	75,94	24,74	17,87	65,67	20,47	32,37	23,47	1985
-0,10	4,84	12,03	0,60	80,08	0,79	2,20	1,07	2010	-3,56	77,61	59,32	22,37	58,02	24,12	35,31	26,97	1986
-0,03	4,77	10,31	0,56	69,54	0,66	1,72	0,87	2011	-3,14	64,64	53,50	20,69	58,28	22,39	36,29	25,73	1987
0,00	6,02	4,31	0,58	77,20	0,70	2,01	0,96	2012	-2,50	74,41	15,15	14,27	52,37	15,80	35,70	19,49	1988
-0,12	6,24	14,30	0,01	88,30	0,84	2,84	1,21	2013	-1,37	109,95	45,24	11,47	47,39	12,64	32,99	15,97	1989
-0,09	5,68	10,27	0,57	86,02	0,78	2,36	1,08	2014	0,11	0,32	18,71	0,20	1,35	0,24	2,26	0,57	1990
-0,15	33,39	8,19	0,45	86,93	0,69	2,32	1,00	2015	0,14	0,91	14,76	0,26	1,14	0,30	3,16	0,77	1991
-0,20	4,67	5,16	0,44	88,14	0,70	2,04	0,95	2016	-0,01	0,56	2,82	0,05	0,92	0,08	2,38	0,40	1992
-0,05	4,91	12,30	0,63	79,43	0,79	2,23	1,05	2017	0,38	3,21	14,03	0,75	49,98	0,99	7,79	2,15	1993
0,01	4,47	8,22	0,06	68,60	0,73	2,17	0,98	2018	0,11	3,18	26,71	0,57	64,30	0,90	7,19	2,10	1994
0,01	4,43	8,93	0,64	63,89	0,73	2,10	0,98	2019	-0,13	3,69	26,72	0,43	72,83	0,69	8,29	2,07	1995
0,02	4,60	6,44	0,68	64,15	0,78	2,16	1,03	2020	-0,21	2,19	27,92	0,11	75,97	0,34	4,92	1,29	1996
0,09	4,64	6,43	0,74	54,84	0,84	2,06	1,06	2021	-0,19	1,57	28,71	0,13	92,29	0,65	5,80	1,63	1997

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Tab2: Percentage of private sector contribution of the sum

ENEP	RSP	ILPP	RIP	CFFP	VAP	CIP	PBP	ANNEE	ENEP	RSP	ILPP	RIP	CFFP	VAP	CIP	PBP	ANNEE
100,14	99,12	84,82	99,99	14,28	99,72	97,30	99,28	1998	98,80	46,25	33,10	77,52	38,82	74,68	45,05	66,26	1974
100,16	98,80	74,71	99,95	8,57	99,60	96,22	98,97	1999	88,79	44,96	41,59	77,71	40,08	75,71	56,99	70,67	1975
100,15	98,76	72,59	99,91	11,42	99,55	96,21	98,93	2000	80,72	39,75	30,53	71,56	39,40	69,90	54,83	66,05	1976
99,91	98,36	97,27	99,67	37,22	99,60	96,75	99,08	2001	92,04	40,27	31,91	78,51	39,87	76,28	57,67	71,32	1977
99,91	98,78	97,63	99,74	43,82	99,69	97,61	99,31	2002	89,17	45,99	30,78	75,53	40,81	73,80	56,63	69,41	1978
99,93	98,97	98,97	99,80	51,84	99,76	98,26	99,48	2003	92,55	49,39	32,60	77,37	39,41	75,67	63,18	72,75	1979
99,95	99,32	98,45	99,86	61,55	99,84	98,82	99,65	2004	101,87	46,04	26,62	80,13	46,06	78,83	57,38	73,91	1980
99,95	99,35	98,95	99,87	60,78	99,84	98,80	99,64	2005	102,09	48,84	26,61	81,88	48,73	80,65	60,80	76,48	1981
99,95	99,39	98,97	99,87	63,10	99,84	98,92	99,67	2006	100,56	57,41	25,49	83,98	52,93	82,88	65,39	79,38	1982
100,03	96,75	98,24	99,59	55,12	99,55	99,20	99,48	2007	100,24	54,70	26,66	84,65	54,57	83,62	65,05	79,58	1983
100,05	97,12	89,11	99,57	45,22	99,51	99,02	99,41	2008	102,29	27,95	0,00	76,14	44,48	74,98	63,26	72,23	1984
100,26	97,25	97,95	99,88	64,31	99,85	98,22	99,53	2009	105,98	24,06	75,26	82,13	34,33	79,53	67,63	76,53	1985
100,10	95,16	87,97	99,40	19,92	99,21	97,80	98,93	2010	103,56	22,39	40,68	77,63	41,98	75,88	64,69	73,03	1986
100,03	95,23	89,69	99,44	30,46	99,34	98,28	99,13	2011	103,14	35,36	46,50	79,31	41,72	77,61	63,71	74,27	1987
100,00	93,98	95,69	99,42	22,80	99,30	97,99	99,04	2012	102,50	25,59	84,85	85,73	47,63	84,20	64,30	80,51	1988
100,12	93,76	85,70	99,99	11,70	99,16	97,16	98,79	2013	101,37	-9,95	54,76	88,53	52,61	87,36	67,01	84,03	1989
100,09	94,32	89,73	99,43	13,98	99,22	97,64	98,92	2014	99,89	99,68	81,29	99,80	98,65	99,76	97,74	99,43	1990
100,15	66,61	91,81	99,55	13,07	99,31	97,68	99,00	2015	99,86	99,09	85,24	99,74	98,86	99,70	96,84	99,23	1991
100,20	95,33	94,84	99,56	11,86	99,30	97,96	99,05	2016	100,01	99,44	97,18	99,95	99,08	99,92	97,62	99,60	1992
100,05	95,09	87,70	99,37	20,57	99,21	97,77	98,95	2017	99,62	96,79	85,97	99,25	50,02	99,01	92,21	97,85	1993
99,99	95,53	91,78	99,94	31,40	99,27	97,83	99,02	2018	99,89	96,82	73,29	99,43	35,70	99,10	92,81	97,90	1994
99,99	95,57	91,07	99,36	36,11	99,27	97,90	99,02	2019	100,13	96,31	73,28	99,57	27,17	99,31	91,71	97,93	1995
99,98	95,40	93,56	99,32	35,85	99,22	97,84	98,97	2020	100,21	97,81	72,08	99,89	24,03	99,66	95,08	98,71	1996
99,91	95,36	93,57	99,26	45,16	99,16	97,94	98,94	2021	100,19	98,43	71,29	99,87	7,71	99,35	94,20	98,37	1997

Source: input output of SPSS tab 1 and 2

Tab(3): Statistiques descriptive

prive	N	Min	Max	Moy	Eca.t.	Var.	Var.	Eca.t.	Moy	Max	Min	N	public
PBp	48	66,05	99,67	90,74	12,20	148,87	148,87	12,20	9,25	33,95	,33	48	Pbe
Cip	48	45,05	99,20	85,01	17,65	311,56	311,56	17,65	14,98	54,95	,80	48	Cie
Vap	48	69,90	99,92	92,38	10,44	109,16	109,16	10,44	7,61	30,10	,08	48	Vae
CFFp	48	7,71	99,08	40,72	21,59	466,45	466,45	21,59	59,27	92,29	,92	48	CFFe
Rip	48	71,56	99,99	93,07	9,73	94,77	94,77	9,73	6,92	28,44	,01	48	Rie
ILPp	48	,00	98,97	71,84	27,75	770,55	770,55	27,75	28,15	100,00	1,03	48	ILPe
RSp	48	-9,95	99,68	76,59	29,88	892,82	892,82	29,88	23,40	109,95	,32	48	Rse
ENEp	48	80,72	105,98	99,30	4,10	16,85	16,85	4,10	,69	19,28	-5,98	48	ENEe
N val.	48											48	N val.

Source: input output of SPSS tab 1 and 2

Tab(4): Matrix of correlation coefficient Pearson (a)

N= 48	PBE	CIE	VAE	CFFE	RIE	ILPE	RSE	IEE
PBE	1,000	,988**	,998**	-,063**	,996**	,891	,882**	,386**
CIE	,988**	1,000	,977**	-,740**	,974**	,893**	,892	,339**
VAE	,998**	,977**	1,000	-,064**	,999**	,887**	,883**	,394**
CFFE	-,063**	-,740**	-,064**	1,000	-,074**	-,005*	-,050**	,10**
RIE	,996**	,974**	,999**	-,074**	1,000	,891**	,879**	,401**
ILPE	,891**	,893**	,887**	-,005*	,891**	1,000	,752**	,317**
RSE	,882**	,892**	,883**	-,050**	,879**	,752**	1,000	,141**
ENEE	,386**	,339**	,394**	,10**	,401**	,317**	,141**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Tab(5): Test of equality of means

Sig. (2-tailed)	t	Paired Differences					df=47
		95% Confidence Interval of the Difference		Std. Error Mean	Std. Dev.	Mean	
		Upper	Lower				الثانية
0,000	-23,13	-74,39	-88,57	3,52	24,40	-81,48	PBE - PBP
0,000	-13,74	-59,78	-80,28	5,09	35,30	-70,03	CIE - CIP
0,000	-28,10	-78,71	-90,84	3,01	20,89	-84,77	VAE - VAP
0,005	2,97	31,09	6,00	6,23	43,19	18,55	CFFE - CFFP
0,000	-30,65	-80,49	-91,80	2,81	19,47	-86,14	RIE - RIP
0,000	-5,45	-27,55	-59,80	8,01	55,51	-43,68	ILPE - ILPP
0,000	-6,16	-35,84	-70,54	8,62	59,76	-53,19	RSE - RSP
0,000	-83,20	-96,21	-100,98	1,18	8,21	-98,60	ENEE - ENEP

Test One-Sample Kolmogorov-Smirnov Tab(6):

		Pb	Ci	Va	CFF	Ri	ILP	Rs	ENE
Parametresn	Moy.	50,00	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ormal ^{a,b}	Ecar-t.	42,71	39,338	43,861	23,420	44,36	35,27	39,978	49,728
Differences	Abs.	,202	,189	,201	,073	,207	,142	,196	,285
les plus	Pos	,202	,189	,201	,073	,207	,142	,196	,285
extremes	Nég	-,202	-,189	-,201	-,073	-,207	-,142	-,196	-,285
Z de Kolm.-Smi.		1,97	1,850	1,974	,712	2,02	1,395	1,925	2,789
Signif.asyp. (bilat.)		,001	,002	,001	,692	,001	,041	,001	,000

a. La distribution à tester est gaussienne. b. Calculée à partir des données.

Tab(8): test results

M de Box		0,000
F	Approximately	0,000
	ddl1	28
	ddl2	30789.691
	Signification	1,000
Test the null hypothesis of equality of population covariance matrices		

Tab(7):Test for equality of group means

	Lambda de Wilks	F	ddl1	ddl2	Sig.
PBEP	,081	1070,427	1	94	,000
CIEP	,199	377,870	1	94	,000
VAEP	,056	1579,860	1	94	,000
CFFEP	,841	17,709	1	94	,000
RIEP	,048	1879,506	1	94	,000
ILPEP	,613	59,429	1	94	,000
RSEP	,553	76,063	1	94	,000
ENEEP	,007	13842,597	1	94	,000

Source:input output of SPSS tab 1 and 2

Tab(10):Variables introduced/eliminated^{a,b,c,d}

Pas	Intro-duced	Eliminated	Lambda de Wilks							
			Stat	ddl1	ddl2	ddl3	F exact			
							Stat	ddl1	ddl2	Sig.
1	ENE		,007	1	1	94	13842,59	1	94	,000
2	ILP		,006	2	1	94	7330,18	2	94	,000
3	Ri		,005	3	1	94	5618,62	3	94	,000
4	Pb		,003	4	1	94	6487,82	4	94	,000
5	Ci		,003	5	1	94	5608,34	5	94	,000
6	Rs		,003	6	1	94	4988,34	6	940	,000
7	CFF		,003	7	1	94	4519,94	7	94	,000
8		va	0,056	8	1	94		8	94	,000

Tab(9):Déterminants Log

Déterminant Log	Rang	disc
24,043	7	1
24,043	7	2
24,043	7	Intra - groupes combinés

Les rangs et logarithmes naturels des déterminants imprimés sont ceux des matrices de covariance du groupe.

Tab(12): Lambda Wilks

Test de la ou des fonctions	Lambda de Wilks	Khi-deux	ddl	Sig.
1	0,003	532,828	7	0,000

Tab(11):proper values

Fonction	Valeur propre	% de la variance	% cumulé	Corrélation canonique
1	359,541 ^a	100,0	100,0	0,999
a. Les 1 premières fonctions discriminantes canoniques ont été utilisées pour l'analyse.				

Tab(14):Coefficients of canonical discriminant functions

Fonction	
-1,532	Pb
,331	Ci
,013	CFF
1,554	Ri
-,050	ILP
-,033	Rs
,096	ENE
-18,975	(Constant)

Tab(13):coefficients of standardized canonical discriminant functions

	Fonction
Pb	-18,687
Ci	5,840
CFF	,285
Ri	15,128
ILP	-1,378
Rs	-,996
ENE	,394

SPSSSource:input output of tab 1 and 2

Tab(16): Functions at the barycentres of groups

Function	
1	disc
-18.763	Public sector disc1
18.763	Private sector disc2
Non-standardized canonical discriminant function Evaluated of groups means	

Tab(15):structure Matrix

Function	
,640	ENE
,236	Ri
,218	Va ^a
,178	Pb
,106	Ci
,047	Rs
,042	ILP
-,023	CFF

a. This variable is not used in the analysis

Tab(18):Classification Results^{b, c}

		disc	Classe(s) d'affectation prévue(s)		Total
			1	2	
Original	Effectif	1	48	0	48
		2	0	34	48
	%	1	100,0	0,0	100,0
		2	0,0	100,0	100,0
Validé- croisé ^a	Effectif	1	48	0	48
		2	0	48	48
	%	1	100,0	0,0	100,0
		2	0,0	100,0	0,00

Classification function CoefficientTab(17):¹

2	1	
-59,784	-2,309	Pb
13,202	,787	Ci
,643	,148	CFF
60,082	1,764	Ri
-1,883	-,020	ILP
-1,293	-,042	Rs
3,551	-,051	ENE
-717,656	-5,600	(Constant)
Fon. Disc. Lin. FisherSource:input output of SPSS		

Tab(20):Indice KMO et test de Bartlett

Measure of sampling details de Kaiser-Meyer-Olkin.		0,747
Test of sphericity of Bartlett	Khi-deux approxim	575,469
	ddl	28
	Sig. de Bartlett	0,000

Tab(19):OLAP Cubes^a

Predicted Group for Analysis 1:Total	Mean	Minimum	Maximum
Discriminant Scores from Function 1 for Analysis 1	-900.624	-21.725	-14.626
a. disc = 1			
Predicted Group for Analysis 1:Total	Mean	Minimum	Maximum
Discriminant Scores from Function 1 for Analysis 1	18.763	14.626	21.725
a. disc = 2			

Tab(22):Qualite de representation

	Initial	Extraction
PPEP	1,000	,990
CIEP	1,000	,973
VAEP	1,000	,987
CFFEP	1,000	,920
RIEP	1,000	,987
ILPEP	1,000	,838
RSEP	1,000	,809
ENEEP	1,000	,249
Méth.Extr. Anal.comp.prin		

Tab(21):Matrix of discriminant functions coefficients

	PBP	CIP	VAP	CFFP	RIP	ILPP	RSP	ENEP
PBP	,677 ^a	-,938	-,819	,012	,484	,121	,662	-,035
CIP	-,938	,698 ^a	,652	,104	-,298	-,292	-,706	,001
VAP	-,819	,652	,671 ^a	-,292	-,895	,198	-,495	,150
CFFP	,012	,104	-,292	,043 ^a	,441	-,377	-,104	-,184
RIP	,484	-,298	-,895	,441	,745 ^a	-,416	,223	-,244
ILPP	,121	-,292	,198	-,377	-,416	,860 ^a	,320	,258
RSP	,662	-,706	-,495	-,104	,223	,320	,718 ^a	,337
ENEP	-,035	,001	,150	-,184	-,244	,258	,337	,702 ^a

P

SPSSSource:input output of

Tab(23): Eigen values and dispersion ratios on globaleaxesTotal Variance explained

component	Initial Eigenvalue			Extraction sum of squares of the retained factors			Sum of the squares of the factors retained for the rotation		
	Total	% de la var	% cum	Total	% de la var	% cum	Total	% de la var	% cum
1	11,49	71,822	71,822	11,491	71,822	71,822	11,491	71,82	71,822
2	2,01	12,616	84,438	2,019	12,616	84,438	2,019	12,61	84,438
3	1,80	11,272	95,710	1,804	11,272	95,710	1,804	11,27	95,710
4	,45	2,838	98,548						
5	,17	1,077	99,625						
6	,05	,366	99,991						
7	,001	,008	99,999						
8	000,	001,	100,00						

Extraction methode : Analysis in the principal components.

SPSSSource:input output of

Evolution of percentages

Figure3:Added value of the sum

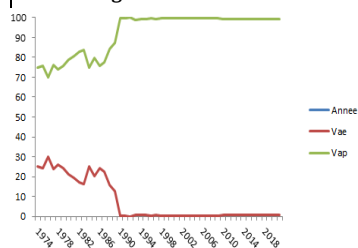


Figure2:Intermediate consumption of the sum

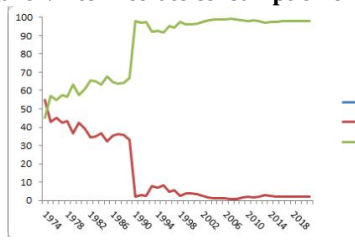
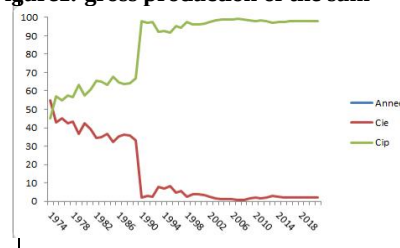


Figure1: gross production of the sum



Extracted from tab 1 and 2.

Evolution of percentages

Figure 6: Indicte taxes related to production of the sum

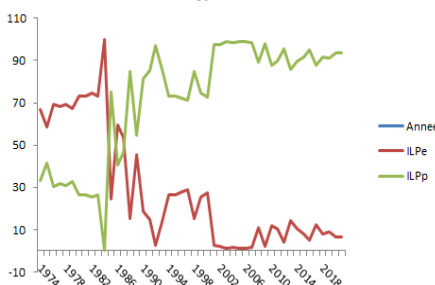


Figure5:Internal income of the sum

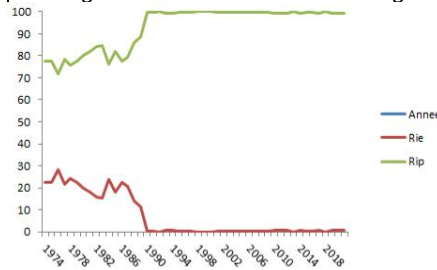
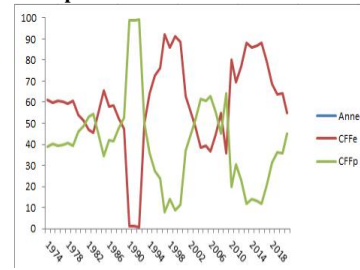


Figure4:Consumption of internal fixed of the sum



Extracted from tab 1 and 2.

Evolution of percentages

Figure9:Legal discriminant fuction for public

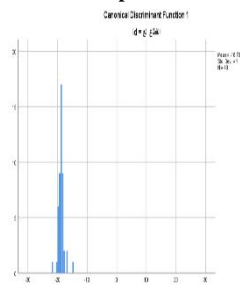


Figure8:Net surplus of exploitation of the sum

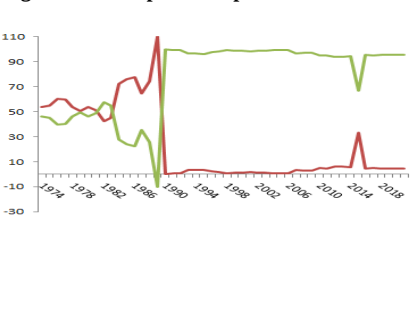
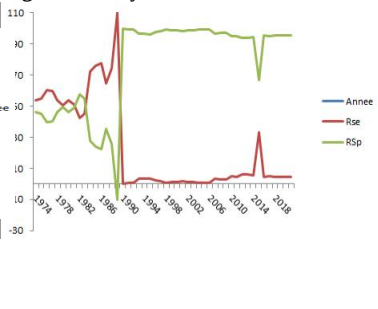


Figure7:Salary remuneration of the sum



Extracted from tab 1 and 2.

Figure11:Eigen value

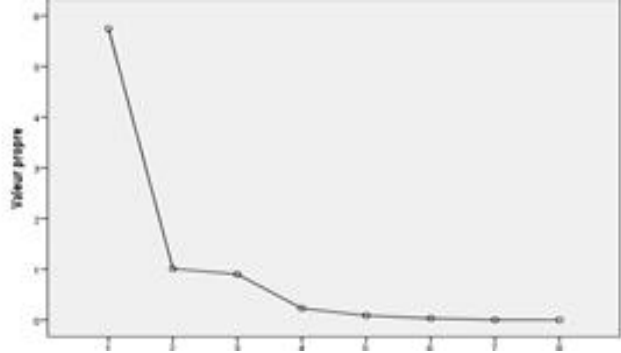
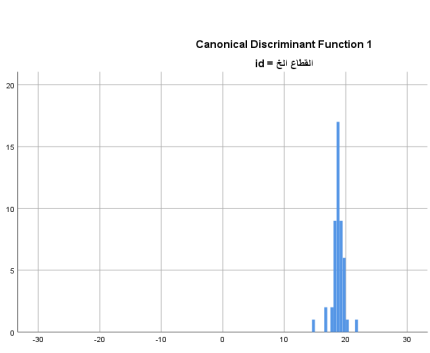
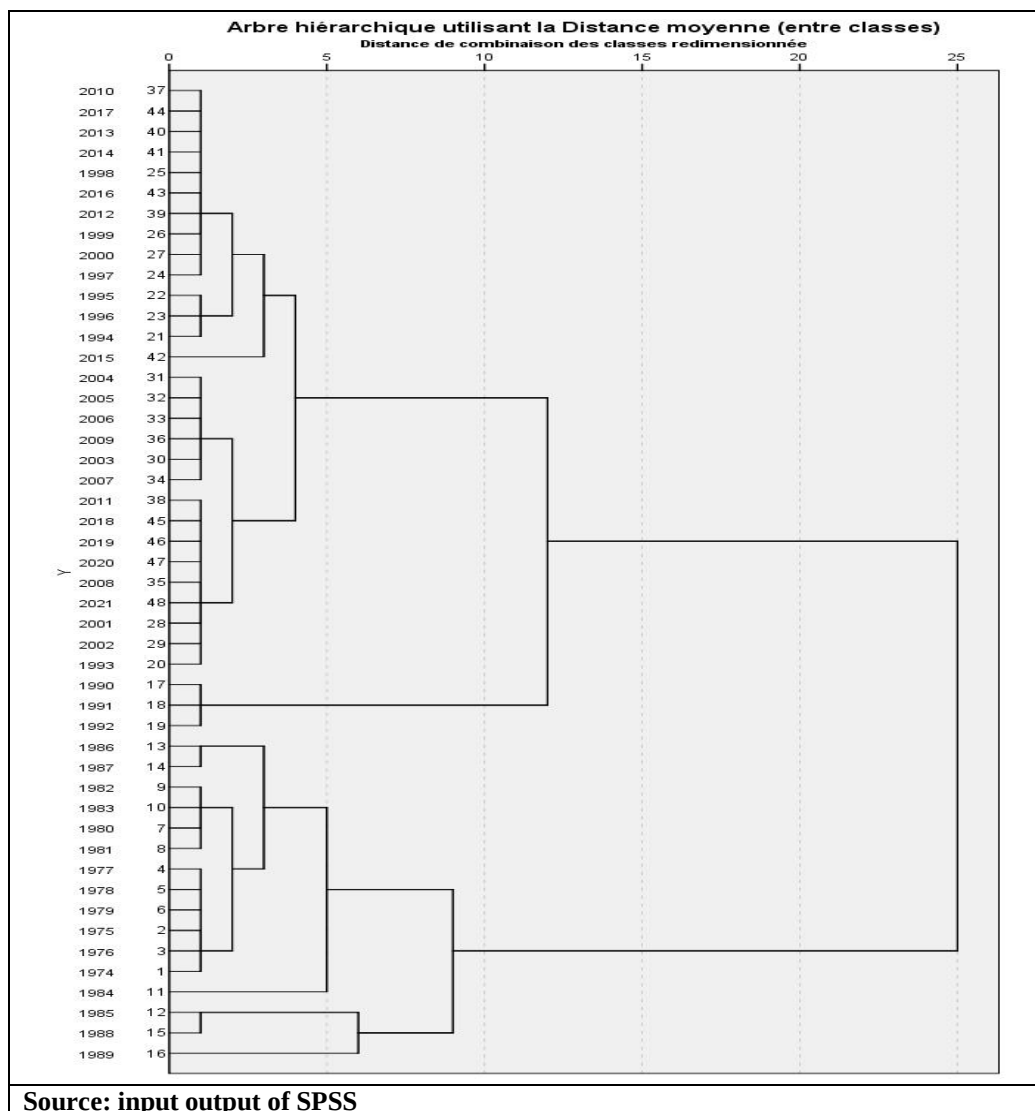


Figure10:Legal discriminant fuction for private



Extracted from tab 1 and 2.

Figure(12): Hierarchical tree using average distances (between classes)



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