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WORKING PAPERS

Fraud Perception Index (FPI) Analysis for 2016

Analysis of data from the survey conducted by OBEGEF - Observatório de Economia e Gestão de Fraude

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Preface

Since 2011, based on data from 2010, OBEGEF has presented estimates on the Unregistered Economy in Portugal. Every year we reflected on the problem, tried new models, as well as ensured the continuity of the series to guarantee the comparability of the values across the years.

There are lots of lawful activities that make part of the unregistered economy - lawful, therefore, not resulting from an economic and financial fraud, or from deviant behaviours - and there are lots of frauds associated with operations that are integrated in the national accounting. Having that in mind, three years ago OBEGF decided to build a fraud index.

For this purpose, it established a work group consisting of José António Moreira (coordinator) and Jorge Alves, Manuel Carlos Nogueira, Orlando Mascarenhas, Óscar Afonso, Paulo Vasconcelos and Raquel Ribeiro. The group concluded immediately that a direct quantification was impossible due to the phenomenon's hidden nature, even for the victims, and opted for a quantification of the perception of fraud. In order to accomplish that, it was necessary to draw up a questionnaire, choose a representative sample of Portuguese population, and rely on the collaboration of GFK Portugal to build a data base of the answers.

We have worked with scientific rigour, nevertheless, we are aware that we're at the beginning of the course, and there is a lot to improve in the questionnaire and in its readings. As the unequivocal proof of the above, some trends proved contrary to expectations, creating a great opportunity for us to rethink the problems.

That is why we think the press conference was propitious to launch a debate on the mathematical methods applied, with this year's questionnaire results as a sample.

The rapporteurs of this text would like to express their gratitude for the work of the group created for the purpose; we are sure next year we'll get closer to the reality and we'll be more capable of analyzing the answers.

ABSTRACT

Fraud is a major problem nowadays. For the definition of measures to fight fraud, it is essential the existence of adequate information guiding public policies. The present work aims to make a contribution in that sense by analyzing the perception of fraud in Portugal. To attain this objective, a survey was carried out with a representative sample of the Portuguese Continental population. Results reveal that the Portuguese perceive fraud as having a large dimension in the country and that it has increased in 2016 compared to 2015.

Keywords: perception of fraud, Portugal

1. Introduction

The main focus of this research is to evaluate the perception of fraud in Portugal. According to KPMG (2006: 6), "Fraud is an extensive legal concept which generally refers to an intentional act committed to ensure an unlawful or unjust profit. Transgression (or bad conduct) is also a vast concept which generally refers to a violation of laws, regulations, internal policies and expectations of the market in terms of business ethics." Despite the apparent clarity of the concept of fraud, "there is a set of factors (institutional, cultural, cognitive and other) that hinder a rigorous quantification of fraud in Portugal" (Pimenta, 2009:4).

For Pimenta (2009), fraud in Portugal (in all of its aspects) represents from 1.5% to 2.0% of GDP, which by itself shows the extension of the phenomenon. The difficulty in quantification of fraud results from the impossibility to identify its victims. As a result, it hinders the awareness of fraud and the application of the methods of identification of crimes, as well as their quantification.

Although fraud is a difficult phenomenon to measure and evaluate, its estimation is important for two reasons. Firstly, measuring (even if by perception only) and evaluating the risk of fraud, makes it possible to improve the actions of prevention and fight of the crime. Secondly, but equally important, such measurements serve to alert, at least, the public opinion which otherwise - with no quantifiable notion at hand - tends to ignore or underestimate the risks of fraud and, consequently, the damage it causes to everybody.

It's important to stress that the aim of the following research, elaborated by the Observatory of Economy and Fraud Management (OBEGEF), is not to quantify fraud in Portugal, but to evaluate the perception of fraud in Portugal, with a view to build a Fraud Perception Index. For the purpose, OBEGEF has drawn up a questionnaire and GfK Portugal has collected the data from a representative sample of the population of mainland Portugal, in accordance with the last census held. The questionnaire and the sample, as well as the primary analysis of the collected data, are described below.

2. The questionnaire

OBEGEF has drawn up a five-part questionnaire. In the first part, the respondent finds a short introduction to the concept of fraud:

"A fraud can be defined as: A dishonest action or behaviour, liable to legal condemnation, by which somebody (a person or an organization) deceives a third party with the intent of gaining their own benefit, which in turn results in the third party's pecuniary or non-pecuniary loss or damage.

And some examples of the types of fraud:

"Improper use of property; appropriation or misuse of information; appropriation or misuse of money; corruption and bribery; cartelisation of the market; money laundering; fiscal and consumer fraud."

In the second and the third part, there are questions that aim to evaluate the perception of the "Evolution" and "Extension" of fraud in Portugal. The fourth part aims to evaluate the "Contact with fraud", while the fifth part conveys a social and demographic characterization of the respondents. The objective of the fourth part is to confirm the occurrence (or its lack) of situations in which the respondents had a direct contact with fraud.

All in all, the questionnaire drawn up by OBEGEF has the following basic structure:

Table 1- Structure of the Fraud Perception Survey in Portugal

Structure of the Fraud Perception Survey	Description
Part 1- Introduction	Presentation of the concept of fraud
Part 2- Evolution of fraud in Portugal	General evolution of fraud (one question: P1) Evolution by type of fraud (8 questions: P2.1; P2.2; P2.3; P2.4; P2.5; P2.6; P2.7; P2.8) Media highlight attributed to fraud (one question: P3)
Part 3- Dimension of fraud in Portugal	Current fraud size: P4.1; P4.2; P4.3; P4.4; P4.5; P4.6; P4.7; P4.8) Types of victims of fraud (8 questions: P5.1; P5.2; P5.3; P5.4; P5.5; P5.6; P5.7; P5.8) Effectiveness of the justice system in combating fraud (one question: P6)

Part 4- Contact with fraud	Contact with fraud (5 questions: P7.1; P7.2; P7.3; P7.4; P7.5)
Part 5- Information about respondents	Sociodemographic characterization (14 questions)

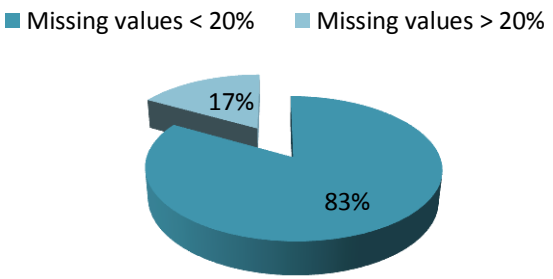
3. Sample

1210 people participated in the research, all of them residents in the national mainland. During the second semester of 2016 those people were questioned anonymously by the interviewers of GfK (a market research firm).

Bearing in mind the objective of the research and the planned analysis of the data, as well as to guarantee the best quality of the information to be processed, it was decided to eliminate all the questionnaires with the missing values rate above 20% of all the questions.

Table 2 and Chart 1 - Analysis of missing values

	Absolute frequencies	Relative frequencies
Missing values ≤ 20%	1007	83%
Missing values > 20%	203	17%
	1210	100%



As the analysis in the Table 1 and Graphic 2 show, that decision implied the elimination of 203 questionnaires (17% of the total of questionnaires), and consequently the final sample consists of 1007 individuals (83% of the total of questionnaires). At a later stage, as the

literature suggest, the missing values of the 1007 questionnaires that met the selection criteria, were substituted by the respective mean (see Table 3).

Table 2- Substitution of missing values by average of items

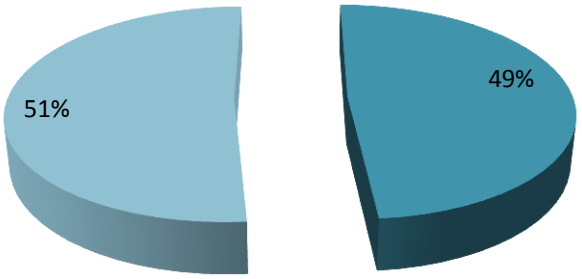
	Variable	Number of Missing Values replaced
1	P.1	22
2	P.2.1	97
3	P.2.2	47
4	P.2.3	42
5	P.2.4	54
6	P.2.5	105
7	P.2.6	37
8	P.2.7	28
9	P.2.8	47
10	P.3	29
11	P.4.1	34
12	P.4.2	25
13	P.4.3	17
14	P.4.4	22
15	P.4.5	74
16	P.4.6	14
17	P.4.7	8
18	P.4.8	31
19	P.5.1	62
20	P.5.2	12
21	P.5.3	18
22	P.5.4	24
23	P.5.5	30
24	P.5.6	45
25	P.5.7	38
26	P.5.8	27
27	P.6	23
28	P.7.1	0
29	P.7.2	0
30	P.7.3	0
31	P.7.4	0
32	P.7.5	0

In the following section, we describe the main social and demographic features of the final sample.

As one can read in the Table 4 and Graphic 2 found below, of all the 1007 respondents 49% (490 people) were male, and 51% (517 people) were female, with the age of 18 up to 87 years (Mean = 46 years old).

Table 4 and graphic 2

	fa	fr
Male	490	49%
Female	517	51%
	1007	100%



One can verify that 32% (332 people) live in Greater Lisbon, 17% on the North Coast (176 people), 15% of the respondents live on the Central Coast (154 people), 14% (137 people) in the Interior and 12% (118 people) in Greater Porto (see Table 5). Below the 10% rate one can find the 5% of the respondents (50 people) who live in Alentejo and 5% (50 people) who live in Algarve.

Table 5 - Region

	Fa	Fr
Greater Lisbon	322	32%
North Coast	176	17%
Central Coast	154	15%
Interior	137	14%
Greater Porto	118	12%
Alentejo	50	5%
Algarve	50	5%
	1007	100%

As far as the household size is concerned, one can verify that the majority of the respondents live in households that consist of 2, 3 or 4 people, 32% (319 people), 30% (300 people) and 20% (204 people) respectively. In turn, in households composed of only one person, as composed of 5 or more people, there are 9% of respondents in each of these situations (92 people) (see Table 6).

Table 6 - Size of the household

	Fa	Fr
1 people	92	9%
2 peoples	319	32%
3 peoples	300	30%
4 peoples	204	20%
5 or more peoples	92	9%
	1007	100%

The majority of respondents are married or live together with a partner (648 people), while 24% (238 people) are single and 7% (68 people) are divorced. 5% of the respondents (53 people) are widowers.

Table 7 - Marital status

	fa	Fr
Maried/Live with a partner	648	64%
Single	238	24%
Divorced	68	7%
Widowers	53	5%
	1007	100%

As far as the education is concerned, 7% of the respondents (70 people) have a university degree, 1% of the respondents (8 people) have a polytechnical degree, 29% (287 people) have a high school degree (12 years), 25% (254 people) completed 9 years of education, 14% (138

people) completed 6 years of education, 23% (231 people) completed primary education, and 2% (19 people) have an incomplete primary education.

Table 8 - Education Level

	fa	Fr
University degree	70	7%
Polytechical degree	8	1%
High school degree	287	29%
9 years of education	254	25%
6 years of education	138	14%
Primary education	231	23%
No total primary education	19	2%
	1007	100%

With regard to the professional situation, the majority of the respondents is employed, whether it's a dependent employment (50%, 505 people) or self-employment (10%, 101 people). 10% of the respondents (105) is unemployed. Moreover, 19% (189 people) are retired/ pensioners, 6% (57 people) are housewives and 5% (50 people) are students.

Table 9 - Professional situation

	fa	Fr
Dependent employment	505	50%
Retired / pensioners	189	19%
Unemployed	105	10%
Housewives	57	6%
Students	50	5%
Self-employment	101	10%
	1007	100%

With regard to the size of the place of residence of the respondents, around half of them live in places with less than 10,000 inhabitants, 38% (385 people) live in places with less than 2,000 inhabitants, and 18% (179 people) live in places with the population between 2,000 and 9,999 inhabitants. About a third (30%, 307 people) live in places with population between

10,000 and 99,000 inhabitants, 6% (57 people) in places with more than 10,000 inhabitants, and 6% (56 people) and 2% (23 people) live in the cities of Lisbon and Porto, respectively.

Table 10 - Size of place of residence

	fa	Fr
Less than 2.000	385	38%
Between 2.000 and 9.999	179	18%
Between 10.000 and 99.999	307	30%
More than 100.000	57	6%
City of Lisbon	56	6%
City of Oporto	22	2%
	1007	100%

Table 11 present the distribution of the respondents according to their social status. Class A includes the respondents who belong to high social class, class B includes the respondents who belong to high/middle social class, class C includes those of middle class, class D includes the respondents from middle/low social class and finally, class E includes those who belong to low social class.

Table 11 – Social status

	fa	Fr
Class A	23	2%
Class B	140	14%
Class C	218	22%
Class D	470	47%
Class E	156	15%
	1007	100%

Only 2% of the respondents (23 people) belong to high social class, 14% (140 people) belong to high/ middle social class, 22% (218 people) belong to middle social class, 47% (470 people) belong to middle/ low social class and 17% (156 people) belong to low social class.

4. Data analysis

4.1. Instrument for the data collection

Bearing in mind the exploratory character of the research, and its objective to evaluate the perception of fraud in Portugal with the intent to build a Fraud Perception Index, we have opted to use exploratory factorial analysis and confirmatory factorial analysis to evaluate adequacy of the built instrument. The first analysis was performed with statistical software IBM SPSS (version 21), and the second one with the statistical software IBM AMOS (version 21).

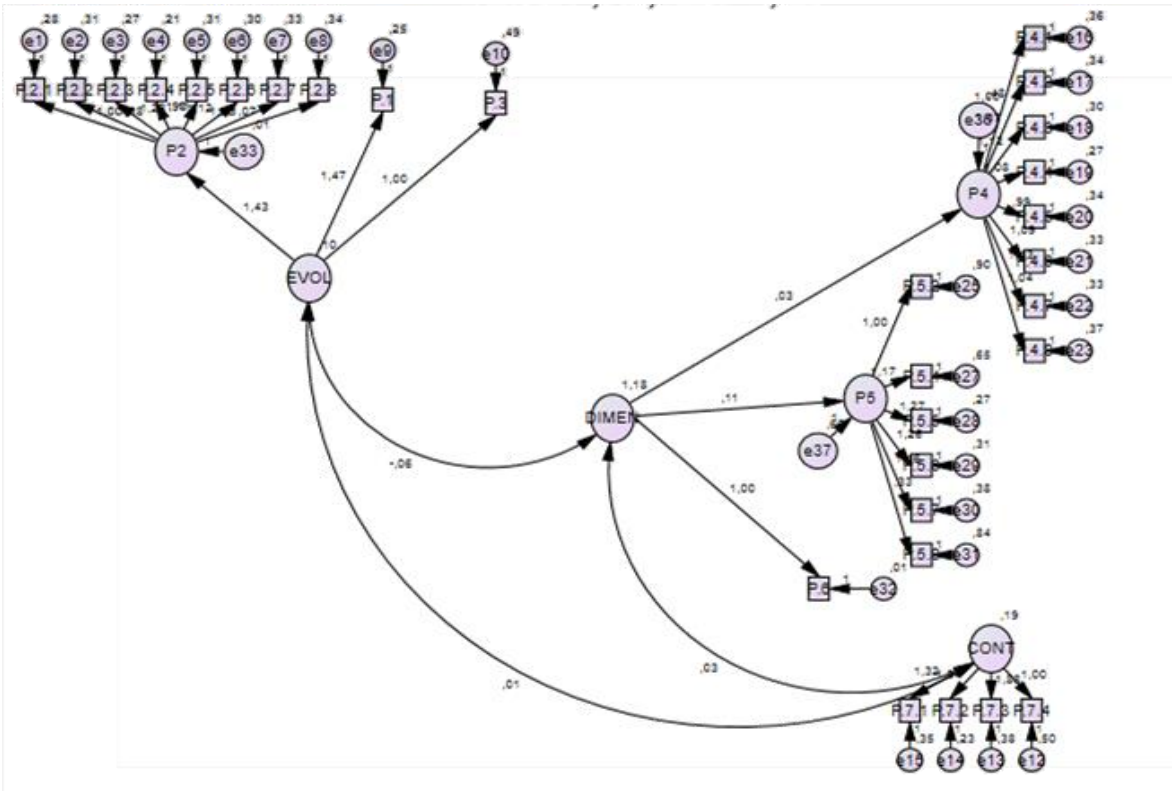
The exploratory factorial analyses performed through the main components method revealed adequacy of the scales built to evaluate the Evolution according to the types of fraud, Actual size of fraud, Types of victims of fraud, and Contact with fraud (see Table 12).

Table 12 – The exploratory factorial analyses - Indicators

	KMO[1]	Number of components extracted with a value of more than 1	Total variance explained (%)	Alfa de Cronbach[2]
Evolution by type of fraud (P2.1 a P2.8)	0,913	1	52,532	0,870
Current fraud size (P4.1 a P4.8)	0,940	1	66,741	0,929
Types of fraud victims (P5.1 a P5.8)	0,913	1	58,906	0,894
Contact with fraud (P7.1 a P7.5)	0,803	1	58,306	0,820

Then, an evaluation of the proposed model was performed. The confirmatory factorial analysis preformed through the maximum likelihood method resulted in the elimination of 4 questions (see Figure 1), three of which belonged to the third part of the questionnaire (P5.1, P5.3 and P5.8), and one to the fourth part (P7.5). The final measurement model without the 4

questions reveals statistics and indexes of a good adjustment: IFI=0.904; TLI= 0.896, CFI= 0.904; RMSEA=0.062 χ2/gl=4.828 (see detailed analysis in Annex).



Taking into account weak correlations between the dimensions of the evaluation of the Fraud Perception, in this research they are considered independent.

4.2. Fraud Perception in Portugal in 2016

For a primary evaluation of the fraud perception in Portugal we opted for a simple mean calculation of the 7 considered dimensions of fraud. The global perception of fraud in 2016 assumes the score of 100 in the Fraud Perception Index in Portugal.

In 2016, the simple mean of the means of seven considered dimensions assumes the score of 3,36 on a scale of 1 to 5 (see Table 13).

Tabela 13- Fraud Per Size Perception

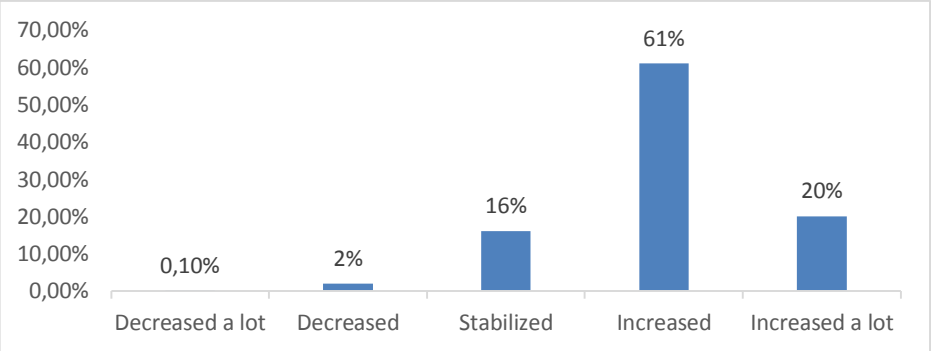
	Average
D1 - General evolution of fraud (1 = greatly decreased, 5 = greatly increased)	4,00
D2 - Evolution by type of fraud (1 = decreased a lot, 5 = increased a lot)	3,87
D3 - Media highlight attributed to fraud (1 = decreased a lot, 5 = increased a lot)	3,76
D4 - Current size of the fraud (1 = very small, 5 = very large)	3,65
D5 - types of victims of fraud (1 = very little, 5 = very large)	2,97
D6 - Effectiveness of the justice system in combating fraud (1 = very large, 5 = very small)	3,50
D7 - Contact with fraud (1 = none; 5 = very large)	1,80
Overll average	3,36

As shown in Table 13, the dimensions with the highest fraud perception are dimension 1 - general evolution of fraud, dimension 2 - evolution according to the types of fraud, and dimension 3 - the importance that the mass media attaches to fraud. On the other hand, the dimensions that contribute less to the perception of fraud are: dimension 5 - types of the victims of fraud, and dimension 7 - contact with fraud. We describe below in a detailed way the results referring to each of the dimensions.

Dimension 1 - General evolution of fraud

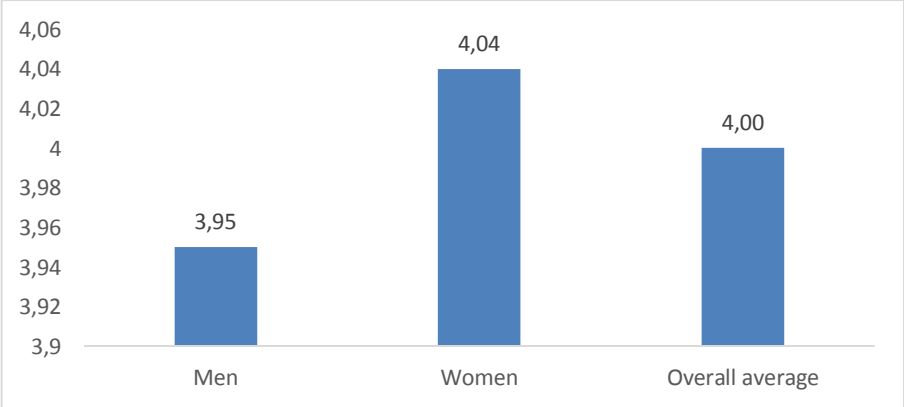
In terms of general evolution of fraud, one can mention that 61% of the respondents think that fraud, in general terms, has grown during the last year, 20% think it has grown considerably, and only 16% think it has stabilized (see Graphic 3).

Graphic 3 – General evolution of fraud



As one can note in the Graphic 4, women perceive the evolution of fraud in a more accentuated way than men (4,04 against 3,95).

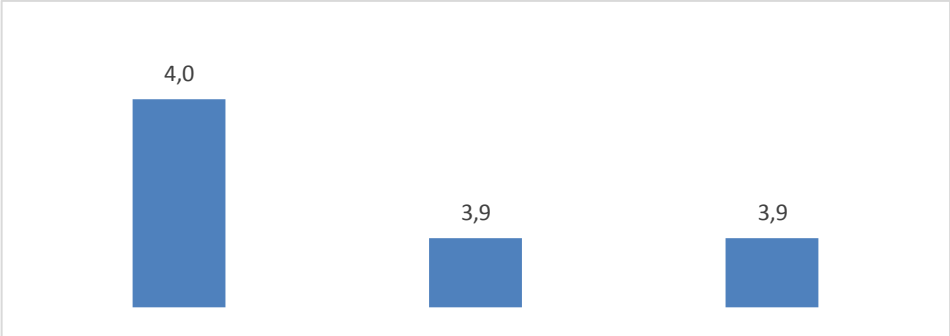
Graphic 4 - General evolution of fraud by sex (1 = decreased a lot, 5 = increased a lot)



Dimension 2 - Evolution according to the types of fraud

Regarding the evolution of fraud according to the types of fraud, the respondents perceive that among the presented types of fraud, corruption and bribery are the ones to have grown the most in the last year.

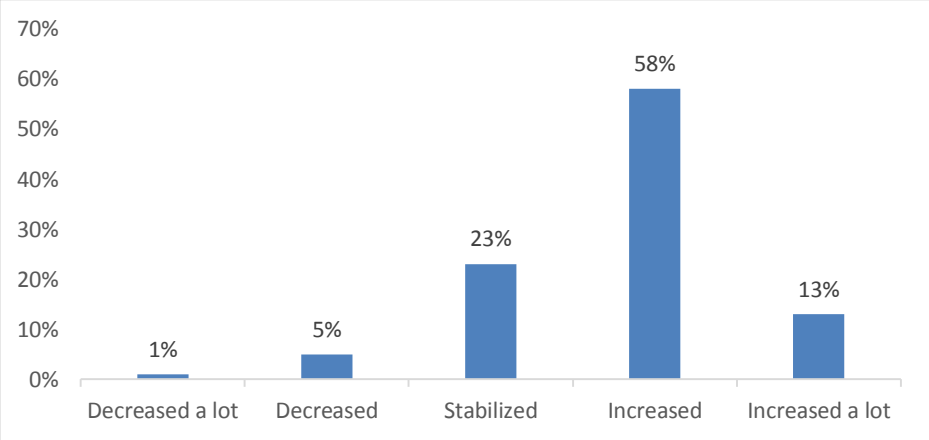
Graphic 5 - Evolution of fraud by types of fraud (1 = decreased a lot, 5 = increased a lot)



Dimension 3 - Importance that the mass media attach to fraud

Regarding the importance that the mass media attach to fraud, it can be concluded that majority of the respondents (71%) perceive that the importance attached by the mass media to fraud has grown or has grown considerably (see Graphic 6).

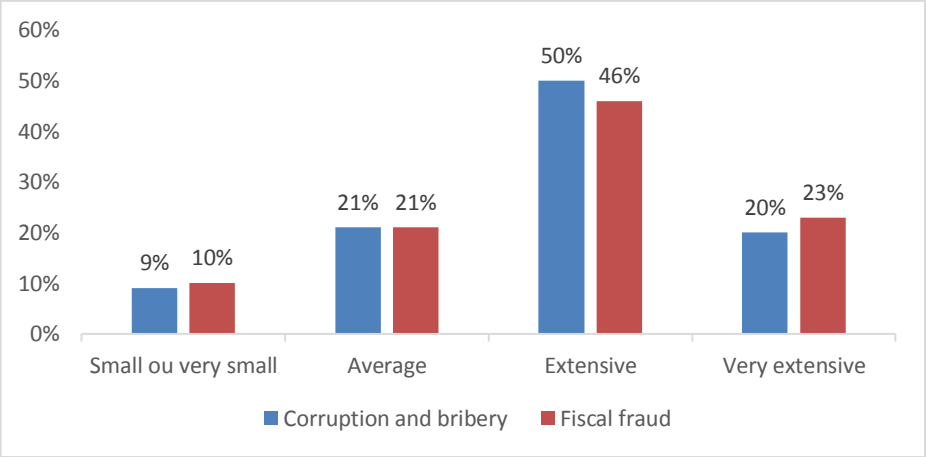
Graphic 6 - Media highlight attributed to fraud



Dimension 4 - Actual extension of fraud

When it comes to the actual extension of fraud, as expressed in Graphic 7, here too, it's corruption and bribery where fraud is perceived as the greatest by the respondents, 70% thinks it is extensive or very extensive, followed closely by the fiscal fraud (69%).

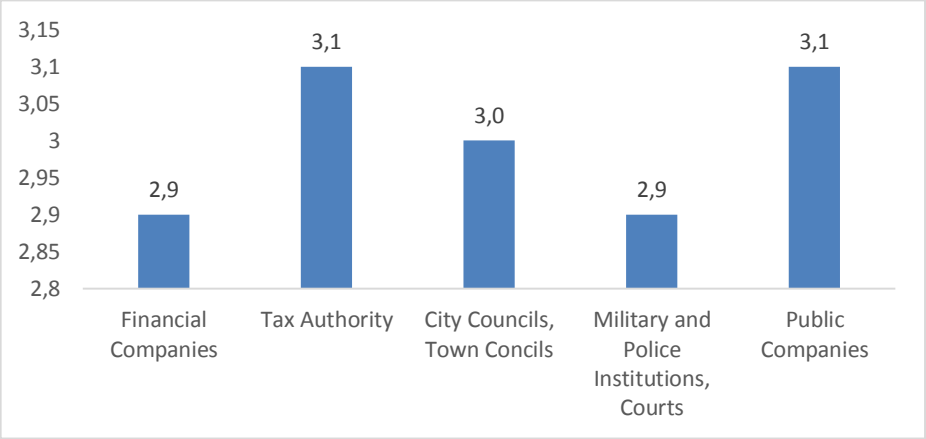
Graphic 7 – Actual extension of fraud



Dimension 5 - Types of the victims of fraud

Regarding the types of the victims of fraud (Graphic 8), the respondents perceive that the biggest victims are Public Companies and the Tax Authority, followed closely by City Councils and Town Councils.

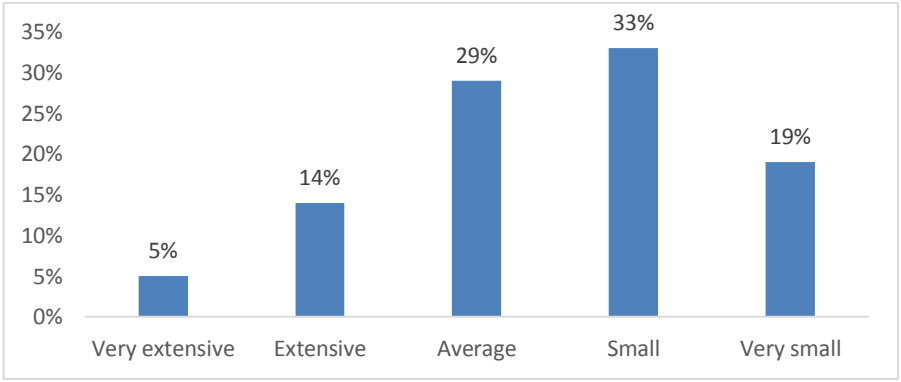
Graphic 8 - Types of victims of fraud (1 = no victims, 5 = many victims)



Dimension 6 - Effectiveness of the justice system in the fight against fraud

Majority of the respondents (52%) perceive that the System of Justice is not efficient in the fight against fraud, with 33% to perceive its efficiency as low, and 19% - very low (Graphic 9).

Graphic 9 - Effectiveness of the justice system in combating fraud

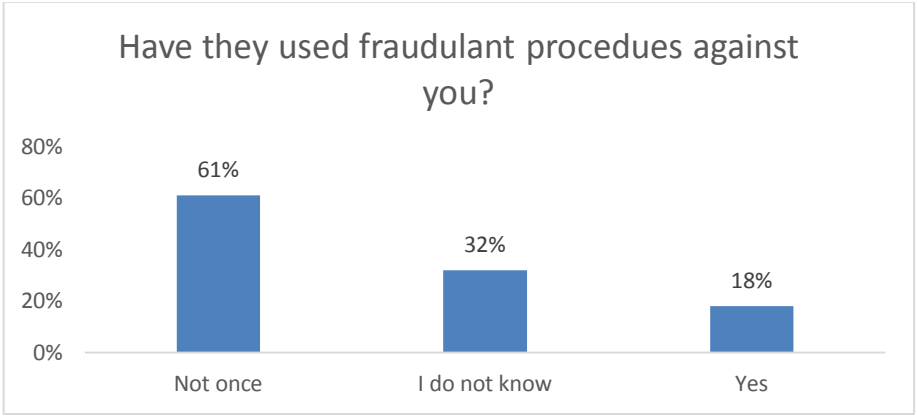


Dimension 7 - Contact with fraud

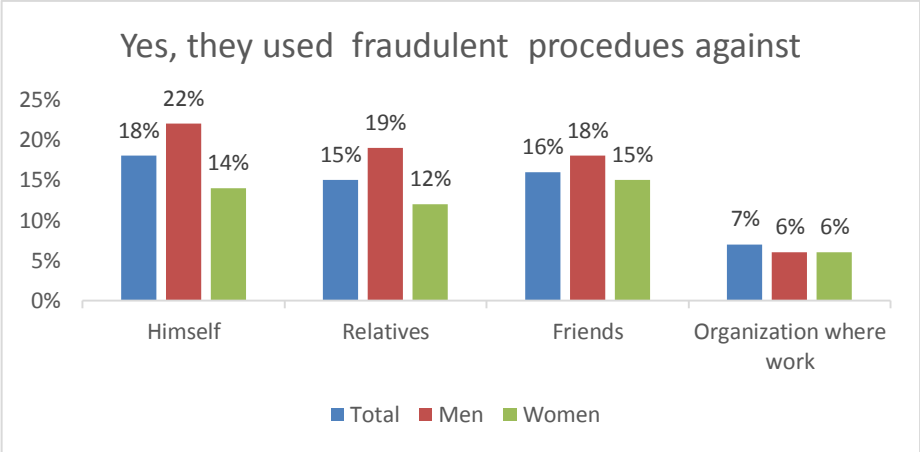
As one notes while reading the Graphics 10 and 11, 18% of the respondents consider that during the last year they were victims to some of fraudulent proceedings. Additionally, 15% mentioned to have knowledge of the fraudulent proceedings against their family members, 16% against their friends, and 7% - against the organization they work for.

The men reported a higher number of situations of fraudulent proceedings against themselves or their social network, than women did.

Graph 10 - Contact with fraud



Graphic 11 - Fraudulent procedures



5. Conclusions

For the first year of the study of the FPI for Portugal, in which it assumes the score of 100, only some conclusions can be drawn in general terms, and in terms of social and demographic analysis. Thus, the following should be highlighted:

- In the dimension "General evolution of fraud", the Portuguese perceive it has grown in the last year. For 61% of the respondents, in general terms, fraud has grown, and for 20% it has grown considerably in the last year. The women perceive the evolution of fraud in a more accentuated way than the men.
- With regards to dimension "Evolution according to the types of fraud", the average of the eight considered types of fraud indicates that the Portuguese think fraud has grown (3,87, 5 = has grown considerably). The perception of fraud is greater in corruption and bribery in relation to other types of fraud considered.
- In the dimension "Importance that the mass media attach to fraud", in average, the perception of the Portuguese is that the importance has grown (3,76, 5 = has grown considerably), with 58% of the respondents thinking that it has grown, and 13% - that it has grown considerably.

- In the dimension "Actual extension of fraud", the perception is that it is large (3,65, 5 = very large), with highlight on corruption and bribery, and the fiscal fraud with the highest scores.
- As for the "Types of the victims of fraud", the perception presents average scores (2,97, 5 = very big). Among the presented institutions, the Tax Authority, City Councils and Town Councils are perceived as the victims most affected by fraud.
- In the dimension "Efficiency of the system of justice in the fight against fraud", in average, the Portuguese perceive that it is low (3,50, 5= very low), with 33% perceiving it as low, and 19% - very low.
- Finally, in the "Contact with fraud" one notes that majority of the Portuguese mention not to have had contact with fraud directly or through their social network (members of the family, friends, institutions where they work). Nevertheless, 18% of the respondents confirm to have been a victim of some kind of fraudulent proceedings against themselves during the last year, and 21% thinks they can't claim the opposite.

Annexes

Annex I - Confirmatory factorial analysis

1. The evaluation of the quality of the model as a whole

In the evaluation of the model as a whole and "unlike what happens with other techniques of multivariate analysis, there are no single statistic tests that would be accepted, in a consensual way, as the best ones to evaluate the adjustment of the whole model to the data." (Lisboa et al., 2012: 428). Therefore, we present below the results of some of the most frequently used methods to evaluate the precision of the adjustment: chi-square ($\chi 2$), Comparative Fit Index (CFI), Tucker-Lewis fit Index (TLI), Incremental Fit Index (IFI) e Root Mean Square Error of Approximation (RMSEA). Later, these scores will be confronted with the levels of acceptance recommended by different authors.

Table 14- Adjustment quality statistics and indices

Statitistic	reference values		Authors
X^2	-	The smaller the better	(Marôco, 2010)
X^2/gl	>5	Bad fit	
	]2;5]	Sufficient fit	(Marôco, 2010)
	]1;2]	Good fit	
	~1	Very good fit	
CFI	<0.8	Bad fit	
TLI	[0.8;0.90[	Sufficient fit	(Marôco, 2010)
	[0.9;0.95[	Good fit	
	≥0.95	Very good fit	
IFI	≥0.95	Very good fit	(Lisboa *et al*., 2012)
RMSEA	>0.10	Bad fit	
	]0.05-0.10]	Good fit	(Marôco, 2010)
	≤0.05	Very good fit	

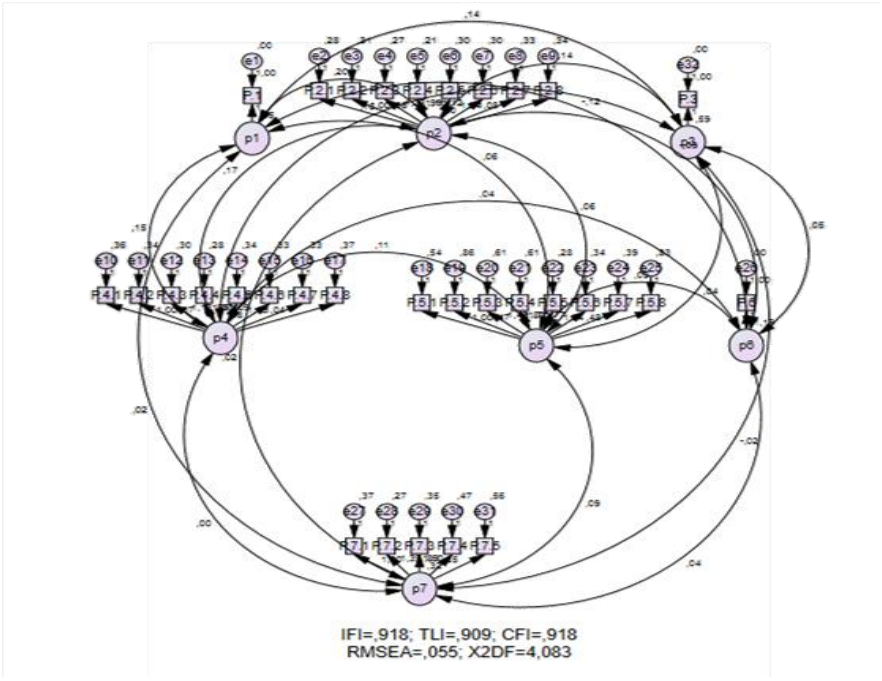
Considering the maximum likelihood method and following the suggestions drawn from the analysis of the modification indexes (which resulted in the elimination of 3 questions 5.1; 5.3 and 7.5) the scores obtained for these indicators were as follows:

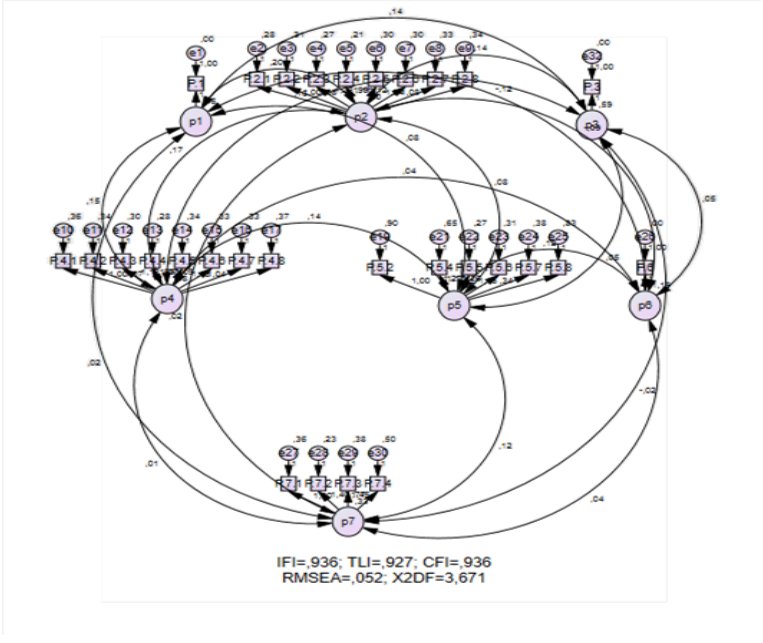
Table 15 - CFA FIT after analysis of modification indexes

Indicators	Value
IFI	0.936
TLI	0.927
CFI	0.936
RMSEA	0.052
X^2/gl	3.671

As verified in the analysis of the Table 15, as far as the measurement model is concerned, one can state that it presents statistics and indexes of a good adjustment: IFI=0.936; TLI= 0.927, CFI= 0.936; RMSEA=0.052 χ2/gl=3.671 (see Figures 2 and 3).

Figure 2 and 3 - Confirmatory factor analysis (1st order)





2. Evaluation of the measurement model

As suggested by Lisboa et al. (2012) regarding the evaluation of the quality of the measurement model, the following measures of local adjustment were used: measurement reliability of latent variables and indicators and discriminant validity analysis.

- **Reliability of each of the indicators**

To evaluate the reliability of each of the indicators, the multiple coefficient of correlation (R^2) was used. This indicator consists in the evaluation of the squared degree of correlation between different latent variables and each of their indicators.

This indicator evaluates the quality of measure of each indicator attributed to each of the respective variables. According to Marôco (2010: 53), "in general terms, the scores R^2 inferior to 0.25 (the factor explains 25% of the variance of the manifested variable) indicate possible problems with the local adjustment with this variable." As one can see in the below table, the question 5.8 presents a R^2 below what is recommended by the literature. Therefore, we eliminated the question accordingly.

Table 16 - Analysis of the reliability of each indicator

			srw	srw^2	C.R.
p2	→	P.2.1	0,646	0,42	21,956
p2	→	P.2.2	0,658	0,43	22,484
p2	→	P.2.3	0,727	0,53	25,687
p2	→	P.2.4	0,733	0,54	25,980
p2	→	P.2.5	0,630	0,40	21,260
p2	→	P.2.6	0,675	0,46	23,211
p2	→	P.2.7	0,696	0,48	24,159
p2	→	P.2.8	0,641	0,41	21,724
p4	→	P.4.1	0,756	0,57	27,629
p4	→	P.4.2	0,786	0,62	29,249
p4	→	P.4.3	0,818	0,67	31,047
p4	→	P.4.4	0,817	0,67	31,006
p4	→	P.4.5	0,759	0,58	27,816

p4	→	P.4.6	0,794	0,63	29,707
p4	→	P.4.7	0,805	0,65	30,284
p4	→	P.4.8	0,763	0,58	28,038
p5	→	P.5.2	0,653	0,43	22,616
p5	→	P.5.4	0,766	0,59	28,079
p5	→	P.5.5	0,896	0,80	35,815
p5	→	P.5.6	0,882	0,78	34,869
p5	→	P.5.7	0,839	0,70	32,179
p5	→	P.5.8	0,288	0,08	08,984
p7	→	P.7.1	0,692	0,48	23,443
p7	→	P.7.2	0,860	0,74	30,762
p7	→	P.7.3	0,804	0,65	28,075
p7	→	P.7.4	0,528	0,28	16,667

After elimination of the question 5.3. the final FIT of the model is as follows:

Table 17 - CFA FIT after elimination of the question 5.3.

Indicators	Value
IFI	0.943
TLI	0.935
CFI	0.943
RMSEA	0.050
X^2/df	3.539

- **Reliability of each of the latent variables**

In order to evaluate the reliability of each of the latent variables, normally one resorts to two indicators: Composite Reliability (CR) and Average Variance Extracted (AVE).

The CR serves to measure the way in which each of the latent variables are measured by their respective indicators (Lisboa et al., 2012). In the case of this indicator, it is suggested to accept scores over 0,7 (Hair, Anderson, Tatham, & Black, 1995).

The AVE measures the proportion of the variance of the indicators linked to measurement of each of the latent variables explained by the same latent variable. In the case of this indicator, it is suggested to accept scores over 0,5 (Hair et al., 1995). As one can verify in the table below, all the scores are within the parameters recommended by the literature.

Table 18 - Standard Deviation, Correlation and Alpha Matrix of Cronbach- Final CFA

	SD	P1	P2	P3	P4	P5	P6	P7	CR	AVE
P1	0,45	-							-	-
P2	0,69	0,67	**0,87**						0,87	0,46
P3	0,82	0,27	0,41	-					-	-
P4	0,57	0,32	0,56	0,31	**0,93**				0,93	0,62
P5	0,68	0,14	0,20	0,07	0,24	**0,90**			0,88	0,56
P6	1,09	-0,16	-0,18	0,07	0,05	0,14	-		-	-
P7	0,77	0,06	0,06	-0,05	0,02	0,26	0,06	**0,81**	0,82	0,54

Note: SD- Standard Deviation; Diagonal to Negrito- Alpha of Cronbach; CR- composite reliability; AVE- Mean variance extracted

It is also important to emphasize that - as one can verify through an analysis of the Table 18 - the questions that measured, according to OBEGEF, the 3 dimensions of the Fraud Perception (evolution of fraud, extension of fraud and contact with fraud) revealed weak correlation, therefore in this study they are considered as independent. Thus P1, P2, P3, P4, P5, P6 and P7 were treated independently, as follows.

- **Discriminant validity**

According to Lisboa et al. (2012: 436-437), the discriminant validity "evaluates the extension to which the indicators linked to measurement of different latent variables

are correlated with each other, and consequently, the extension to which the independent latent variables are correlated with each other." In order to state that a certain latent variable meets the requirement of discriminant validity, "a significantly superior correlation must exist between the indicators linked to measurement, than there is between them and the indicators linked to any other latent variable" (Lisboa et al., 2012: 437). As one can verify through an analysis of the Table 19, the values are within normal limits.

Table 19- Discriminant validity analysis

1		2	Correlação	Correlação^2	AVE 1	AVE 2
p1	<-->	p2	0,666	0,444	-	0,458
p1	<-->	p3	0,27	0,073	-	
p1	<-->	p4	0,32	0,102	-	0,62
p1	<-->	p5	0,141	0,020	-	0,563
p1	<-->	p6	-0,164	0,027	-	
p1	<-->	p7	0,055	0,003	-	0,536
p2	<-->	p3	0,408	0,166	0,458	
p2	<-->	p4	0,558	0,311	0,458	0,62
p2	<-->	p5	0,203	0,041	0,458	0,563
p2	<-->	p6	-0,178	0,032	0,458	
p2	<-->	p7	0,063	0,004	0,458	0,536
p3	<-->	p4	0,308	0,095	-	0,62
p3	<-->	p5	0,071	0,005	-	0,563
p3	<-->	p6	0,065	0,004	-	-
p3	<-->	p7	-0,045	0,002	-	0,536
p4	<-->	p5	0,244	0,060	0,62	0,563
p4	<-->	p6	0,051	0,003	0,62	-
p4	<-->	p7	0,02	0,000	0,62	0,536
p5	<-->	p6	0,139	0,019	0,563	-
p5	<-->	p7	0,256	0,066	0,563	0,536
p6	<-->	p7	0,064	0,004	-	0,536

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