Hacienda Pública Española / Revista de Economía Pública, 196-(1/2011): 9-35

Sins of the Elder: Fiscal Illusion in Democracies*

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Recibido: Marzo, 2010
Aceptado: Noviembre, 2010

Abstract

This work discusses the implications of democratic maturity on levels of *Fiscal Illusion*. Its main contribution is to identify the relevance of good-governance institutions that prevent incumbents in established democracies from degenerating into electoral rent-seekers. This work develops a model that converges with a Gordon (1989) type theorem. This theorem predicts that some countries ruled by incumbents are more likely to revert to *FI* practices as the electorate's maturity increases and if there are no strong restrictions on the social acceptance of political rents. Our empirical results show that democratic maturity tends to diminish fiscal illusion.

Keywords: Democratic maturity; Fiscal Illusion; rent-seeking.

JEL classification: H6, O11, D72

1. Introduction

"Government is based on two things: restraint and deception"
Fernando Pessoa, The Book of Disquiet

The age of a democracy is important for social scientists. We typically believe that maturity diminishes individual errors; therefore, more mature political institutions should be less exposed to the weaknesses of young democracies.

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* The author is indebted to two anonymous reviewers of *Hacienda Pública Española* for their stimulating comments on a previous version of this article. The author also received helpful comments from the participants at the 2009 International Conference on Macroeconomic Analysis and International Finance (Rethymno, Crete) and at the 5th Meeting of the Portuguese Political Science Association (Aveiro, 2010). Remaining errors are the author's responsibility. The financial support provided by the Portuguese Foundation for Science and Technology under research grant PTCD/ECO/65711/2006 (partially funded by FEDER) is gratefully acknowledged.
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This work will argue that this assumption tends to be true *if and only if* democratic institutions do not allow political opportunism, political cheating, or fiscal illusion.

Therefore, as time goes by, it is here argued that the electorate must be more assertive, the legislative power should inspect executive power more, and the social and electoral punishment of poor political practices must be effective.

If we do not observe a more assertive electorate, legislative checks, and the electoral punishment of political opportunism, then as a democracy ages, it will tend to have more opportunities for illusionary policies.

As argued in the literature, one of the most subtle political illusions is the fiscal illusion.

This work discusses the implications of the age of democracies on the magnitude of *Fiscal Illusion* practices. For this purpose, the following sections will contextualize the discussion, introduce a model derived from Puviani's (1903) *Fiscal Illusion*, and conclude with a theorem that highlights the importance of government transparency as a social cost of an incumbent deceiving the established democratic regimen. We also analyze regression models, and their results are as expected: maturity diminishes fiscal illusion only if democratic institutions are more established.

2. A review of the related literature

When Amilcare Puviani (1903) published "The Theory of Fiscal Illusion", he founded the *Economics of Illusion*. Puviani did not present a clear definition of Fiscal Illusion, and even recent authors on the topic do not converge on a single definition (as denounced by Mourao, 2007). However, we believe that the least polemical definition most aptly characterizes Fiscal Illusion as voters' and taxpayers' incorrect perception of budget aggregates.

More than fifty years after it was written, James Buchanan (1960) brought Puviani's obscure work into the economic mainstream.

James Buchanan, who studied topics such as that of "rational ignorance" derived from Downs (1957), used Puviani's words to explain the substantial lag between the true intentions of governments and the beliefs of the electorate. This lag is typically manipulated to increase the size of government through less visible (and less reactive) taxation.

Puviani's original[1] words suggested that *fiscal illusion* is a solution to the question of how taxpayers' resistance to governmental actions can be diminished. In addressing this question, *fiscal illusion* has mainly been studied in terms of budget revenues. According to Buchanan (1967), *Illusions* can be inserted into revenues in many ways: obscuring individual shares in the opportunity costs of public outlays; utilizing payment institutions to bind the requirement to a time period or an occurrence that the taxpayers seem likely to endorse;

charging explicit *fees* for nominal services provided for impressive or pleasant events; levying taxes that capitalize on social fear; making the burden appear less than might otherwise be the case; using "scare tactics" that have the propensity to make the alternatives to particular tax proposals appear worse than they are; fragmentation of the total tax weight on an entity into numerous small levies; and making the final tax opaque. Whatever the method, this *illusion* always increases the amount of public revenues with a minimum of electorate resistance.

However, according to Simon (1956) and Stigler (1961), fully informed and perfectly rational agents cannot be subject to an illusion, at least not for long. Additionally, for Wittman (1995), there is substantial evidence refuting the assumptions of persistently misinformed electors. For instance, the quantity of information owned by electors has been under-evaluated –people care about political decisions because political decisions have significant effects on their lives. There is also no need to decide using complete information– efficient decisions can be made with partial information, like in the stock market. Tendentious information has amplified the effects –aggregating electors' preferences has shown that the mistakes of individual electors cancel each other out. Therefore, the temporal evolution of democracies should reduce the opportunity for *Fiscal Illusion* practices.

However, controversially, Buchanan and Tullock (1962), Aranson and Ordeshook (1977), and Becker (1983) demonstrated that it is possible that increasing democratic maturity does not reduce the opacity of some governance practices, which may be due to the role of lobbying groups or to bad bureaucratic practices.

The study of Fiscal Illusion has also been enriched by many other authors such as Pommerehne and Schneider (1978) and Oates (1988). Pommerehne and Schneider (1978) focused on the institutional determinants of fiscal illusion under centralized or decentralized economies, which was an innovative approach in that the research focus was on national institutions. Oates (1988) examined the problem in a decentralized economy, and he discussed how fiscal illusion influences local public finances.

More recently, the called "third generation of Political Budget Cycles" authors, like Shi and Svensson (2002) or Alt and Lassen (2006), suggest that politicians not only engage in opportunism as a strategy in their agenda but also because they intend to generate information asymmetry on public issues. Edelman (2001) discusses the ways in which this information asymmetry is supported by many sources of political illusion.

We believe that this issue (of the impact of fiscal illusion on democracy) has great potential for academic discussion and has serious implications for democratic systems.

First, previous authors did not clearly determine the ultimate consequences of democratic maturity for fiscal illusion. Consequently, we need to observe the time when fiscal illusion generates the most severe effects on democracy, whether it is during the early years of

a democratic regime or much later. This information will allow politicians, voters and global institutions to be more assertive in monitoring democratic quality.

Second, we follow Mourao's (2010) argument that "fiscal illusion is dynamic", so new taxation schemes appear when the old ones are negatively perceived by voters and taxpayers. Only by paying attention to this issue can we identify the new schemes and, more importantly, ask the government how the collected revenues are spent. Puviani (1903) and Fasiani (1941) previously suggested that this was the appropriate role of academics and economists.

Finally, Fasiani (1941) argued that fiscal illusion could become fiscal delusion at a critical point. This fiscal delusion would generate social revolts like the *Boston Tea Party*, but more importantly, it would lead to distrust between citizens and the State. In this case, citizens could support new regimens, namely autocratic systems. Therefore, for people with an interest in social and economic stability and for those who study democratic maintenance, it is crucial to study fiscal illusion and its interference in democratic life.

Therefore, a clear question remains to be addressed: Does democratic maturity promote *Fiscal Illusion*? Or simpler, the older a democracy, more less likely fiscal illusion will occur, *coeteris paribus*?

As demonstrated in the following model, depending on the expected return from *Fiscal Illusion* practices (conditioned on each country's level of governmental transparency, χ), democratic maturity (t) can promote significant and varying effects.

3. Democratic maturity and *Fiscal Illusion*

3.1. Toward a model of democratic maturity and *Fiscal Illusion*

Referring to the original concept, we define the level of *Fiscal Illusion (FI)* using, $f \equiv R^e - R^a$, i.e., according to the incumbent's perspective, f is the difference between the levels of taxation (R^a) perceived by taxpayers and publicly reported and the true level of taxes (R^e).[2] For simplicity, R^a is treated exogenously[3]; therefore, the incumbent decides f, the extent of fiscal illusion, conditioned by the remaining parameters of the model. We consider R^a and R^e belonging to the range [0,1], meaning that these parameters can be discussed as shares of national income or as the size of government. f also belongs to the range [0,1]. We follow Puviani (1903) and assume that the result of fiscal illusion is the amount of political rents (g).

In this game, the gain for an incumbent[4], if undetected (with probability p), is measured by the product of f and t (t is the electorate's maturity, which is measured within a range of 0, young democracies, to 1, well-established democracies). This assumption follows Tullock

(1967) and Myles (2002) and attempts to illustrate that it is more difficult to resort to *Fiscal Illusion* in a well-established democracy than in a young democracy: political rents become more significant when the same level of undetected fiscal illusion operates with higher democratic maturity, compensating the incumbent for the increased risk of being detected by a more mature electorate.

If fiscal illusion is detected (with probability *1-p*), the gain becomes a loss for the incumbent and is multiplied by a fine rate, *u.* Then the loss is *–tfu*.[5] In constructing the model, we can think of the expected value of this game (gain or loss) in terms of the incumbent's popularity among the ruled people.

Then, we can write *g* as

$$g = [pt+(1-p)(-tu)]f \tag{3.1}$$

Public consumption, *G,* follows Tullock (1967); it is the sum of observable expenditures ($\bar{g}$) plus political rents (*g*).

$$G = \bar{g} + g$$

The budget equilibrium occurs with the publicly reported values. Then $\bar{g} = R^a$.

Hence, public consumption (*G*) is defined as (3.1').

$$G = R^a + [pt+(1-p)(-tu)]f \tag{3.1'}$$

To construct the utility function of the incumbent, Ω, we follow Allingham and Sandmo (1972)[6] and Gordon (1989)[7]. According to these authors, the utility function is characterized by decreasing absolute risk aversion, and utility is diminished by the products of social control, including cheating (in our case, the product of public transparency with fiscal illusion). Then we can also consider the incumbent of our model as a controlled rent-seeker, as discussed by Besley (2006, p. 180-188).

These assumptions lead to form (3.2).

$$\Omega = E[U(G)] = (pt)U[R^a + f] + (1-p)tU[R^a + f(-u)] - \chi f \tag{3.2}$$

where χ is the measure of governmental transparency[8], *f* is the extent of Fiscal Illusion, and χf is the utility cost of deviating from complete transparency. It is assumed that countries are characterized by their value of χ but are identical in all other respects.

We also assume that *U* is concave, so (3.2) is also concave, and $U'(G)>0$ is a necessary condition for the optimal fiscal illusion being positive. Because this set of conditions occurs for a finite and strictly positive solution, we follow the assumption $\lim_{+\infty} U'(G)=0$. It is as-

sumed that $U''(G)<0$, which follows a classic (and realistic) condition in the literature. Finally, it is also assumed that $U=0$ on $]-\infty,0]$.

Combining (3.2) with the budget constraint (3.1'), we can answer a previous question: when does Fiscal Illusion occur?

Using individual maximization leads to the first-order condition for f

$$E\{p*t*U'(R^a+f)+[1-p]*[-t*u]*U'(R^a-f*u)\} - \chi = 0 \quad (3.3)$$

f will only be positive when the marginal utility of *Fiscal Illusion* is greater than zero at a zero level of *FI*.

Formally, *FI* will occur when, $V_0 - \chi > 0$, where $V_0 = E\{[t(up - u + p)]U'(R^a))\}$[9].

Hence, those countries characterized by higher values of $V_0 - \chi$ are likely to show higher values of *FI*. In other words, *Fiscal Illusion* occurs when incumbents believe that the expected return is significantly higher than the social cost.

Then, if our first question is

"When does Fiscal Illusion occur?"

Our simplest answer is:

"Fiscal Illusion occurs if, given institutional controls and the associated risk, it is profitable to the incumbent. Fiscal Illusion will occur more often if the incumbents face less institutional controls (like a more relaxed Parliamentary force or less institutional checks) or if the risk of Fiscal Illusion diminishes, i.e., if the probability of responsabilizing incumbents for Fiscal Illusion consequences is lower (for instances, if democratic competition decreases or if the electorate looses assertiveness)".

Now, we move to our main question:

What is the effect of democratic maturity on *Fiscal Illusion*?

The effect of an increase in the electorate's maturity is given in the following Gordon–type (1989) theorem[10]. It states that at the first stages, maturity slightly increases fiscal illusion, and that after the early years, maturity tends to decrease fiscal illusion.

Theorem 3.1

With decreasing absolute risk aversion, there exists some $\chi^* < V_0$ *such that*
$\frac{\partial f}{\partial t} < 0$ *if* $\chi > \chi^*$ *and* $\frac{\partial f}{\partial t} > 0$ *if* $\chi^* > \chi$

Proof

Through double differentiation of (3.3), the effect of the electorate's maturity can be found to be

$$\frac{\partial \Omega / \partial t}{\partial \Omega / \partial f} = \frac{\partial f}{\partial t} = \frac{p * U(R^a + f) + [1 - p] * U(R^a - f * u)}{p * t * U'(R^a + f) + [1 - p] * [-t * u] * U'(R^a - f * u) - \chi} \tag{3.4}$$

Let us observe the behavior of (3.4). Following our previous assumptions, the numerator is always positive. The denominator shows a different pattern, however. For example, for $\chi_1 = U'(R^a + f)$, the denominator is negative, and (3.4) is also negative. However, for $\chi_2 < p*t*U'(R^a + f) + [1 - p]*[-t*u]*U'(R^a - f * u)$, (3.4) is positive because the denominator is positive. Because the decreasing absolute risk aversion implies the numerator is monotonic in χ, the sign $\frac{\partial f}{\partial t}$ must change once (at χ^*), as stated in the theorem.

Integrating (3.4) to obtain t and graphing it, we obtain Figure 3.1, which illustrates the implications of the theorem: for the first ts, Fiscal Illusion will increase; for t^* (observed for χ^*), Fiscal Illusion reaches its peak; after t^*, Fiscal Illusion tends to decrease.

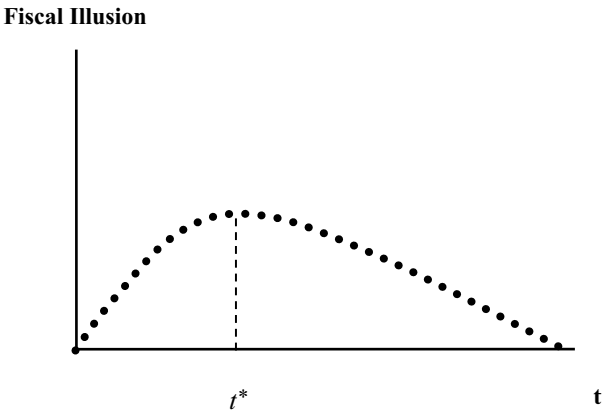

Figure 1. Fiscal Illusion and years of democracy (t)

This analysis predicts that some countries will be ruled by incumbents who are more likely engage in *FI* practices as electorate maturity increases and government transparency decreases. In addition to this effect, an increase in t may raise V_0 such that transparent examples will begin to deceive the electors as the gain $V_0 - \chi$ increases. This is the case with vicious practices in established democracies, as alternatively reported by Fukuda-Parr and Ponzio (2002), Goetz and Jenkins (2002), and Porta (2004).

Because an increase in t may also increase V_0, the model suggests that the expected return from the incumbent's choice to engage in fiscal illusion must be decreased to prevent transparent governments from degenerating. Some related suggestions of how to fight *Fiscal Illusion* practices have been provided by, among others, Mourao (2007), Lipford (2001), Crampton (2003), Miranda and Picur (2003), and Esteller-Moré *et al.* (2004), who suggest reducing budgetary complexity, publicly denouncing the worst fiscal practices and using "watchdog" institutions.

Recently, some empirical studies found results that are in line with these predictions, proving that there are various types of interactions between democratic maturity, institutional transparency, and *Fiscal Illusion* levels (see Alt and Lassen, 2006). This recent literature proved that new democracies exhibit more reactive fiscal aggregates (strengthening the hypothesis that empirically, $\frac{\partial f}{\partial t} < 0$) than established democratic regimes.

However, we also computed our own regressions. The following subsection presents those regressions.

3.2. An empirical attempt to relate democratic maturity and fiscal illusion

To empirically test our conclusion, we ran a set of regressions. We previously concluded that depending on each country's institutions, maturity can decrease fiscal illusion practices. Mourao (2008a) previously demonstrated that the fiscal illusion index values show a negative trend over time. Based on previous literature (Mourao, 2008a), we suggested that young democracies should evidence higher levels of fiscal illusion than older democracies. A recent branch of literature (Shi and Svensson, 2006; Alt and Lassen, 2006; Brender and Drazen, 2004; Arvate, Avelino and Tavares, 2009; or Vergne, 2009) has confirmed this suggestion: new democracies tend to be more exhibitionist when spending and more inefficient when collecting taxes than old democracies, making these countries more vulnerable to Fiscal Illusion practices (Fasiani, 1941; Mourao, 2007)[11].

Combining this finding with the previous achievements of this paper, we will test the effect of the age of a democracy on fiscal illusion.

Our annual data were provided by Mourao (2008a). Until now, this is the only available dataset that measures fiscal illusion across 68 countries from 1960 to 2006[12]. Therefore, we ran panel data regressions (by the Generalized Method of Moments)[13] using the following specification (3.5) and accounting for the non-linear effects of the age of a democracy on its level of fiscal illusion[14]. We will only use one lag of the fiscal illusion because we ran the unit roots test for panel data developed by Im, Pesaran and Shin (1995) and found an empirical probability of rejection that the variable "fiscal illusion" follows an AR1 process (an autoregressive model of the first order) of less than 0.01. In specification (3.6), μ_i refers to country-specific effects, and ε_{it} designates the errors, which are assumed to be *identically and independently distributed*. **X** refers to a vector of the variables that we will use to con-

trol our results: years of legislative election, real GDP per capita and trade openness, following Mourao (2008b). For running our (two-step) system-GMM regressions with robust errors estimation, we used STATA (v.10.0).

$$fiscal\_illusion_{it} = \alpha * fiscal\_illusion_{it-1} + \beta * age_{it} + \gamma * age^2_{it} + \Omega X_{it} + \mu_i + \varepsilon_{it} \qquad (3.5)$$

We used the fiscal illusion values from Mourao's (2008a) Fiscal Illusion Index. The Fiscal Illusion Index is a statistical construct that aims to evaluate Fiscal Illusion levels for a wide range of countries from 1960 to 2006. It is based on the major literature concerning Fiscal Illusion, and it can be viewed as an index of the propensity toward fiscal illusion. Some of the 26 primary dimensions considered in this index are the ratio of indirect to direct taxation, the composition of public debt, the composition of public expenditures, and the quality of democratic institutions (legislative checks and balances and media access). The Fiscal Illusion Index ranges between 0 and 1. We detail the Fiscal Illusion Index in the appendix.

The age of democracies was calculated using the political age of each democratic regime and the Polity IV filter, which is an electronic resource (*http://www.systemicpeace.org/polity/polity06.htm*). We defined the age of each democracy as the number of years since each democracy was established. The website *http://www.electionguide.org* provided data signaling the years of legislative elections. The International Financial Statistics (2006) of the International Monetary Fund provided the values for trade openness (measured as the sum of imports plus exports divided by GDP) and real GDP per capita.

We observed the 68 countries[15] that Brender and Drazen (2004) and Mourao (2008a) previously studied. Following these authors' criteria, we divided the 68 democracies into two groups depending on their level of development[16]. Developed countries include the Organization for Economic Co-operation and Development (OECD) economies that were members of the organization during the entire sample period and "new" democracies such as Spain, Portugal, Greece, and Turkey. Twenty-four countries in our sample belong to this group, and the other 44 are classified as developing countries. To test additional divisions, we also divided the sample into Presidential/Parliamentary regimes and into Federal/Non-Federal countries.

The descriptive statistics for our data are provided in the Appendix D (Table D1).

For the different groups of countries, the specification (3.5) gives the following estimates (Table 1).

Our results show that there is persistence in fiscal illusion: a higher level of fiscal illusion in the past generates higher levels of fiscal illusion in the present. However, in the case of developing countries, fiscal illusion is more persistent; on average, their current level of fiscal illusion is a half of the previous year's level, while for developed countries, the current level is about 45% of the previous year's level[17].

Table 1

#regression	a.1	a.2	a.3	a.4	a.5	a.6	a.7	a.8
	Developing country	Developing country	Developing country	Developing country	Developed country	Developed country	Developed country	Developed country
	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*
	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion
	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
Fiscal Illusion (1st lag)	0.544 ***	0.522 ***	0.542 ***	0.540 ***	0.448 ***	0.423 ***	0.422 ***	0.411 ***
	(0.019)	(0.017)	(0.018)	(0.016)	(0.020)	(0.023)	(0.023)	(0.022)
years of democracy	-0.001 ***	-9.1e-4 ***	-8e-4 ***	-9.2e-4 ***	-0.003 ***	-0.003 ***	-0.002 ***	-0.002 ***
	(0.0004)	(2e-4)	(2.3e-4)	(2e-4)	(0.0001)	(0.0001)	(0.0004)	(0.0003)
(years of democracy)^2	-2e-5 ***	-1e-5 **	-9.2e-6	-9.3e-6	-1e-5	-2,30E-05	-2e-5	-2e-5
	(4.0e-6)	(5.9e-6)	(6.1e-6)	(6e-6)	(8.9e-6)	(8e-6)	(8.4e-6)	(8.2e-6)
GDP per capita		-0.004	-0.002	-0.003		-0.024 ***	-0.022 ***	-0.023 ***
		(0.003)	(0.003)	(0.005)		(0.007)	(0.006)	(0.007)
Trade Openness			-0.014 ***	-0.014 ***			0.015	0.014
			(0.005)	(0.005)			(0.008)	(0.009)
Electoral year				6.3e-4				-0.002
				(0.003)				(0.004)
Intercept	0.066***	0.045***	0.078***	0.065***	0.063***	0.064***	0.058***	0.064***
	(0.021)	(0.015)	(0.034)	(0.032)	(0.024)	(0.026)	(0.0123)	(0.031)
Wald stat	4965.2	5102.45	5376.34	5484.32	4207.3	4678.32	4420.12	4567.78
Arellano-Bond (2nd serial correlation) [p-values]	0.97 [0.34]	0.43 [0. 57]	0.65 [0.47]	0.89 [0.36]	0.88 [0.35]	0.78 [0.35]	0.43 [0.54]	0.65 [0.48]
Hansen J-test (p-values)	e-4	4,00E-03	5,00E-06	7,00E-04	8,00E-03	9,00E-03	e-2	e-2
N (countries)	44	44	44	44	24	24	24	24
N (observations)	1902	1618	1580	1580	1024	1008	993	993

Significance levels: 1% (***); 5% (**); 10% (*)
Standard errors between brackets

#regression	b.1	b.2	b.3	b.4	b.5	b.6	b.7	b.8
	Presidential systems	Presidential systems	Presidential systems	Presidential systems	Parliamentary systems	Parliamentary systems	Parliamentary systems	Parliamentary systems
	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*
	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion
	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
Fiscal Illusion (1st lag)	0.559***	0.522***	0.564***	0.525***	0.434***	0.467***	0.447***	0.429 ***
	(0.014)	(0.013)	(0.015)	(0.015)	(0.027)	(0.027)	(0.029)	(0.029)
years of democracy	–1.5e-3***	–1.1e-3***	–1.4e-3***	–8.9e-4***	–0.0009***	–0.0012***	–0.001***	–0.001 **
	(1.92e-4)	(1.8e-4)	(2.2e-4)	(2.1e-4)	(4.2e-4)	(4.1e-4)	(4.2e-4)	(.35e-4)
(years of democracy)^2	–2.4e-5***	–2.4e-5***	–2.6e-5***	–2.3e-5***	–4.3e-5***	–4.6e-5***	–4.5e-5***	–4.3e-5***
	(4.9e-6)	(5.1e-6)	(5.1e-6)	(5.2e-6)	(1.2e-6)	(1.8e-6)	(1.1e-6)	(1.8e-6)
GDP per capita		–0.014**	–0.015**	–0.015***		–0.018	–0.012	–0.011
		(0.007)	(0.007)	(0.005)		(0.010)	(0.018)	(0.018)
Trade Openness			–0.013**	–0.012**			0.011	0.023
			(0.006)	(0.006)			(0.011)	(0.014)
Electoral year				5,90E-04				–0.002
				(2.4e-3)				(0.005)
Intercept	–0.169***	–0.185***	–0.129***	–0.142***		–0.388***	–0.344***	–0.348***
	(0.037)	(0.036)	(0.034)	(0.032)		(0.083)	(0.079)	(0.081)
Wald stat	4377.4	4487.38	5276.33	5452.89	4753.21	4851.82	4983.2	4923.4
Arellano-Bond (2nd serial correlation) [p-values]	0.89 [0.33]	0.45 [0.53]	0.70 [0.39]	0.81 [0.34]	0.75 [0.35]	0.78 [0.36]	0.47 [0.58]	0.45 [0.58]
Hansen J-test (p-values)	4,00E-04	6,00E-04	3,00E-03	e-3	3,00E-03	4,00E-03	5,00E-03	8,00E-03
N (countries)	46	46	46	46	22	22	22	22
N (observations)	1986	1828	1790	1783	803	798	793	788

Significance levels: 1% (***); 5% (**); 10% (*)
Standard errors between brackets

#regression	c.1	c.2	c.3	c.4	c.5	c.6	c.7	c.8
	Federal countries	Federal countries	Federal countries	Federal countries	Non-federal countries	Non-federal countries	Non-federal countries	Non-federal countries
	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*	1960-2006*
	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion	Fiscal Illusion
	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
Fiscal Illusion (1st lag)	0.543***	0.525***	0.527***	0.544***	0.529***	0.528***	0.518***	0.522***
	(0.024)	(0.024)	(0.027)	(0.027)	(0.014)	(0.013)	(0.015)	(0.015)
years of democracy	–1.5e-3*	–1.6e-3*	–1.5e-3*	–1.4e-3*	–9.1e-4***	–9.4e-4***	–8.9e-4***	–8.5e-4***
	(4.9e-4)	(4.8e-4)	(3.7e-4)	(5.9e-4)	(2.2e-4)	(3.2e-4)	(1.9e-4)	(2e-4)
(years of democracy)^2	–3.1e-5***	–3.2e-5***	–3.6e-5***	–3.2e-5***	–3.6e-5***	–3.7e-5***	–3.7e-5***	–3.5e-5***
	(9.0e-6)	(8.3e-6)	(9.1e-6)	(9.4e-6)	(4.2e-6)	(5.8e-6)	(5.7e-6)	(5.6e-6)
GDP per capita		–0.022*	–0.019*	–0.019*		–0.019***	–0.016***	–0.014***
		(0.010)	(0.008)	(0.010)		(0.003)	(0.004)	(0.004)
Trade Openness			0.011	0.011			–0.013**	–0.013**
			(0.020)	(0.011)			(0.007)	(0.006)
Electoral year				–5e-4				2.3e-4
				(0.003)				(3e-4)
Intercept	–0.224**	–0.222**	–0.217**	–0.199**	–0.145***	–0.172***	–0.157***	–0.166***
	(0.102)	(0.091)	(0.096)	(0.083)	(0.041)	(0.043)	(0.054)	(0.054)
Wald stat	4566.2	9752.6	5316.22	4974.3	4602.8	49965.3	4412.13	4555.44
Arellano-Bond (2nd serial correlation) [p-values]	0.67 [0.50]	0.43 [0.55]	0.85 [0.33]	0.89 [0.31]	0.88 [0.32]	0.66 [0.50]	0.50 [0.57]	0.70 [0.50]
Hansen J-test (p-values)	9,00E-03	7,00E-03	9,00E-03	7,00E-03	5,00E-03	7,00E-03	2,00E-04	e-5
N (countries)	18	18	18	18	50	50	50	50
N (observations)	704	680	674	666	1972	1958	1909	1898

Significance levels: 1% (***); 5% (**); 10% (*)
Standard errors between brackets

In Table 1, we also observed that years of democracy reduce fiscal illusion, as claimed by our model, although the reduction tends to be more significant for developed countries[18]. To explain this observation, we suggest that economic growth may improve the role of political institutions because real GDP per capita is a significant control variable for developed countries.

Interestingly, trade openness is not significant for developed countries, although it influences fiscal illusion in developing countries. This finding is supported by the "efficiency hypothesis" of Alesina and Perotti (1997), who showed in their seminal work that the national institutions of developing countries may improve when these countries are exposed to international trade.

Electoral years seem to not influence the levels of fiscal illusion in our estimates. This result follows Puviani (1903), who argued that fiscal illusion can be thought of as a structural dimension of the fiscal relationship between citizens and their governments and not as a circumstantial product or a discretionary element of that relationship.

Although we did not exhaust all possible divisions (because we were mainly motivated by institutional features), the results obtained for Presidential vs. Parliamentary systems or for Federal vs. Non-Federal countries highlight our previous conclusion that Fiscal Illusion tends to diminish with democratic maturity. We observed that maturity tends to be more significant on reducing fiscal illusion in Parliamentary and in Non-Federal countries (than in Presidential regimens or in Federal states). We also run Wald tests and we got significant p-values that allow us to reject the null hypotheses that the coefficients estimated for *year of democracy* and *year of democracy^2* are equivalent between Parliamentary and Presidential regimens or between Federal and Non-Federal countries.

Our statistics from the Wald (joint significance) tests reveal that the estimates are significant in each estimation. Our statistics for the Arellano-Bond test for residual autocorrelation of the second order reveal that our estimates are not characterized by residual correlation problems. We also computed the correlation matrix for the independent variables (see Appendix D), which allows us to infer that multicolinearity is not a serious issue in our case. We also ran tests for panel heteroskedasticity, and the likelihood ratios had statistical values that allow us not to accept the null hypothesis at a significance level of below 1% (full details are available upon request). Following Wooldridge (2002, p. 118-122), we ran tests for the endogeneity of real GDP per capita in our regressions, and we were able to reject that hypothesis for all of our estimations at a significance level below 1% (again, full details are available upon request).

These results converge with our original expectations and with Puviani's (1903) and Fasiani's (1943) argument that with more solid democratic institutions, the age of a democracy tends to diminish fiscal illusion.

Combining our empirical results, we can state that the age of a democracy tends to diminish fiscal illusion if national institutions are mature. Otherwise, political opportunism, populist regimes, and electoral illusions may not be reduced with the age of democracies.

Another implication of our results is related to the role of international organizations that help countries move from autocratic to democratic systems (for instance, the United Nations). These organizations must be more assertive concerning the fiscal policies of transition countries during the early years of a democracy. As we demonstrated, Fiscal Illusion tends to be more significant in this early period. To avoid bad fiscal practices that can be maintained over time, it is important to correct the serious problem of Fiscal Illusion during the early stages of a democracy.

Caplan (2007) also argued that better-educated citizens, a more assertive parliamentary power and better-informed taxpayers can generate competent institutions to monitor incumbents. Only these efficient institutions can reduce the gains to rent-seeking politicians of cheating citizens through fiscal illusion. Further, it is only when these gains are reduced that citizens can be the best trustees of a democracy.

4. Conclusion and Political Implications

This work demonstrated that the controversial question pertaining to the effect of democratic maturity on public finances is not recent but derives from the discussion begun by Puviani (1903) in *Fiscal Illusion* and subsequently enriched by Buchanan (1960), Buchanan and Tullock (1962), and Wittman (1995).

In spite of recent empirical attempts to identify democratic maturity as a negative influence on a country's level of *Fiscal Illusion*, this work developed a model that predicts that due to the social acceptance of political rents, some countries will be more likely to engage in *FI* practices as electorate maturity increases, reflecting a Gordon-–type (1989) theorem.

This model has important implications. First, it highlighted the need to reduce the expected returns of *Fiscal Illusion* practices at the early stages of each democracy to prevent the adverse effects associated with the increasing age of democratic regimes. This model also reinforces the advantages of good governance practices and the responsibility of governmental transparency institutions in avoiding the higher social costs of political deception.

Concretizing, this article warns that if you support democracy, then you must be aware of Fiscal Illusion practices, in order to reduce them. As age diminishes fiscal illusion, we also observed that this reduction can be accelerated with solid democratic institutions, with a more accentuated political competition, with an improvement of government checks and with a better educated and a more assertive electorate.

In future work, we will explore the case in which the probability of detection (p in the theoretical model) is different for young and for old democracies. Additionally, we would like to explore how the model conclusions affect voter utility and social welfare (not just the behavior of incumbents). Finally, we intend to incorporate the dynamics of political competition into the theoretical model to analyze whether incumbents' behaviors differ from challengers' behaviors and to analyze the reaction of the electorate.

Notes

1. Mourao (2007) provides an exhaustive survey of the vast literature that followed the Puviani (1903) Buchanan (1960) concept of *Fiscal Illusion*.
2. Another approach uses agency theory and explores information asymmetry. However, our intention was to follow Puviani's original model to avoid the methodological polisemy that characterizes the fiscal illusion discussion and that Mourao (2007) denounces.
3. We can complicate our basic assumptions and consider R^a as depending on f (with $dR^a/df<0$ and $d^2R^a/df^2<0$), but then our model provides a similar result to that shown in Appendix B.
4. Here, we also follow the dualistic society described by Puviani and Fasiani: if there are citizens who gain from Fiscal Illusion, then they are considered as belonging to the incumbent side; all other citizens suffer from Fiscal Illusion, and if they detect it, they will penalize the incumbents.

5. u is the fine rate, the most favourable penalty charged to an incumbent. u belongs to the interval [0,1].
6. According to the original Allingham and Sandmo (1972) model, both the penalty and the threat of the probability of an audit make people pay their taxes. In this case, both the penalty and the threat of the probability of electors detecting *Fiscal Illusion* make incumbents engage in governance transparency.
7. The penalty for discovered *Fiscal Illusion* depends on the understatement of democratic maturity rather than of revenues. Hence, the model more accurately reflects empirical reality according to Sour (2004).
8. For simplicity, assume χ is positive.
9. The value $t(up - u + p)$ is the expected rate of return to a monetary unit (say a dollar) gained from recurring to *FI.* The value V_0 is the marginal expected rate of return of *FI.*
10. A Gordon-type theorem follows Gordon (1989). In this article, Gordon (1989) shows that with decreasing absolute risk aversion and with a monotonic numerator of an implicit derivative, the sign of that implicit derivative changes once.
11. For a full table of articles relating Fiscal Illusion and Public Finances consequences, see Mourao (2007),
12. In our database, we only considered the years with democratic regimes for each country. For instance, we did not consider data for Russia in 1980 or for the Czech Republic in 1975.
13. We also estimated (3.5) using the fixed effects estimator. Our results with the fixed effects estimator are not significantly different from the GMM results. This outcome may be due to the large average length of the panels (29 years for the whole sample, 24 years for developing countries, and 37 years for developed countries). Fixed effects results and related details will be available upon request.
14. In this case, we follow Mohtadi and Roe (2003), who developed a model in which political rents decrease with the increasing competition among rent-seekers over time.
15. For the list of countries, see the Appendix C.
16. For a stimulating debate on democracy and level of development, please see Leftwich (2002).
17. We ran Wald tests on the hypothesis that the coefficients estimated for the first lag of fiscal illusion are equal for developing and for developed countries. The Wald statistics allow us to reject that null hypothesis at a significance level of 1%.
18. For developing countries, on average, the estimate for 'years of democracy' is -0.001; for developed countries, on average, the estimate for the same variable is -0.003.

References

Alesina A. and Perotti, R. (1997), "The Welfare State and Competitiveness", *American Economic Review,* 87: 921-939.

Allingham, M. and Sandmo, R. (1972), "Income Tax Evasion: A Theoretical Analysis", *Journal of Public Economics*, 1 (3-4): 323-338.

Alt, J. and Lassen, D. (2006), "Fiscal Transparency, Political Parties, and Debt In OECD Countries", *European Economic Review*, 50 (6): 1.403-1.439.

Aranson, P. and Ordeshook, P. (1977), "Incrementalism, Fiscal Illusion and the growth of government in representative democracies", *Fourth Interlaken Seminar on Analysis and Ideology*. Interlaken.

Arvate, P., Avelino, G. and Tavares, J. (2009), "Fiscal conservatism in a new democracy: sophisticated versus naïve voters", *Economics Letters*, 102: 127-127.

Becker, G. (1983), "A theory of competition among pressure groups for political influence", *The Quarterly Journal of Economics*, 98 (3): 371-400.

Besley, T. (2006), *Principled Agents,* Oxford University Press, New York.

Brender, A., and Drazen, A. (2004), "Political Budget Cycles in New versus Established Democracies", *NBER Working Papers Series,* 10539, 2004.

Buchanan, J. (1960), *Fiscal theory and Political Economy*, The University of North Carolina Press. Chapel Hill. pp. 59-64.

Buchanan, J. (1967), *Public Finance in democratic process: fiscal institutions and individual choice*, The University of North Carolina Press, Chapel Hill.

Buchanan, J. and Tullock, G. (1962), *The calculus of consent*, University of Michigan Press. Michigan.

Caplan, B. (2007), *The Myth of the Rational Voter*. Princeton: Princeton University Press, 2007.

Crampton, E. (2003), "Who pays a tax? A primer on tax incidence", *Mimeo*. Mercatus Center.

Downs, A. (1957), *An economic theory of democracy*, Harper Collins. New York.

Edelman, M. (2001), *The Politics of Misinformation: Communication, Society and Politics,* Cambridge: Cambridge University Press, 2001.

Esteller-Moré, A., Solé-Ollé, A. and Sorribas-Navarro, P. (2004), Fiscal adjustment to exogenous shocks-evidence from Spanish municipalities, *Centro de Investigación en Federalismo Fiscal y Economía Regional*, Instituto de Economía de Barcelona.

Fasiani, M. (1941), *Principii di Scienza delle Finanze*, Vol. I, Giappichelli, Torino [quoted version: Fasiani, M. (1962), *Principios de Ciencia de la Hacienda*, Aguilar, Madrid; tradução de Gabriel de Usera].

Forte, F. (2004), "Fiscal and Monetary Illusion and the Maastricht rules", *XVI Conference SIEP – Societá Italiana di Economia Pubblica*, Pavia.

Fukuda-Parr, S. and Ponzio, R. (2002), "Governance: Past, Present, Future Setting the governance agenda for the Millennium Declaration in UNDP (2002)", *Human Development Report*. United Nations Organization: New York.

Goetz, A. and Jenkins, R. (2002), "Voice, Accountability and Human Development: The Emergence of a New Agenda", *Background paper for Human Development Report.*

Gordon, J. (1989), "Individual Morality and Reputation Costs as Deterrence to Tax Evasion", *European Economic Review*, 33 (4): 797-805.

IFS (2006), *International Financial Statistics.* New York: International Monetary Fund, 2006.

Im, K., Pesaran, M. and Shin, Y. (1995), "Testing for Unit Roots in Heterogeneous Panels", Cambridge Working Papers in Economics 9526, Faculty of Economics, University of Cambridge.

Krueger, A. (1974), "The Political Economy of the Rent-Seeking Society", *American Economic Review,* 64: 291-303.

Leftwich, A. (2002), "Democracy and Development", *New Political Economy*, 7 (2): 269-281.

Lipford, J. (2001), "How transparent is the US Budget?", *The Independent Review*, 5 (4): 575-591.

Miranda, R. and Picur, R. (2003), "CFO as Budget Magician: Fiscal Illusion in Public Finance", *Government Finance Review*. April. 29.

Mohtadi, H. and Roe, T. (2003), "Democracy, rent seeking, public spending and growth", *Journal of Public Economics*, vol. 87 (3-4): 445-466. Elsevier.

Mourao, P. (2007), "The Economics of Illusion – a discussion based in Fiscal Illusion", *Journal of Public Finance and Public Choice*, 25 (1): 67-86.

Mourao, P. (2008a), "Towards a Puviani's Fiscal Illusion Index", *Hacienda Pública Española/Revista de Economía Pública*, 187 (4): 49-86.

Mourao, P. (2008b), "Political Budget Cycles and Fiscal Illusion: a panel data study"; in Marques, H., Soukiazis, E. & Cerquiera, P. (Eds.), (2008), *Perspectives on Integration and Globalisation*; *LIT Verlag*; City of Publication: Munster.

Mourao, P. (2010), "Fiscal Illusion causes Fiscal Delusion – Please be careful"; in Magalhaes, S., Jahankhani, H. and A. Hessami, eds, 2010; *Global Security, Safety, and Sustainability,* Springer-Verlag, New York, pp. 232-237.

Myles, G. (2002), *Public Economics*, Cambridge University Press. Cambridge.

Oates, W. (1988), "On the Nature and Measurement of Fiscal Illusion: A Survey". In *Taxation and Fiscal Federalism: Essays in Honour of Russell Mathews,* editado por G. Brennan, B. Grewal, and P. Groenwegen, 65-82. Sydney: Australian National University Press, 1988.

Pommerehne, W. and Schneider, F. (1978), "Fiscal Illusion Political Institutions and Local Spending", *Kyklos,* 31: 381-408.

Porta, D. (2004), "Political parties and corruption: Ten hypotheses on five vicious circles", *Crime, Law and Social Change*, 42 (1): 35-60.

Puviani, A. (1903), *Teoria della illusione finanziaria*, Sandron. Palermo,

Shi, M. and Svensson, J. (2002), *Political Budget Cycles in Developed and Developing Countries,* Manuscript, Institute for International Economic Studies, Stockholm University.

Shi, M. and Svensson, J. (2006), "Political Budget Cycles: Do They Differ across Countries and Why?", *Journal of Public Economics,* 90: 1.367-89.

Simon, H. (1956), "Rational Choice and the Structure of the Environment", *Psychological Review*, 63 (2): 129-138.

Sour, L. (2004), "An economic model of tax compliance with individual morality and group conformity", *Economia Mexicana*, 13 (1): 43-61.

Stigler, G. (1961), "The Economics of Information", *Journal of Political Economy*, 69 (3): 213-225.

Tullock, G. (1967), "The Welfare Costs of Tariffs, Monopolies, and Theft", *Western Economic Journal*, 5 *(now Economic Inquiry)*: 224-232.

Vergne, C. (2009), "Democracy, elections and allocation of public expenditures in developing countries", *European Journal of Political Economy*, 25: 63-77.

Wittman, D. (1995), *The myth of democratic failure: why political institutions are efficient*, The University of Chicago Press. Chicago.

Wooldridge, J. (2002), *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.

Resumen

Este trabajo analiza las implicaciones de la madurez democrática en los niveles de la ilusión fiscal.
Su principal contribución es identificar la relevancia de las instituciones de un buen gobierno que impiden que los políticos en las democracias establecidas degeneren. Este trabajo desarrolla un modelo que converge con un teorema de tipo Gordon (1989). Este teorema predice que algunos países tienen más probabilidades de volver a las prácticas de ilusion fiscal a medida que aumenta la madurez del electorado y si no hay fuertes restricciones sobre la aceptación social de las rentas políticas.
Nuestros resultados empíricos muestran que la madurez democrática tiende a disminuir la ilusión fiscal.

Palabras clave: madurez democrátca, ilusión fiscal, rentas políticas.

Clasificación JEL: H6, O11, D72

Appendix A1 – The Fiscal Illusion Index

An attempt has been made by Mourao (2008a) to empirically evaluate the extension of Fiscal Illusion for 68 democracies since 1960. This attempt has produced the Fiscal Illusion Index.

This index has been constructed considering the variety of dimensions affecting Fiscal Illusion, studying the perspective of those who exert public power and the perspective of those who are ruled.

Using Mourao (2008a)'s words:

"Several studies analyze the status of transparency in democratic countries. These studies are variously concerned with specific regions (Alesina *et al.* 1996), with the bureaucratic quality (Kaufmann, Kraay, and Zoido-Lobatón 1999), with particular codes for good fiscal transparency practices (Hameed 2005), or with previously selected political dimensions (Bernoth and Wolff 2006). Although these indicators are useful for understanding the status of governance for a single indicator or, at best, from a single perspective (e.g., rulers/incum-

bents/ politicians), they cannot give us a complete measure of the overall well-being of a democracy because they do not take into account the quality of other institutions –voters, lobbying groups, and society as a whole.

After the identification of the theoretical framework, twenty-six variables have been chosen according to their use in the cited literature. Considering the nature of the data and the limitations of the alternative methods, the percentile rank (as a normalization method) was chosen for each (country-year) observation, taking into account all observations from each variable. The chosen method to explain the variance of the observed data through a few linear combinations of the original data was a specific technique belonging to the group of the Multivariate Analysis –the Multiway Principal Components Analysis (MPCA). Therefore, each normalized variable with a significant factor loading (greater than 0.7) had a weight equal to the square of the factor loading divided by the explained variation by factor.

At the end, each intermediate composite indicator had a weight equal to its proportion of the variance as explained by all the factors. (...) the final value given to each country-year observation is re-scaled, again using the percentile rank but now considering all weighted values. Therefore, the Fiscal Illusion Index, as a percentile ranking, indicates how a country-year observation performs compared to the other country-year observations in its position.

The results obtained reveal that Fiscal Illusion varies greatly around the world. Countries such as Mali, Pakistan, Russia, and Sri Lanka have the highest average values over the time considered, whereas Austria, Luxembourg, Netherlands, and New Zealand have the lowest. Regarding the time dimension, between 1980 and 1995, there was a significant decrease in the average value of the index across countries, suggesting a reduction in the adoption of Fiscal Illusion practices during this period. After 1995, the index remained stable in most countries".

As Mourao (2008a) also suggests, this stability is not good at all. It may reflect that fiscal illusion practices are not being reduced but rather that they have been maintained across the democratic countries since 1995.

Appendix A2 – Fiscal Illusion Index (1990 and 2006)

Country	Year	Fiscal Illusion Index
ARGENTINA	1990	0,216164858
ARGENTINA	2006	0,401
AUSTRALIA	1990	0,353
AUSTRALIA	2006	0,27
AUSTRIA	1990	0,052
AUSTRIA	2006	0,088
BELGIUM	1990	0,218689111
BELGIUM	2006	0,25

Country	Year	Fiscal Illusion Index
BOLIVIA	1990	0,676
BOLIVIA	2006	0,564
BRAZIL	1990	0,3056
BRAZIL	2006	0,366
BULGARIA	1990	0,305
BULGARIA	2006	0,283
CANADA	1990	0,138
CANADA	2006	0,116
CHILE	1990	0,401
CHILE	2006	0,327
COLOMBIA	1990	0,671
COLOMBIA	2006	0,598
COSTA_RICA	1990	0,462
COSTA_RICA	2006	0,3
CYPRUS	1990	0,484
CYPRUS	2006	0,474
CZECH_REP	1990	0,425
CZECH_REP	2006	0,243
DENMARK	1990	0,109
DENMARK	2006	0,121
DOMINICAN	1990	0,457
DOMINICAN	2006	0,311
ECUADOR	1990	0,397555556
ECUADOR	2006	0,349
EL_SALVADOR	1990	0,922
EL_SALVADOR	2006	0,569
ESTONIA	1990	0,356088889
ESTONIA	2006	0,38
FIJI	1990	0,828
FIJI	2006	0,395
FINLAND	1990	0,044
FINLAND	2006	0,07
FRANCE	1990	0,444323995
FRANCE	2006	0,433
GERMANY	1990	0,101
GERMANY	2006	0,117
GREECE	1990	0,613
GREECE	2006	0,447
GUATEMALA	1990	0,859
GUATEMALA	2006	0,799
HONDURAS	1990	0,9604
HONDURAS	2006	0,859
HUNGARY	1990	0,6
HUNGARY	2006	0,551
ICELAND	1990	0,082
ICELAND	2006	0,147

Country	Year	Fiscal Illusion Index
INDIA	1990	0,881
INDIA	2006	0,833
IRELAND	1990	0,152
IRELAND	2006	0,105
ISRAEL	1990	0,327533333
ISRAEL	2006	0,306
ITALY	1990	0,349
ITALY	2006	0,312
JAPAN	1990	0,227
JAPAN	2006	0,346
KOREA	1990	0,54
KOREA	2006	0,426
LITHUANIA	1990	0,518
LITHUANIA	2006	0,294
LUXEMBOURG	1990	0,192311111
LUXEMBOURG	2006	0,177
MADAGASCAR	1990	0,88
MADAGASCAR	2006	0,849
MALAYSIA	1990	0,647
MALAYSIA	2006	0,48
MALI	1990	0,946977778
MALI	2006	0,943
MAURITIUS	1990	0,695
MAURITIUS	2006	0,649
MEXICO	1990	0,356
MEXICO	2006	0,455
NEPAL	1990	0,892244444
NEPAL	2006	0,696
NETHERLANDS	1990	0,036
NETHERLANDS	2006	0,062
NZ	1990	0,012
NZ	2006	0,022
NICARAGUA	1990	0,634
NICARAGUA	2006	0,594
NORWAY	1990	0,127
NORWAY	2006	0,145
PAKISTAN	1990	0,874444444
PAKISTAN	2006	0,935
PANAMA	1990	0,518555556
PANAMA	2006	0,518
PAPUA	1990	0,792933333
PAPUA	2006	0,646
PARAGUAY	1990	0,743
PARAGUAY	2006	0,712
PERU	1990	0,61
PERU	2006	0,768

Country	Year	Fiscal Illusion Index
PHILIPINES	1990	0,852
PHILIPINES	2006	0,685
POLAND	1990	0,796
POLAND	2006	0,767
PORTUGAL	1990	0,302
PORTUGAL	2006	0,276
ROMANIA	1990	0,571
ROMANIA	2006	0,646
RUSSIA	1990	0,986
RUSSIA	2006	0,83
SLOVAKIA	1990	0,493
SLOVAKIA	2006	0,337
SLOVENIA	1990	0,5658
SLOVENIA	2006	0,592
SOUTH_AFRICA	1990	0,625
SOUTH_AFRICA	2006	0,396
SPAIN	1990	0,137
SPAIN	2006	0,09
SRI_LANKA	1990	0,996
SRI_LANKA	2006	0,927
SWEDEN	1990	0,035
SWEDEN	2006	0,069
SWITZERLAND	1990	0,038
SWITZERLAND	2006	0,102
TRINIDAD	1990	0,783755556
TRINIDAD	2006	0,666
TURKEY	1990	0,58
TURKEY	2006	0,401
UK	1990	0,179
UK	2006	0,232
US	1990	0,128
US	2006	0,219
URUGUAY	1990	0,727
URUGUAY	2006	0,76
VENEZUELA	1990	0,583
VENEZUELA	2006	0,487

Source: Mourao (2008).

Appendix B – Elaborating our initial assumptions

We can consider that R^a depends on fiscal illusion, this is $R^a\ (f)$. Actually, higher levels of fiscal illusion lead the taxpayer to think that he is less taxed than he is really taxed. In this

case, we can think in a concave function relating fiscal illusion and the amounts of taxes perceived by taxpayers; thus $\frac{\partial R^a}{\partial f} < 0$ and $\frac{\partial^2 R^a}{\partial f^2} < 0$.

We will keep (3.1) and (3.1') as before. But (3.2) is changed into:

$$\Omega = E[U(G)] = (pt)U\left[R^a(f) + f\right] + (1-p)tU\left[R^a(f) + f(-u)\right] - \chi f$$

Consequently, (3.3) comes

$$E\{p*t*[1+\frac{\partial R^a}{\partial f}]*U'(R^a(f)+f)+[1-p)*t*\left[\frac{\partial R^a}{\partial f}-u\right]*U'(R^a - f*u)\} - \chi = 0$$

And (3.4) is given by

$$\frac{\partial\Omega/\partial t}{\partial\Omega/\partial f} = \frac{\partial f}{\partial t} = \frac{p*U(R^a(f)+f)+[1-p]*U(R^a(f)-f*u)}{p*t*[1+\frac{\partial R^a}{\partial f}]*U'(R^a(f)+f)+[1-p]*t*[\frac{\partial R^a}{\partial f}-u]*U'(R^a - f*u) - \chi}$$

If we impose a soft assumption: $-1 < \frac{\partial R^a}{\partial df} < 0$

Then we still get our Gordon type theorem and our previous conclusion is again obtained.

Appendix C – List of countries in our sample

	Developing=1; Developed=0	Presidential:1; Parliamentary:0	Federal:1; Centralized:0	years of democracy covered (until 2006)
ARGENTINA	1	1	1	21
AUSTRALIA	0	1	1	46
AUSTRIA	0	1	1	46
BELGIUM	0	0	1	46
BOLIVIA	1	1	0	23
BRAZIL	1	1	1	20
BULGARIA	1	0	0	15
CANADA	0	1	1	46
CHILE	1	1	0	17
COLOMBIA	1	1	0	46
COSTA_RICA	1	1	0	60
CYPRUS	1	1	0	30
CZECH_REP	1	1	1	16
DENMARK	0	0	0	46
DOMINICAN	1	1	0	9
ECUADOR	1	1	0	26
EL SALVADOR	1	1	0	20
ESTONIA	1	0	0	15
FIJI	1	1	0	35
FINLAND	0	0	0	46

	Developing=1; Developed=0	Presidential:1; Parliamentary:0	Federal:1; Centralized:0	years of democracy covered (until 2006)
FRANCE	0	1	0	37
GERMANY	0	0	1	46
GREECE	0	0	0	31
GUATEMALA	1	1	0	9
HONDURAS	1	1	0	24
HUNGARY	1	0	0	15
ICELAND	0	0	0	46
INDIA	1	1	1	46
IRELAND	0	1	0	46
ISRAEL	1	0	0	46
ITALY	0	1	0	46
JAPAN	0	1	0	46
KOREA	1	1	0	17
LITHUANIA	1	0	0	15
LUXEMBOURG	0	0	0	46
MADAGASCAR	1	1	0	15
MALAYSIA	1	1	0	46
MALI	1	1	0	14
MAURITIUS	1	0	0	38
MEXICO	1	1	1	8
NEPAL	1	1	1	16
NETHERLANDS	0	1	0	46
NEW ZEALAND	0	0	0	16
NICARAGUA	1	1	0	46
NORWAY	0	0	0	46
PAKISTAN	1	1	1	19
PANAMA	1	1	0	15
PAPUA	1	0	0	30
PARAGUAY	1	1	0	14
PERU	1	1	0	6
PHILIPINES	1	1	0	18
POLAND	1	1	0	15
PORTUGAL	0	0	0	32
ROMANIA	1	1	0	9
RUSSIA	1	1	1	15
SLOVAKIA	1	0	0	14
SLOVENIA	1	1	0	15
SOUTH_AFRICA	1	1	0	11
SPAIN	0	0	1	26
SRI_LANKA	1	0	0	46
SWEDEN	0	0	0	46
SWITZERLAND	0	1	1	46
TRINIDAD	1	1	0	44
TURKEY	0	0	0	20
UNITED KINGDOM	0	1	1	46
UNITED STATES OF AMERICA	0	1	1	46
URUGUAY	1	1	0	25
VENEZUELA	1	1	1	46

Sources:Brender and Drazen (2004); http://www.cia.gov; http://www.cia.gov; Polity IV filter (Authority trend value>=6, more democratic countries).
Note: Sources consulted on 21st/november/2010.

Appendix D - Tables

Table D1
DESCRIPTIVE STATISTICS

Variable	N	Mean	Standard deviation	Maximum	Minimum
Fiscal Illusion Index (log)	3195	–0.724	0.180	–0.373	–1.361
Age of democracy	3098	24	10.87	216	15
Real GDP per capita (log)	2694	8.375	1.080	10.821	5.613
Trade Openness (log)	2650	3.961	0.584	5.437	2.078
Election year (dummy)	2996	0.196	0.397	1.000	0.000
Fiscal Illusion Index (log) [developed countries]	1048	–0.786	0.128	–0.493	–1.132
Age of democracy [developed countries]	1016	37	8.45	216	22
Real GDP per capita (log) [developed countries]	1030	9.163	0.738	10.821	7.279
Trade Openness (log) [developed countries]	1017	3.973	0.593	5.421	2.078
Election year (dummy) [developed countries]	1948	0.270	0.444	1.000	0.000
Fiscal Illusion Index (log) [developing countries]	1948	–0.683	0.193	–0.373	–1.361
Age of democracy [developing countries]	2169	19	15.67	53	15
Real GDP per capita (log) [developing countries]	1664	7.887	0.963	10.057	5.613
Trade Openness (log) [developing countries]	1633	3.954	0.578	5.437	2.079
Election year (dummy) [developing countries]	1948	0.156	0.363	1.000	0.000
Fiscal Illusion Index (log) [presidential system]	2190	–0.715	0.154	–0.397	–1.302
Age of democracy [presidential system]	2185	32.06	15.28	216	15
Real GDP per capita (log) [presidential system]	1876	8.065	1.067	10.821	5.613
Trade Openness (log) [presidential system]	1838	3.846	0.579	5.437	2.078
Election year (dummy) [presidential system]	2044	0.187	0.349	1	0
Fiscal Illusion Index (log) [parliamentary system]	1011	–0.715	0.234	–0.373	–1.361
Age of democracy [parliamentary system]	1011	18.854	13.765	34	15
Real GDP per capita (log) [parliamentary system]	823	8.912	0.972	10.821	6.084

Variable	N	Mean	Standard deviation	Maximum	Minimum
Trade Openness (log) [parliamentary system]	815	4.529	0.487	5.421	2.078
Election year (dummy) [parliamentary system]	952	0.215	0.404	1	0
Fiscal Illusion Index (log) [federal countries]	824	–0.732	0.156	–0.397	–1.302
Age of democracy [federal countries]	825	46.993	16.183	216	15
Real GDP per capita (log) [federal countries]	710	8.761	1.244	10.641	5.613
Trade Openness (log) [federal countries]	690	3.916	0.678	5.152	2.079
Election year (dummy) [federal countries]	774	0.234	0.402	1	0
Fiscal Illusion Index (log) [Non-federal countries]	2371	–0.726	0.187	–0.373	–1.361
Age of democracy [Non-federal countries]	2371	15.752	16.754	34	15
Real GDP per capita (log) [Non-federal countries]	1989	8.313	1.119	10.821	5.642
Trade Openness (log) [Non-federal countries]	1963	4.077	0.504	5.437	2.078
Election year (dummy) [Non-federal countries]	2222	0.194	0.395	1	0

Tables D2
CORRELATION MATRIXES

(Legend: lindexfi – Fiscal Illusion (log); mature – age of democracy; lgdp – real GDP per capita (log); ltrd – trade openness (log); elect – electoral year)

Developing countries

	lindexfi	mature	lgdp_pc	ltrd	elect
lindexfi	1.0000				
mature	–0.1011	1.0000			
lgdp_pc	–0.4544	0.4332	1.0000		
ltrd	–0.3362	0.1366	0.1897	1.0000	
elect	–0.0253	0.0687	0.0600	–0.0003	1.0000

Developed countries

	lindexfi	mature	lgdp_pc	ltrd	elect
lindexfi	1.0000				
mature	–0.5794	1.0000			
lgdp_pc	–0.3165	0.4323	1.0000		
ltrd	–0.4214	0.1817	0.2057	1.0000	
elect	–0.0093	–0.0047	–0.0044	–0.0179	1.0000

Legislative countries

	lindexfi	mature	lgdp_pc	ltrd	elect
lindexfi	1.0000				
mature	–0.1337	1.0000			
lgdp_pc	–0.4974	0.5083	1.0000		
ltrd	–0.3824	0.2089	0.3218	1.0000	
elect	–0.0598	0.1177	0.1032	0.0862	1.0000

Presidential systems

	lindexfi	mature	lgdp_pc	ltrd	elect
lindexfi	1.0000				
mature	–0.5112	1.0000			
lgdp_pc	–0.6095	0.8145	1.0000		
ltrd	–0.2854	0.5477	0.6927	1.0000	
elect	–0.0693	0.1833	0.1707	0.1201	1.0000

Federal countries

	lindexfi	mature	lgdp_pc	ltrd	elect
lindexfi	1.0000				
mature	–0.3299	1.0000			
lgdp_pc	–0.6649	0.5864	1.0000		
ltrd	–0.3675	0.2148	0.2697	1.0000	
elect	–0.0867	0.091	0.1235	0.0488	1.0000

Non-federal countries

	lindexfi	**mature**	**lgdp_pc**	**ltrd**	**elect**
lindexfi	1.0000				
mature	–0.3989	1.0000			
lgdp_pc	–0.2539	0.3854	1.0000		
ltrd	–0.3185	0.2238	0.2467	1.0000	
elect	–0.0468	0.1914	0.1545	0.0208	1.0000

All countries

	lindexfi	**mature**	**lgdp_pc**	**ltrd**	**elect**
lindexfi	1.0000				
mature	–0.1289	1.0000			
lgdp_pc	–0.1439	0.3778	1.0000		
ltrd	–0.3175	0.2542	0.0457	1.0000	
elect	–0.3267	0.0911	0.1545	0.0298	1.0000