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An exploratory analysis of the dynamics of the activity of the Fiscal Anti-fraud Directorate General in the 2014-2020 period at the level of Romania

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Abstract. The Fiscal Anti-fraud Directorate General (DGAF) is a structure of the Romanian public authority whose primary objective is the fight against tax evasion and tax and customs fraud. The activity of investigating fraud and dismantling the transactional chains that lead to prejudicing the state budget is important both from a financial point of view and from a social point of view and it contributes to building trust in the safety and integrity of the tax system. Given the need for a sustainable legal framework for fighting against evasion and taking into account the importance of a unitary control mechanism able to eliminate parallelisms or divergences in the assessment of economic operations, the research focuses on the analysis of the dynamics of the activity of the Fiscal Anti-fraud Directorate General by means of the indicators reported by the institution. The paper allows the identification of certain correlations or interdependencies between the specific indicators of the fraud investigation activity, as well as the foreshadowing of some areas for normative improvement related to the reporting of the results of the anti-fraud activity. The reduction of tax evasion and the increase in collected budget revenues are objectives that convey a strategic importance to DGAF's activity, so that the research of the indicators reported by this structure of public authority produces an image of the degree of economic compliance and the compliance with the premises of fiscal fairness and equity.

Keywords: Fiscal Anti-fraud Directorate General (DGAF), tax evasion, reporting of sanctions, tax fraud, Principal Component Analysis (PCA).

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1. Introduction

In line with an entire series of positive aspects generated by the technological evolution and economic growth, modern society is facing a whole series of negative aspects reflected in various fraudulent actions. There are situations when the non-compliant behavior of some taxpayers manifests by speculating deficiencies of regulation or intentional violations of regulations in order to continuously develop fraudulent methods capable of overcoming the vulnerabilities of existing prevention measures, many of which target the tax sector (Hilal, Gadsden and Yawney, 2022). Due to the fact that fraud prevention systems do not provide adequate security against these illegal acts, the state and specialized units and departments have introduced a series of measures and inspection/control techniques so as to detect the fraudulent acts after they have already been committed (West and Bhattacharya, 2016). In addition to this, there is a monitoring activity, which is a surveillance action of the taxpayers for voluntary compliance. Nonconformance detection techniques have been extensively studied by researchers in recent decades, many of them using statistical and artificial intelligence models.

Non-compliance detection is a broad area which tackles the issue of identifying cases of data or events that do not comply with the expected, legal behavior (Chandola, Banerjee and Kumar, 2009). Many of the techniques used for detecting non-conformities are fundamentally identical, however, depending on their scope, they use different analysis methods (Chandola, Banerjee and Kumar, 2009). The prevalence of non-compliance and the effects of non-compliant conduct are topics of interest for research from multiple perspectives, the non-compliance being observed both at the level of the factors which are audited and at the level of the auditing entities (Munteanu, 2021).

Hilal and two co-authors, Gadsden and Yawney (2022), classify the nonconformities into three different categories: specific, contextual, and collective. According to them, specific non-conformities, which are the focus of most research, are depicted as individual cases of data or events significantly different from the rest of the data. Contextual nonconformities are cases of data which do not conform to a specific context. The structure of the data set introduces the notion of context for these types of non-conformities, and in the formulation of the problem it is necessary to specify the context (Chriac (Matei), Nișulescu and Aivaz, 2021). For example, a contextual attribute of a fraud would be the time of acquisition, with the audited entity incurring unjustifiably large expenses over a period of time compared to another period (Chandola, Banerjee and Kumar, 2009). Collective nonconformities are a collection of related instances that are not compliant with the entire set of data or events. Individual events or data cases from a nonconformity may not necessarily be nonconformities per se, however, if there is a certain relationship between the entities, they may reveal a nonconformity (Ngai et al., 2011).

The Fiscal Anti-fraud Directorate General was established within the National Agency for Fiscal Administration on June 26, 2013, by Government Emergency Ordinance no. 74/2013, approved by Law no. 144/2014. The effective operationalization and the first inspection actions took place in December 2013. The main objective of the Fiscal Anti-fraud Directorate General is the firm fight against tax evasion and tax and customs fraud. The activity of investigating fraud and dismantling the transactional chains set up to the detriment of the state budget is important both financially and socially, strengthening the confidence in the security and integrity of the tax system.

Given the need to strengthen the legal framework for fighting against evasion and taking into account the importance of a unitary control mechanism that removes parallelisms and thus eliminates the different or even contrary tax assessment of the same economic operation, we

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have considered it appropriate/useful to carry out a dynamic analysis of the activity of the Fiscal Anti-fraud Directorate General via the indicators reported by it.

2. Methodology and data

For a statistical analysis oriented towards the fulfilment of the research objectives, several variables from the ANAF website, the section dedicated to the results of the Fiscal Anti-fraud Directorate General, were taken into consideration. Studies on the sanctions imposed through control/inspection missions in Romania focused on the comparative analysis of the indicators reported by various structures within ANAF. This paper continues the areas of research proposed by previous studies (Munteanu, 2021) and focuses on the evolution and investigation of the indicators reported by DGAF in the years 2014-2020.

The indicators used in the analysis, which represent the variables introduced into the model are:

- the amount of damages (million euro)
- the number of audited taxpayers (number)
- the number of notifications of criminal investigation bodies (number)
- the value of precautionary measures regarding identified assets (million euro)
- the number of contraventions for which fined were imposed (number)
- the total amount of fines (million euro)
- the total value of confiscated goods, cash and income (million euro)
- the number of suspended commercial activities (number).

The research was conducted in two phases. In the first phase, we have performed a dynamic analysis of all these indicators, and in the second phase we have analyzed the statistical relationships between the variables using the Principal Component Analysis method. The SPSS statistical software was used for data processing, testing the significance of the indicators and graphical representations.

The Principal Component Analysis (PCA) is a descriptive method of multidimensional analysis of the data, which helps analyze the relationships, the associations between the numerical variables which, in view of the analysis, are standardized (centered and reduced).

The objectives pursued while implementing PCA are the following:

- highlighting the statistical relationships between the considered variables;
- emphasizing the similarities / differences between the analyzed variables, the statistical units being analyzed according to the set of registered variables;

The Principal Component Analysis can only be applied to the quantitative variables expressed in the same unit of measurement. If the variables are expressed in different units of measurement then their standardization is carried out.

3. Results and discussion

Assessing the dimension of DGAF's activity and its change over time are absolutely necessary in terms of mobilizing and ensuring the necessary resources in order to achieve the desired objectives. The analysis of the evolution over time was based on the indicators recorded in Table 1, including a 7-year period, 2014-2020. Based on the results obtained from this analysis, DGAF’s development strategies for the next years can be established, taking into account the factors which can influence its activity.

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
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www.techniumscience.com

Table 1. Descriptive statistics of the variables

	Identified damages (mill. euro)	Audited tax-payers	No. of notific.	Precaut. meas.	No. of contrav.	Fines (mill. euro)	Confiscated goods, cash and income (mill. euro)	No. of taxpayers for whom the commercial activities were suspended
2014	213	24,160	714	557.44	19,429	20.97	62.88	1,628
2015	283	35,514	810	583.37	30,835	32.81	54	849
2016	193	36,318	705	445.39	29,075	31.93	17.95	498
2017	***411.09***	***32,518***	***443***	***153.8***	***24,641***	***30.61***	***18.15***	***522***
2018	217.99	48,601	328	56.25	31,218	34.91	11.96	615
2019	122.45	37,575	235	75.69	23,198	33	23.93	479
2020	***100.72***	***14,772***	***183***	***69.36***	***6,645***	***11.63***	***10.51***	***188***

Table 1 shows a difference between the value of all indicators in the year 2020 and the value from all the other years, the year 2020 being strongly influenced by the health crisis due to the SARS-Cov-19 virus. A maximum level of the value of identified damages was registered in 2017, reaching 411 million euro, even though the number of notifications was much lower than in the previous years. One important reason could be the fact that transactional chains are sometimes so complex that they can involve hundreds of companies, and in order to file a criminal complaint, minutes concluded with all the companies in the chain are required. This complex process can involve tax audits for periods of up to 10 years if the facts are of a criminal nature, or 5 years if the facts are of a fiscal nature. The volume of documents being very large, even for a single company, the damages relate to the completion of each of the minutes, but the criminal notification is made at the moment when all the inspections are completed. There are also exceptional cases in which the criminal notification is made on several levels: at level one, all the shell companies in the chain are inspected, at level two all the transitional companies and the last level of the notification includes the beneficiaries. In these situations, many of the inspections that have criminal implications can start, for example, in 2014 and can be completed in 2017. Regarding the resolution of these complaints, there are two ways to complete the anti-fraud inspections:

1. damages with criminal implications are sent to the competent criminal body with a notification;

2. damages of a fiscal nature until the introduction of the documentary inspection are sent to the Fiscal Inspection for the initiation of a fiscal inspection to be finalized with the issuance of the Fiscal Inspection Report and of a taxation decision for establishing the fiscal claims.

With regard to the audited taxpayers, there are cases, especially in the case of operational and unannounced inspections, when no deviations are found on the ground, and then an inspection minutes is concluded without a Minutes of finding and sanctioning contraventions, i.e., without criminal implications or recommendation of a tax inspection. The year 2018 was the first year after the conclusion of the protocol with SRI (Romanian Intelligence Service). After this year, the audited taxpayers number doubled, while the number of criminal notifications decreased. Moreover, in the same year, people from outside DGAF were allowed

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

in the management structures, who did not hold the position of anti-fraud inspector and implicitly did not have competencies in DGAF. On the other hand, many commissioners from the former financial guard reappeared, by transfer, and later, in June 2020, the special status of anti-fraud inspector would be withdrawn and replaced with the position of inspector; this change meant that even employees of the town halls could occupy, with a permanent move, the position of inspector, a fact which has already occurred.

The analysis of the value of the coefficients in the correlation matrix allows the assessment of the possibility of applying the Principal Component Analysis: high values of these coefficients (greater than +0.5 or less than -0.5) show that there are statistically significant relationships between the considered valuables (direct relationships, if the value of these coefficients is positive, inverse relationships, if the value of these coefficients is negative). In this case, the Principal Component Analysis can be applied. Low values of these coefficients show that there are no correlations between the statistical variables, therefore the Principal Component Analysis, whose purpose is to identify these correlations, cannot be applied.

Table 2. Correlation Matrix[a,b]

	Audited tax-payers	No. of notific.	Precaut. meas.	No. of contrav.	Fines (mill. euro)	Confiscated goods, cash and income (mill. euro)	No. of taxpayers for whom the commercial activities were suspended
Audited taxpayers (CV)	1.000	.089	-.108	.897	.938	-.163	-.049
Number of notifications (NS)	-	1.000	.964	.501	.256	.730	.638
Precautionary measures (MA)	-	-	1.000	.302	.058	.828	.696
Number of contraventions (NC)	-	-	-	1.000	.945	.141	.169
Fines (million euro) (A)	-	-	-	-	1.000	-.028	-.016
Confiscated goods, cash and income (million euro) (CB)	-	-	-	-	-	1.000	.881
Number of taxpayers for whom the commercial activities were suspended (CSA)	-	-	-	-	-	-	1.000

a. Determinant = .000
b. This matrix is not positive definite.

The Component matrix analysis demonstrates the strong relationships between the analyzed indicators (Table 2). Thus, the number of audited taxpayers has a strong direct correlation with the number of contraventions (0.897) and the value of fines (0.938). Our study notes that in the stage prior to the launch of an inspection carried out by anti-fraud inspectors, a risk analysis is conducted of the companies to be inspected, and the inspection is carried out for the cases in which the risk coefficients indicate potential fraud.

Anti-fraud inspections are started based on the National Action Plan. Taxpayers are selected based on a risk analysis, and an evaluation form is prepared for each taxpayer. Most of the time, the areas with fiscal risk are targeted, such as the recently started „Cronos" action, in collaboration with the Labor Inspection, for detecting undeclared work and bringing the grey/informal economy to the surface (Ziua Cargo, 2022). Similar actions are started regularly.

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

Prior to this major action was the action related to energy products. Due to the fact that the companies are most often checked in the databases and the audited companies are from areas with a high fiscal risk, the close relationship with the imposed fines is explicable. Basically, the checks in the office are materialized on the ground in the form of imposed sanctions. Thus, the significantly strong relationships (0.897 and 0.938) are not considered redundant and are not eliminated from our study, since they are a statistical confirmation of the fact that the checks prior to the control are also materialized in the factual identification of some non-conformities and in the application of sanctions against the entities which are subjected to inspections by the anti-fraud division.

Regarding the analysis of the number of notifications, strong relationships of this indicator with the value of the precautionary measures on some identified assets (0.964), with the number of contraventions (0.501), with the total value of confiscated goods, cash and income (0.730) and with the number of taxpayers whose commercial activities have been suspended (0.638) are noticed. The analysis of the number of notifications indicates the totality of the cases when, following the inspection action and the analysis of the fiscal file, the control body finds that there are sufficient indications in order to initiate the criminal investigation on the commission of criminal offenses. The result of the statistical relationship (0.964) shows that in such situations the measure is accompanied by the finding that there is an imminent danger that the debtor would evade the payment of obligations to the consolidated state budget or harm the state budget, which is why the decision is made to take precautionary measures, such as the seizure of some of the debtors' assets or the precautionary attachment applied to their liquid assets. Similarly, confiscating goods (0.730) or suspending commercial activities (0.638) measures are more likely to be ordered.

Variations of the variables are presented in the Communalities output (Table 3), as follows:

Table 3. Communalities

	Initial	Extraction
Audited taxpayers (CV)	1.000	.956
Number of notifications (NS)	1.000	.878
Precautionary measures (MA)	1.000	.912
Number of contraventions (NC)	1.000	.992
Fines (million euro) (A)	1.000	.969
Confiscated goods, cash and income (million euro) (CB)	1.000	.890
Number of taxpayers for whom the commercial activities were suspended (CSA)	1.000	.759

Extraction Method: Principal Component Analysis.

If the variance of a variable is small, then the variable can be removed from the actual analysis given that it is not correlated with the factorial axes. Since all the values obtained in the *Extraction* column are higher than 0.800, we will not eliminate from the analysis any of the analyzed variables, all the variables contributing to the explanation of ANAF's activity.

The eigenvalues of the correlation matrix (Table 4) are presented in the *Total Variance Explained* output, the *Initial Eigenvalues* column.

Table 4. The Eigenvalues of the Correlation Matrix

Total Variance Explained

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.597	51.391	51.391	3.597	51.391	51.391
2	2.759	39.411	90.802	2.759	39.411	90.802
3	.487	6.959	97.761			
4	.116	1.651	99.412			
5	.030	.430	99.843			
6	.011	.157	100.000			
7	-2.119E-16	-3.028E-15	100.000			

Extraction Method: Principal Component Analysis.

The first two factorial axes together explain 90,802% of the total variance. Thus, according to Benzecri's criterion, which involves choosing that number of axes which explain over 70% of the total variance of the point cloud, in order to explain the largest differences, we will use 2 factorial axes.

The graphical representation of the eigenvalues in Figure 1 (Scree Plot) shows the significant differences in size between the first two eigenvalues and the next five eigenvalues, which indicates that the number of factorial axes that can be used in the Principal Component Analysis is two axes.

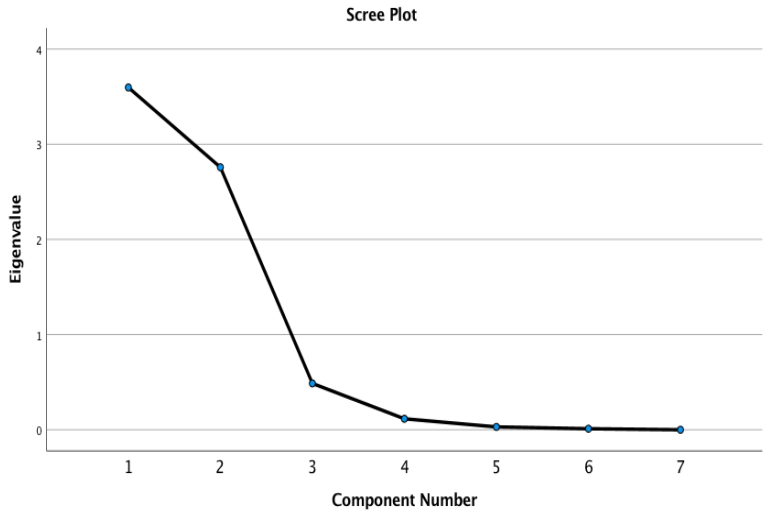

Figure 1. The graphical representation of the Eigenvalues of the Correlation Matrix

The values shown in Table 5, *Component matrix*, show the position of the variables on the factorial axes. For example, the number of audited taxpayers has positive coordinates on both factorial axes, the value being very high on the second factorial axis (0.926).

Table 5. Component Matrix

	Component	
	1	2
Audited taxpayers (CV)	.313	.926
Number of notifications (NS)	.924	-.156
Precautionary measures (MA)	.881	-.369

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

Number of contraventions (NC)	.645	.759
Fines (million euro) (A)	.445	.878
Confiscated goods, cash and income (million euro) (CB)	.813	-.479
Number of taxpayers for whom the commercial activities were suspended (CSA)	.772	-.403

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

The high values of the coordinate variables on the factorial axes show that those variables are strongly correlated with the respective axis. These variables significantly explain the differences between the statistical units. Specifically, there are significant differences between the statistical units in terms of the values recorded for these variables.

The graphical representation in Figure 2 allows the visualization of the position of the variables in the factorial axes system, allowing the identification of the direction and intensity of the correlation between the variables.

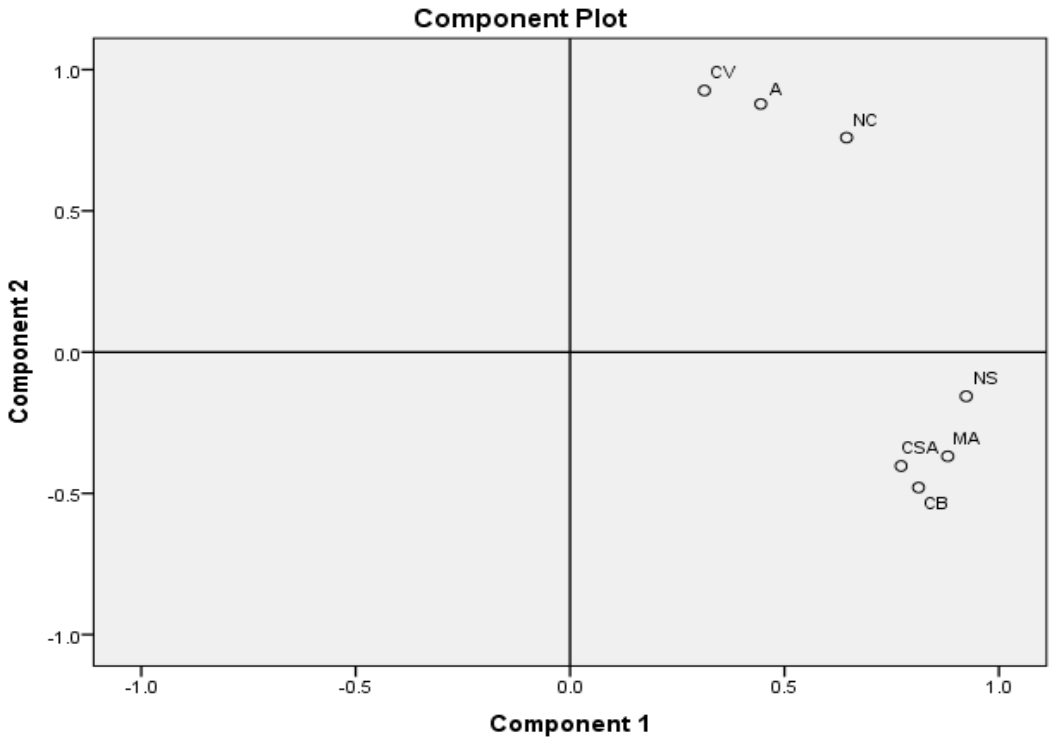

Figure 2. The representation of variables in the system of the first two factorial axes

Figure 2 provides a graphical representation of the correlations outlined based on the basis of the Correlation Matrix. The association of the point cloud on the right side of the factorial axis related to Component 1 shows the relationships of the indicators and supports the conclusions of the study. Thus, the preliminary phase of the control actions carried out by the anti-fraud directorate, which materializes in determining the number of taxpayers to be subjected to inspection, statistically indicates a high probability of factual confirmation, by means of the control performed on the taxpayer, finding contraventions and imposing sanctions. To a different extent, some of the findings of the control bodies during the inspection operations

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

are materialized in finding sufficient indications of committing certain crimes, with consequences for the initiation of criminal inspection procedures or the establishment of precautionary measures.

Table 6. Component Score Coefficient Matrix

	Component	
	1	2
Audited taxpayers (CV)	.087	.336
Number of notifications (NS)	.257	-.057
Precautionary measures (MA)	.245	-.134
Number of contraventions (NC)	.179	.275
Fines (million euro) (A)	.124	.318
Confiscated goods, cash and income (million euro) (CB)	.226	-.174
Number of taxpayers for whom the commercial activities were suspended (CSA)	.215	-.146

Extraction Method: Principal Component Analysis.
Component Scores.

The Figure 3 below shows that the year 2020 is very far from the other years analyzed, as it coincides with the year of the Covid-19 pandemic in which the government took a series of measures to limit and stop the spread of the disease (Stan, Rus and Tasențe, 2020). While the years 2014 and 2015 are on the opposite side of 2020, the years 2016-2019 are very similar in structure, the values of the indicators followed in this study oscillating around the average level.

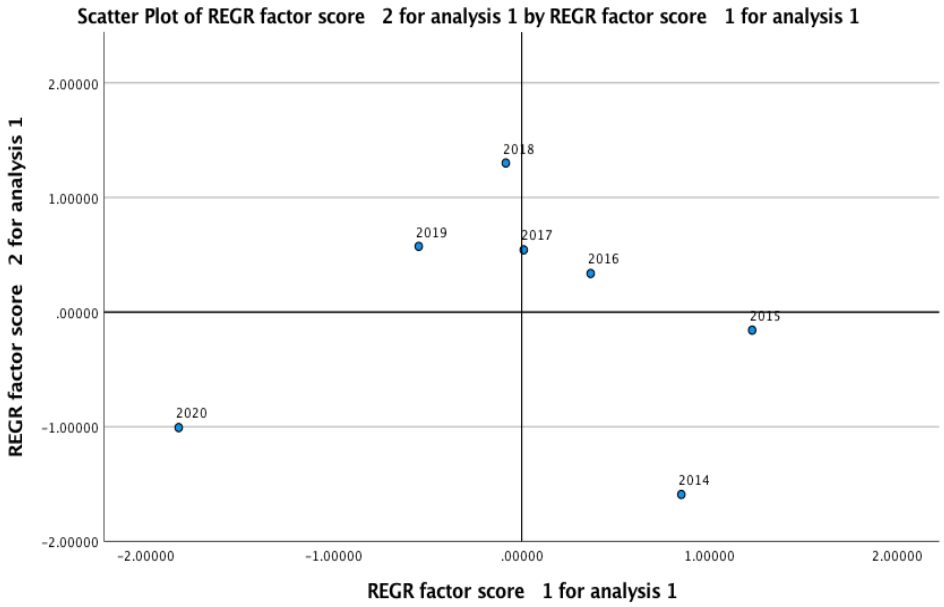

Figure 3. The representation of years in the system of the first two factorial axes

Our study has some limitations, one of which being the fact that the analysis is based on data reported by DGAF, without being able to compare the information with the reports of another public structure. At the same time, the data are not adjusted to the results of subsequent inspections carried out by other state bodies, criminal or fiscal, which confirm, complete or refute the dimension of the indicators reported by DGAF.

Technium Social Sciences Journal
Vol. 30, 337-347, April, 2022
ISSN: 2668-7798
www.techniumscience.com

Following the order of implementing the measures established by the state bodies, the taxpayer has the legal possibilities of accepting and complying with them, or of challenging them administratively or judicially. There are many situations when, following the complaints made by taxpayers, it is found that the measures ordered by the control body were not correct, the result being the reduction or even cancellation of the measures established following the controls. At present, there is no publicly accessible centralization of the indicators reported by public authorities following the inspection activities adjusted to the results of subsequent inspections or to the conclusions of the appeals initiated by the taxpayers.

4. Conclusions

The exploratory analysis performed on the basis of these indicators registers specific dynamics both from year to year and between the indicators of results tracked numerically and in value, due to some aspects related especially to the way the activity is carried out.

Reducing tax evasion and increasing the collected budget revenues are objectives that convey a strategic importance to the activity of DGAF, so that the research of the indicators reported by this structure of public authority produces an image of the degree of economic compliance or of the compliance with the premises of fiscal fairness and equity. Moreover, our analysis starts from the belief that the functional or regulatory improvement in the field of fighting against tax evasion can be supported by statistical studies that combine the indicators reported by the authorities with empirical events or data.

DGAF's creation stemmed from the recommendation for institutional improvement formulated by the Romanian Court of Accounts following the finding of a series of major non-compliances in the activity carried out in the fight against fraud by the old structure with responsibilities in this regard, the Financial Guard. The new structure, DGAF, aimed to strengthen public confidence in the fight against fraud, being set up in order to quickly recover the damages to the state budget as a result of criminal activities in the area of tax evasion.

The specialization of a personnel dedicated to fighting against these complex phenomena poses challenges, both from the perspective of regulation and from the perspective of carrying out the actual activity. At the same time, the drawing up of the responsibilities of a new structure of public authority and the issuance of the decisions by the inspectors undergoing specialised training, invested with the prerogatives of power of control bodies, strengthen the importance of fairness and equity principles in carrying out the activities related to fighting against fraud and tax evasion. Specific changes made over the past year and a half regarding some provisions of the Fiscal Procedure Code and related regulations have led to the situation in which an authority without responsibilities in terms of administration, inspection and establishment of fiscal claims - The Fiscal Anti-fraud Directorate General (DGAF) issued taxation decisions, similar to those issued by other structures within ANAF at the end of tax inspections, although its capacity was to estimate the extent of fiscal damages and to recommend the initiation of fiscal inspections by other structures within ANAF. The result was a debt issue, for which non-payment at maturity generated enforcement, with all the consequences that such a process brings to the natural persons and legal entities concerned, namely the emergence of a wave of fiscal litigations and the need for regulatory clarification.

The existence of these challenges encourages research and creates new areas of study. It is undeniable that the need for effective structures in the fight against tax fraud and evasion, such as DGAF, is of paramount importance. Thus, a report of the European Commission shows that undeclared work in Romania continues to be high, with the shadow or informal economy being estimated (according to the Fiscal Council) at 21.5% of GDP. The sensitive sectors are

construction (Stan, 2021), services (Aivaz, 2021) and textile production. In practice, the shadow economy is considered to include either illegal economic activities, with products or services, or with legal products and services, but for which the persons involved refuse to fulfil certain organizational obligations or to pay certain obligations to the state. In this context, the work carried out by DGAF is meant to contribute to economic growth. The results of the present study and the limitations encountered in collecting the data call for the improvement of the channels for disseminating information regarding the results of the control activity carried out by the public authority. The centralization and comparability of the data increase the confidence in the fairness of the inspection act, while the transparency and updating of the results reported following these crystallize the prerogatives of a robust and fair fiscal system.

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