

The Determinants of Budgetary Conservatism. The Swiss Cantons Case ?¹

Francesc PUJOL and Luc WEBER²

ABSTRACT

The present article tries to understand differences on voters' fiscal conservatism. Empirical evidence suggests that preferences depend on strictly cultural patterns (cultural area measured by language) in a determinant way. Thus, fiscal preferences can be considered as being largely exogenous. This implies that, except for special cases, it is not possible to find simple proxy variables for fiscal preferences. An *ad hoc* index of fiscal preferences ought to be built-up when the introduction of this variable is wished for comprehensive explanatory models of fiscal discipline or for other related studies.

JEL Classification : D72, H30, H62

¹A previous version of this paper was presented at the the 49th International Atlantic Economic Conference, Munich, March 9, 2000 and the 11th Conference of the Italian Society for Public Economics on "Political Institutions and Public Finance", University of Pavia, October 8th 1999. Our aknowledge to Robert Cooter (Berkeley University) Nicolas Wallart and Hans-Peter Kriesi (University of Geneva) who provided us some helpful comments.

²Francesc PUJOL, Profesor Adjunto, Departamento de Economía, Universidad de Navarra, fpujol@unav.es. Luc WEBER, Professor of Public Finance, University of Geneva, Luc.Weber@ecopo.unige.ch.

I. Introduction

Extensive empirical evidence tends to confirm the impact of fiscal institutions and rules on fiscal performance. Recently an increasing number of authors ask themselves whether or not an usually omitted variable can play a role explaining fiscal discipline, that is, fiscal preferences. Poterba is to our knowledge the first economist that has clearly raised the issue and identified the potential implications associated. "Voters in some jurisdictions may be less inclined to borrow to support current State outlays or to use deficits to shift the burden of paying for current State programs to the future. If these voters are also more likely to support the legislative or constitutional limits on deficit finance, then the observed link between fiscal rules and fiscal policy could be spurious" (Poterba 1996, p. 399). Note nevertheless that the broader link between preferences and public finance outcomes has been stated well before. "La tendance générale est de recourir à des solutions collectives. Cependant, les pouvoirs publics cantonaux ou communaux ne répondent pas nécessairement de la même façon à des situations semblables. L'héritage du passé et les convictions politiques jouent donc un rôle qu'on ne saurait négliger" (Weber 1981, p. 92).

II. Which relationship between preferences and fiscal performance ?

Not all the economists are convinced that preferences can play a role to better explain budgetary outcomes. For instance, Bayoumi and Eichengreen (1995), Stein, Talvi and Grisanti (1998) or Alesina and Perotti (1997) consider that budgetary institutions can be threaten as exogenous variables, uncorrelated with social preferences. Von Hagen and Harden (1994), argue that preferences have minor influence on deficits. This is because the homogeneous institutions under Breton Woods's framework enabled the influence of preferences to be more explicit, but deficit behavior of the industrialized countries followed a rather similar path.

Preferences have been taken into account by other authors in a different manner. Holtz-Eakin (1988) and Poterba (1995) use government party affiliation as proxy, while Bohn and Inman (1996) and Alesina and Bayoumi (1996) fix the fiscal conservatism of certain collectivities as they are "commonly agreed". Bohn and Inman (1996) go a step further by using citizens' declared conservatism in polls. These variables follow the

predicted correlation with deficits and debt but are not determinant.

Dafflon and Pujol (1999) have built-up an index of fiscal conservatism taking advantage of the unique Swiss institutional setting. They have selected all the federal referenda with fiscal content reflecting the fiscal conservatism of each one of the 26 cantons (the second political layer in Switzerland). That is, a given canton is considered to be more fiscal conservative than Swiss mean when the level of acceptance of taxes raise or expenditures suppression is higher than the mean, or when a canton rejects more aggressively the opposite proposals. 75 out of 176 voting between 1979 and 1998 fulfill the conditions. Graph 1 shows the index for each canton. A canton with an index-value higher than 50 is more conservative than the Swiss mean, and less otherwise. Dafflon and Pujol (1999) find that the more the fiscal conservative a canton, the less the amount of deficits, *ceteris paribus*.

[Graph 1 about here]

III. Are fiscal preferences endogenous ?

Even if empirical evidence tends to suggest that preferences really matter for fiscal discipline, a critical objection can be formulated against the robustness of this result. It could be the case that preferences are at the end of the day determined by other budgetary, political or economic variables that are indeed usually taken into account in the explanatory models of debt. Thus, from being an explanatory variable of deficit behavior, fiscal conservatism could become an endogenous variable depending on other parameters. The factual correlation between preferences and deficits would be then purely apparent, spurious, without any causal relationship. To answer this question, an explanatory model for fiscal preferences has to be built-up.

Even if preferences were exogenous or at least partially, the analysis of preferences behavior would be nevertheless useful. Preferences will depend on various sort of explanatory variables. As political and economic variables are normally taken into account in the explanatory models of debt, it could be enough to retain the more specific cultural and social variables (correlated with preferences) in order to propose an

approximation of fiscal preferences. Thus, the rather complex notion of fiscal preferences could be replaced by other standard sociological and cultural variables more easily measurable.

We will analyze these two related questions in the following sections of the article.

IV. An explanatory model for fiscal preferences

We choose the index RIGOR built-up by Dafflon and Pujol (1999) as a measure of the Swiss cantonal fiscal conservatism. Table 1 indicates the range of issues that have been retained to elaborate the values for each canton.

[Table 1 about here]

As explanatory model, we retain the criterion proposed by Alesina and Roubini (1997). Two mainstream views are considered in order to explain political decisions on fiscal issues. The first approach privileges opportunistic motivation of agent. Decisions are made principally to satisfy own interests of individuals or groups (Lindbeck 1976, Niskanen 1971, Olson 1965). The alternative approach supports that decisions are taken on partisan or ideological grounds (Cusack 1997, Erikson and *al* 1989, Hibbs 1977). Alesina and Roubini (1997) propose this grouping to explain politicians' behavior on economic issues, but we think that this model can be extended to voters' behavior.

a)

Opportunistic approach variables

If the calculus of voters' self-interest has to be outweighed compared to other sources of explanation of voters' behavior on fiscal conservative issues, we expect that voters will react in order to minimize cantonal adverse effects on federal budget variations. Proposals that tend to entail the well-being of a given canton more than the Swiss mean will be accepted in this looser canton in a lesser extent than its otherwise true measure of fiscal conservatism.

The amount of federal funds received by each canton (CHFUND) can be expected to be clearly negatively correlated with fiscal conservatism. Cantons that receive higher federal funds than average will tend to behave less stringent on proposals for federal grants or services reduction, as they can be the most adversely affected.

In the same order of ideas, the highest the proportion of primary sector in the cantonal economy (AGRI), the lower the level of fiscal conservatism. The reason is that agriculture policy is guided at federal level in Switzerland. In fact, some objects submitted to referenda refers to agricultural grant suppression, as it is indicated in Table 1.

The percentage of elderly people (AGING) can also play a role in cantonal referenda behavior. If aging people do not react following mainly request motivation for next generation, they can be prone to vote less rigorous than average, following the similar argument than for the precedent variable. If, contrarily, self-interest motivation is not clear, a positive relationship with fiscal conservatism can even appear, as it is often stated that old persons are in general more conservative than average.

The relationship between the rate of cantonal income growth (GROWTH) and fiscal preferences can also be viewed under the opportunistic approach. Cantons where economic performance is lower than Swiss mean could vote less stringent on fiscal issues as some federal grants depend on it. Also, cantons that experience a flat rate of economic growth would be less motivated to accept a rise of federal taxes. Federal budget balance becomes thus less important than the perverse cantonal effects that changes on fiscal burden can impose.

For an analogous reason, the level of cantonal income (INCOME) can be positively related with fiscal conservatism. The richer a canton, the lower the burden of federal taxes measured as a percentage of mean personal income. Rich cantons have thus less difficulty to accept increases on federal taxes than poor cantons.

Finally, the percentage of cantonal population living in cities with more than 10'000 inhabitants (CITY) is expected to be negatively correlated with fiscal conservatism. The opportunistic approach explanation is that as agglomeration are usually more public services demanding, cantons with higher percentage of people living in cities will be less interested to support stringent measures that reduces the perimeter of the federal public sector. On the other hand, partisan approach can also be appealed here. If cities

confer a public-sector-friendly-framework, such cantons have a set of preferences more favorable towards public solutions, and will be more critical concerning the elimination of federal programs.

b)

Partisan approach variables

If, alternatively, we consider that fiscal decisions are mainly taken following individual beliefs on social interactions, the partisan approach measures are expected to prevail.

Logically, one important variable under this approach is ideological preference, measured as the percentage of seats at the cantonal legislative body occupied by left-ring parties (LEFT). The more leftist are the voters, the less they are expected to vote as fiscal conservatives.

The size of cantonal public sector (PUBLIC) can be considered as a measure of willingness for public solutions for social problems. If we assume that lack of fiscal conservatism can be used as a mean to expand the federal public sector, these two variables are expected to be negatively correlated.

Dafflon and Pujol (1999) show that preferences matter for cantonal fiscal performance. It can be guest in turn that cantonal indebtedness has an influence on fiscal conservatism. If higher amounts of debt are accepted because of fiscal preferences, cantons easily accepting debt at the cantonal level will be less concerned with the increasing amount of debt at federal level, thus voting less fiscal conservative. We have split the amount of cantonal gross debt into two variables : the amount of gross debt at the beginning of the period under analysis (DEBTINI) and the subsequent series of annual deficits between 1979 and 1996 (DEFICITS). As for the amount of initial indebtedness (DEBTINI), it could be expected a negative relation with fiscal conservatism at first sight. Economists normally predict the opposite relation. To ensure the respect of the intertemporal budget constraint in order to avoid fiscal crisis, the more a collectivity is indebted, the highest the probability of being forced to adopt fiscal adjustments, which implies a modification of past fiscal behavior of politicians, that can be accompanied

with an increase of fiscal conservatism. By contrast, the total amount of deficits assumed during the period (DEFICITS) are expected to be negative correlated with present values of fiscal conservatism.

We take also into account an institutional variable, that is, the presence of mandatory referendum for fiscal issues at the cantonal level (REFEREN). Institutions near to direct democracy are considered to better enhance voters' preferences in the design of public policies. It is usually argued that as voters are more fiscal conservatives than politicians (Peltzman 1992), collectivities with more direct democracy institutions will be more fiscal conservative. In the meantime, it is not so clear that this negative relation will be strong in the Swiss case. First of all, the dummy variable is perhaps too much crude one, and does not offer the right weighting. Secondly, fiscal referenda are theoretically much more related with the size of the public sector than with the amount of deficits. We have excluded a measure of cantonal fiscal constraints, as we do not observe enough institutional variability among cantons.

Finally, we select three more genuine cultural variables, to be considered as control variables.

The first one is the cultural appurtenance of the canton, as Switzerland is a multicultural multilingual country. We measure it by the percentage of inhabitants speaking German as mother tongue (LANGUAGE). As this variable reflects strong cultural values, we cannot propose a theoretical prediction for its relationship with fiscal preferences. We can only propose a guess, following "commonly agreed opinions", as it has been done elsewhere (Bohn and Inman 1996 and Alesina and Bayoumi 1996). Our guess is that German speaking cantons will behave more fiscal rigorous than the Latin cantons (French and Italian speaking cantons).

The second cultural variable is the religious influence (CONFESSION) again because in Switzerland are present several Christian confessions, primarily the Roman Catholic and different Protestant obediences. Extrapolating certain sociological arguments, we guess that the highest the percentage of Protestants, the higher the level of fiscal conservatism.

The latest cultural variable is the existence of an university (UNIVERSITY), which is the case for 8 cantons out of 26. We chose it as a proxy for the level of education, and

more specifically, as a measure of the public opinion impact of universities. It can be imagined that where people is more cultivated, they are more sensible to proposals that carry out long term social benefits even at the price of present sacrifices.

V. Empirical results

The regression of Dafflon and Pujol's (1999) Index of fiscal conservatism on the 14 explanatory variables selected is presented in Table 2. Two techniques have been applied. The first one (column 1) consists in a multiple regression using Ordinary Least Squares (OLS). The second one (column 3) uses the Weighted Least Squares (WLS), technique which is more adapted to cross-section models, as the presence of heteroskedasticity of errors can be feared. The heterogeneity of individuals (here the cantons) can be the source of different variability of residuals. As commonly done, we use the size of the individuals as weight. We choose the square root of cantonal resident inhabitants as weight, like Feld and Kischgässner (1997) for a similar structure of data. We have run a second regression for each technique, retaining only the variables that appear to be statistically significant in the broader model (columns 2 and 4).

[Table 2 about here]

Looking at the results, we find that in the broader model, 10 variables are systematically linked with the index of fiscal conservatism (at least at a level of significance of 10 %) in the OLS model, and 5 if we consider the WLS model.

5 out of 6 "opportunistic approach variables" appear to be correlated with fiscal preferences when using OLS, whereas only 2 of them remain statistically significant according to the WLS technique. All of them follow the predicted behavior. Thus, the amount of federal funds (CHFUND) is always negatively correlated with fiscal conservatism, while the relationship is positive concerning the economic growth (GROWTH). As said, three other variables are significant only with the OLS technique (even if the sign of the relations remain the same for the WLS configuration). That is AGING, with a positive relationship that suggests that preferences prevail over opportunistic considerations in this particular case; INCOME, also with a positive correlation; and CITY,

with a negative relation with fiscal conservatism, as expected. The variable AGRI is surprisingly not significant.

Moving forward to "partisan driven motivations", we find that, as expected, cantonal party sensibility (LEFT) counts for fiscal preferences : the more the leftist a canton, the lower the level of fiscal conservatism. The amount of initial debt (DEBTINI) influences positively fiscal conservatism in the expected way, but this relationship is significant only in the OLS framework. The other three variables are not significant. The sign of the relation between preferences and the size of cantonal public sector (PUBLIC) is negative, while it is positive concerning the link with deficits of the period (DEFICITS). Surprisingly, the relation with the presence of fiscal referenda (REFEREN) is negative. As for the two control variables, they are all highly correlated with preferences (all of them at an interval of confidence of 1%), and in a positive manner, as guest for all two. Reduced models (columns 2 and 4) confirms the results obtained in the broader specification, increasing for almost all cases the t-value to a level of statistic significance of at least 1%, which suggest that the explanatory variables are correctly selected.

Another outstanding result is the high level of significance of the whole model, as the adjusted R^2 value for the OLS model attains 0.966 (complete specification) and 0.970 (reduced specification), which is remarkable for a pure cross-section model. Only 3 % of the variation of the dependent variable cannot be fitted by the explanatory variables selected. The Adjusted R^2 value of the WLS is logically higher but it has no more the notion of goodness of the approximation because of the introduction of the same weight in the two sides of the equation.

VI. Preliminary interpretation of the results

Thus, at a first view, we can clearly affirm that fiscal preferences are almost completely endogenous, as we can perfectly explain their variation using different kinds of variables. Even if fiscal preferences seem to better explain fiscal discipline, preferences themselves depend on other political, economic and social variables.

The second goal of our exercise, that is, to propose a proxy for fiscal preferences, seems appointed to less easy success as a considerable number of variables are systematically linked with fiscal preferences. But going into detail, we find that some of them are or could be also introduced as explanatory variables in a model to estimate the fiscal

performance of the cantons. We think specially to the variables CHFUND, AGING, GROWTH, INCOME, CITY, LEFT and DEBTINI. Thus only the control variables are usually ignored when trying to explain public debt behavior, except precisely when the control variables are introduced as proxy for fiscal preferences. It is then necessary to evaluate if this approximation can be justified.

VII. Assessing the impact of cultural determinants on fiscal preferences

The goal of this section is to evaluate whether or not control variables are good approximations for fiscal preferences. We run then new regressions taking into account only the two cultural variables : LANGUE, CONFESSION and UNIVERSITY, using the same techniques as before. Column 1 of table 3 shows the OLS results, while column 2 presents parameters calculated by WLS.

[Table 3 about here]

Adjusted R^2 of the OLS model remains notably high, at 0.873. Moreover, as we find that only LANGUE appears to be statistically significant, we run a second set of regression, this time taking into account only LANGUE (columns 3 and 4 of table 3). Adjusted R^2 remains at the same level (0,876).

Thus, it can reasonably be affirmed that LANGUE behaves as a good proxy for fiscal preferences in the Swiss model. It seems to be a similar result to what was proposed by Bohn and Inman (1996) and Alesina and Bayoumi (1996) when they suppose that the South States of the USA are more fiscal conservatives than the rest. Our approach is nevertheless definitively different. We have not only guest that German speaking cantons are fiscal conservative, but this assumption has been empirically tested when LANGUE has been regressed against the measured value of fiscal conservatism. This latter measure is absent in the works mentioned (even if Bohn and Inman 1996 propose an additional measure of a general notion of conservatism built-up by polls).

Another intriguing result is that if we run the very first model with all the same explanatory variables but eliminating the variable LANGUE, the resulting picture (table

4) is completely modified compared to the original one.

[Table 4 about here]

The results of the regression of table 4 show that only 2 variables under the OLS model and 2 variables in the WLS model are statistically correlated with fiscal conservatism, but consistently only the variable LEFT, when in the original model they were respectively 10 and 6. The level of the adjusted R^2 value drops dramatically from the initial 0,966 to a mere 0,632 for the OLS version. The latter value is nevertheless considerable, and we observe that even if not statistically significant at the standard levels of confidence, the t-Statistic of a number of values is quite far from the null.

All this results suggest that not only LANGUE is linked with fiscal preferences, but it can be considered as the main explanatory variable. Moreover, LANGUE has to be taken into account to "reveal" which other variables are also systematically related with preferences.

VIII. Conclusions

The results presented in the precedent section impose an entire revision of the first preliminary conclusion presented in section 6. Accordingly to our very first estimation we were obliged to affirm the endogeneity of fiscal preferences. Now, we are forced to support the opposite. The reason is that fiscal preferences depend largely on the variable LANGUE. We aimed to take into account the cleavage between German-speaking Switzerland and French and Italian speaking zones, cleavage that goes far away from the simply language division. The variable LANGUE catches the cultural appurtenance of Swiss citizens (German, French and Italian sphere of influence). This differentiation is the main source of strong social patterns, based on historical grounds and cultural inheritance. It is licit to suppose that this strong differentiated heritage can produce effects in the *Weltanschauung* of each canton : the views on the relations between individuals an the State, the role and the size to give to the public sector and, finally, the attitude towards fiscal imbalances, that is, the level of fiscal conservatism. This is in accordance with Hofstede (1984) findings. He carried out an analysis of international

work-related values based in a large sample polls for more than 40 countries. He finds that such cultural differences does not seem to prevail between the two Belgian language areas, while "a completely different picture is found for the other bilingual surveyed country, Switzerland. In this case, German-speaking Switzerland is clearly culturally associated with Germany and French-speaking Switzerland with France; there is a wide culture gap between the two language areas, in particular on the dimension of Power Distance. The two parts of Switzerland belong to different culture areas" (Hofstede 1984, p. 228).

LANGUAGE represents a notion purely cultural, historical, that cannot be reduced in a savant combination of other cultural or institutional variables. As we said, LANGUAGE contains at some extent the notion of preferences anchored on common past. At the end, to say that fiscal preferences depend on preferences (cultural, historical) it is the same as to say that we are not in measure to identify which are the key factors that mould fiscal preferences. That is why we conclude that preferences ought to be considered as being largely exogenous. We have had the chance to arrive to this conclusion thanks to the visible Swiss cultural differentiation based on language. But this easy proxy will be much harder to find in other countries and regions, even if, as with the Swiss case, the existence of heterogeneous fiscal preferences can be intuitively suspected.

The main implication of this discovering is that if we want to measure the impact of fiscal preferences on fiscal performance, we are obliged to produce an *ad hoc* estimator of this complex notion, and we ought to renounce to propose *a priori* other substitute variables, as fiscal preferences depend on various complex factors, and furthermore, because they are largely exogenous.

References

ALESINA, Alberto and Tamin BAYOUMI (1996), "The Costs and Benefits of Fiscal Rules: Evidence from U.S. States", *NBER Working Papers*, No. 5614, National Bureau of Economic Research, June.

ALESINA, Alberto and Roberto PEROTTI (1997), "Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects", *IMF Staff Papers*, Vol. 44 (2), pp. 210-248.

ALESINA, Alberto, Nouriel ROUBINI with Gerald COHEN (1997), *Political Cycles and the Macroeconomy*, The MIT Press, Cambridge, Massachusetts.

- BAYOUMI, Tamim and Barry EICHENGREEN (1995), "Restraining Yourself: The Implications of Fiscal Rules for Economic Stabilization", *IMF Staff Papers*, Vol. 42 (1).
- BOHN, Henning and Robert INMAN (1996), "Balanced Budget Rules and Public Deficits: Evidence from the U.S. States", *NBER Working Papers*, No. 5533, National Bureau of Economic Research, April.
- CUSACK, Thomas (1997), "Partisan Politics and Public Finance: Changes in Public Spending in the Industrialized Countries, 1955-1989", *Public Choice* Vol. 91, pp. 375-395.
- DAFFLON, Bernard and Francesc PUJOL (1999), "Preferences and Fiscal Discipline. Swiss Cantonal Evidence", *Cahiers du Département d'Economie Politique*, University of Geneva, N. 99.05.
- ERIKSON, Robert, Gerald WRIGHT Jr. and John McIVER (1989), "Political Parties, Public Opinion, and State Policy in the United States", *American Political Science Review*, Vol. 83 (3), pp. 729-750.
- FELD, Lard and Gebhard KIRCHGÄSSNER (1997), "Public Debt and Budgetary Procedures: Top Down or Bottom Up? Some Evidence from Swiss Municipalities", University of Saint Gall, mimeo.
- HIBBS, D. (1987), *The Political Economy of Industrial Democracy*, Harvard University Press, Cambridge.
- HOLTZ-EAKIN, Douglas (1988), "The Line Item Veto and Public Sector Budgets. Evidence from the States", *Journal of Public Economics*, Vol. 36, pp. 269-292.
- HOFSTEDE, Geert (1984), *Culture's Consequences. International Differences in Work-Related Values*, Sage Publications, Beverly Hills.
- LINDBECK, A. (1976), "Stabilization Policies in Open Economies with Endogenous Politicians", *American Economic Review*, pp. 1-19.
- NISKANEN, William (1971), *Bureaucracy and Representative Government*, Aldine Atherton, Chicago.
- OLSON, Mancur (1965), *The Logic of Collective Action; Public Goods and the Theory of Groups*, Harvard University Press, Cambridge.
- PELTZMAN, Sam (1992), "Voters as Fiscal Conservatives", *The Quarterly Journal of Economics*, Vol. 107 (2), pp. 327-361.
- POTERBA, James (1995), "Balanced Budget Rules and Fiscal Policy: Evidence from the States", *National Tax Journal*, Vol. 48 (3), pp. 329-336.
- POTERBA, James (1996), "Budget Institutions and Fiscal Policy in the U.S. States" *American Economic Review*, Vol. 86 (2) pp. 395-400.
- STEIN, Ernesto, Ernesto TALVI and Alejandro GRISANTI (1998), "Institutional Arrangements and Fiscal Performance: The Latin American Experience", *NBER Working Papers*, No. 6358, National Bureau of Economic Research, Cambridge, January.
- Von HAGEN, Jürgen and Ian HARDEN (1994), "National Budget Processes and Fiscal Performance", *European Economy Reports and Studies*, No. 3, pp. 311-418.
- WEBER, Luc (1981), "Gouverner et administrer" in *Encyclopédie Illustrée du Pays de Vaud*, Vol. IX, Ed. 24 Heures, Lausanne, pp. 82-95.

Graph 1 Source : Dafflon and Pujol (1999)

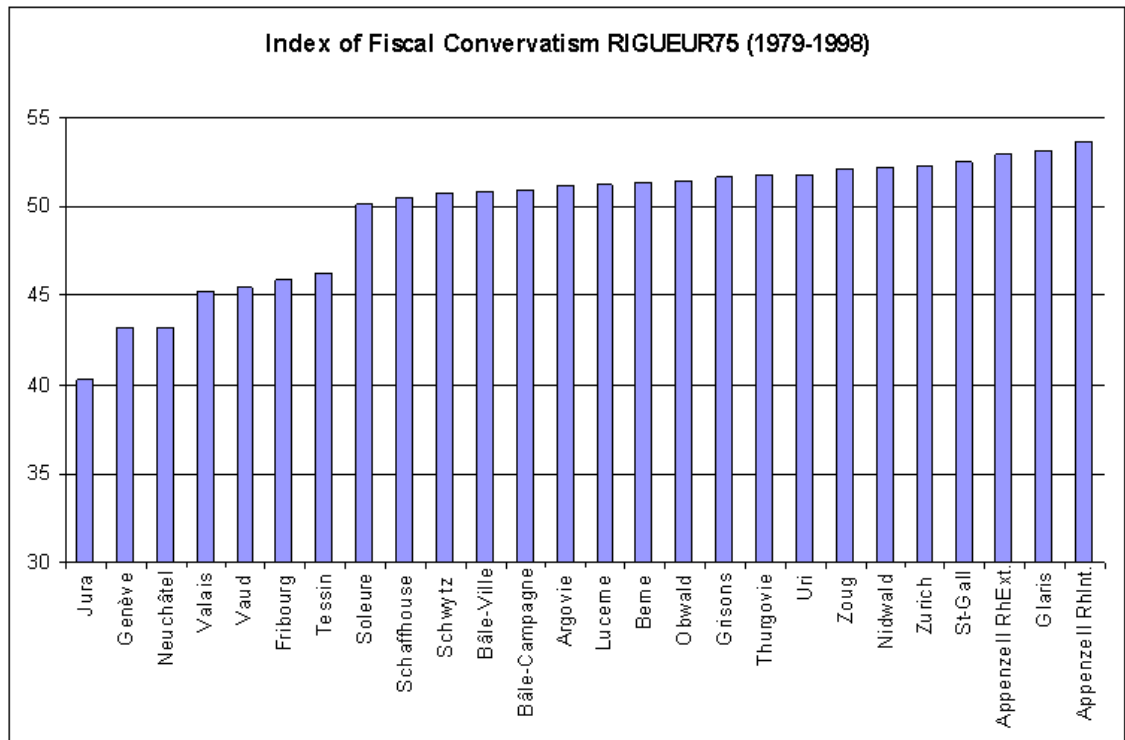


Table 1. Fiscal issues submitted to referendum between 1979 and 1998

			Number of voting
	Conservative voting		
	More Taxes	General	297, 308, 312, 371, 398, 399,
		Transportation	316, 317, 343, 351, 405, 406, 407, 442
		Finance	302, 331, 389,
		Specific	303, 312, 324, 332, 401
	Less Expendit.	Army	346, 393, 427
	Less Grants	Agriculture	304, 333, 413, 428, 446
		Education	326, 328
		Social Security	325, 327, 373, 397, 422, 437
		Transportation	429
		Economy	436

		Fiscal Adjustment		400, 421, 439		
		Non Conservative voting		Number of voting		
		Less Taxes		384		
		More Expend	Social security	305, 323, 350, 352, 415, 416, 423, 444		
			Culture, Education	339, 340, 410, 425		
			Transportation	347, 368, 370, 382		
			Environment, Energy	294, 313, 349, 367, 377, 381		
			Administration	386, 387, 431		
		More Grants	Economy	335		
			Agriculture	341, 356, 363, 418, 430		
			Housing	342		

Source : Dafflon and Pujol (1999)
Table 2 : Regression of RIGOR by OLS and WLS

	OLS		OLS		WLS (POPSQ)		WLS (POPSQ)	
	Broader model Coefficient (t-Stat)		Reduced model Coefficient (t-Stat)		Broader model Coefficient (t-Stat)		Reduced model Coefficient (t-Stat)	
C	37,4122 (12,705)	***	39,66224 (19,676)	***	39,87187 (14,113)	***	45,4876 (18,024)	***
CHFUND	-0,04949 (-2,018)	*	-0,06718 (-3,364)	***	-0,05887 (-2,177)	**	-0,7904 (-3,189)	***
AGRI	0,01109 (0,167)				-0,046756 (-0,538)			
AGING	0,30888 (2,516)	**	0,18287 (2,367)	**	0,20634 (1,729)			
GROWTH	1,05762	*	0,94677	**	1,018329	*	0,78252	*

	(2,096)		(2,603)		(1,921)		(1,992)	
INCOME	0,0000847	**	0,0000628	**	0,0000713			
	(2,321)		(2,204)		(1,630)			
CITY	-0,03238	**	-0,02746	***	-0,01352			
	(-2,557)		(-2,918)		(-1,041)			
LEFT	-0,15312	***	-0,15800	***	-0,17815	***	-0,13904	***
	(-6,021)		(-7,116)		(-7,124)		(-5,079)	
PUBLIC	-0,000273				-0,0000767			
	(-1,259)				(-0,321)			
DEBTINI	0,000335	***	0,000250	***	0,000147			
	(2,972)		(3,923)		(1,222)			
DEFICITS	0,000074				0,0000587			
	(0,697)				(0,636)			
REFEREN	-0,481199				-0,20029			
	(-1,219)				(-0,705)			
LANGUAGE	0,072333	***	0,07207	***	0,069942	***	0,07219	***
	(10,964)		(12,589)		(12,988)		(12,773)	
CONFESSION	0,03680	***	0,04144	***	0,04355	***	0,03276	***
	(2,941)		(3,917)		(3,491)		(3,476)	
UNIVERSITY	1,58482	***	1,54185	***	1,39278	***	1,37113	***
	(3,614)		(3,892)		(3,938)		(3,535)	
R ²²	0,985		0,982		0,966	(1)	0,929	(1)
Adjusted R ²²	0,966		0,970		0,923		0,908	
Sum squared resid.	4,8953		6,0351		11,145		23,224	
F-statistic	52,305	***	80,713	***				

Notes : *** denotes an interval of confidence of al least 1%; ** for 5 % level; * for 10 % level.

(1) Unweighted statistics provided by Eviews.

Table 3 : Regression of RIGOR against the control variables by OLS and WLS

	OLS		WLS (POPSQ)		OLS		WLS (POPSQ)	
	Coefficient (t-Stat)		Coefficient (t-Stat)		LANGUAGE only Coefficient (t-Stat)		LANGUAGE only Coefficient (t-Stat)	
C	42,5059 (59,330)	***	43,1702 (76,736)	***	42,9776 (76,377)	***	43,6825 (97,189)	***
LANGUAGE	0,10165 (11,623)	***	0,09398 (12,889)	***	0,10109 (13,344)	***	0,09398 (15,035)	***
CONFESSION	0,01101 (0,766)		0,00534 (0,396)		--		--	
UNIVERSITY	0,31257 (0,483)		0,50265 (0,994)		--		--	
R ²²	0,888		0,879		0,881	(1)	0,873	(1)
Adjusted R ²²	0,873		0,863		0,876		0,867	
Sum squared resid.	37,092		39,866		39,288		42,131	
F-statistic	58,063	***			178,063	***		

Notes : *** denotes an interval of confidence of at least 1%; ** for 5 % level; * for 10 % level.

(1) Unweighted statistics provided by Eviews.

Table 4 : Regression of RIGOR against all variables but LANGUAGE by OLS and WLS

	OLS Broader model Coefficient (t-Stat)		WLS (POPSQ) Broader model Coefficient (t-Stat)	
C	36,1853 (3,719)	***	47,9667 (4,499)	***
CHFUND	-0,09890 (-1,241)		-0,18039 (-1,837)	*
AGRI	0,24752 (1,191)		0,43487 (1,429)	
AGING	0,15020 (0,373)		0,32249 (0,700)	
GROWTH	2,09849 (1,281)		-0,76517 (-0,386)	
INCOME	0,000143 (1,193)		0,000228 (1,404)	
CITY	-0,01147 (-0,277)		0,02319 (0,473)	
LEFT	-0,26069 (-3,361)	***	-0,27345 (-2,956)	***
PUBLIC	0,0000294 (0,041)		-0,000290 (-0,315)	
DEBTINI	0,000392 (1,056)		0,000183 (0,391)	
DEFICITS	-0,0000745 (-0,214)		-0,000296 (-0,866)	
REFEREN	0,55039 (0,434)		0,37498 (0,346)	
LANGUAGE	-.-		-.-	

CONFESSION	0,09767	**	0,07901	
	(2,630)		(1,678)	
UNIVERSITY	0,68998		1,12722	
	(0,484)		(0,825)	
R ²²	0,823		0,667	(1)
Adjusted R ²²	0,632		0,307	
Sum squared resid.	58,392		110,085	
F-statistic	4,306	***		

Notes : *** denotes an interval of confidence of at least 1%; ** for 5 % level; * for 10 % level.

(1) Unweighted statistics provided by Eviews.