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FISCAL MISPERCEPTION AND TAX DETERMINANTS: *AN EMPIRICAL STUDY WITH SPECIAL FOCUS ON FISCAL ILLUSION*

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Fiscal Misperception and Tax Determinants:

An empirical study with special focus on Fiscal Illusion

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Resumen

Este trabajo revisa la antigua controversia sobre los efectos de la *ilusión fiscal* en las preferencias de gasto público, y nivel de impuestos, de los ciudadanos. Para ello desarrolla una metodología que, a partir de modelos *probit, logit* y de *mínimos cuadrados ordinarios*, permite contrastar empíricamente las repercusiones de este fenómeno. Los resultados muestran que la infraestimación de la carga impositiva provoca una mayor demanda de impuestos, mientras que la infraestimación del gasto público tiene un efecto negativo, y de menor intensidad, sobre esta misma variable. El estudio revela a su vez, que la errónea percepción impositiva no sólo afecta a la demanda de impuestos sino también a la valoración que los individuos hacen de los beneficios derivados de esos impuestos. Este trabajo concluye que la Ilusión fiscal genera una mayor demanda de impuestos y una peor valoración de los beneficios derivados del gasto público.

Palabras Clave: Ilusión fiscal; public choice; España, preferencias fiscales; cuña fiscal.

Abstract

The aim of this study is to investigate the effects of *fiscal illusion* on individuals' tax and public spending demands. To this end, using survey data from 64 Spanish citizens, I develop a methodology that permits the application of *Ordinary Least Square*, *Probit* and *Logit* models to contrast the actual repercussions of *fiscal illusion*. The project presents evidence suggesting that tax burden underestimation causes a higher tax demand, while public expenditure underestimation has a negative, and less intense, effect on the demand for taxes. It also shows that tax misperception not only affects individuals' demand for taxation, but the valuation they make of the tax levy benefits. This project concludes that *fiscal illusion* opposite sign effects do not cancel each other out, generating as a result a non-efficient fiscal demand.

Keywords: fiscal illusion; public choice; Spain; public attitudes; tax burden.

1. INTRODUCTION

> "Perhaps ... the money which [the taxpayer] is required to pay directly out of his pocket is the only taxation which he is quite sure that he pays at all. ... If all taxes were direct, taxation would be much more perceived than at present; and there would be a security which now there is not, for economy in the public expenditure." (Sausgruber & Tyran, 2004)
>
> John Stuart Mill (1848:237)

This is the first reference to *fiscal illusion*[1]; as a misperception of the tax burden that alters individuals´ fiscal choices. Historically there have been two approaches to *fiscal illusion*, those who focussed on the consequences of tax misperception over public spending and those who focussed on the effects of public spending underestimation over tax demand.

J.S. Mill himself, Amilcare Puviani on his work *La Teoria della Illusione Finanziaria* (1903), and later on the Public Choice School[2], with James Buchanan as highest representative, were the first to suggest *fiscal illusion* as a source of increasing public spending.

On the other hand, authors like J. K. Galbraith (1958) and A. Downs (1961), pioneered in claiming that *fiscal illusion* could also be a cause of suboptimal public spending demand, if individuals did not correctly perceive the amount and benefits of that expenditure.[3]

Since then, most research have focused on the determinants of *fiscal illusion* rather than on its effects over government spending. Yet, there have been some attempts to prove a significant relation; Wagner (1976), Dollery and Worthington (1996) and more recently Chetty et al. (2009); nonetheless with uneven fortune and inconclusiveness. Thus leaving this controversy without an empirical and necessary answer. (Sanandaji & Wallace, 2011)

This project seeks to provide an answer to this controversy; How does, in reality, *fiscal illusion* influences the demand for taxation/public spending?[4]

The project focuses on the Spanish case, and measures the fiscal perception and preferences of Spaniards. Confirming the presence of *fiscal illusion* and, subsequently, determining how their misperception, and variables like *ideology*, *education* or *income*, influence their taxation and expenditure preferences. In other words, this study presents which are the variables that explain the demand for taxation of a Spanish citizen, paying special attention to the role played by *fiscal illusion*; responding in addition to other

[1] According to Oates "the notion that systematic misperception of key fiscal parameters may significantly distort fiscal choices by the electorate" (Sanandaji & Wallace, 2011) Another definition by (Mourâo, 2008) "Fiscal Illusion as voters' and taxpayers' incorrect perception of budget aggregates".

[2] Public Choice applies the methods of economics to the theory and practice of politics and government. This approach has provided important insights into the nature of democratic decision-making. (Butler, 2012)

[3] John Kenneth Galbraith said *"…the preference of Americans for cars over public goods is symptomatic of [fiscal] illusion"* (Dollery & Worthington, 1996)

[4] This project identifies the tax levy with the amount of public expenditure, i.e. a balanced budget assumption.

stimulating questions, e.g. is *taxation awareness* related to *education or age*? Are right wingers more prone to support tax cuts?

To this end, I develop a new *fiscal illusion* analysis model that permits to empirically contrast its effects on fiscal demands. This methodology redefines *fiscal illusion* and tax demand variables -as percentage variations- and gathers information on individuals´ fiscal preferences and perception, enabling its calculation and study. The novelty of this approach makes no previous fiscal illusion related data useful. Thus, compelling to collect the necessary data, through a specifically design survey.

Once in possession of the required data, I perform an econometric analysis, using OLS, probit and logit models, to contrast how variations on *fiscal illusion* variables influence individuals` demands for taxation. Giving answer to the research question, and to other not contrasted general assumptions.

Despite the significant number of works on fiscal illusion available to date. The singularity of the topic, treating *fiscal illusion* as an explanatory -not as a dependent variable- and specially its methodology -individualist approach and a new way of defining *fiscal illusion* variables-, makes this study absolutely unique and extremely attention-grabbing.

The conclusions drawn from the study, support the Public Choice theories. Suggesting the presence of tax underestimation and government spending over estimation, which are leading to a higher taxation. Nonetheless, the study has its limitations and its results are not definitive, neither easily extrapolated.

The structure of the study is organized as follows. Section 2 reviews previous literature on *fiscal illusion,* and especially previous works with an individualistic and through survey approach. Section 3 focusses on the theoretical foundations of the project, the methodology, the variables, the dataset and the econometric strategy utilized. Section 4 presents the results and findings of the study, while Section 5 introduce the main conclusions. Finally, the Appendix shows the survey used in the project, and other significant figures and clarifications.

2. FISCAL ILLUSION: A SURVEY

The majority of recent applied works on *fiscal illusion,* intend to observe the sources of *fiscal illusion* -share of self-employment, educational level of citizens, access to information,…- and quantify its different levels for alternative regions or nations. Dell'Anno & Dollery (2013), Dell'Anno & Mourao (2012) and Lopez-Laborda & Zabala, (2015), are some of the most remarkable works following this methodology, and with this purpose.

The other main path of research on *fiscal illusion* try to test its real implications, dealing with this phenomenon in aggregate terms, likewise. Wagner (1976), and following his methodology others authors, tried to prove a positive relation between a high complexity tax system and a higher public expenditure, using *fiscal illusion* theoretical framework to assume the invisibility of taxes as a cause for tax misperception. The results were positive and significant for Wagner and dissimilar for the works that followed him.[5]

The very few –applied studies- have an individualist approach. This literature review is focusing on specifically those who follow this methodology (Sanandaji & Wallace, 2011) and (Sausgruber & Tyran, 2004). Additionally, I am reviewing two works which utilize survey data, and define variables in the same manner this study has done. Besides, the topic they deal with is attitudes toward fiscal consolidation; similar to fiscal preferences determinants. These projects are (Boeri, Börsch-Supan, & Tabellini, 2001) and (Hayo & Neumeier, 2014)

The project carried out by Sanandaji and Wallace (2011) aims to statistically prove the existence of fiscal misperception among the Swedish population. To do so, they realize a survey by means of which reckon the tax burden awareness as a percentage deviation, finding an average 30% underestimation. Sanandaji and Wallace (2011) claim this is due to the not consideration -perception- of indirect taxation, and also to what they call *fiscal obfuscation*, basically a misinterpretation between who pay the tax and where the tax incidence actually is.

For Sanandaji and Wallace (2011) this *fiscal obfuscation* is caused by the share of the payroll tax that is directly paid by the company, and therefore not perceive for the worker as a tax –quite similar to the way social contributions are paid in Spain-. They also claim that this effect is deliberately generated by governments as a strategy to increase the tax levy without the political costs of increasing visible taxes.

Boeri, Börsch-Supan and Tabellini (2001) and Hayo and Neumeier (2014) share an almost identical methodology, consisting on the collection of data through a survey which enables them to quantify the preferences, perceptions, knowledge and other control variables of their study populations.

Hayo and Neumeier (2014) try to econometrically notice –applying ordered and multinomial logit models- which are the public attitudes toward fiscal consolidation and which are its determinants; personal economic situation, time preferences, fiscal illusion, etc. Boeri et al (2001) then again, use its gathered data to notice which are the different explanatory variables –age, income, ideology, type of job, sex, knowledge- that influence Italians, Germans, Spanish and French concerning their public expenditure preferences; higher or lower unemployment benefits, contributions rate, public debt, etc. With that purpose they make use of probit and logit models, and also descriptive statistics, graphs and tables.

Boeri et al (2001) find out that citizens do not want to cut public expenditure, even if they are aware of the unsustainability of the model. And suggest that major differences in

[5] See Dollery and Worthington (1996), for an in depth review of Wagner and Wagner methodology users, studies.

fiscal preferences are between old and young, poor and rich, employed and unemployed and different political ideologies. It will be convenient take into account that this is a 14 year-old study, thus its results must be taken with caution.

On the other hand, Hayo and Neumeier (2014) notice that people is more prone to support fiscal consolidation the more aware of the current situation they are, the better economic situation or the more forward-looking.[6]

Lastly, Sausgruber and Tyran (2004) propose a very interesting experiment in which they contrast the Mill Hypothesis of Fiscal Illusion; consisting on a misperception of the tax burden due to the invisibility of indirect taxation. On the experiment they test the willingness toward income redistribution, from a population with different incomes, through indirect and direct taxation. The results are surprisingly clear, with indirect taxation and posterior redistribution 90% of the people where happy with the tax system, whereas with direct taxation only 10% of the population supported the system. They also conclude that after successive repetitions of the game people learnt form the experience and the difference became much lower.

To finish the literature review, as a recapitulation, we may notice that every work following an individualistic approach have found significant levels of *fiscal illusion*, as a consequence of indirect taxation and the lack of perception of the tax incidence. Furthermore, some studies suggest that misperception, and ideology are explanatory variables for individuals` fiscal attitudes.

However, except form Sausgruber and Tyran (2004) with its peculiar experiment, no one have set a clear and significant relationship between the *fiscal illusion* suffered by an individual and its demand for public expenditure/taxation. This is the goal of this study.

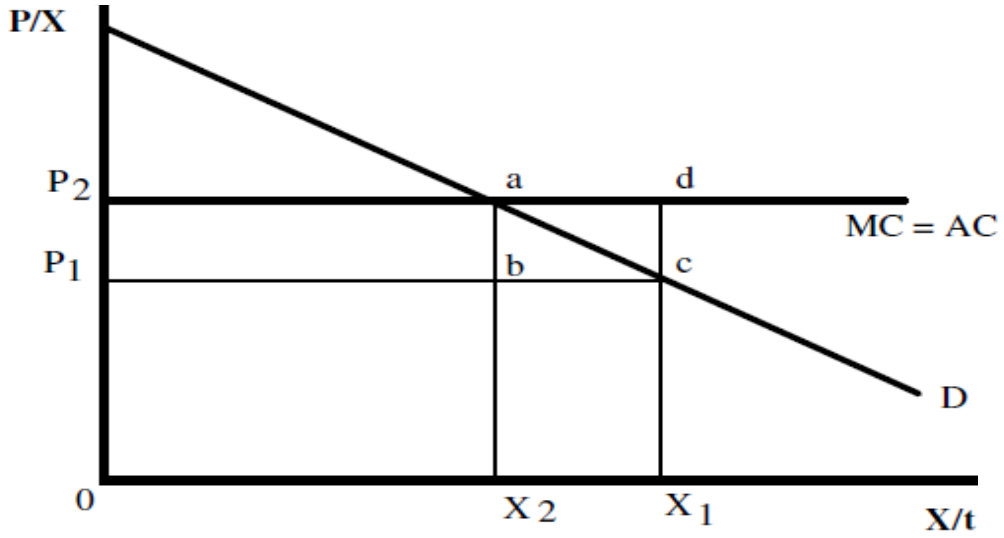
[6] "Our results support many of the conjectures found in the public choice and political economy literature. People are more likely to support fiscal consolidation the better their economic situation, the more forward-looking and patient they are, the better their knowledge about the costs of deficit spending, and the lower their trust in the government's fiscal competence" (Hayo & Neumeier, 2014, p. 23)

3. METHODOLOGY

In this section I describe the methodology used in the project. Firstly, I mention the theoretical underpinnings of *fiscal illusion* literature. Secondly, I explain the project methodological foundations, with special emphasis in the visual analysis. And, finally, I proceed with the description of the methodological procedure and empirical model followed in the study, to answer the research question.

Fiscal Illusion theories are based on the simple but strong economic principle that imperfect information leads to inefficient economic decisions.[7] An individual that misperceives the costs or benefits of an economic choice will not take a correct decision. *Figure 3.1* illustrates this phenomenon, showing how an under perception of taxation marginal and average cost, leads to an inefficient equilibrium "c" in which the tax levy is greater than optimum, X1>X2, and the welfare loss is the area "adc".

Fig. 3.1 Individual Cost-Demand model for taxation



Source: Dollery and Worthington (1996, p. 4).

Note. The figure presents the effects of fiscal under perception.

This project methodology slightly modifies *Figure 3.1*, but still uses the same economic foundations for the study.

Figure 3.2 reflects this new approach, whose two main differences with the previously used are:

1. Individuals observe the marginal cost of taxation. What they do not perceive is the amount of taxes they face, i.e. the tax burden.

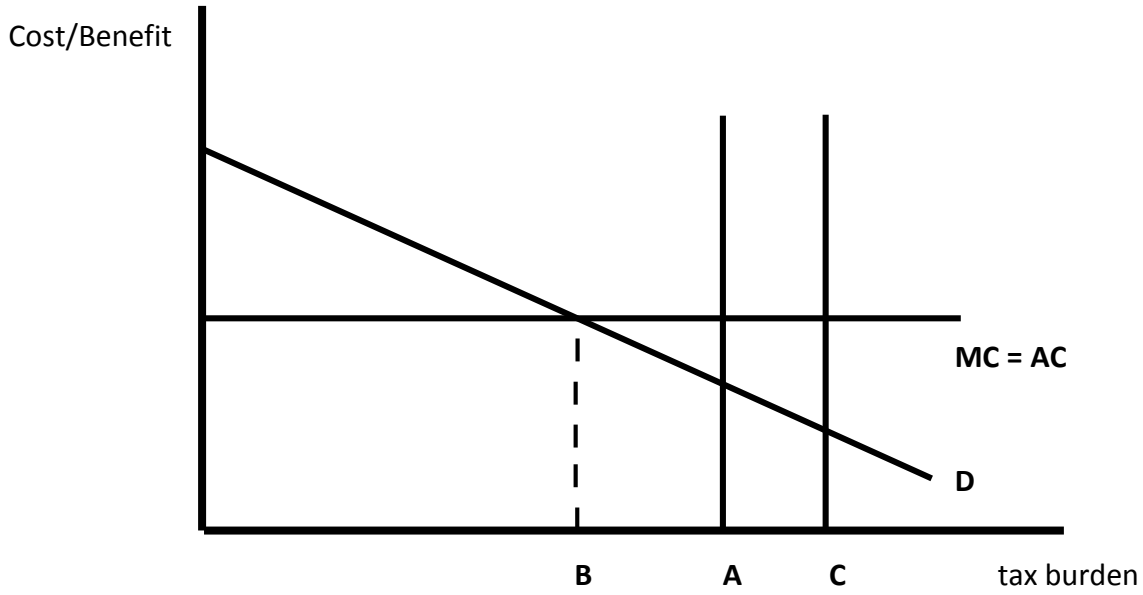
2. It reflects individual taxation, not aggregate. Thus, X axis reflects the tax burden, not the tax levy. And cost and demand curves reflect individual preferences.

[7] Economic actions are carried out if the marginal revenue of taking that decision exceeds its marginal cost. Hence, if we apply this principle to fiscal demands, an individual will demand higher taxation/public expenditure up to the point where its marginal revenue equals its marginal cost. If his or her perception of tax costs and public spending benefits are incorrect, it will lead to an inefficient outcome, according to his or her preferences.

Model analysis:

- In this model, "C" represents the actual tax burden as % of gross income, "A" represents the perceive tax burden, and "B" represents the individual´s ideal or fair tax burden, as the optimal tax burden, where marginal profit and marginal cost of taxation equalize.
- It defines taxation awareness as the difference between "A" and "C", demand for taxation as the difference between "A" and "B", and Real tax demand as the difference between "C" and "B".
- Demand function is determined by the social benefits of taxation which can be misperceived.

Fig. 3.2 Theoretical model



Note. The figure presents fiscal perception and preferences of an individual with tax misperception and a negative Tax demand.

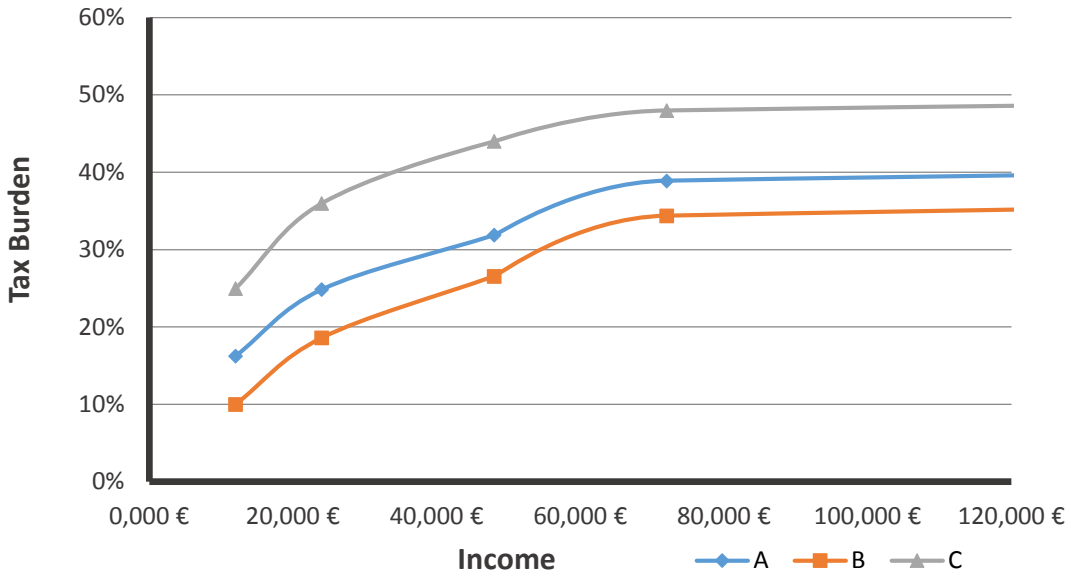
This model is consistent with *fiscal illusion* literature, suggesting that incorrect estimation of the amount or benefits of taxation, "Demand", and incorrect estimation of the tax burden, "C", would lead to an inefficient tax demand.

If we generalized this model, from a specific level of income to the entire range of different incomes, we obtain *Figure 3.3.* This figure shows the different tax burden functions; the actual function, the perceive one and the preferred one. "C", "A" and "B", respectively. And also permits to reckon and visualize; *Taxation awareness*, *Tax demand (nominal)* and *Real tax demand*, for each income and on average. [8]

Figure 3.3 is crucial because it can be measured empirically, and therefore it allows to analyze how variations in individuals` fiscal perception distorts their fiscal demands. In other words, it permits to test the actual effects of *fiscal illusion* on individuals´ fiscal preferences by measuring how variations in *Taxation* and *Returns awareness* influence *Tax demand* and *Real tax demand.*

[8] This variables are clearly defined in pages 13, 14 and 15.

Fig. 3.3 Labour tax burden



Note. A = respondent perception of tax burden, as % of gross income. B = respondent conception of fair tax burden, as % of gross income, C = actual tax burden as % of gross income.

Regarding tax misperception there are three possible ways in which it can affect the demand for taxation. According to *Figure 3.3:*

1- Movements in "A" does not affect "B": Changes in *Taxation awareness,* do not influence the considered fair tax burden, this would mean that the more tax aware people is the more aware they are that they are paying more –or not that much less- than what they wanted. I.e., the better tax perception the lower taxation demand. The implications will be that a better informed person will demand lower taxes than a worse informed, on average.[9] [10]

2- Movements in "A" are perfectly followed by movements in "B". "B" is somehow attached to "A". Changes in *Taxation awareness,* are followed by changes of the same amount in the individual considered fair tax burden, this would mean that citizens demand, more or less of what they perceive, but always the same, without taking into account the rate. They would have a constant *Tax demand*. This would imply that better an informed person will demand the same taxes than a non-informed person, on average. Therefore there would be no need for reducing *fiscal illusion*, because it would not influence people demands. According to the model used *Figure 3.2*, this phenomenon could be explained if changes in tax perception will cause changes in the tax benefits perception, leading to the same previous optimal equilibrium "B".[11]

[9] Ceteris Paribus.
[10] This implications applies if there is an underestimation of the tax burden, as data shows 90% of the respondents suffer from tax under estimation. The opposite will apply if there is an over-perception of the tax burden.
[11] This procedure will be better understood after defining the tax demand variables.

3- A combination of the previous scenarios. Tax under perception affects both tax benefits estimation and tax demand, leading to an outcome in which people demand more taxes than optimal and consider a lower tax burden as fair or think the benefits of taxation are lower.

Regarding tax benefits misperception, the way it influences *Tax demand* is reckon on a different manner. The amount of public expenditure is identify with the tax levy, balanced budget assumption. The demand for public expenditure is therefore identify with the demand for taxes and *Returns awareness* measures the amount and redistribution of public expenditure. As a consequence the effects of public spending misperception can be analyze as follows. According to the model used, *Figure 3.2:*

1- Movements in "D" will change both the nominal *Tax demand* and the *Real tax demand*. Since the intersection point between marginal revenue and marginal cost will change and both "A" and "C" will remain constant.

2- Movements in "D" will change the *Real tax demand* but not the *Tax demand*. Since the intersection point between marginal revenue and marginal cost will change, "C" will remain constant, but "A" will shift keeping *Tax demand* unaltered. This would be the case if *Returns awareness* would affect *Taxation awareness*.

3.1. EMPIRICAL MODEL

Following the aforementioned theory and methodology to study the effects of *fiscal illusion* on individuals` fiscal preferences. I perform the following *OLS* regressions with *Tax demand and Real tax demand* as dependent variables, for each of the different representative incomes and means. Besides, I perform probit and logit models with *Increase* and *Decrease taxes* as binary response variables. Regressions with *Tax demand* as explained variable reflect the consequences of *fiscal illusion* on fiscal demands, while regressions with *Real tax demand* as regressand illustrate how *fiscal illusion* affects the perception of taxation benefits.

$$Demand\ for\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + \mathcal{E} \quad (1)$$

$$Real\ demand\ for\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + \mathcal{E} \quad (2)$$

Equation 1 and 2, aisle the effect of *Taxation awareness* on *Tax demand* and *Real Tax demand*, respectively, from the opposite sign effect of *Returns awareness*. Yet limited by the inclusion of the control variables. Allowing us to fully appreciate its effect on individuals' preferences.

$$Demand\ for\ taxes\ =\ \beta_0 + \beta_1\ returns\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + \mathcal{E} \quad (3)$$

$$Real\ demand\ for\ taxes\ =\ \beta_0 + \beta_1\ returns\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + \varepsilon \quad (4)$$

Equation 3 and 4, do the equivalent of 1 and 2 but for the case of *Returns awareness*. Permitting to analyze the effect of public spending misperception over fiscal preferences without the interference of the consequences of tax perception.

$$Demand\ for\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ returns\ awareness + \beta_3\ ideology + \beta_4\ educ + \beta_5\ income + \beta_6\ age + \varepsilon \quad (5)$$

$$Real\ demand\ for\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ returns\ awareness + \beta_3\ ideology + \beta_4\ educ + \beta_5\ income + \beta_6\ age + \varepsilon \quad (6)$$

Equation 5 and 6 reflect the complete *Tax demand* function, and additionally both the effects of tax and public spending misperception on the ideal tax burden.

These equations, are contemplated in *Tables 4.1, to 4.6,* where they are displayed for each representative income. Furthermore, these regressions are reckoned with different specification forms, removing not significant and possibly biased variables.

On the other hand, I perform probit and logit models with *Increase taxes* and *Decrease taxes* as dependent variables. These models enables to contrast the consistency of respondents' answers and gives another qualitative perspective -not quantitative as *Tax demand*- to which the demand for taxation determinants are.

$$Increase\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + residuals \quad (7)$$

$$Decrease\ taxes\ =\ \beta_0 + \beta_1\ taxation\ awareness + \beta_2\ ideology + \beta_3\ educ + \beta_4\ income + \beta_5\ age + residuals \quad (8)$$

Lastly, other tests and regressions have been performed to give answer to other no major, though interesting questions, e.g. identifying *Taxation awareness* determinants and respondents attitudes towards fiscal consolidation explanatory variables.[12]

[12] See Appendix (p. 42).

3.2. VARIABLES AND DATASET

In this section of the study, I present the required and used variables. After that, I proceed to its definition. Continuing with the sources of the data and the compromises made. Finally, I review the dataset, summarising and commenting the important facts and trends.

Previous literature on *fiscal illusion* is either focussed on its determinants -not on its effects on public expenditure-, or focussed on its consequences in aggregate terms –not with an individualistic approach-, as it has previously been mentioned. As a result of this, there are not previous works on *fiscal illusion* to look at and contrast what variables they have utilized.

Nevertheless, Boeri et al (2001) on his *Would you like to Shrink the Welfare State?* Deal with a similar topic, aiming to notice which are the determinants toward fiscal consolidation preferences, with an individual and through survey methodology. On this work, they made use of variables like ideology, age or income, as explanatory varibales. Which can certanly serve as *Tax demand* determinants.

In this study I use those variables; *Ideology, Income* and *Age.* Naturally, *Tax demand* and *Real Tax demand* are included as dependent variables, and *Taxation* and *Returns awareness* as *fiscal illusion* variables. I personally propose *Education,* as a possible explanatory varible for taxation demand, and I additionally use *Deficit, PxPublic, PxPublic2* and binary variables; *Tax reform, Reduce taxes and Increase taxes;* which reflect respondents' attitudes toward fiscal consolidation, fiscal reform and the necessity of tax cuts or tax rises. Giving a deeper insight into respondents fiscal preferences

Table 3.1 Variables

VARIABLES	KEY NAME	DEFINITION
Income	Income	Income approximated to one of the representative incomes
Education	P7_Educ	Level of education. 0-2=Primary School. 3-4=Secondary School. 5=Higher Education. 6=Masters and PhDs
Ideology	Ideology	Conservative=1 Centre=2 Social-democrat=3 Socialist=4 Other=.
Age	Age	Age
Real Tax Demand	DEM_REAL_MEAN (12, 24,48,72,1.0000)	% difference between the actual tax burden and the demanded tax burden It exists a Real tax demand for each representative income and its average
Tax demand	DEM_IMP_MEAN (12, 24,48,72,1.0000)	% difference between the perceived tax burden and the demanded tax burden It exists a Tax demand for each representative income and its average
Returns Awareness	PERC_GASTO_MEAN (12, 24,48,72,1.0000)	% difference between the public expenditure returns and its perception It exists a Returns awareness for each representative income and its average
Taxation Awareness	PERC_IMP_MEAN (12, 24,48,72,1.0000)	% difference between the actual tax burden and the perceived It exists a Taxation awareness for each representative income and its average
PxPublic	P4_PxPúblicos	Attitude toward co-payments and fees in public services (NHS, juditial system, housing) PxPublic=1 if in favour PxPublic=5 if against
PxPublic2	P4_OtrosServ	Attitude toward co-payments and fees in other public services (Transports, mail, TV) PxPublic=1 if in favour PxPublic=5 if against
Deficit	P3_Deficit	Attitude toward governments` capacity to incur in deficits Deficit=1 if in favour Deficit=5 if againts
Tax reform	P2_Reforma	Attitude toward Tax reform. Binary variable yes=1
Reduce taxes	Imp_reducir	Attitude toward Tax reduction. Binary variable yes=1
Increase taxes	Imp_subir	Attitude toward Tax rises. Binary variable yes=1
Conservative	Derecha	Right-wing, liberal, neoliberal
Centre	Centro	Liberal social-democrat
Social-democrat	ICentro_izq	Centre-left, welfare state
Socialist	izquierda	Left, populists
Other	Otra	Anarchist, real socialist, libertarian

Table 3.2, indicates how fiscal perception and preference variables have been generated. As shown in the table, for each observation –respondent– we have 5 indicators of the different variables – one for each income requested, and its average–.

A = respondent perception of tax burden, as a % of gross income.

B = respondent conception of fair tax burden, as a % of gross income,

C = actual tax burden as % of gross income.

D = respondent perception of the monetary benefit received from public expenditure as % of the tax payments.

E = monetary benefit, received from public expenditure as % of actual tax payments.

Table 3.2 Taxation awareness, tax demand, real tax demand and returns awareness definition

Income	**Taxation Awareness**	**Tax Demand**	**Real Tax Demand**	**Returns Awareness**
Low income 12.000€	$\frac{A-C}{C}$	$\frac{B-A}{A}$	$\frac{B-C}{C}$	$\frac{D-E}{E}$
Middle income 24.000€	$\frac{A-C}{C}$	$\frac{B-A}{A}$	$\frac{B-C}{C}$	$\frac{D-E}{E}$
Middle income2 48.000€	$\frac{A-C}{C}$	$\frac{B-A}{A}$	$\frac{B-C}{C}$	$\frac{D-E}{E}$
High Income 72.000€	$\frac{A-C}{C}$	$\frac{B-A}{A}$	$\frac{B-C}{C}$	$\frac{D-E}{E}$
Very-high Income 1.000.000€	$\frac{A-C}{C}$	$\frac{B-A}{A}$	$\frac{B-C}{C}$	$\frac{D-E}{E}$
Average	**()**	**()**	**()**	**()**

Taxation awareness is defined as the difference between the real tax burden, and the tax burden individuals` estimate or perceive.

Returns awareness is defined as the deviation between the actual public expenditure returns -as % of his tax payments-, and the one individuals` observe. The most straightforward way of defining this variable would have been as the difference between the actual absolute public expenditure returns, and the one individuals` estimate or perceive. However, due to the massive misperception of public expenditure volume and incidence, this way would have led to a non-representative or useful variable.

The way it is actually defined includes somehow the taxation awareness of the respondents and therefore not only the public expenditure awareness. The problem with this new way is that people with a high taxation misperception may have a good *Returns awareness,* at the same time they are suffering from public expenditure misperception. This is because, even though they think they are receiving less, this effect is not reflected

because they are also underestimating how much they have paid in taxes. This will be cause by a negative correlation between *Taxation* and *Returns awareness.*[13]

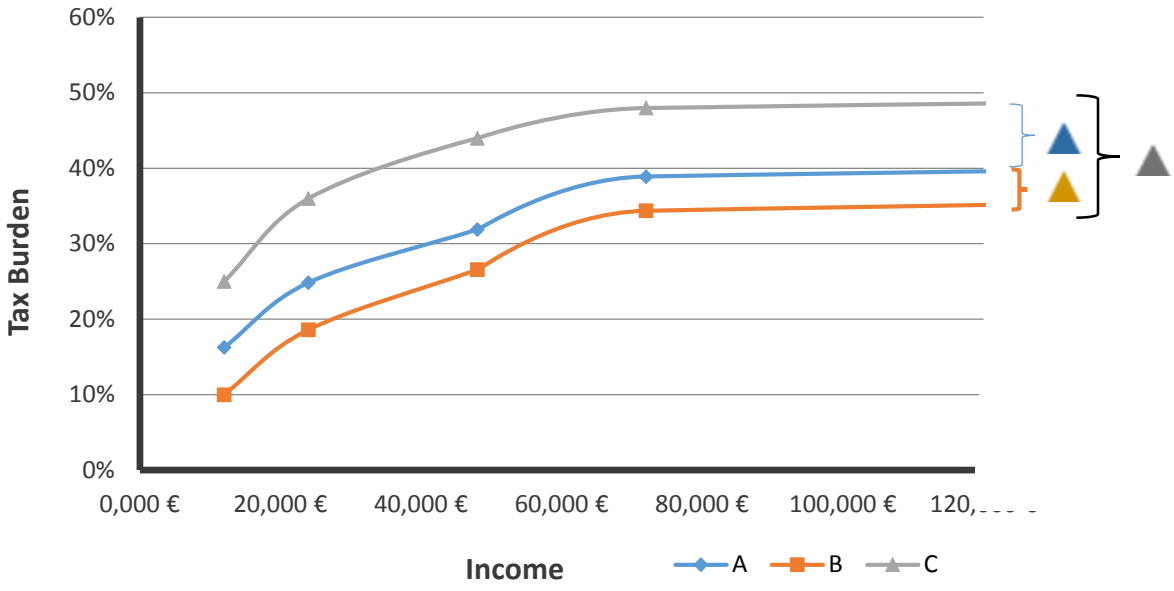
If this was the case, this definition of the variable would lead to a perfect indicator for *fiscal illusion*, one in which both the effect of fiscal and public spending misperceptions were included. Nonetheless, -and not surprisingly- due to the huge misperception of government spending volume and incidence, that correlation is close to null.[14] Letting us to consider, that variable as a redistribution and public spending size awareness variable, and thus as a perfect proxy for public expenditure awareness.

Tax demand (nominal) is defined as the deviation between the perceive tax burden, and individual´s ideal tax burden –the one they think is fair-.

Real tax demand is defined as the deviation between the actual tax burden, and the individual´s ideal tax burden.

Figure 3.3 provides a good illustration to understand how this variables are define and what they represent. *Tax demand* is the variable that measures how alterations in the perceive tax burden –"A"- affects the % deviation between "A" and "B". While *Real tax demand* measures how variations in the taxation awareness affects the position of function B, i.e. how it affects the % deviation between "C" and "B".

Fig. 3.3 Taxation awareness, tax demand and real tax demand, visual calculation



Note. Tax demand Real tax demand Taxation awareness

Ideology is defined as a discrete variable which contains the Spanish five biggest parties' ideological spectrum;[15] Conservative-liberal, Centre, Social-democrats, Socialists and Others.[16]

[13] The less *Taxation awareness*, the more *Returns* awareness. (Negative correlation)
[14] See *Table 3.5* (p.21).
[15] According to the *barómetro del CIS:* PP and Podemos 21,3%, PSOE 21,1%, Ciudadanos 20,8% IU 4,1%. (March,2015)
[16] For other ideologies.

Education is defined as discrete variables. According to the INE[17] statistical procedure, in *Education* has been distinguished among primary education, secondary education, higher education, and masters or doctors.

Income is also defined as a discrete variable. I chose to approximate respondents' income by one of the salaries survey and not specifically theirs. There are two reasons behind this procedure:

1- If requested about their specific income many people would not have be willing to reveal it, causing a problem of missing values.

2- This way there is an approximation of their real salary that enables to test if respondents are more tax aware when questioned about their income than when questioned about others.

Deficit, PxPublic and *PxPublic2* are defined as discrete additionally. Ranging from "1" when completely agreeing with the capacity of incurring in public deficits, and the application of co-payments, to "5" when completely disagreeing.

Finally, *Tax reform, Reduce taxes and Increase taxes* are defined as binary variables. Taking value "1" when in favour of tax reform, tax cuts or tax rises, respectively, and "0" otherwise.

3.2.1 Data

The data used in this study comes mainly from a survey specifically developed for this purpose. The reason why I have not used previously generated data, is that most of the existing *fiscal illusion* related data is in aggregate terms -by nations not individuals- and the limited data gathered by individuals is not related with the other explanatory and control variables used on the project, e.g. *Income, Ideology, Tax demand*. Thus, collecting data via survey enabled me to gather information on fiscal perception and preferences by individuals, and to generate the variables that I necessitated for the project.

The required treasury information, regarding actual tax payments and public expenditure returns, has been gathered from the Spanish tax agency -*Agencia Tributaria-,* the Spanish Treasury –*Ministerio de Hacienda y Administraciones Públicas-,* the Think Tank *Civismo,* and *Eurostat.*[18]

The methodology used in the survey is the following:

- The survey covers 5 representative incomes –not the whole range of possible incomes-; it assumes an employee with a single source of income and without dependents, which means is paying IRPF[19] with no fiscal deductions and there is no representation for capital taxes; and also assumes inexistence of fiscal evasion, the individual presented pays what it is legally stipulated.

- Respondents are questioned about their fiscal perception and preferences, regarding the 5 representative incomes. Additionally, they are inquired other qualitative questions on their fiscal preferences, and control questions.

[17] *Instituto Nacional de Estadística, Spanish* statistic national institute.
[18] For more specificity of the sources look in the Bibliography section.
[19] Spanish direct income tax.

Some of the sources of fiscal misperception are the fragmentation of the tax system and the invisibility of indirect taxes, which will not be captured if respondents were only survey about the direct income tax. That is why, they are inquired about all tax payments they made, not only direct taxes.

Nevertheless, it seems correct not to include the social security contributions paid by the employer as part of the tax payments. This is because, firstly we may not consider them taxes but a health, pension and unemployment insurance quota. And secondly because is not the aim of this project to include on its study the *fiscal obfuscation*[20] caused by the misperception of the incidence of the tax.

However, it might have been problematic to survey people about the part of their gross income that goes to pay taxes without taking into account the share that goes to social contributions. Consequently, employee social contributions are included as part of the taxes paid and also proportionally on the public expenditure reverted. This way respondents do not need to reckon how much of the difference between their gross and net income goes to pay taxes and social contributions, and the effects over public expenditure reverted are minimal.

The methodology used to reckon the fiscal burden on taxpayers mixes fiscal calculations with the results delivered by the Think Tank *Civismo* and the economic newspaper *Cinco Días,* Tax Calculator. The procedure is the following:

- Employing the information provided by the *Agencia tributria,* I firstly reckon the applicable direct income tax rate –through the Aeat IRPF calculator[21]- Then, add the corresponding fiscal payments of other taxes –VAT, special taxes, inheritance tax- weighting its importance *per cápita* by its tax levy[22], and tax rate. Assuming in the calculation –as Keynes proposed, and seems coherent- a decreasing average propensity to consume.

- In order to minimize the deviation caused by non-appropriate weighting of the different taxes, the prediction is corrected with the results provided by the two independent Tax Calculators previously mentioned.

Table 3.3 illustrates the amount of taxes paid by a 24.000€ gross income employee calculation.

[20] Mentioned in the Literature review section, is referred to a misunderstanding of the tax incidence.
[21] Link for Aeat IRPF calculator https://www2.agenciatributaria.gob.es/wcl/PRET-RW14/
[22] Knowing that the tax levy form special taxes is a quarter of the VAT levy –data collected from the Spanish Government Budget revenue section- and knowing that the VAT rate is approximately 20%, I assume that the effect on tax collection of special taxes will equal a quarter increased -25%- in the VAT rate. This is a 25% VAT, and no special taxes, will result on the same tax collection than with both type of taxes, assuming that consume will remain constant. This way special taxes collection is weighted by its tax levy and include in the tax calculations.

Table 3.3 *Labour* tax burden calculation

$Gross\ salary = 24.000€$	$IRPF\ tax\ rate \times 16{,}25\%$ $CCSS\ rate \times 6{,}25\%$	➡	5.400€
$Net\ salary = 18.600€$	$APC \times 0{,}9$		
$Personal\ expenditure = 16.740€$	$Special\ Taxes$ $Other\ taxes \times 25\%$ VAT	➡	4.185€
	$Total\ taxes\ paid$		9.585€
	$As\ \%\ of\ income$		39%

This data methodology collection has provided with a dataset representative of the study population. In the following part of the data Section I review and analyze the gathered data using descriptive statistics, tables and figures.

Fig. 3.4 Ideological spectrum

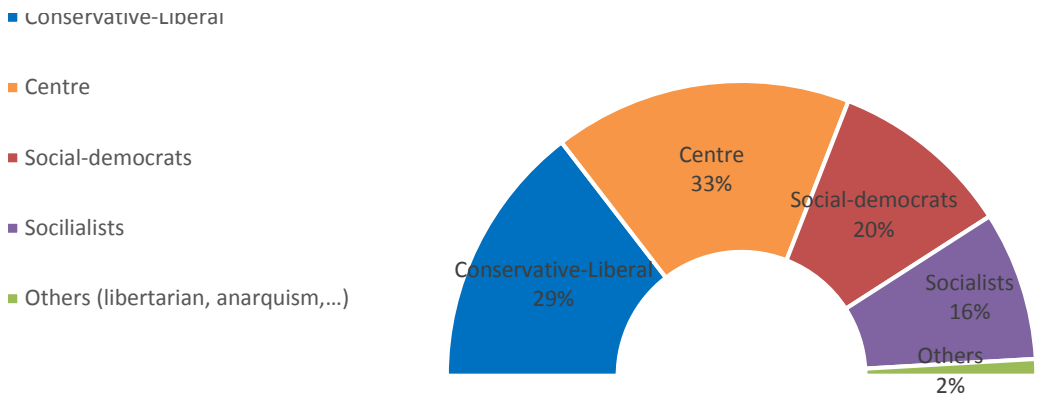
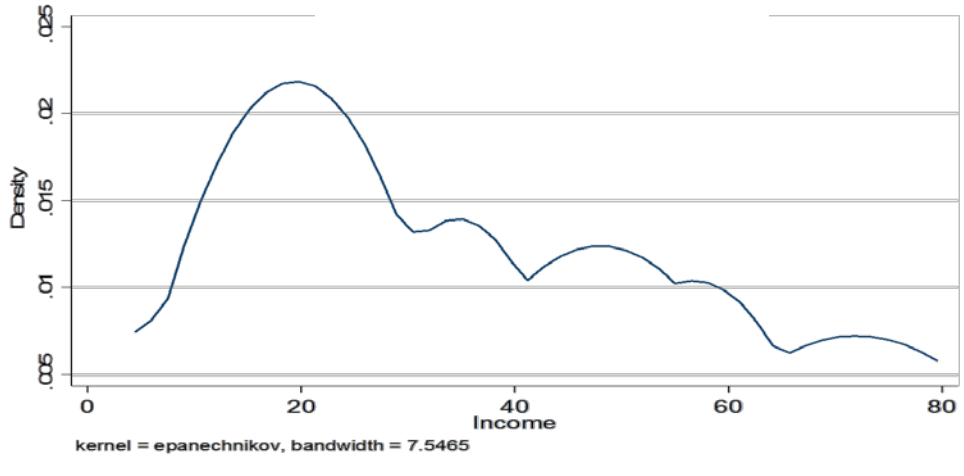


Figure 3.4, reflects the dataset ideological spectrum, which seem to be consistent with the Spanish case.

Figure 3.5 shows a representative income distribution, with a positive skewness and a natural shape, yet, a bit higher than the actual Spanish income distribution

Figure 3.6 reproduces *Education* and *Age* distribution. This two variables are very concentrated around university education and early twenties, respectively. Hence not very representative.

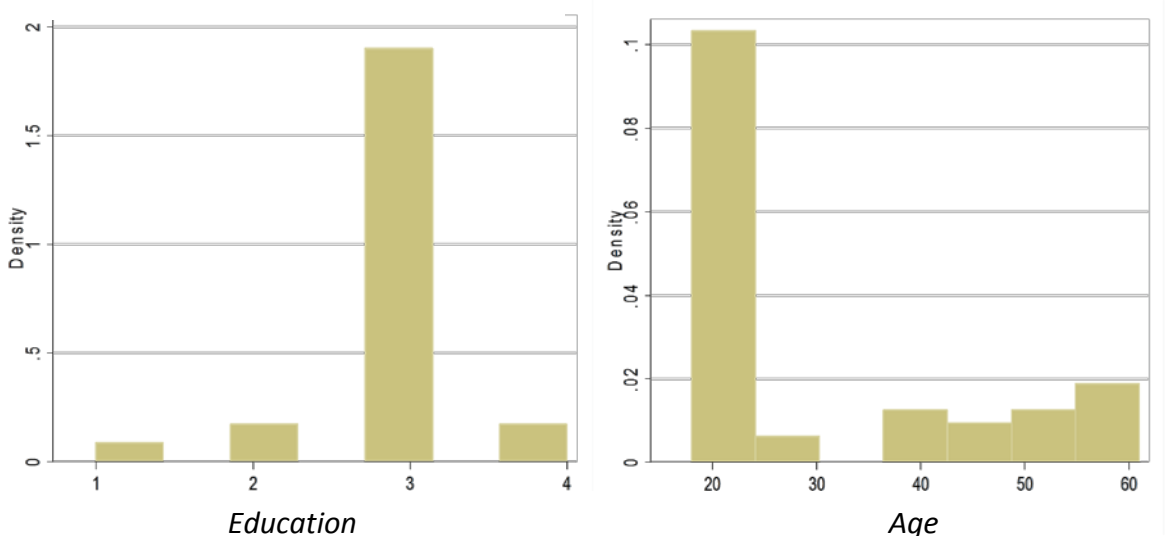
Fig. 3.5 Income distribution



Variable	*Mean*	*Median*
Income	34.080€	24.000€

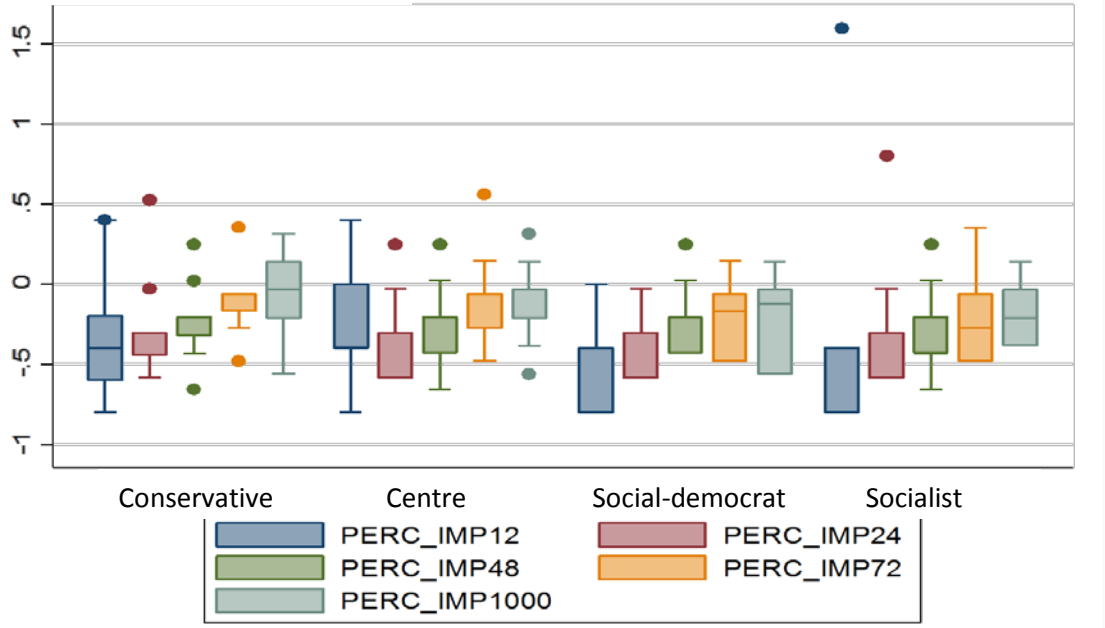
Regarding *Taxation awareness,* in *Figure 3.7* we can observe how the taxation misperception is higher –more negative- when asking about lower incomes, and decreases as the income requested increases. This may be a consequence of not fully taking into account indirect taxes –which affect to a greater extent lower income citizens-
.

Fig. 3.6 Education and Age distribution



It can also be noticed that the smaller variability in taxation awareness is around middle incomes, with a huge variability in low and very high incomes, 12-72.000€ and 1.000.000€. This could be a consequence of worse perception the further from oneself income individuals are requested, more difficulty to know the tax burden.

Fig. 3.7 Tax perception for different incomes by ideology (proportionally)



Note. Y axis represents taxation awareness in proportion, e.g 0.5=50% over perception.

In the case of 12.000€ tax burden perception, it could also play an important role the small percentage of taxes paid, causing small misperception having an important percentage effect –is not the same misperceive from 1 to 2 than form 3 to 4, even though in absolute terms it is-.

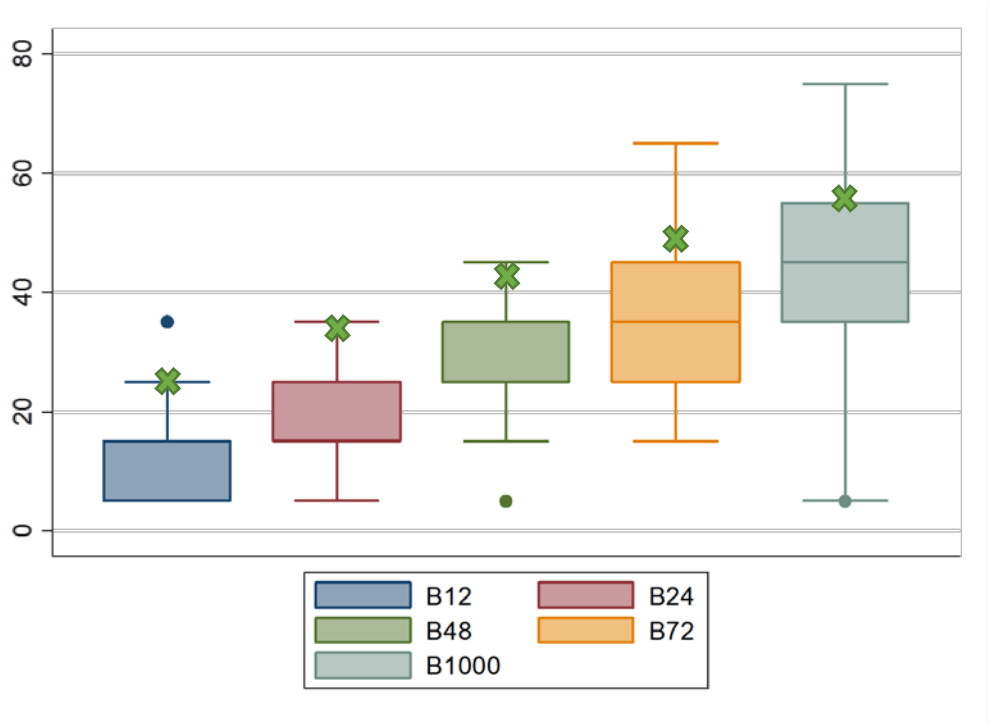
Table. 3.4 Taxation awareness distribution

	Percentiles	Smallest		
1%	-.6166	-.6166		
5%	-.5711	-.5815		
10%	-.5361	-.5711	Obs	56
25%	-.4561	-.5711	Sum of Wgt.	56
50%	-.24155		Mean	-.2565571
		Largest	Std. Dev.	.237251
75%	-.1665	.0108		
90%	-.0309	.3557	Variance	.056288
95%	.3557	.3695	Skewness	1.314627
99%	.63	.63	Kurtosis	5.91272

We can also notice that the taxation misperception level is more or less constant by *Ideology*, perhaps with a bit less of variability in right-wingers, where there is also more outliers.

Table 3.4, shows that 90% of respondents suffer from tax underperception, on average tax underperception is 25%. Morover, it indicates that *Taxation awareness* distribution is skewed to the right and more concentrated than a normal distribution. Meaning that most of respondents have a common fiscal misperception, very few worse than average and some have a better perception

Fig. 3.8 Tax burden preferences distribution for different levels of income (%)



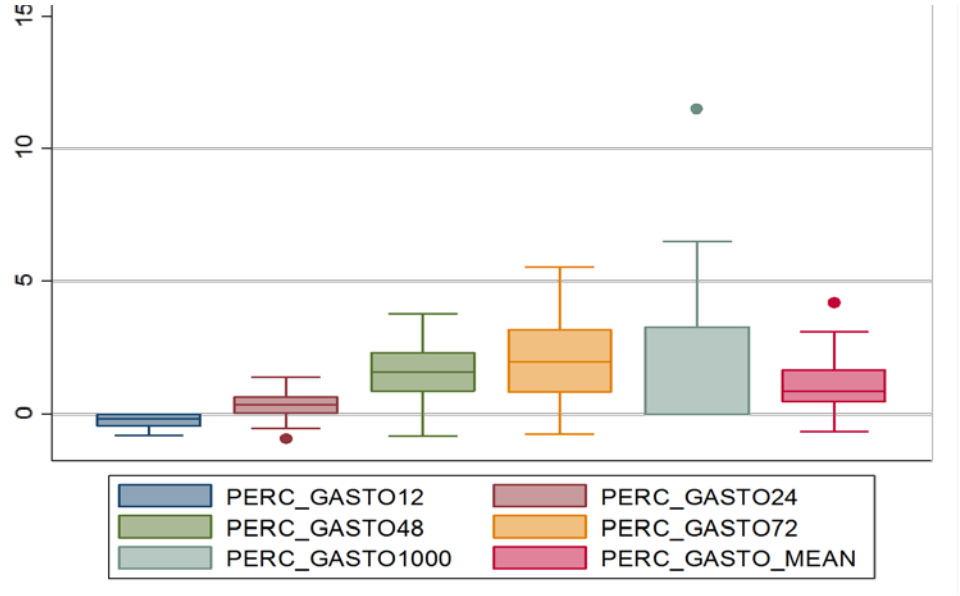
Note. The green crosses represent the actual tax burden.

The figure above represents the distribution of respondents' answers when requested for their considered fair tax burden for a 12.000-24-48-72 and 1.000.000€ income individual.

Figure 3.8 shows the ideal tax burden for respondents. The trend is clear, on average people think a progressive tax burden is fair, yet it is worth mentioning that the higher the income the more disagreement-variability in the fair tax burden. The green crosses represent the actual tax burden, which allows us to realize how on average people demand lower taxes, however this demands are less significant for higher incomes.

Similarly, is very curious the fact that, the lower adjacent value for 1.000.000€ is lower than the ones for 48-72.000€ income. This could be in line with some theories that support that very high incomes should face lower tax burdens, because they already make enormous tax payments and thus contribute more than enough. To set an example, they defend a taxing system similar to the applied to social contributions, with a maximum from which you will pay the same amount, resulting on an inverted "u" tax function.

Fig. 3.9 Returns awareness distribution for different levels of income (proportionally)



Note. Y axis represents returns awareness in proportion, e.g 5=-500% over perception.

Finally, regarding *Returns awareness,* in *Table 3.5* and *Figure 3.9* we can see that respondents perceive a higher return in public expenditure -on an increasing manner- that the actual figures. The exception is for people with an income of 12.000€ for whom the proportion of public expenditure is underestimated. The deviation on the perception also increases with the income. A possible explanation to this phenomenon might be that citizens are not fully aware of the high level of redistribution, underestimating the returns to lower incomes and overestimating it for higher incomes.

Table 3.5 Returns awareness for different levels of income (%)

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_GASTO12	44	-.2571023	.2478893	-.8125	0
PERC_GASTO24	44	.3656682	.5584344	-.9405	1.381
PERC_GASTO48	44	1.446498	1.036636	-.8529	3.7794
PERC_GASTO72	44	2.033007	1.527248	-.7619	5.5476
PERC_GA~1000	44	1.965909	3.623884	0	11.5
PERC_GASTO~N	44	1.110793	1.050962	-.6736	4.2035

3.3. ECONOMETRIC STRATEGY

With regard to the econometric modelling used in the project, the empirical analysis is performed from a cross section dataset, in which the estimation of the regressions specified in *Equations (1)* to (*6)* are carried out by *Ordinary Least Square (OLS)*. While, *Equations (7)* and *(8) are carried out* by probit and logit models, following the strategy used by Hayo & Neumeier (2014) and Boeri, Börsch-Supan, & Tabellini (2001).

For the first set of estimations, heteroskedasticity, does not seem to be a worrying problem. Awareness variables, which were the most likely to cause heteroscedasticity, are compute as a percentage -not in absolute terms- reducing this possibility. Furthermore, Breusch-Pagan and White´s test have been performed precautionary, applying robust standard errors when necessary. This technique is known as Huber-White and provides heteroskedasticity-consistent estimator standard errors.[23]

There is no major reason to think endogeneity is a problem either, since no presumably determinant variable for tax demand has been omitted. But even if it were, it would not be convenient to lose one of the few variables that I manage -using it as an instrument- employing a *Two-Stages Least Squares (2SLS)* model. Origin-social context, could be consider an explanatory variable not included and correlated with ideology. Nonetheless, *Ideology* has been tested for endogeneity –Hausman test- rejecting this possibility.

Consequently, on the one hand, *OLS* estimators appear to be the optimum for *Eq. (1)* to *(6),* given the outcome of our demand for taxation function is not binary but a continuous variable. Not even being a multinomial logit model -with regard of the three different possible outputs, more/less or equal taxes- a good specification for the hypothesis that it is to be tested. On the other hand, a probit and logit model seem to be the best option to perform *Eq. (7)* and *(8),* calculating the effects on *Reduce taxes and Increase taxes* – binary variables- at means, and also reckoning the average marginal effects.

[23] According to Tabaré Fernández (2004), STATA ® -econometric software utilized in this project- directly apllies *Generalzed Least Square (GLS)* when robust standard errors are solicitated.

4. EMPIRICAL RESULTS

In this section I present and comment the study findings. Firstly, I analyse *Tables 4.1* to *4.6,* which illustrate *Equations (1) to (6)* with different specification forms.[24] Secondly I examine *Tables 4.7* and *4.8,* which reflect *Eq. (7) and (8),* comparing its results with the previously found. And finally, trough *Figure 4.1,* I provide a brief summary and clarification of the results.

With regard to the regressions over *Tax demand -Equations (1), (3) and (5)-,* we may notice that *Taxation awareness* is virtually always significant and most times at 5% or even 1%, this is telling us that the misperception of the tax burden surely influence the *Tax demand* expressed by citizens. Its coefficients vary mainly from 0,3 to 0,6, the more extreme the income the more important and also gains weight when omitting variables. A possible explanation for the extreme incomes issue is that, people may have a stronger belief of what it is fair to pay for a 12.000€ or a 1.000.000€ income person than for a middle income 24-48.000€, where they use their estimate tax burden as an indicator for what it is fair.[25] *Graph 1* might be helpful to capture the idea.

Ideology is not a highly significant variable to explain *Tax demand*. It seems to gain significance the higher the income –only reaches a 10% significance normally-. A likely explanation might be that it is a determinant variable for the progressiveness of the tax burden rather than the tax burden itself. It also gains significance when other variables are omitted, this can be consequence of the omission of *Education,* inasmuch as they are positively correlated. To a lower extent may be also caused by the omission of *Income*. Its coefficient ranges between 0,05 and 0,1.

Education is normally a significant variable with a coefficient around 0,2. The main problem with this variable is its low variability on the sample, which should make us suspect from such a high coefficient. It is also possible that it is taking significance form *Ideology.* Another possibility is that the more education the more aware you are of the benefits of public expenditure and the more you demand.

Income is not an explanatory variable for *Tax demand.*[26]

Age is only significant at 10% for high incomes, and its coefficient is close to 0,005. It is possible that the older you get the more you value security, and the more prone to support granting a minimum standard of living at the expense of the better-off.

Returns awareness is significant at 10% and only for 72.000€, 1.000.000€ and average. Its coefficient is around 0,06. It is possible that the more you estimate the high income are receiving the more you think is fair to tax them.

Regressions have a higher R-squared the higher the income. The reason can be that for lower incomes preferences are similar for everybody, while for middle and high incomes this changes. And for those cases the specified regressions start explaining the differences.

[24] *Tables 4.1 to 4.4* are found on the Appendix IV (p. 47 to 50). For better clarification of the *Tables* see Appendix *Tables' clarification* (p. 40). Regressions with robust standard errors are signposted with a ★.

[25] This fact will cause that the misperception for an extreme income, cause a greater reaction on its expressed tax demand, while with middle income, as do not have a specific belief, at the same time the perception changes so do their belief regarding which is the fair tax burden.

[26] *Income* even though is not correlated with tax demand, it is highly correlated with Taxation awareness. The more income the more aware of taxes.

. ***Table 4.5*** *Equation (5)*

Variable	m12	m120	m24	m240	m48	m480	m72★	m720	m1000★	m10000	mean★	mean0
Ideology	.06932	.12254	.11696	.09801	.07714	.10323	.05216	.09223	.0576	.09196	.06902	.10175
	.52466	.23049	.04709	.06952	.09564	.01137	.28782	.03032	.37008	.06172	.08931	.00195
P7_Educ	.32424		.19199		.17167		.23116		.31784		.2517	
	.08077		.03941		.02199		.00476		.00356		.00035	
Income	-.00055		-.00081		.00118		.0002		.002		.00051	
	.90913		.76328		.55362		.92604		.48359		.77176	
Age	.00602	-.00035	.00378	9.5e-05	.0029	-.00112	.00588	.00243	.01039	.00589	.00596	.00129
	.37606	.96069	.29318	.97947	.30689	.76993	.06642	.50666	.01666	.26282	.02291	.75552
PERC_GASTO12	.44291	.27943										
	.31963	.4932										
PERC_IMP12	-.53349	-.69069										
	.0206	.00395										
PERC_GASTO24			-.0027	-.02114								
			.97743	.81862								
PERC_IMP24			-.35873	-.49391								
			.04861	.00527								
PERC_GASTO48					.05551	.00984						
					.21418	.79307						
PERC_IMP48					-.01777	-.05134						
					.9299	.78982						
PERC_GASTO72							.06217	.04241				
							.05007	.10276				
PERC_IMP72							-.36366	-.38317				
							.05305	.03552				
PERC_GA~1000									.03392	.03411		
									.089	.03293		
PERC_IMP1000									-.53285	-.61059		
									.03833	.0378		
PERC_GASTO~N											.09001	.06832
											.02496	.05238
PERC_IMP_M~N											-.33936	-.45391
											.02317	.00804
_cons	-1.6623	-.66943	-1.2565	-.56271	-1.1727	-.45776	-1.3181	-.55584	-1.673	-.59353	-1.4831	-.61604
	.00803	.05603	.00052	.00333	.00016	.00207	4.5e-05	.00096	5.1e-05	.00039	4.4e-07	.00018
r2	.30348	.23409	.43961	.26156	.38095	.17153	.50155	.26125	.5531	.33448	.61957	.34057
r2_a	.13632	.14398	.30512	.17469	.23238	.07407	.38193	.17433	.44585	.25619	.52826	.26299
aic	56.046	75.176	14.848	25.166	-.76405	2.6828	6.0776	13.492	23.495	36.118	-7.8787	4.7738
n	32	39	32	39	32	39	32	39	32	39	32	39

legend: b/p

. ***Table 4.6*** *Equation (6)*

Variable	m12	m120	m24	m240	m48	m480	m72 ★	m720	m1000	m10000	mean	mean0
Ideology	-.0019	.03804	.06245	.05199	.05979	.07734	.04106	.0665	.05489	.07027	.03591	.06075
	.96561	.34068	.05461	.06772	.05555	.00701	.28956	.04993	.21378	.09063	.18114	.02348
P7_Educ	.24407		.10194		.11696		.15354		.2166		.17379	
	.00239		.04723		.0198		.01528		.00358		.00025	
Income	-.00244		-.00098		.00065		-.00038		.00104		-.00044	
	.21761		.51092		.62698		.82233		.59423		.70776	
Age	.00291	.00037	.00115	-.00051	.00182	-.00081	.00319	.00084	.00535	.00234	.00289	.00016
	.29272	.89334	.55982	.79181	.33652	.72624	.19925	.71263	.06392	.40373	.09086	.92821
PERC_GASTO12	.09316	-.0593										
	.60292	.71015										
PERC_IMP12	.27591	.24905										
	.00416	.00751										
PERC_GASTO24			-.01987	-.02362								
			.70692	.62714								
PERC_IMP24			.43491	.36851								
			.00012	.00017								
PERC_GASTO48					.03486	.00324						
					.24234	.87773						
PERC_IMP48					.67408	.66221						
					3.3e-05	1.2e-06						
PERC_GASTO72							.03868	.03022				
							.11759	.15623				
PERC_IMP72							.55064	.54353				
							.00066	.00013				
PERC_GA~1000									.03206	.02777		
									.0215	.04173		
PERC_IMP1000									.59082	.54483		
									.00154	.00191		
PERC_GASTO~N											.05307	.03681
											.04564	.18458
PERC_IMP_M~N											.48211	.42716
											2.6e-05	.00011
_cons	-1.237	-.66257	-.8021	-.46973	-.89285	-.41328	-.9264	-.44273	-1.1832	-.43833	-1.0367	-.49189
	1.8e-05	1.8e-05	.00011	1.7e-05	3.2e-05	.00011	.00019	.00031	3.2e-05	.00111	2.1e-07	2.9e-06
r2	.48403	.23325	.59594	.40324	.67012	.52952	.5375	.42217	.55718	.32988	.69808	.44632
r2_a	.36019	.14305	.49896	.33304	.59095	.47417	.4265	.35419	.4509	.25105	.62562	.38118
aic	-1.7456	2.1788	-23.065	-24.829	-26.546	-29.642	-8.9907	-11.576	-1.0082	4.3983	-33.637	-30.189
n	32	39	32	39	32	39	32	39	32	39	32	39

legend: b/p

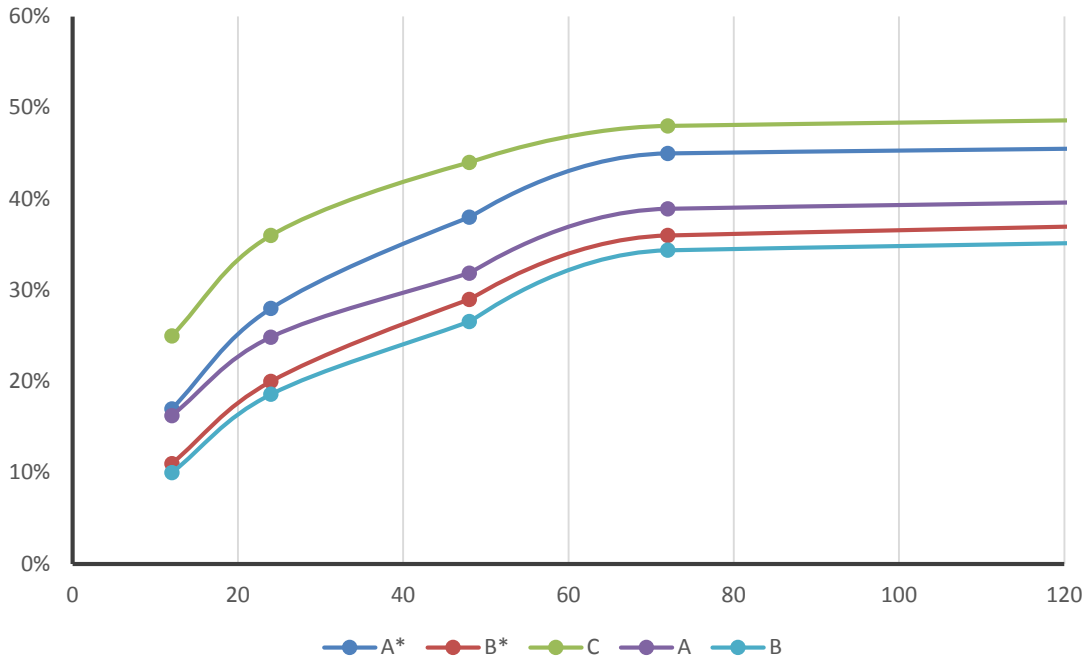
Regarding the regressions over *Real tax demand, Equations -(2), (4)* and (*6)-,* we observe that for each 10 percentage points *Taxation awareness* rise; *Real tax demand* increase in 45 percentage points, approximately. This effect is significant for every regression, meaning that the more tax aware you are the higher is the tax burden you consider fair.

The control variables, *Ideology, Education* and *Age,* and *Returns awareness* have a pretty similar behaviour over *Real tax demand* and *Tax demand*. This mean that this variables are affecting the ideal tax burden; the more left-wing, older or more educated, the higher the tax burden demanded it is. Nonetheless, it is also true that they lose a bit of significance and weight, probably due to sectarians that support higher or lower *Tax demand* without being consistent with the tax burden they demand.

It's worth note taking, that R-squared are constant regarding *Real tax demand.* It is possible that the expressed preferences are similar but the ideal tax burden it is not.

Regarding now both regressions over *Tax demand* and *Real tax demand*, we can notice that variables are more significant and regressions more representative for the mean models. This is probably because the mean models make no discrimination by income, as a consequence the number of observations are 5 times bigger reflecting trends more clearly and on average.

Figure 4.1 Tax perception improvement effects



Note. When A shift upwards A, B also move upwards B* but to a less extent. Causing Tax demand to increase or be more negative –difference between A* and B*- and Real tax demand to decrease or be less negative –difference between C and B*-.*

As a summary, Figure 4.1, indicates the effects of a tax misperception improvement –better taxation awareness-, according to the results obtained in the study.

Taking into consideration that the average *Tax awareness* is= -0,256, if tax perception was perfect, the average *Tax demand* would be 0,1024 lower -10,24 percentage points lower-, and the *Real tax demand* will be 0,1229 higher. E.g. moving from a -11% *Tax demand* to a -21,24%. And from a -40% *Real tax demand* to a -27,7%.[27]

This implies -as suggested in the methodology section- that a better tax perception affect both the expressed tax demand negatively –asking for less taxes-, and the considered fair tax burden positively –considering a higher tax burden as fair-.

Regarding *returns awareness,* getting a perfect perception will result in a *Tax demand* decrease of 0,066 -6,6 percentage points-. And a reduction of 0,044 pp of the *Real tax demand.* Contrary as expected, due to the actual overestimation of public spending returns.

Table 4.7 *Equation (7)*

	Decrease taxes				
	Probit		Logit		OLS
	At means	Av marginal effect	At means	Av marginal effect	
Ideology	-0.194	-0.165	-0.166	-0.199	-0.186
	(2.13)*	(2.58)**	(2.67)**	(2.10)*	(2.23)*
Income	0.000	0.000	0.000	0.000	0.000
	(0.10)	(0.10)	(0.05)	(0.05)	(0.11)
Age	-0.001	-0.001	-0.001	-0.001	-0.002
	(0.17)	(0.17)	(0.13)	(0.13)	(0.37)
P7_Educ	-0.196	-0.166	-0.162	-0.195	-0.146
	(1.17)	(1.22)	(1.15)	(1.13)	(1.09)
PERC_IMP_MEAN	0.137	0.116	0.127	0.153	0.117
	(0.39)	(0.40)	(0.46)	(0.45)	(0.37)
N	39	39	39	39	0.20
					39

* p<0.05; ** p<0.01

With respect to the regressions over *Reduce taxes, Eq. (7),* we notice that *Ideology* turns to be the only significant explanatory variable, with a 16,6 to 19,9 percentage points increase in the likelihood of supporting tax cuts when increasing Ideology by one position.[28] We may also observe that *Taxation awareness, Education* and *Age,* even though not significant when explaining *Reduce taxes,* still have the same coefficient sign than regressions over *Tax demand.*

Regarding regressions over *Increase taxes, Eq. (8)*, we can see that *Taxation awareness* is a significant variable in 3 out of 5 regressions with a negative coefficient between -0,35 and -0,64. While *Ideology,* is significant in 2 of the model specifications with coefficients ranging between 0,054 and 0,11. *Education* and *Age* have positive coefficients, in line with previous results.

Explanatory variables for regressions over *Tax demand* and*, Reduce taxes a*nd *Increase taxes,* differ in significance and weight, but not in sign. This differences show the existence of an ideological barrier that influence individuals´ expressed opinion, beyond

[27] *Real tax demand* average is -40%. And *Tax demand* average is -11%.
[28] See the definition of the variable (page 13).

its fiscal preferences, e.g. with the same fiscal perception and preferences a left winger will be on average less prone to support tax cuts than a right winger.

This two approaches to the determinants of taxation demand –quantitative and qualitative- illustrate sectarism problems, and the difference between asking, more or less? and how much?

Table 4.8 *Equation (8)*

	Increase taxes				
	Probit		Logit		OLS
	At means	Av marginal effect	At means	Av marginal effect	
Ideology	0.059	0.096	0.054	0.096	0.110
	(1.15)	(2.15)*	(1.27)	(2.10)*	(1.82)
Income	0.002	0.003	0.002	0.003	0.002
	(0.84)	(0.95)	(0.94)	(1.03)	(0.68)
Age	0.000	0.000	0.000	0.000	0.004
	(0.10)	(0.10)	(0.10)	(0.11)	(0.96)
P7_Educ	0.065	0.107	0.058	0.104	0.088
	(0.76)	(0.78)	(0.79)	(0.79)	(0.91)
PERC_IMP_MEAN	-0.393	-0.646	-0.353	-0.630	-0.524
	(1.43)	(2.11)*	(1.54)	(2.09)*	(2.25)*
N	39	39	39	39	0.26
					39

* p<0.05; ** p<0.01

5. CONCLUDING REMARKS

The purpose of this project is to solve the old controversy about the effects of tax and government spending misperception, over the public budget and tax burden. Trying to provide an empirical answer to the question; How does, in reality, *fiscal illusion* influences the demand for taxation?

The model used to evaluate this impact, is based on a cost-revenue model[29] in which individuals do not fully perceive the benefits of taxation, nor the tax burden they face. This is admittedly a very simple model, but still sufficient to explain *fiscal illusion* effects and serve as theoretical foundation for the project.

This new model redefine *fiscal illusion* and fiscal preferences variables enabling the collection of survey data form 64 Spanish citizens and its posterior econometric analysis, applying *Ordinary Least Square (OLS)*, *Probit* and *Logit* models, to contrast the actual repercussions of *fiscal illusion.*

The project reveals that tax misperception have a strong positive effect over tax demand, while public expenditure underestimation leads to a lower demand for taxation. Nonetheless, this effects do not cancel each other out. Since -contrary to what J.K. Galbraith suggested- individuals tend to overestimate public spending returns. As a consequence, they demand higher than optimal taxation. Reinforcing the effect of tax under perception[30] and confirming the assumption that *fiscal illusion* does indeed cause a higher government spending demand, at least for the Spanish case.

Another important finding, is that tax perception not only influences the valuation of the costs of taxation, as previous *fiscal illusion* literature suggests, but also the valuation of the benefits derive from it. This implies, as Boeri, Börsch-Supan, & Tabellini (2001) claimed, that citizens´ preferences are endogenous, and adapted to the status quo.[31] Thus limiting to some extent, the negeative effects of *fiscal illusion*.

Lastly, this study contrast the presence of an ideological biased beyond individuals´ fiscal preferences. It demonstrates that this phenomenon is present in binary positioning systems, for and against policies or qualitative assertions, in which connotations have a much more important role than in quantitative consulting. The main implication of this finding regarding taxation is; to get an optimum fiscal demand citizens have to be inquired, how much taxes? instead of, more or less taxes?

We shall take this results with caution, being aware of data limitations.[32] Taking into account that none preference or perception data is robust to the fact that respondents do not have strong incentives to reveal their preferences, perceptions or personal information, truthfully or thoughtfully. (Sausgruber & Tyran, 2004) And, moreover, people may support the current or a higher level of public expenditure at the same time they advocate for tax cuts -focusing this project exclusively on taxation-.[33]

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[29] Very similar to the basic model used as theoretical foundation on the previous *fiscal illusion* literature (p. 8)

[30] Taking into consideration that the average *Tax awareness* is= -0,256, if tax perception was perfect, the average *Tax demand* would be 0,1024 lower -10,24 percentage points lower-, and the *Real tax demand* will be 0,1229 higher. E.g. moving from a -11% *Tax demand* to a -21,24%. And from a -40% *Real tax demand* to a -27,7% (p. 28).

[31] "… citizens' preferences are endogenous, and adapted to the status quo. Voters suffer from a "negativity bias": once they get something, they don't want to give it up" (Boeri, Börsch-Supan, & Tabellini, 2001)

[32] Non random sample. Taken at a specific point of the business cycle that may affect preferences. Different assumptions (review data section p.16).

[33] Violating the first assumption made by this Project; public spending=taxation.

To conclude, further research with a more precise data will be require to clear up *fiscal illusion* effects*.* However, this study, has been another back up for the *Public Choice School* theories on *fiscal illusion.*

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APPENDIX I: SURVEY

Survey representation:

- Employee without dependents (no exemptions and tax labour income)
- Answer the percentage of gross income that goes to pay taxes

A ≡ % of gross income, you think he have to pay in taxes. (NOT only direct taxes)

B ≡ % of gross income, you think it would be fair to pay.

D ≡ monetary benefit, you think is receiving from public expenditure as % of his tax payments. (If you think its receiving more than contributing, D>100%, if receiving less D<100%)

While **C** y **E** are the actual figures.

C ≡ actual tax burden, as % of gross income.

E ≡ monetary benefit, he receive from public expenditure as % of his tax payments in reality.

P.1 Fill column A, B y D

* Figures are shown in percentage points.

Income	A	B	C	Taxation Awareness	Tax Demand	D	E	Returns Awareness
Low income 12.000€				$\frac{A-C}{C}$	$\frac{B-A}{A}$			$\frac{D-E}{E}$
Middle income 24.000€				$\frac{A-C}{C}$	$\frac{B-A}{A}$			$\frac{D-E}{E}$
Middle income2 48.000€				$\frac{A-C}{C}$	$\frac{B-A}{A}$			$\frac{D-E}{E}$
High income 72.000€				$\frac{A-C}{C}$	$\frac{B-A}{A}$			$\frac{D-E}{E}$
Very high income 1.000.000€				$\frac{A-C}{C}$	$\frac{B-A}{A}$			$\frac{D-E}{E}$
Mean				**()**	**()**			**()**

P.2 ¿Do you think a tax system reform is required?
Yes/No

¿For what purpose? (Select as many as you consider)

☐ Avoid tax fraud ☐ Increase taxes ☐ Reduce taxes ☐ Reduce fiscal illusion[34]

[34] Ilusión Fiscal entendida como errónea percepción de la presión fiscal. Es decir, pensar que se pagan menos impuestos de lo que realmente se paga.

P.3 Ideology (Economic field in brackets)

☐ Left (socialist) ☐ Centre-Left (social-democrat) ☐ Centre (mix) ☐ Right (liberal) ☐ Other (real communism, anarchism)

P.4 Age

……

P.5 Education level

☐ 0-2: Primary School.

☐ 3-4: Secondary School.

☐ 5: Higher Education.

☐ 6: Masters and PhDs.

P.6 ¿What do you think about governments` capacity to incur in defict?

☐ Is positive ☐ Is negative ☐ Often positive ☐ Often negative ☐ Ambiguous

P.7 ¿Do you agree with shadow prices and co-payments in publicly provided goods (housing, health and education)?

☐ Agree ☐ Normally agree ☐ Normally disagree ☐ Disagree

And, in other public services (mail, transports, bureaucracy…)?

☐ Agree ☐ Normally agree ☐ Normally disagree ☐ Disagree

P.8 Studies field

☐ Economics, Management, Business, Law.

☐ History, CC Politics, Philosophy, Psychology.

☐ Health sciences (Medicine, Nursery...)

☐ Pure sciences (Maths, Engineering, Architecture...)

☐ Non applicable.

P.9 Income

……

Link for the online survey:
https://docs.google.com/forms/d/1f91TH1gjHYpk1PeQ53EwWIUEhp9MBchg05jO7CdCzlE/viewform

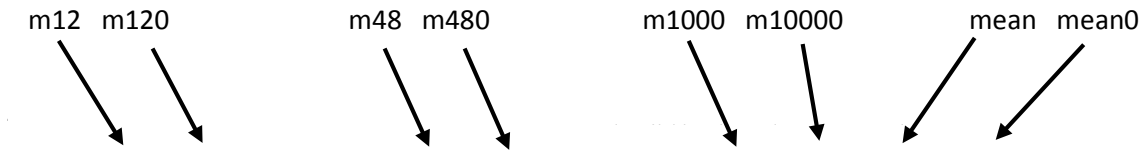
Link for 80% survey data:

https://docs.google.com/forms/d/1f91TH1gjHYpk1PeQ53EwWIUEhp9MBchg05jO7CdCzlE/viewanalytics and https://docs.google.com/spreadsheets/d/1ISr33DHz3Ui-gOv9C70_F8ToOlW2Ypu2FEs3k2s12mM/edit#gid=419882311

APPENDIX II: TABLES´ CLARIFICATION

On each *table* are shown different model specification in columns; and variables coefficient -and its correspondent p-value below it- in rows.

m12 represent the regression for the case in which respondents are survey about the 12.000€ income individual. m24 represent the for the case in which respondents are survey about the 24.000€ income individual, and so on for m48, m72, m1000. mean represent the regression in aggregate terms, using the variables average to do the regression . For each of this models there are also different specification forms, e.g. m12 m120 m1200. To whom I will refer as “complete”, 0 and 00 models, respectively. In the complete models all variables are included, and in the 0 and 00 some non-significant or likely to caused biased parameters are omitted. We should observe that for each income regression has obviously be used its correspondent *Tax demand* and *Taxation awareness* variable while the control variables remain constant.



Variable	m12	m120	m24	m240	m48	m480	m72	m720	m1000	m10000	mean	mean0
Ideology	.01903	.01771	.09822	.05575	.07669	.13469	.04391	.12048	.07212	.11335	.05743	.08427
	.87029	.86975	.10608	.31322	.08899	.00194	.39391	.01215	.29271	.06635	.21294	.04819
P7_Educ	.34904		.21909		.17178		.23325		.35079		.26614	
	.08448		.0259		.01939		.00658		.00243		.00595	
Income	-.00313		-.00331		.00113		-.00095		.00028		-.00095	
	.5427		.19797		.54307		.66402		.92289		.57978	
Age	.00595		.00371		.00291		.0063		.01168		.00624	
	.42275		.32973		.29497		.06228		.0114		.12764	
PERC_GASTO12	.37543	.10294										
	.43759	.81542										
PERC_GASTO24			.00869	-.00645								
			.93147	.94944								
PERC_GASTO48					.05586	.02237						
					.20055	.59344						
PERC_GASTO72							.07287	.05278				
							.02872	.0953				
PERC_GA~1000									.03675	.03409		
									.08422	.06641		
PERC_GASTO~N											.09533	.0749
											.02254	.09766
_cons	-1.396	-.22734	-1.1087	-.313	-1.1669	-.53175	-1.2516	-.48327	-1.7112	-.37376	-1.3908	-.42232
	.03305	.38647	.00219	.02627	8.5e-05	4.4e-05	.00014	.00049	8.0e-05	.00953	.0004	.00022
r2	.13325	.00183	.34327	.02676	.38076	.22153	.41934	.19249	.46762	.19148	.53051	.1671
r2_a	-.03343	-.04935	.21697	-.02315	.26167	.18161	.30767	.15108	.36524	.15002	.44023	.12438
aic	61.043	90.795	17.925	34.729	-2.7539	9.8311	8.9632	20.279	27.096	40.911	-3.1481	11.356
n												

Coefficient

P-value

legend: b/p

APPENDIX III: OTHER RESULTS

Reduce taxes and Increase taxes

Table A.1 Reduce taxes likelihood

Log likelihood = -20.9556 Pseudo R2 = 0.1769

Imp_reducir	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Income	1.003458	.0209123	0.17	0.868	.9632969	1.045294
Age	1.000591	.0287997	0.02	0.984	.9457075	1.05866
P7_Educ	.3980136	.3388992	-1.08	0.279	.0750101	2.111913
PERC_IMP_MEAN	1.92663	3.052032	0.41	0.679	.0863744	42.97461
Derecha	12.1257	17.55007	1.72	0.085	.7107628	206.8659
Centro	9.614552	13.02782	1.67	0.095	.6753703	136.8725
Centro_izq	2.349765	3.450894	0.58	0.561	.1321111	41.79358
Izquierda	1	(omitted)				
Otra	1	(omitted)				
_cons	4.69168	13.90559	0.52	0.602	.0140756	1563.829

Table A.2 Increase taxes likelihood

Logistic regression Number of obs = 28
LR chi2(6) = 9.21
Prob > chi2 = 0.1620
Log likelihood = -9.9417497 Pseudo R2 = 0.3166

Imp_subir	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Income	1.036373	.0370331	1.00	0.317	.966273	1.111559
Age	1.005689	.0474966	0.12	0.904	.9167759	1.103225
P7_Educ	1.98545	3.311121	0.41	0.681	.0755641	52.16776
PERC_IMP_MEAN	.0002205	.0010419	-1.78	0.075	2.10e-08	2.318517
Derecha	1	(omitted)				
Centro	.3141105	.5125361	-0.71	0.478	.0128284	7.691189
Centro_izq	1.303019	2.13585	0.16	0.872	.0524444	32.37443
Izquierda	1	(omitted)				
Otra	1	(omitted)				
_cons	.0010593	.0051964	-1.40	0.163	7.07e-08	15.86994

Tax Awareness

Table A.3 Taxation awareness determinants

Source	SS	df	MS		
Model	.487108362	7	.069586909	Number of obs	= 40
Residual	2.04100956	32	.063781549	F(7, 32)	= 1.09
				Prob > F	= 0.3921
Total	2.52811792	39	.064823536	R-squared	= 0.1927
				Adj R-squared	= 0.0161
				Root MSE	= .25255

PERC_IMP_M~N	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Derecha	-.0231409	.1039773	-0.22	0.825	-.2349358	.188654
Centro_izq	-.083453	.1204548	-0.69	0.493	-.3288113	.1619054
Izquierda	.0825948	.1426395	0.58	0.567	-.2079522	.3731419
Otra	-.2080792	.2674371	-0.78	0.442	-.7528308	.3366723
Age	.0007688	.0030802	0.25	0.804	-.0055053	.007043
P7_Educ	-.0213274	.0740602	-0.29	0.775	-.172183	.1295282
Income	.0043222	.0021016	2.06	0.048	.0000413	.0086031
_cons	-.3100214	.2431057	-1.28	0.211	-.8052115	.1851687

Table A.4 Ttest Taxation awareness, by conservative and socialist.

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	40	-.2727175	.0379769	.240187	-.349533	-.195902
1	16	-.2161562	.0580725	.2322898	-.3399348	-.0923777
combined	56	-.2565571	.031704	.237251	-.3200934	-.1930209
diff		-.0565613	.0704072		-.1977191	.0845966

```
    diff = mean(0) - mean(1)                                      t =  -0.8033
Ho: diff = 0                                     degrees of freedom =       54

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.2126         Pr(|T| > |t|) = 0.4253          Pr(T > t) = 0.7874
```

```
. ttest PERC_IMP_MEAN, by(Izquierda)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	47	-.2557021	.0308787	.2116939	-.3178578	-.1935465
1	9	-.2610222	.1198477	.3595432	-.5373916	.0153471
combined	56	-.2565571	.031704	.237251	-.3200934	-.1930209
diff		.0053201	.0871167		-.1693384	.1799785

```
    diff = mean(0) - mean(1)                                      t =   0.0611
Ho: diff = 0                                     degrees of freedom =       54

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.5242         Pr(|T| > |t|) = 0.9515          Pr(T > t) = 0.4758
```

Table A.5 Test for different taxation awareness by ideology (Lincom conservative-socialist).

PERC_IMP_M~N	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
(1)	-.1057357	.1496377	-0.71	0.485	-.4105378	.1990664

Table A.6 Taxation awareness mean by ideology (bysort Ideology).

-> Ideology = 1

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_IMP_M~N	16	-.2161562	.2322898	-.6166	.3695

-> Ideology = 2

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_IMP_M~N	19	-.2376	.2068818	-.5361	.3557

-> Ideology = 3

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_IMP_M~N	10	-.32838	.1936255	-.5711	-.0238

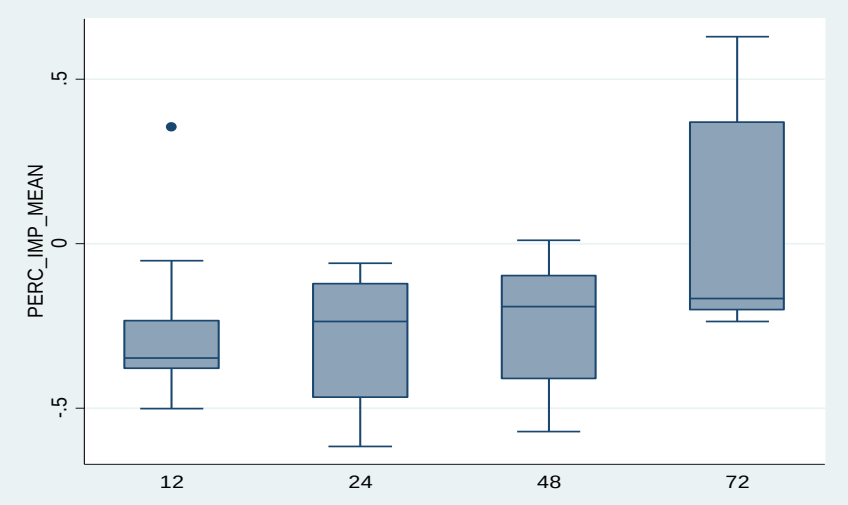
-> Ideology = 4

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_IMP_M~N	9	-.2610222	.3595432	-.5815	.63

-> Ideology = .

Variable	Obs	Mean	Std. Dev.	Min	Max
PERC_IMP_M~N	2	-.38065	.1702006	-.501	-.2603

Table A.7 Taxation awareness distribution by income



Respondents Consistency

Table A.8 Tax demand by Increase taxes

```
. bysort Imp_subir: sum DEM_IMP_MEAN

-------------------------------------------------------------------------------
-> Imp_subir = 0

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
DEM_IMP_MEAN |        48   -.1941375    .2468213     -.6926       .3657

-------------------------------------------------------------------------------
-> Imp_subir = 1

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
DEM_IMP_MEAN |         8    .1430875    .2792308     -.1689       .7467
```

Table A.9 Tax demand and Increase taxes correlation matrix

(obs=56)

	Imp_su~r
Imp_subir	1.0000
DEM_IMP12	0.2756
DEM_IMP24	0.4027
DEM_IMP48	0.2473
DEM_IMP72	0.2750
DEM_IMP1000	0.3086
DEM_IMP_MEAN	0.4315

Table A.10 Attitudes toward fiscal policies by Ideology and Income

-> Ideology = 1

Variable	Obs	Mean	Std. Dev.
Imp_reducir	16	.75	.4472136
Imp_subir	16	0	0
P3_Deficit	16	3.3125	1.014479
P4_PxPubli~s	16	2.9375	.9979145
P4_OtrosServ	16	2.125	1.024695

-> Ideology = 2

Variable	Obs	Mean	Std. Dev.
Imp_reducir	19	.6842105	.4775669
Imp_subir	19	.1578947	.3746343
P3_Deficit	19	3.789474	.976328
P4_PxPubli~s	19	3.736842	1.284182
P4_OtrosServ	19	2.894737	1.286457

-> Ideology = 3

Variable	Obs	Mean	Std. Dev.
Imp_reducir	9	.3333333	.5
Imp_subir	10	.3	.4830459
P3_Deficit	10	3.1	1.100505
P4_PxPubli~s	10	3.5	1.269296
P4_OtrosServ	10	2.5	.8498366

-> Ideology = 4

Variable	Obs	Mean	Std. Dev.
Imp_reducir	9	.4444444	.5270463
Imp_subir	9	.1111111	.3333333
P3_Deficit	9	2.888889	1.054093
P4_PxPubli~s	9	4.555556	.7264832
P4_OtrosServ	9	3.777778	.6666667

-> Ideology = .

Variable	Obs	Mean	Std. Dev.
Imp_reducir	2	1	0
Imp_subir	2	.5	.7071068
P3_Deficit	2	4	0
P4_PxPubli~s	2	3.5	.7071068
P4_OtrosServ	2	3.5	.7071068

-> Income = 12

Variable	Obs	Mean	Std. Dev.
Imp_reducir	9	.6666667	.5
Imp_subir	9	.3333333	.5
P3_Deficit	9	3.444444	.7264832
P4_PxPubli~s	9	3.555556	1.013794
P4_OtrosServ	9	3.111111	1.054093
Ideology	8	2.375	.9161254

-> Income = 24

Variable	Obs	Mean	Std. Dev.
Imp_reducir	15	.6666667	.48795
Imp_subir	15	0	0
P3_Deficit	15	3.4	1.121224
P4_PxPubli~s	15	3.533333	1.245946
P4_OtrosServ	15	2.733333	.9611501
Ideology	15	2.133333	.9904304

-> Income = 48

Variable	Obs	Mean	Std. Dev.
Imp_reducir	12	.3333333	.492366
Imp_subir	12	.3333333	.492366
P3_Deficit	12	3.416667	1.1645
P4_PxPubli~s	12	3.416667	1.564279
P4_OtrosServ	12	2.5	1.314257
Ideology	12	2.25	.9653073

-> Income = 72

Variable	Obs	Mean	Std. Dev.
Imp_reducir	7	.8571429	.3779645
Imp_subir	7	0	0
P3_Deficit	7	3.714286	1.603567
P4_PxPubli~s	7	3.571429	1.272418
P4_OtrosServ	7	2	1.290994
Ideology	7	1.714286	1.112697

APPENDIX IV: OTHER FIGURES

. estimat

Table 4.1 *Equation (1)*

Variable	m12	m120	m1200	m24	m240	m2400	m48	m480	m4800	m72	m720	m7200	m1000	m10000	m100000	mean	mean0	mean00
Ideology	.04665	-.00514	.02012	.09142	-.00071	.02665	.09922	.1137	.13309	.07234	.09412	.11667	.06582	.10177	.13442	.07391	.06372	.08879
	.5976	.93786	.7858	.06796	.98609	.5158	.08438	.00536	.00105	.13223	.00815	.00155	.26073	.02321	.00661	.06769	.03439	.00698
P7_Educ	.23878	.23203		.20674	.20509		.16049	.17203		.19257	.17208		.29358	.28481		.22138	.21591	
	.09496	.07082		.01191	.01183		.08025	.02535		.01475	.01112		.00342	.00115		.00123	.00034	
Income	.00053			-.00149			.00057			.00012			.00016			-.00036		
	.89591			.54836			.83117			.95528			.9533			.84925		
Age	.00554			.0035			.00056			.00511			.00881			.00475		
	.32452			.26177			.87677			.09614			.02179			.0644		
PERC_IMP12	-.49984	-.51291	-.60699															
	.01102	.00249	.00199															
PERC_IMP24				-.3811	-.43533	-.46547												
				.0226	.00437	.00309												
PERC_IMP48							-.43757	-.42593	-.42267									
							.07145	.02325	.02635									
PERC_IMP72										-.38928	-.4804	-.43154						
										.03297	.00165	.00608						
PERC_IMP1000													-.47315	-.62258	-.62053			
													.04543	.00243	.00538			
PERC_IMP_M~N																-.35788	-.40005	-.44472
																.02309	.00267	.00247
_cons	-1.489	-1.1479	-.53243	-1.199	-.94491	-.41765	-1.0179	-1.0173	-.55429	-1.0647	-.87111	-.41876	-1.4184	-1.1742	-.42326	-1.2165	-1.025	-.45761
	.00284	.00333	.00754	5.9e-05	.00017	.00037	.00222	3.5e-05	1.6e-06	.00013	3.8e-05	1.3e-05	3.9e-05	1.2e-05	.00049	1.5e-06	1.2e-07	8.8e-07
r2	.26289	.22741	.17566	.42175	.26633	.16748	.26982	.33908	.26834	.37197	.40269	.29419	.45458	.46232	.29563	.47896	.44457	.28475
r2_a	.15121	.17913	.14333	.33413	.22047	.13483	.15918	.29777	.23965	.27682	.36536	.26651	.37194	.42872	.26801	.40002	.40985	.2567
aic	59.822	75.894	94.699	13.699	26.653	30.882	25.075	21.612	23.956	11.557	7.6529	13.812	27.222	31.307	44.547	-2.6284	-8.358	2.8087
n	39	52	54	39	52	54	39	52	54	39	52	54	39	52	54	39	52	54

legend: b/p

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Table 4.2 *Equation (2)*

Variable	m12	m120	m1200	m24	m240	m2400	m48	m480	m4800	m72	m720	m7200	m1000	m10000	m100000	mean	mean0	mean00
Ideology	-.01333	-.033	-.00908	.04207	-.00589	.01099	.0537	.06705	.08127	.04678	.06313	.07932	.06242	.08289	.10561	.03525	.03431	.05276
	.70998	.29648	.78242	.17335	.80693	.65033	.12698	.00847	.00162	.22582	.02028	.00415	.15364	.0093	.00246	.21112	.09288	.01804
P7_Educ	.21656	.18633		.13538	.12828		.12368	.12482		.14392	.12729		.2135	.20576		.16565	.15434	
	.00053	.00311		.00862	.00762		.03048	.01025		.02335	.01462		.00407	.00089		.00069	.00019	
Income	-.00217			-.00118			.00034			-.00045			-.00049			-.00088		
	.19233			.44767			.83619			.80152			.80837			.51168		
Age	.00248			.00204			.00139			.00371			.00495			.00291		
	.2774			.29363			.53049			.13296			.07794			.10652		
PERC_IMP12	.29434	.29333	.2743															
	.00044	.00037	.00169															
PERC_IMP24				.42845	.40333	.38674												
				.00014	2.1e-05	6.2e-05												
PERC_IMP48							.5266	.56059	.56296									
							.00091	1.0e-05	1.5e-05									
PERC_IMP72										.57205	.5266	.5535						
										.0003	1.9e-05	1.2e-05						
PERC_IMP1000													.65502	.57105	.56052			
													.00048	.00013	.00044			
PERC_IMP_M~N																.49269	.46046	.44973
																5.3e-05	2.6e-06	1.9e-05
_cons	-1.1438	-1.0092	-.52195	-.87685	-.73203	-.40129	-.8155	-.76223	-.42676	-.81648	-.6877	-.35183	-1.0443	-.91582	-.37091	-.9183	-.81296	-.40642
	7.2e-07	7.2e-07	1.2e-07	5.7e-06	2.1e-06	1.0e-07	.00013	1.7e-06	2.7e-08	.00025	2.6e-05	2.1e-06	4.5e-05	2.1e-06	2.2e-05	4.7e-07	3.5e-09	2.1e-09
r2	.48048	.33736	.18071	.51183	.37248	.27266	.46343	.46387	.3825	.45979	.42854	.37154	.45761	.41698	.27998	.57041	.49847	.33689
r2_a	.40176	.29595	.14859	.43786	.33326	.24414	.38213	.43037	.35828	.37794	.39283	.34689	.37544	.38054	.25175	.50532	.46712	.31089
aic	-10.48	-1.205	7.0494	-23.077	-28.658	-25.819	-12.828	-27.008	-24.693	-5.0019	-19.366	-16.202	4.0621	-5.0811	5.7486	-29.727	-47.883	-38.252
n	39	52	54	39	52	54	39	52	54	39	52	54	39	52	54	39	52	54

legend: b/p

. est **Table 4.3** *Equation (3)*

Variable	m12	m120	m24	m240	m48	m480	m72	m720	m1000	m10000	mean	mean0 ★
Ideology	.01903	.01771	.09822	.05575	.07669	.13469	.04391	.12048	.07212	.11335	.05743	.08427
	.87029	.86975	.10608	.31322	.08899	.00194	.39391	.01215	.29271	.06635	.21294	.04819
P7_Educ	.34904		.21909		.17178		.23325		.35079		.26614	
	.08448		.0259		.01939		.00658		.00243		.00595	
Income	-.00313		-.00331		.00113		-.00095		.00028		-.00095	
	.5427		.19797		.54307		.66402		.92289		.57978	
Age	.00595		.00371		.00291		.0063		.01168		.00624	
	.42275		.32973		.29497		.06228		.0114		.12764	
PERC_GASTO12	.37543	.10294										
	.43759	.81542										
PERC_GASTO24			.00869	-.00645								
			.93147	.94944								
PERC_GASTO48					.05586	.02237						
					.20055	.59344						
PERC_GASTO72							.07287	.05278				
							.02872	.0953				
PERC_GA~1000									.03675	.03409		
									.08422	.06641		
PERC_GASTO~N											.09533	.0749
											.02254	.09766
_cons	-1.396	-.22734	-1.1087	-.313	-1.1669	-.53175	-1.2516	-.48327	-1.7112	-.37376	-1.3908	-.42232
	.03305	.38647	.00219	.02627	8.5e-05	4.4e-05	.00014	.00049	8.0e-05	.00953	.0004	.00022
r2	.13325	.00183	.34327	.02676	.38076	.22153	.41934	.19249	.46762	.19148	.53051	.1671
r2_a	-.03343	-.04935	.21697	-.02315	.26167	.18161	.30767	.15108	.36524	.15002	.44023	.12438
aic	61.043	90.795	17.925	34.729	2.7539	9.8311	8.9632	20.279	27.096	40.911	3.1481	11.356
n	32	39	32	39	32	39	32	39	32	39	32	39

legend: b/p

. estir ***Table 4.4*** *Equation (4)*

Variable	m12	m120	m24★	m240	m48	m480	m72★	m720	m1000	m10000	mean	mean0★
Ideology	.02411	.01504	.08517	.03537	.07675	.08995	.05356	.07756	.03878	.04826	.05237	.05193
	.71956	.7484	.04531	.28573	.11941	.00743	.26473	.03429	.45805	.25999	.201	.08785
P7_Educ	.23124		.06908		.11299		.15038		.18006		.15327	
	.01309		.29041		.14497		.05027		.03329		.02542	
Income	-.0011		.00205		.00281		.00136		.00295		.00163	
	.67005		.24517		.1332		.50396		.19621		.35894	
Age	.00295		.00123		.00139		.00255		.00393		.0025	
	.35416		.63656		.56532		.40257		.24295		.25569	
PERC_GASTO12	.12806	.17296										
	.39621	.36854										
PERC_GASTO24			-.03368	.00781								
			.63011	.89796								
PERC_GASTO48					.02151	.0084						
					.64118	.79845						
PERC_GASTO72							.02247	.0159				
							.44841	.5086				
PERC_GA~1000									.02892	.0193		
									.07673	.13671		
PERC_GASTO~N											.04551	.02406
											.25376	.45218
_cons	-1.3747	-.61566	-.98129	-.56835	-1.1132	-.61798	-1.0271	-.48695	-1.1408	-.389	-1.1679	-.55104
	3.3e-05	2.9e-06	.00018	2.1e-08	1.3e-05	4.0e-08	.00055	1.4e-05	.0004	.00025	8.9e-07	5.8e-09
r2	.27874	.02154	.26206	.02917	.33465	.1698	.2574	.11542	.33323	.10645	.37904	.09202
r2_a	.14004	-.02864	.12014	-.02061	.2067	.12722	.11459	.07005	.20501	.06063	.25963	.04546
aic	6.9726	20.691	-5.7918	-8.3478	-6.0949	-10.421	4.1615	-1.4647	10.088	11.375	-12.562	-16.474
n	32	39	32	39	32	39	32	39	32	39	32	39

legend: b/p