THREE ESSAYS ON ECONOMIC AND POLITICAL INSTITUTIONS

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DEDICATION

To my wife, Patricia

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PREFACE

This thesis is a study on the behavioral incentives and control mechanisms defined by economic and political institutions. The three essays are empirical quantifications of the economic effects implied by different institutional arrangements. We examine the economic implications of legal and political structures using economic theory, econometric analysis and hypothesis testing.

The first essay is a study of incentives for resource use under different contractual arrangements in the Argentinean agricultural production. Using a transaction costs approach, we contend that in a context of modern agriculture, with well defined property rights, agricultural contracts must balance costs and benefits, aligning tenant and landlord incentives towards a similar objective. The study debates the potential effects of tenancy status and duration of contracts, over soil conservation and input use. We present empirical evidence about the effects over the soil and input use in tenant and owner-operator farms using farm level data from the 2002 National Agricultural Census of Argentina. Contrary to the conventional wisdom, the empirical results do not support a general and clear negative effect for tenancy arrangements. Our intuition is that the interaction among specific characteristics of farmers, natural resources endowment and institutional environment are more important factors than the land tenancy or contract type itself.

The second essay looks at the relationship between electoraly motivated fiscal policy cycles and separation of powers. Previous empirical work on electoral cycles implicitly assumes the executive has full discretion over fiscal policy. In contrast, we contend that an unaligned legislature may have a moderating role under separation of powers. Focusing on the budget surplus, we find that stronger effective checks and balances explain why cycles are weaker in developed and established democracies. Once the discretional component of executive power is isolated, there are significant cycles in all democracies. Hence, what we add to the ongoing debate about the factors behind conditional Political Budget Cycles is a study of the role of effective checks and balances that reduce the discretion of the executive.

The third essay presents evidence of electoraly-motivated changes in the budget balance, public expenditures, composition of public expenditures and provincial revenues in Argentine provinces. The empirical study is made using panel data analysis for 22 Argentine provinces during the period 1985-2001. Results show that conditioning on the alignment of provincial and federal executives (same political party in power) there is evidence of systematic changes in fiscal policies around elections. The observed changes support the predictions of rational opportunistic models of Political Budget Cycles. In election years, total provincial expenditures increase in aligned provinces, without affecting the fiscal balance, because to the increased discretional transfers from the federal government supporting the provincial incumbent federal revenues. By contrast, deficit increases for unaligned provinces. In addition, expenditure shifts toward current spending and away from capital spending for unaligned provinces in electoral years.

Finally, I wish to thank the members of my Thesis Committee Professors Jorge M.Streb (Chairman), Germán Coloma, Marcos Gallacher and Juan Jorge Medina for their insightful suggestions. A special acknowledgement I owe to Professor Streb for helpful, deep and extensive discussions on issues contained (and not) in this study. I also wish to thank the Director of the Department of Economics, Professor Mariana Conte Grand, for their warm and continuous encouragement. The Instituto de Economía y Sociología at INTA (Instituto Nacional de Tecnología Agropecuaria) has provided important support for developing this study. I am very grateful for it.

Chapter 1

Contracts, Transaction Costs and Agricultural Production in the Pampas

I. Introduction

Land tenure and contractual arrangements are controversial issues in the Pampean agriculture. The early colonial pattern of large land holdings dictated the system of sharecropping agriculture with immigrant farmers that developed after 1860. Some authors describe the sharecropper system as a rational economic arrangement that favored landlords and tenants. There was no collusion on the part of large landholders to bar access to land by the newly arrived European farmers and the land market was open and competitive without legal or economic barriers to entrance (Cortés Conde, 1995). However, other authors contend that tenure regime and sharecropping arrangements had negative social and productive consequences (Scobie, 1964; Ferrer, 1965).

Eventually, through inheritance or sale, many of the very large "estancias" (cattle ranch) were broken up, but the original pattern of land occupation resulted in larger landholdings than in similar regions of the U.S. as the "Corn Belt". In spite of these differences in land tenure arrangements, Gallacher et. al. (2003) suggests that a similar overall performance is observed in agricultural production in both countries because farmers are efficient in resource allocation (including land tenure arrangements).

During the last 15 years, Argentine agricultural production has been rising and land rental (both fixed rent and sharecropping) is a growing practice, implying a greater separation between the property and control of land. In this paper, our objective is to show that land tenure arrangements in the Pampean agriculture align interests and incentives in an efficient way. Using a transaction costs approach, we present empirical evidence about the effects of agricultural contracts (fixed rent, sharecropping) on soil conservation practices and input use (fertilizers).

The organization of the paper is the following. Section II briefly reviews the literature and presents the theoretical background. Section III describes the characteristics of the study area and the data set from the 2002 National Agricultural Census (NAC). Section IV presents the econometric analysis. Section IV has the final comments.

II. Literature Review and Theoretical Background

The analysis of fixed rent and sharecropping contracts has been extensively developed in the literature. In a fixed rent contract, the tenant pays a fixed amount not related to farm production. On the other hand, the sharecropping contract allows the tenant only a fraction of the total product (e.g., between 65 and 70% in Pampean grain production).

In a sharecropping contract the tenant has incentives to under-utilize inputs, this is widely known as the sharecropping problem in its “Marshallian” version (Johnson, 1950). Several reasons have been proposed to explain the use of sharecropping contracts. One incorporates risk in the analysis of contracts (Stiglitz 1988). Under this explanation, sharecropping is a way to share risk between the landlord and the tenant and the sharecropping contract appears as a choice in order to avoid risks. Therefore, the tenant shares not only the product but also part of the risk associated with agricultural production. One reply to this argument is that if there are no restrictions to make multiple fixed rent contracts, it is possible to avoid risk diversifying the use of fixed contracts (Newbery 1977). Alternatively, the “moral hazard” approach suggests that efficient contracts balance the exchange between the costs associated with the risk and the benefits derived from generating optimal incentives for both parties. A sharecropping contract can be seen as a result of this balance (Stiglitz 1988).

These models have been considerably developed in the literature and empirically applied in the study of the contractual relations. Empirical results are mixed about efficiency under fixed and sharecropping contracts, with studies focused on developing countries with traditional agricultural sectors.

Our analysis will concentrate on the relationship between the landlord and the tenant using a theoretical framework associated with the transaction costs approach. Cheung (1968) shows that with well defined property rights the type of contracts does not affect efficient resource allocation. A critical assumption is the absence of transaction costs and in particular the inexistence of monitoring costs in the use of inputs or the effort made by the tenant.

Following Allen and Lueck (2002), we do not consider risk and we add to the analysis the use of specific characteristics of land. Specifically, the soil attributes are treated as an additional input in the production process. When a producer carries out the production in his own land, he manages the resources taking into account the present and future implications of his decisions. By contrast, a tenant with a fixed rent contract will only worry about his current results. Then, if greater yields could be obtained by putting aside adequate soil management, applications of fertilizers or other practices, the tenant has incentives in this direction.

In sharecropping contracts, if effort is observed imperfectly and there are monitoring costs, there would be incentives to underutilize inputs by the tenant. This implies, also that he may have less incentives to use the soil attributes excessively or to carry out actions with potential harmful effects over the natural resources. This could be seen as a potential benefit of sharecropping contracts (Allen and Lueck 2002).

However, this does not imply that sharecropping is always the most convenient arrangement for the landlord. Transaction costs are important in controlling and dividing the output, because the tenant has incentives to underreport the quantity of crop to the landlord. Of course, the landlord is aware of this problem and he will do all that he can to avoid this behavior.

The relative advantage of a fixed rent contract is to avoid the quantity control. However, it presents the problem of over-utilization of soil attributes. The sharecropping contract reduces the incentives to dig the soil, but it has costs related to the control of quantity and quality of crop.

Some other factors can lead the actions of tenants and landlords to the optimal use of the resources. For example, repeated transactions can build a reputation and reduce the costs of control. If transactions are less frequent but the landlord has good knowledge of the activity, he can reduce the monitoring costs. If control of production is relatively more costly, then he can opt for fixed rent contracts.

It is often argued that short-term contracts do not generate adequate incentives for both the conservation of resources and investments. However, when an owner-operator decides how to manage his land, he has as an inter-temporal profit-maximizing objective. When he considers the option of renting the land to a tenant, the analysis cannot be different. The landlord surely is aware of the incentives that the tenant has to make an over use of the soil attributes in the short term.

Our working hypothesis is that the design of the contracts should align interests of tenants and landlords, minimizing transaction costs. The contract design should make the actions converge in such a way that the results for a tenant will be similar to those of an owner or landlord-operator. However, a greater alignment of interests tends to increase the complexity and the costs of the contracts. Longer contracts may stimulate the conservation of assets and soil, but at the same time require more detailed conditions that are costly to control and enforce.

Pampean agricultural production is based mostly on short-term contracts, but the transactions are repeated and frequent. The incentive to build a reputation can act as an alternative mechanism for long-term contracts. A repeated short term contract can have implicit renovation if the tenant carries out the expected actions, but it is revoked easily if not. Our intuition is that we should not observe a systematic bias in resource allocation between annual tenants (fixed rent or sharecropping) *vis à vis* landlord-operators[1].

Hence, our principal conjecture is that contractual arrangements must balance costs and benefits, aligning incentives towards an objective similar to a producer-landlord with full interest in maximizing and conserving his wealth. We do not expect major differences between owner operators and tenants in input use or natural resources conservation.

If the crop share contracts do not give full incentives for the optimal use of inputs, and there are monitoring and control costs, some differences in input use (e.g., fertilizers) could be found in case of fixed rent contracts with respect to sharecropping contracts.

These conjectures are empirically tested in section IV.

III. Study Area and Data

The geographic focus of this study is the central-eastern region of Argentina known as the Pampas, one of the most productive agricultural areas in the world and of major importance to the Argentine economy (85% of the total grain production). Wheat and corn have been the principal crops for the last 100 years and soybean is a more recent crop.

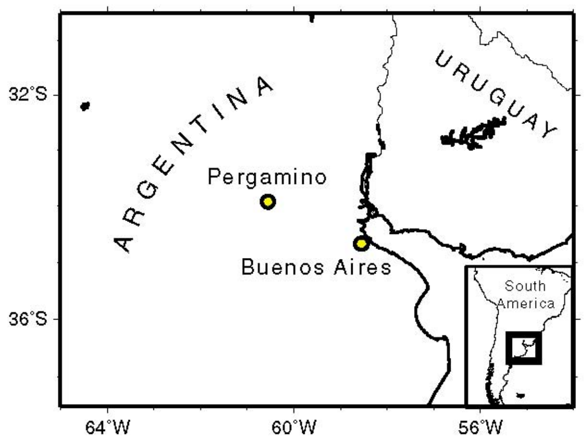
The empirical analysis is carried out using farm level data from the National Agricultural Census 2002 (NAC 2002) of Pergamino County, Province of Buenos Aires.

Cropping systems include maize, soybean, wheat-soybean double crop and characteristic rotations include maize and soybean. Pergamino is representative of the

[1] In Pampean agriculture, annual contracts prevail. According to current legislation, all agrarian contracts must be signed for three years and registered in courts. Even though detailed statistical information is not available on the fulfilment of this requirement, it is a well-know fact in the rural media that the majority of contracts do not comply with this formality. The evidence points out that for different reasons, surely linked to the transaction costs, farmers have opted to set up informal contracts. In this sense, we consider that the actual legal framework is neutral for the selection of the contracts and the productive decisions.

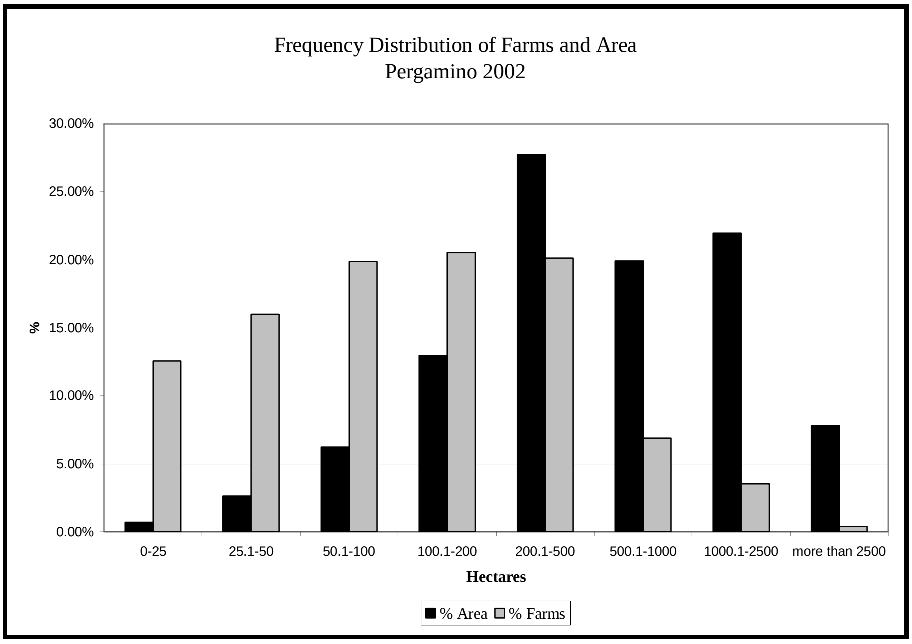
Pampas and it presents characteristics of modern agriculture (defined property rights, modern inputs and technological knowledge) which makes it comparable, for example, with the American "Corn Belt". Figure 1 displays the location of the study area.

Figure 1. The study area.



The available micro data includes productive, economic and management variables for 1117 farms in a total area of 285,992 hectares, averaging 256 hectares per farm. Figure 2 presents the frequency distribution of farms and area.

Figure 2. Frequency Distribution of Farms and Area



IV. Econometric Analysis

We carry out estimations of binary election models (Probit) to explain the utilization of soil conservation practices (no tillage or reduced tillage). Selection models (Tobit) are used to explain the cultivated area with no till practices and total fertilized area. From the 1117 farms we considered those that produced at least some of the four principal crops (soybeans, corn, wheat and sunflower). The result is a total of 944 observations available for the study. Dependent and independent variables and their definitions are presented in Table 1.

Table 1. Definition of Variables

Dependent Variables:
CONS: Dummy variable that assumes the value of one if on the cultivated area some conservationist practice is carried out (e.g. no tillage, reduced tillage,).
AREANT: Area with no till practice as percentage of the total area cultivated with soybeans, corn, wheat and sunflower.
TOTFERT: Total fertilized area as percentage of the cultivated area in corn, wheat and sunflower.
CWFERT: Fertilized area in corn and wheat crops as percentage of the total implanted area with corn and wheat.
SSFERT: Fertilized area in soybeans and sunflower crops as percentage of the total implanted area with soybeans and sunflower.
Independent Variables:
T: Dummy variable for tenant farms. It assumes the value of one if the ratio between the own cultivated area (OA) and the total area of the farm (ATOT) is less o equal to 0.20 ($0.20 \geq OA/ATOT$).
TF: Dummy variable for type T farms with fixed rent contract. It assumes the value of one if the rent is fixed in a proportion greater or equal than 0.80 with respect to the total rented area.
TS: Dummy variable for type T farms with sharecropping contract. It assumes the value of one if the sharecropped area is a proportion greater or equal than 0.80 with respect to the total area rented.
T_OTHER: Dummy variable that takes value of one for type T farms that belong neither to the category TF nor to the category TS (T_OTHER = T – TF – TS).
OWN_TEN: Dummy variable for farms that combine own land and tenancy. It assumes the value of one if $0.20 < OA/ATOT < 0.80$.
CULTA: Total cultivated area with wheat, corn, soybeans and sunflower, in thousands of hectares.
SOY: Dummy variable that assumes the value of one if the farm produces only soybeans
SUMM: Dummy variable that assumes the value of one if the farm carries out just summer crops (corn-soybeans)
PLOWS: Total number of plows (or similar equipment)
TRACT: Dummy variable that takes the value one if the farm has one or more tractors.
DIR: Total number of machinery for direct seed-planting (no till machinery)
SERV: Total area contracted for services of plowing and soil preparation in thousand of hectares
MAINT: Total area contracted for maintenance work and conservation of the crops, in thousands of hectares.
EDU: Education of the producer measured in a scale between 1 and 7.5 (1: no education; 7.5: complete college education) (this variable assumes the value of zero when the farm is some type of partnership or corporation).
EDUD: Dummy variable that assumes the value of one when the variable EDU assumes the value of zero (it controls for possible bias in the coefficient associated with EDU due to the inclusion of zeros)
RESID: Dummy variable that assumes the value of one if the producer or any of the partners resides on the farm.
MANAG: Dummy variable that assumes the value of one if the farm keeps formal accounting and productive records.
PUBEXT: Dummy variable that assumes the value one if the farm receives extension services from some public organization (state or federal).
PRIVADV: Dummy variable that assumes the value of one if the farm uses some private technical advise (independent professionals, companies, NGOs)

CONS is a binary variable that identifies the use of the conservation practices (when CONS=1). A group of four continuous variables measures the relative adoption of no till practices (AREANT) and fertilizing (TOTFER), the relative fertilization in cereals (CWFER), and fertilization in oilseeds (SSFER). Table 2 presents the probit estimation for the binary dependent variable CONS.

Table 2. Probit (Conservation Practices) and Tobit (No Till - Fertilization) Estimates

Variables	CONS (1)	CONS (2)	AREANT (3)	AREANT (4)	TOTFERT (5)	TOTFERT (6)
T	-0.177		-2.654		-7.593	
	(-1.55)		(-0.56)		(-1.91)*	
TF		-0.251[A]		-11.192[B]		-5.901[C]
		(-1.63)		(-1.75)*		(-1.13)
TS		0.119[A]		4.867[B]		-11.034[C]
		(0.59)		(0.57)		(-1.47)
A_OTHER		-0.300		3.426		-7.845
		(-1.68)*		(0.48)		(-1.30)
OWN_TEN	-0.103	-0.106	-1.986	-2.035	-2.347	-2.342
	(-0.89)	(-0.92)	(-0.42)	(-0.43)	(-0.62)	(-0.62)
CULTA	-0.365	-0.361	-2.964	-20.754	-7.036	7.119
	(-2.43)**	(-2.39)**	(-0.50)	(-0.47)	(-1.40)	(-1.42)
SUMM	-0.156	-0.165	-23.440	-23.825		
	(-1.62)	(-1.71)*	(-5.82)***	(-5.92)***		
SOY					-63.220	-63.122
					(-15.58)***	(-15.54)***
PLOWS	-0.177	-0.177	-6.291	-6.192		
	(-5.42)***	(-5.42)***	(-4.85)***	(-4.78)***		
TRACT	-0.676	-0.670	-27.386	-28.174	-7.798	-7.770
	(-5.12)***	(-5.04)***	(-4.91)***	(-5.04)***	(-1.78)*	(-1.77)*
DIR	0.585	0.594	23.749	23.893	4.333	4.299
	(6.87)***	(6.93)***	(7.76)***	(7.80)***	(1.84)*	(1.83)*
SERV	0.552	0.557	20.453	21.407		
	(2.34)**	(2.36)**	(2.18)**	(2.28)**		
MAINT					5.635	5.578
					(2.70)***	(2.67)***
EDU	0.107	0.111	4.738	4.860	2.593	2.548
	(3.36)***	(3.50)***	(3.53)***	(3.62)***	(2.32)**	(2.27)**
EDUD	0.627	0.650	20.461	20.322	16.190	16.104
	(3.20)***	(3.30)***	(2.45)**	(2.44)**	(2.36)**	(2.35)**
MANAG	0.241	0.238	6.436	7.136	13.906	13.843
	(2.25)**	(2.21)**	(1.44)	(1.60)	(3.73)***	(3.69)***
PUBEXT	0.458	0.452	13.312	13.260	9.621	9.695
	(2.16)**	(2.13)**	(1.57)	(1.56)	(1.37)	(1.38)
PRIVADV	0.221	0.210	9.725	9.514	4.441	4.569
	(2.00)**	(1.90)*	(2.13)**	(2.08)**	(1.15)	(1.18)
RESID	-0.271	-0.270	-14.960	-14.897	-7.642	-7.673
	(-2.45)**	(-2.42)**	(-3.28)***	(-3.28)***	(-2.07)**	(2.07)**
Constant	-0.224	-0.236	44.939	44.695	19.833	19.956
	(-1.05)	(-1.11)	(5.00)***	(4.99)***	(2.61)***	(2.62)***
Method of Estimation	Probit	Probit	Tobit	Tobit	Tobit	Tobit
No. Observations	944	944	944	944	944	944
Censored Observations (Dep. Var.<=0)	-	-	324	324	353	353
Not Censored Obs.	-	-	620	620	591	591
Log-Likelihood	-524.05	-521.15	-3620.897	-3618.903	-3243.137	-3242.953
LR Test	213.44***	219.26***	240.12***	244.11***	390.10***	390.46***
Pseudo R^2	0.171	0.174	0.0321	0.0326	0.0567	0.0568

Notes: z statistics in parentheses; *** Significant at the 1%; **Significant at the 5%; *Significant at the 10%; A and B: see Table 3 for Wald test of coefficients equality

The independent variables are grouped in those measuring the type of land tenancy (T, TF, TS, T_OTHER, OWN_TEN) and those that control by productive characteristics (CULTA, SOY, SUMM, SERV, MAINT), physical capital (PLOWS, TRACT, DIR), human capital and management (EDU, RESID, MANAG, PUBEXT, PRIVADV).

In the first model, the variables T and OWN_TEN were included to estimate the effect of these two forms of tenancy on CONS (controlling for covariates). In the second equation the tenancy status is distinguished by type of contract, including the variables TF, TSP and A_OTHER. Our main interest is on coefficients associated with tenancy variables (T, TF and TS), and we observe that those coefficients are not significant in any of the estimations. Only the coefficient associated with the category T_OTHER appears with negative sign and marginally significant at 10% in estimation 2. The estimated coefficient of TS has a positive sign and that of TF has a negative sign (and marginally significant at 11%). Following the theoretical conjecture that there are greater incentives to over use soil attributes in fixed rent contracts, this finding may imply a differential effect between fixed rent and crop share contracts. Table 3 (line A) presents a Wald test that contrasts the hypothesis of equality of both coefficients.

Table 3. Wald Test of Coefficients Equality (Fixed Rent and Sharecropping Contracts)

	Statistic	p-value	Statistic	p-value	
A	chi2(1)= 2.44	0.11	D	F(1, 570)= 0.66	0.42
B	F (1, 928) = 2.64	0.10	E	F(1, 929) = 2.81	0.09
C	F(1, 929) = 0.36	0.55	-	-	-

The result shows that (marginally) at 11% we can reject the null hypothesis of equality. This suggests some differential effect of greater adoption of conservation practices in cases of sharecropping contracts. So, the tenancy status appears relatively neutral in terms of conservation practices, with a slightly superior adoption of conservation practices in crop share contracts.

Regarding control variables, it is clear that the quantity and type of available machinery affects the adoption of conservation practices, since the effect of PLOWS and TRACT over CONS appears to be systematically negative and significant, while the effect of DIR is positive and significant. Variables related with human capital and management presents a positive and significant effect over the adoption of conservation practices.

Columns 3 to 6 in Table 2, present the estimations using no till area (AREANT) and fertilized area (TOTFERT) as a percentage of the total farming area as dependent variables. Farms that do not carry out soil conservation practices or do not fertilize always have a percentage equal to zero. To address this problem of sample selection, we used models of simultaneous selection (Tobit) to perform the estimations.

Equation 3, with no till practices (AREANT) as dependent variable, shows that the estimated coefficient for variable T is not significant. On the other hand, in equation 4, the coefficient associated with fixed rent (TF) is negative and significant. This result is similar to the conservation practices equation. In the same way, we perform a Wald test to contrast equality between the estimated coefficients for TF and TS. Results (line B Table 4) suggest a greater use of no till practices for crop share tenants.

The coefficient associated with tenancy (T) is negative and significant at 10% in equation 5. However, controlling by contract type, there are no significant differential effects relative to the base category (landlords). We also tested the null hypothesis of equality between these coefficients (line C Table 4). The Wald test does not reject the null hypothesis of coefficients equality.

The effect of the dummy variable SOY, that controls farms dedicated only to soybean production, appears negative and significant in fertilization equations. Fertilization in soybeans is much less frequent, since marginal yield response is reduced. In order to control this effect we analyzed the practice of fertilization in two sub samples. One sub sample includes farms producing cereal crops and the other those producing oilseeds. Estimation results for each sub sample are presented in Table 4 (equations 7 to 10).

Equation 7, shows that the tenancy variable is significant and positive when fertilization in corn and wheat (CWFERT) is the dependent variable. Equation 8 includes dummy variables for sharecropping and fixed rent contracts, and the Wald test (line D in Table 4) suggests equality between estimated coefficients.

For oilseed crops fertilization (SSFRT, equation 9) the coefficient associated with T is negative and significant. When the effects are separated by contract type (equation 10), the negative effect on fertilization by the tenants is explained principally by the group of sharecropping tenants. The Wald test (line E in Table 4) allows the rejection of the null hypothesis of equality.

Table 4. Tobit Estimates (Cereals and Oilseeds Fertilization)

Variables	CWFERT (7)	CWFERT (8)	SSFERT (9)	SSFERT (10)
T	15.757		-44.403	
	(2.65)***		(-2.33)**	
TF		12.054[D]		-31.592[E]
		(1.59)		(-1.30)
TS		22.316[D]		-129.616[E]
		(1.97)**		(-2.34)**
A_OTHER		17.491		-28.223
		(1.91)***		(-0.98)
OWN_TEN	9.995	10.032	13.518	13.680
	(1.83)*	(1.84)*	(0.82)	(0.83)
CULTA	-3.316	-6.111	-40.744	-42.146
	(-0.95)	(-0.92)	(-1.41)	(-1.45)
TRACT	-2.447	-2.732	-25.239	-27.166
	(-0.35)	(-0.39)	(-1.39)	(-1.50)
DIR	10.007	10.049	-0.068	-0.316
	(3.03)***	(3.05)***	(-0.01)	(-0.03)
MAINT	3.033	3.124	25.986	25.666
	(1.12)	(1.15)	(2.47)**	(2.43)**
EDU	3.613	3.675	5.124	4.339
	(2.15)**	(2.19)**	(1.05)	(0.89)
EDUD	24.803	24.937	18.245	14.485
	(2.46)**	(2.24)**	(0.60)	(0.47)
MANAG	20.514	20.742	54.670	55.606
	(3.72)***	(3.73)***	(2.98)***	(3.03)***
PUBEXT	24.788	24.706	-5.005	-4.807
	(2.42)**	(2.41)**	(-0.16)	(-0.16)
PRIVADV	9.158	8.821	9.492	10.924
	(1.53)	(1.47)	(0.56)	(0.67)
RESID	-11.683	-11.544	-32.624	-33.204
	(-2.17)**	(-2.15)**	(-1.85)*	(-1.88)*
Constant	61.878	61.840	-185.040	-180.928
	(5.35)***	(5.26)***	(-5.09)***	(-4.98)***
Method of Estimation	Tobit	Tobit	Tobit	Tobit
No. Observations	584	584	943	943
Censored Observations (Var. Dep.<=0)	51	51	824	824
Not Censored Observatons	533	533	119	119
Log likelihood	-2951.476	-2951.1134	-965.845	-963.829
Likelihood Ratio Test	79.87***	80.59***	35.79***	38.92***
Pseudo R2	0.013	0.013	0.018	0.020

Notes: z statistics in parentheses; *** Significant at the 1%; **Significant at the 5%; *Significant at the 10%; C, D and E: see Table 3 for Wald test of coefficients equality.

Though the tenancy effect on fertilization is negative when all crops are considered together, it appears to be reasonable to differentiate the effect analyzing separately the cereal and oilseed crops, because they have a different marginal response. Cereal crops present a greater response to nitrogen fertilization. On the other hand, for soybeans this fertilizer has little marginal effect on yields. The application of phosphorus an element with positive residual effects for subsequent crops is more frequent.

The fertilization decision includes two criteria: sufficiency and replacement. The sufficiency criterion is to fertilize only when the level of nutrients in the soil is below the critical value. On the other hand, the replacement criterion, is to fertilize systematically, adding the quantities of nutrients that the crops extract.

We interpret the empirical findings as follows: for cereal crops, even though the tenants do not have incentives to apply the replacement criteria (because they only have a temporary property right on the land) they do have strong incentives to apply the sufficiency criterion to increase yields. Empirical results show that the effect of sufficiency criterion seems to be important, implying that tenants tend to fertilize, on average, more than the owner operators. We can conjecture that owner operators will resort to other practices that substitute the application of fertilizers in cereals (e.g. crop rotations or soybean fertilization as precedent crop).

The theoretical analysis indicates that incentives for fertilizing could be lower in sharecropping contracts. This situation is not clearly distinguished in the estimations since we do not find significant differences between coefficients. Perhaps, greater information about contracts is necessary to distinguish the effects. It is observed that in oilseed crops (soybeans) the effect of the tenancy category is clearly negative over fertilization, particularly in the case of the sharecropping contracts. In this case the sufficiency criteria may have a low impact, since the effects of fertilizers are reduced, and also there are low incentives for replacement, resulting in a clear negative effect.

Summarizing, for cereal crops the tenants (fixed rent or sharecroppers) tend to fertilize more than owners. For oilseed, due to the lower marginal response and the greater residual effect of phosphorus, a negative effect is observed for tenants, in particular for sharecroppers.

V. Final Comments

Land tenancy and contract arrangements used in the Pampean agricultural production are important and controversial issues. However, at least to the best of our knowledge, there are no studies that approach the subject with a transaction costs analytical framework and empirically contrast the conjectures. Our study debates the potential effects over soil conservation or input use of tenancy and duration of contracts. The empirical results show some differential effects but do not support a general and clear negative effect in tenant farms.

Finally, our empirical results are consistent with the theoretical conjecture that the different contract arrangements tend to minimize transaction costs, resulting in a similar resource allocation without superiority of land ownership over land rental by tenants.

References

Allen, Douglas W. and Dean Lueck (2002), *The Nature of the Farm: Contracts, Risk and Organization in Agriculture*. Cambridge, Massachusetts, The MIT Press.

Cheung, Steven N. S.(1968), "Private Property Rights and Sharecropping". *Journal of Political Economy*, Vol. 76, no. 6, 1107-1122.

Cortés Conde, Roberto (1995), *La Economía Argentina en el Largo Plazo*. Buenos Aires, Argentina, Universidad de San Andrés.

Ferrer, Aldo (1965), *La Economía Argentina*. México-Buenos Aires, Fondo de Cultura Económica.

Gallacher, Marcos; Daniel Lema; Elena Barrón and Víctor Brescia (2002) "Decision-Environment and Land Tenure: A Comparison of Argentina and U.S.", CEMA Working Paper N° 229, Universidad del CEMA, Buenos Aires, Argentina.

Johnson, D. Gale (1950), "Resource Allocation under Share Contracts". *Journal of Political Economy,* Vol 58, no.6, 111-23.

Newbery, D.M.G. (1977), "Risk Sharing, Sharecropping and Uncertain Labour Markets". *Review of Economic Studies* 44, 585-94.

Scobie, James (1964), "*Revolution on the Pampas. A Social History of Argentine Wheat*". Austin, Texas, University of Texas Press.

Stiglitz, Joseph (1988), "Economic Organization, Information and Development". In H. Chenery and T.N. Srinivasan eds., *Handbook of Development Economics*, Chapter 5, Vol. I, Elsevier Science Publishers, Amsterdam.

Chapter 2

Discretional Political Budget Cycles and Separation of Powers [*]

I. Introduction

Without discretionary power, there is no room for political budget cycles (PBC). Unlike asymmetric information, the degree of discretion of the executive has been overlooked in the empirical literature on PBC, perhaps because theoretical papers on opportunistic cycles usually model fiscal policy in terms of a single policy maker with full discretion. However, in the U.S. two-party system Alesina and Rosenthal (1995) show how divided government is a tool to moderate the executive. A similar logic might apply in an opportunistic framework, where an opposition legislature may play a special role in moderating PBC. Indeed, Schuknecht (1996) suggests that stronger PBC in developing countries might be due to the existence of weaker checks and balances there.

Hence, what we add to the ongoing debate in Shi and Svensson (2002a, 2002b), Persson and Tabellini (2002), and Brender and Drazen (2004) about the factors behind conditional PBC is a study of the role of effective checks and balances that reduce the discretion of the executive. To measure the nominal presence of a legislative veto player, we use the Henisz (2000) political constraints index. We then construct a measure of effective checks and balances, as the product of the presence of a legislative veto player and the International Country Risk Guide (ICRG) measures of rule of law.

We focus on the behavior of the budget surplus, because it is the most sensitive indicator of aggregate PBC. We also look at the effect of checks and balances on the persistence of the budget surplus, taking into account the literature on the costs of coalition governments and divided government in terms of slower adjustment to shocks (Sachs and Roubini 1989, Alt and Lowry 1994), and more generally the suggestion in Tsebelis (2002) that more veto players imply that it is harder to change the status quo.

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We specially thank Alejandro Saporiti for helping to start this project. Adi Brender and Allan Drazen provided their database on political budget cycles. It was great to receive insightful suggestions from Marco Bonomo and Sebastián Galiani. We benefited from comments by María Laura Alzúa, Mauricio Cárdenas, Alejandro Corbacho, Andrés Escobar, Marcela Eslava, Leonardo Hernández, Jorge Nougués, Ernesto Stein, and participants at the meetings of the LACEA Political Economy Group in Cartagena, the AAEP in Buenos Aires, and the Encontro Brasileiro de Econometria in João Pessoa, at the Conference on Monetary and International Economics of La Plata and at seminars at UdeSA, UTDT, UCEMA and UNLP.

Section II briefly reviews the empirical literature on PBC most closely connected to our study. Section III presents the theoretical framework behind this study. Section IV describes the dataset, which draws mainly on the Brender and Drazen (2004) cross-country panel of democracies, and the Henisz (2002) political constraints dataset. Section V presents econometric evidence on electoral budget cycles, isolating the discretional PBC. Section VI has the conclusions and questions for further research.

II. Empirical literature

There is a rich empirical literature on electoral cycles in fiscal policy. Tufte (1978) provides early evidence on opportunistic fiscal cycles in the United States and other countries. Recently, there has been a wave of empirical work on aggregate PBC using panels of countries. We concentrate on the studies by Shi and Svensson (2002a, 2002b), Persson and Tabellini (2002), and Brender and Drazen (2004), which are the foundation of our research.

We describe these studies below. Briefly stated, Shi and Svensson (2002a, 2002b) find PBC are particularly pronounced in developing countries, relating this to greater corruption and less informed voters. In the subset of democratic countries, Persson and Tabellini (2002) find PBC are stronger in presidential countries and in countries with proportional elections. Brender and Drazen (2004), who also analyze democratic countries, find that new democracies have strong PBC, but in the remnant countries, whether developed or developing, and whatever their form of government, electoral rules, or level of democracy, PBC are not significant.

A. Shi and Svensson

Shi and Svensson (2002b) analyze, for a panel of 91 countries over the 1975-1995 period, the influence of a variable *ele* that takes value 1 in electoral years, and 0 elsewhere. They find that there is a pre-electoral cycle in the fiscal surplus that is much stronger in developing countries: the surplus falls 1.4 percentage points (p.p.) of GDP, against 0.6 p.p. in developed countries. The reason for this difference is not the revenue cycle, which falls 0.3 p.p. in both groups, but rather that spending rises much more strongly in developing countries. They are able to explain these differences across groups of countries in terms of larger rents for incumbents in developing countries, using as proxies either the Transparency International measure of degree of corruption, or an average of five ICRG institutional indicators (rule of law, corruption in government, quality of the bureaucracy, risk of expropriation of private investment, and risk of repudiation of contracts).

Shi and Svensson (2002a) look at a panel of 123 countries over the 1975-1995 period. Besides the pre-electoral effects captured with *ele*, they look at the combined pre- and post-electoral effects with a variable *pbc* that equals 1 in electoral years, -1 in post-electoral years, and 0 otherwise. The variable *pbc*, which imposes the restriction that the contraction after elections is of the same magnitude as the expansion prior to elections, almost invariably turns out to be more significant in statistical terms than the *ele* variable. They again find that PBC are pervasive, and that cycles are stronger in developing countries: *pbc* has a coefficient of –1.0 in developing countries, and -0.4 in developed countries. They explain the differences in terms of a variable *sum*, a weighted average of two indicators. First, the variable *rents*, an average of the five ICRG indicators mentioned above. The rationale is that low rents (i.e., a higher value of *rents*) indicate smaller incentives to remain in power. Second, the variable *informed voters*, the product of number of radios per capita and a dummy that measures the freedom of broadcasting. The rationale is that a greater proportion of informed voters can reduce the problems of asymmetric information that allow cycles to take place. They find that the composite variable *sum* explains the differences between developing and developed cycles in regard to *ele* (however, they overlook to report the results with *pbc*).

B. Persson and Tabellini

Persson and Tabellini (2002) restrict their panel to 60 democratic countries over the 1960-1998 period. They distinguish between the pre-electoral component of electoral cycles in fiscal policy, *ele*, and the post-electoral component, *ele(+1)*, which takes value 1 in post-electoral years, and 0 elsewhere.

Though they do not test whether the differences are statistically significant, there appears to be a clear asymmetry in government expenditure, which is significantly cut the year after elections, while there is no pattern in the year before elections. On the other hand, tax cuts before elections are followed by similar hikes after elections. This pattern is reflected in the electoral behavior of the budget surplus, which falls 0.1 p.p. of GDP before elections, and rises 0.4 p.p. afterwards. Controlling for the effect of the level of democracy, they find cycles not only in the whole range of democracies (polity index from the Polity IV dataset between 1 and 10), but also in the countries with the best democratic institutions (polity index of 9 or 10).

Persson and Tabellini also analyze the effect of electoral rules and forms of government on PBC. As to electoral rules, they find a statistically significant difference in the case of spending before elections, which tends to fall in majoritarian countries, and to rise in proportional countries (though these effects are not statistically significant in themselves, the difference is). As to the form of government, the differences are more prominent. In presidential countries, the post-electoral effects of a fall in expenditure, and a rise of taxes and surplus, are stronger than in parliamentary countries, and the differences tend to be statistically significant.

C. Brender and Drazen

Brender and Drazen (2004) study a panel of 68 democratic countries over the 1960-2001 period. They concentrate on pre-electoral effects using the *ele* variable. They distinguish between new and old democracies. Countries are new democracies during the first four competitive elections, before becoming established democracies. The idea behind this is that voting may require a local learning process that matures with electoral experience, so the problems of asymmetric information may be alleviated over time.

When all countries are pooled, the electoral effect on the budget surplus of the first four competitive elections is between -1 and -1.2 percentage points of GDP, while the rest of the elections have a negligible effect on the budget surplus. When they partition the data, Brender and Drazen find that PBC are statistically significant in new democracies. On the other hand, old democracies show no evidence of cycles using the *ele* variable, whether in OECD countries or not, and whatever the level of democracy (countries with a polity index between 0 and 9, or an index of 10), the form of government (presidential or parliamentary), or the electoral rules (majoritarian or proportional).

III. Theoretical framework

Two key references on rational electoral cycles are Rogoff (1990) and Lohmann (1998a). They have different implications on the likelihood of PBC, and on the effects of PBC on the probability of reelection. Rogoff (1990) models electoral cycles in fiscal policy building on earlier work by Rogoff and Sibert (1988). Under asymmetric information, he shows that cycles can be interpreted as a signal of the competency of the incumbent. In equilibrium, only competent incumbents engage in PBC, and PBC increase the probability of reelection. Lohmann (1998a) models electoral cycles in monetary policy. She makes the nice point that even if one abstracts from the signaling problem, there will still be cycles under asymmetric information about the policy process. The underlying issue is a credibility problem, by which the executive cannot credible commit to not pursue expansionary policy before elections. This credibility problem carries over to fiscal policy. Shi and Svensson (2002a), in a setup that includes government debt, show that the incumbent will have an incentive to raise total expenditure and lower taxes, thereby increasing the budget deficit. In equilibrium, all types of incumbents engage in cycles, so cycles do not increase the probability of reelection.

The standard results on rational PBC not only require asymmetric information, but also a fiscal authority with discretion over fiscal policy; once one drops the assumption of a single fiscal authority, the possibility of PBC will depend on the leeway that the legislature allows the executive in pursuing electoral destabilization (Streb (2003)). This may be empirically relevant, since Alesina, Roubini, and Cohen (1997, chaps. 4 and 6) trace the lack of recent evidence on opportunistic cycles in the United States back to the fact that after 1980 many federal transfer programs have become mandatory by acts of Congress, so they cannot be easily manipulated for short run purposes.

Persson, Roland and Tabellini (1997) sparked off fruitful research on the implications of separation of powers for fiscal policy, but they did not consider its specific implications for PBC. Saporiti and Streb (2004) formally analyze the implications for PBC of considering that in constitutional democracies the process of drafting, revising, approving and implementing the budget requires the concourse of the legislature.[2] In a framework of asymmetric information on the budgetary process similar to the Lohmann (1998a) timing, the moderating influence of the legislature is largest when the status quo is given by the previous period's budget. In terms of the time-consistency literature on "rules versus discretion" stemming from Kydland and Prescott (1977), which discusses how to solve the credibility problems faced by policy-makers, separation of powers is needed to make the budget rule credible, i.e., to commit the executive to not doing stimulative policies in electoral periods.

[2] In the case of monetary policy, Lohmann (1998b) and Drazen (2001) study how the delegation to an independent central bank can moderate electoral cycles. However, a single authority decides fiscal policy.

The interpretation we follow here is that separation of powers has a bite in the fiscal process when the executive and legislative branches are not perfectly aligned. This draws on the insight of Alesina and Rosenthal (1995) on the moderating influence of an opposition legislature. Through the metric of veto players (Tsebelis (2002)), this insight applies not only to divided government in presidential systems, but more generally to coalition governments. Coalition members start to compete among themselves for votes, so it is particularly hard for different political parties to collude close to elections. Given this interpretation, the Saporiti and Streb (2004) model has sharp empirical implications: if there is perfect compliance with the budget law, the budget rule is credible if the party of the executive's leader does not control the legislature.[3] On the other hand, if there is imperfect compliance, the budget rule is never credible. Consequently, PBC should be larger either in countries with low legislative checks and balances, or low observance of the rule of law. We explore this conjecture.

IV. Data and Econometric Specification

We use the Brender and Drazen (2004) dataset. Additionally, we resort to the Henisz (2002) POLCON dataset. The precise definitions and sources of the variables used in the regressions are given in Table1.

Brender and Drazen (2004) compile a panel data set that covers 68 developed and developing democracies, with annual observations for the period between 1960 and 2001. The sample is restricted to years in which the polity index from the Polity IV Project is non-negative, when the country is a democracy with competitive elections. They construct election dates with data from the Institute for Democracy and Electoral Assistance, the International Foundation for Electoral Systems, the Database of Political Institutions (DPI) Version 3, and several other sources.

Brender and Drazen depurate the IMF *International Financial Statistics* (IFS) fiscal series on government surplus, total expenditure, and total revenue and grants, and calculate them as percentage of GDP (drawn from the IFS). They draw on the World Bank *World Development Indicators* for control variables like per capita GDP, GDP growth rates and share of international trade.

[3] This is related to the approach in Lohmann (1998b) on the conditions for independent monetary policy in Germany.

Table 1. Definition of Variables

Variable	Description	Source
Texp	Total government expenditure as a percentage of GDP	B&D(2004)
Trg	Total government revenue and grants as a percentage of GDP	B&D(2004)
Bal	Fiscal balance as a percentage of GDP, given by *trg-texp*	B&D(2004)
lngdp_pc	Natural log of GDP per capita	B&D(2004)
Gdpr	Annual growth rate of real GDP	B&D(2004)
Trade	Share of international trade as a percentage of GDP	B&D(2004)
pop65	Fraction of population above 65	B&D(2004)
pop1564	Fraction of population between 15 and 64	B&D(2004)
ln(1+pi)	Natural log of 1 plus the inflation rate	IFS
Polcon3	Political constraints index	H(2002)
vetoplayer	Takes value 1 if *polcon3* ≥ 2/3, and 3/2**polcon3* otherwise	O.C.
Law	Law and Order index, combined with the ICRG Rule of Law index in the early years when the former is not available, divided by 6	H(2002) and ICRG
Lawd	Dummy, takes value 1 for country if *law*≥4 always, 0 otherwise	O.C.
Checks	Effective veto player, given by *vetoplayer**law*	O.C.
Checksd	Alternative measure of effective veto player, given by *vetoplayer**lawd*	O.C.
Ele	Takes value 1 in election year, 0 otherwise	B&D(2003)
Pbc	*ele* minus its lead *ele(+1)*, takes value 1 in election year, -1 in the following year, and 0 otherwise	O.C.
pbc_dis	Discretional component of cycle, given by *pbc* (1 – checks)*	O.C.
pbc_disd	Discretional component of cycle, given by *pbc* (1 – checksd)*	O.C.
Demo	Takes value 1 if Polity Index≥0.	B&D(2004)
Oecd	Takes value 1 if country belongs to OECD, 0 otherwise	B&D(2004)
Newd	Takes value 1 if country is new democracy, 0 otherwise	B&D(2004)
Pres	Takes value 1 if form of government is presidential, 0 if parliamentary	B&D(2004)
Prop	Takes value 1 if electoral rule is proportional, 0 if majoritarian	B&D(2004)

Notes: B&D(2003) refers to Brender and Drazen (2003), and similarly for B&D(2004); H(2002), to Henisz (2002); IFS, to the IMF *International Financial Statistics*; O.C., to variables that are our own construction.

From the Henisz (2002) POLCON dataset, we use the political constraints index *polcon3*. This index takes into account the extent of alignment across the executive and legislative branches of government, and was designed by Henisz (2000) to measure the political constraints facing the executive when implementing a policy. More alignment increases the feasibility of policy change and implies less political constraints for the executive. The minimum is a value of 0, which implies no constraints and absolute political discretion for the executive. As the value of *polcon3* increases, more political constraints are implied. With a single legislative chamber, *polcon3* may reach a maximum of 2/3; while with two chambers the maximum is 4/5, when neither of the chambers is aligned with the executive.[4]

The Henisz (2000) political constraints measure is derived in a spatial model under the assumption that the status quo policy is uniformly distributed over the policy space [0,1]. Instead, based on the approximation that in many countries the status quo policy is given by the previous budget, and the fact that a legislature can prevent PBC provided that the status quo is given by the previous non-electoral year budget (Saporiti and Streb (2004)), our variable of interest is whether a legislative veto player exists or not. Hence, we define a variable *vetoplayer* that rescales *polcon3*, dividing it by 2/3, and which equals 1 for values of *polcon3* equal to 2/3 or more, because values of 2/3 or more imply that the executive faces at least one veto player. In consequence, *vetoplayer* varies in the [0,1] interval.

We do not have a direct measure of adherence to the budget law. Instead, the POLCON dataset reports the ICRG index on Law and Order, which measures the degree of rule of law based on a scale from 0 (low) to 6 (high) characterizing the strength and impartiality of the legal system and the general observance of the law. In earlier years when the Law and Order index is not available, we use instead the ICRG Rule of Law index.[5] We divide these indices by 6, so *law* varies in the [0,1] interval.

Our measure of effective checks and balances is *checks*=*vetoplayer*law*, which combines *vetoplayer* with *law* to capture both the legislative checks and balances and the degree of compliance with the law. This is our main variable to condition PBC.

Following the theoretical framework and previous empirical literature on electoral cycles in fiscal policy, a relation between a given fiscal variable y in country i and year t ($y_{i,t}$) and the electoral cycle can be described as follows:

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[4] Henisz (2000, 2002) has another measure of political constraints, *polcon5*, that takes into account whether the country is a federal system or not, and whether the judicial system is independent or not. Federalism might be double-counted there, since it is already included in a second chamber of a legislature (Tsebelis (2002), chap. 8).

[5] When there are overlapping observations, Rule of Law is an unbiased predictor of Law and Order, since the intercept is zero and the coefficient is 1. Therefore, we use the more recent series on Law and Order, supplementing it with Rule of Law when the former has missing observations.

where $E_{i,t}$ is a dummy election variable, $x_{i,t}$ is a vector of m controls, $z_{i,t}$ is a proxy

$$y_{i,t} = \sum_{j=1}^{k} \beta_j y_{i,t-j} + \sum_{j=1}^{m} \gamma_j x_{j,i,t} + \delta_E E_{i,t} + \lambda z_{i,t} + \eta z_{i,t} E_{i,t} + \varphi z_{i,t} y_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad , \qquad (1)$$

variable for effective checks and balances conditioning the electoral policy manipulations, μ_i is a specific country effect, and the term $\varepsilon_{i,t}$ is a random error that is assumed i.i.d. This specification represents a dynamic panel model, where the dependent variable is a function of its own lagged levels, a set of controls and the electoral timing conditioned by effective checks and balances.

Estimates are performed using two methods, Fixed Effects (FE) and Generalized Method of Moments (GMM) for dynamic models of panel data using the procedure developed by Arellano and Bond (1991).

V. Empirical Evidence

We now turn to the evidence on aggregate PBC, focusing on the budget surplus. We first introduce effective checks and balances, to isolate the influence of discretional executive power on PBC. We then look at the sensitivity of the results when restricted to developed or developing countries. To make sure the impact of executive discretion on electoral cycles is not driven by a larger degree of uninformed and inexperienced voters, we then contrast, at one corner, developed countries that are established democracies with, at the other, less developed countries that are new democracies. Finally, we partition these subsets according to form of government and electoral rules.

We use the same control variables as Brender and Drazen (2004), except for the use the growth rate of real GDP to control for cyclical effects.[6] We additionally control for the effect of inflation and its square, *ln(1+pi)* and *ln(1+pi)sq,* to account for issues like lack of indexation of tax bases and tax collection lags. We exclude Sweden from the sample, due to a jump in the fiscal series in the early 1990s, so our panel is reduced to 67 countries (see Table 2). The data is annual, though monthly data would be ideal, since the estimates with annual data are downward biased and may lead to underestimate the size of PBC.[7] Descriptive statistics are presented in Table 3.

[6] The use of the output gap measured with the Hodrick-Prescott filter does not affect the results. Since a lagged budget surplus term is included, this captures the negative effects of low growth (and hence a recession with below-trend output) on future budget surpluses.

[7] As Akhmedov and Zhuravskaya (2004) show for Russia, the effects of PBC are strongest in the months closest to elections, and shifts of opposite sign in fiscal policies around elections partly cancel out with low frequency (quarterly or annual) data. In the Latin American environment where inflation is a means of taxation, Stein, Streb and Ghezzi (2004) also find that the manipulation of nominal exchange rate policy follows a short-run PBC, where on average the changes are concentrated in the four months up to elections, and the four months that follow (the

Table 2. Country Characteristics

Country	*oecd*	*newd*	*pres*	*prop*	Years with *demo* ≥ 0	*checks*	*checksd*
Argentina	0	1	1	1	1973-75; 83-2001	0.41	0.00
Australia	1	0	0	1	1960-2001	0.74	0.71
Austria	1	0	0	1	1960-2001	0.64	0.64
Belgium	1	0	0	1	1960-2001	0.98	0.89
Bolivia	0	1	1	1	1982-2001	0.22	0.00
Brazil	0	1	1	1	1960-63; 85-2001	0.23	0.00
Bulgaria	0	1	1	1	1990-2001	0.47	0.59
Canada	1	0	0	0	1960-2001	0.64	0.63
Chile	0	1	1	0	1960-72; 89-2001	0.56	0.62
Colombia	0	0	1	1	1960-2001	0.15	0.00
Costa Rica	0	0	1	1	1960-2001	0.38	0.56
Cyprus	0	0	1	1	1960-62; 68-2001	0.33	0.00
Czech Rep.	0	1	1	1	1990-2001	0.73	0.78
Denmark	1	0	0	1	1960-2001	0.80	0.79
Dominican Rep.	0	1	1	1	1978-2001	0.36	0.00
Ecuador	0	1	1	1	1960; 68-71; 79-2001	0.24	0.00
El Salvador	0	1	1	1	1984-2001	0.21	0.00
Estonia	0	1	1	1	1991-2001	0.49	0.00
Fiji	0	1	1	0	1970-86; 90-99	n.a.	n.a.
Finland	1	0	0	1	1960-2001	0.81	0.81
France	1	0	0	1	1960-2001	0.56	0.59
Germany	1	0	0	1	1960-2001	0.60	0.61
Greece	1	1	1	1	1960-66; 75-2001	0.37	0.00
Guatemala	0	1	1	1	1966-73; 86-2001	0.15	0.00
Honduras	0	1	1	1	1982-2001	0.18	0.00
Hungary	0	1	0	1	1990-2001	0.63	0.70
Iceland	1	0	0	1	1960-2001	0.77	0.75
India	0	0	0	1	1960-2001	0.35	0.00
Ireland	1	0	0	1	1960-2001	0.54	0.64
Israel	0	0	1	1	1960-2001	0.43	0.00
Italy	1	0	0	1	1960-2001	0.66	0.74
Japan	1	0	0	1	1960-2001	0.75	0.77
Korea	0	1	0	1	1960; 63-71; 88-2001	0.35	0.00
Lithuania	0	1	1	1	1991-2001	0.47	0.64
Luxembourg	1	0	0	1	1960-2001	0.74	0.73
Madagascar	0	1	1	1	1992-2001	0.37	0.00
Malaysia	0	0	0	0	1960-2001	0.31	0.00
Mali	0	1	1	0	1992-2001	0.20	0.00
Mauritius	0	0	0	0	1968-2001	n.a.	n.a.
Mexico	0	1	1	1	1988-2001	0.23	0.00
Nepal	0	1	0	0	1990-2001	n.a.	n.a.
Netherlands	1	0	0	1	1960-2001	0.73	0.79
New Zealand	1	0	0	1	1960-2001	0.53	0.52
Nicaragua	0	1	1	1	1990-2001	0.30	0.00

exchange rate becomes 3% more appreciated than average in the run-up to presidential elections and 3% more depreciated after, because the government first steps down on the monthly rate of depreciation and then releases it).

Table 2. Country Characteristics (Cont.)

Country	*oecd*	*newd*	*pres*	*prop*	Years with *demo* ≥ 0	*checks*	*checksd*
Norway	1	0	0	1	1960-2001	0.73	0.72
Pakistan	0	1	0	0	1962-68; 73-76; 88-98	0.24	0.00
Panama	0	1	1	1	1960-67; 89-2001	0.18	0.00
Papua	0	0	0	1	1975-2001	0.46	0.00
Paraguay	0	1	1	1	1989-2001	0.31	0.00
Peru	0	1	1	1	1960-67; 80-99	0.15	0.00
Philippines	0	1	1	0	1960-71; 87-2001	0.24	0.00
Poland	0	1	1	1	1989-2001	0.39	0.46
Portugal	1	1	1	1	1976-2001	0.54	0.63
Romania	0	1	0	1	1990-2001	0.47	0.00
Russia	0	1	1	1	1992-2001	0.07	0.00
Slovakia	0	1	0	1	1993-2001	0.69	0.76
Slovenia	0	1	0	1	1991-2001	0.68	0.79
South Africa	0	0	1	1	1960-91; 94-2001	0.21	0.00
Spain	1	1	1	1	1978-2001	0.56	0.71
Sri Lanka	0	0	1	1	1960-2001	0.14	0.00
Switzerland	1	0	0	1	1960-2001	0.54	0.58
Trinidad	0	0	0	0	1962-2001	0.42	0.60
Turkey	1	1	1	1	1961-70; 73-79; 83-2001	0.38	0.00
UK	1	0	0	0	1960-2001	0.48	0.53
US	1	0	1	0	1960-2001	0.61	0.59
Uruguay	0	1	1	1	1960-70; 85-2001	0.39	0.00
Venezuela	0	0	1	1	1960-2001	0.33	0.00
Total	23	36	37	55		0.45	0.33

Notes: n.a. stands for not available; *checks* and *checksd* are computed for years with *demo*≥0.

Table 3. Descriptive Statistics

	OECD countries					Non-OECD countries					Total				
	I	*bal*	*texp*	*trg*	*checks*	*I*	*bal*	*texp*	*trg*	*checks*	*I*	*bal*	*texp*	*trg*	*checks*
Old	19	-1.8	29.7	28.2	0.68	12	-2.8	25.7	22.6	0.32	31	-2.1	28.2	26.1	0.55
democracies		(3.6)	(10.3)	(9.5)	(0.15)		(4.6)	(11.0)	(9.9)	(0.18)		(4.0)	(10.7)	(10.0)	(0.23)
New	4	-5.1	27.9	22.9	0.47	32	-1.9	22.4	20.6	0.32	36	-2.4	23.4	21.0	0.34
democracies		(3.2)	(13.2)	(11.9)	(0.14)		(2.9)	(9.9)	(9.4)	(0.21)		(3.2)	(10.7)	(9.9)	(0.20)
Total	23	-2.2	29.5	27.5	0.64	44	-2.3	23.9	21.5	0.32	67	-2.2	26.6	24.4	0.45
		(3.7)	(10.7)	(10.0)	(0.17)		(3.8)	(10.5)	(9.7)	(0.20)		(3.8)	(11.0)	(10.3)	(0.24)

Note: *I* refers to number of countries in each group; standard deviation reported in parenthesis below mean values.

A. Effective Checks and Balances and Discretional Component of PBC

We look at the influence of electoral cycles on the behavior of the budget surplus as a percentage of GDP, *bal*. We concentrate on the electoral dummy *pbc*, which takes value

1 in electoral years, –1 in post-electoral years, and 0 otherwise. This variable is meant to capture both pre and post-electoral effects, following the approach in Shi and Svensson (2002a). It is constructed with the *ele* variable in Brender and Drazen (2003), which only takes elections when the polity index is non-negative, combined with its lead, *ele(+1)*.[8]

Persson and Tabellini (2002) remark that pre and post electoral effects may differ, so we first check if the restriction that the coefficient estimate of *ele* is equal to the coefficient estimate of minus *ele(+1)* is not rejected by the data.

Column (1) of Table 4 shows that the restriction that the pos-electoral contraction in the budget surplus as a percentage of GDP (*bal*) is of the same size as the pre-electoral expansion is not rejected by the annual data. We can interpret the effect of PBC as short-run displacements: the surplus falls below its trend, and then jumps above it, if expenditures are speeded up, and taxes postponed, around elections.

Column (2) of Table 4 shows that the electoral cycle measured by the *pbc* dummy variable shows a fall of 0.3 p.p. of GDP in the surplus before elections, and an equivalent rise after elections. The pattern observed by Shi and Svensson (2002a,b) that electoral cycles are stronger in developing countries appears here, though the difference is not statistically significant.[9]

Column (5) tests whether effective checks and balances (*checks=vetoplayer*law*) have a moderating influence on PBC, i.e., whether the coefficient estimate of the compound variable *pbc_checks=pbc*checks* shows the theoretically expected positive sign. We also use in column (3) an alternative measure *pbc_checksd=pbc*checksd*, where we define a dummy variable *lawd* that takes value 1 if *law* is larger than 4 in all years that are reported for a given country, and 0 otherwise, so *checksd=vetoplayer*lawd*. This treatment implies treating rule of law as a fixed characteristic, so each country has either low or high rule of law. This has the advantage of extending the available data to the whole period, since the data on rule of law is only available since 1982. The disadvantage is losing the variation over time of rule of law. Columns (3) and (5) of Table 4 show that either version of effective checks and balances moderate PBC, though in column (5) they do not have a significant influence by themselves (the probability value is 0.113).

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[8] Brender and Drazen (2004) adjust the election years in several countries, based on the difference between fiscal and calendar year. We prefer to stick to the original election dates in Brender and Drazen (2003).

[9] Dividing *pbc* in column (2) of Table 1 into *pbc_oecd=pbc*oecd* and *pbc_noecd=pbc*(1-oecd)*, the coefficients are –0.214 (t=-2.14) and –0.401(t=-3.60). With p-value 0.2118, an F-test cannot reject the equality of both coefficients.

Table 4. Discretional PBC in All Democracies

Dependent variable: *bal*	(1)	(2)	(3)	(4)	(5)	(6)
bal(-1)	0.613	0.613	0.615	0.615	0.469	0.469
	(31.57)***	(31.57)***	(30.74)***	(30.76)***	(16.17)***	(16.19)***
Lngdp_pc	0.463	0.475	0.578	0.578	0.400	0.406
	(1.37)	(1.40)	(1.64)*	(1.64)*	(0.55)	(0.56)
gdpr	0.091	0.091	0.106	0.106	0.107	0.107
	(5.01)***	(4.99)***	(5.57)***	(5.57)***	(4.27)***	(4.27)***
trade	0.003	0.003	0.001	0.001	0.010	0.010
	(0.62)	(0.61)	(0.24)	(0.24)	(1.08)	(1.07)
Pop65	-0.031	-0.034	-0.062	-0.062	0.341	0.341
	(-0.39)	(-0.44)	(-0.76)	(-0.76)	(1.85)*	(1.85)*
Pop1564	0.037	0.037	0.036	0.036	0.013	0.014
	(0.98)	(0.99)	(0.87)	(0.87)	(0.15)	(0.16)
ln(1+pi)	1.504	1.499	1.612	1.607	1.555	1.545
	(2.54)**	(2.53)**	(2.68)***	(2.67)***	(2.13)**	(2.12)**
ln(1+pi)sq	-0.095	-0.091	-0.107	-0.105	-0.187	-0.184
	(-0.55)	(-0.53)	(-0.62)	(-0.61)	(-0.93)	(-0.91)
checks					-0.975	-0.978
					(-1.42)	(-1.43)
checksd			-0.043	-0.032		
			(-0.05)	(-0.04)		
Ele	-0.223					
	(-1.75)*					
ele(+1)	0.371					
	(2.92)***					
Pbc		-0.297	-0.465		-0.793	
		(-3.99)***	(-3.91)***		(-3.30)***	
Pbc_checks					0.700	
					(1.59)	
Pbc_checksd			0.398			
			(1.82)*			
Pbc_dis						-0.851
						(-4.61)***
Pbc_disd				-0.483		
				(-4.30)***		
constant	-8.065	-8.105	-8.622	-8.633	-10.236	-10.345
	(-2.12)*	(-2.13)**	(-2.06)**	(-2.06)**	(-1.30)	(-1.32)
Method of estimation	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects
R^2 within	0.4822	0.4820	0.4850	0.4849	0.3547	0.3546
R^2 between	0.8577	0.8577	0.8601	0.8600	0.2907	0.2891
R^2 overall	0.6533	0.6534	0.6589	0.6590	0.3131	0.3118
No. countries	67	67	64	64	64	64
No. observations	1575	1575	1488	1488	860	860
p-value F-test:						
ele = -ele(+1)	0.4733	-	-	-	-	-
Pbc = -pbc_checks	-	-	-	-	0.7061	-
pbc=-pbc_checksd	-	-	0.6538	-	-	-

Notes: t statistics in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level. To control for time effects, dummies are included for each five-year period from 1960-64 to 1995-99, while the years 2000-01 are the base level. These coefficients are not reported.

Our main interest is in the net effect of checks and balances, given our conjecture that at least one effective veto player will prevent PBC. Specifically, the variable that isolates what can be called the discretional component of cycles is *pbc_dis=pbc**(1-*checks*), or *pbc_disd=pbc**(1-*checksd*). The discretional component of

PBC is an adjustment that implies, at one extreme, that if the legislature is perfectly aligned with the executive (*vetoplayer*=0), or if the observance of rule of law is very low (*law=0*, *lawd*=0), the original *pbc* variable is unchanged. At the other extreme, if the legislature is not aligned with the executive and constitutes a veto player (*vetoplayer*=1), and there is a high value of rule of law (*law*=1, *lawd*=1), an election year would not be counted as such because the electoral cycle would be completely counteracted by the legislative checks and balances.

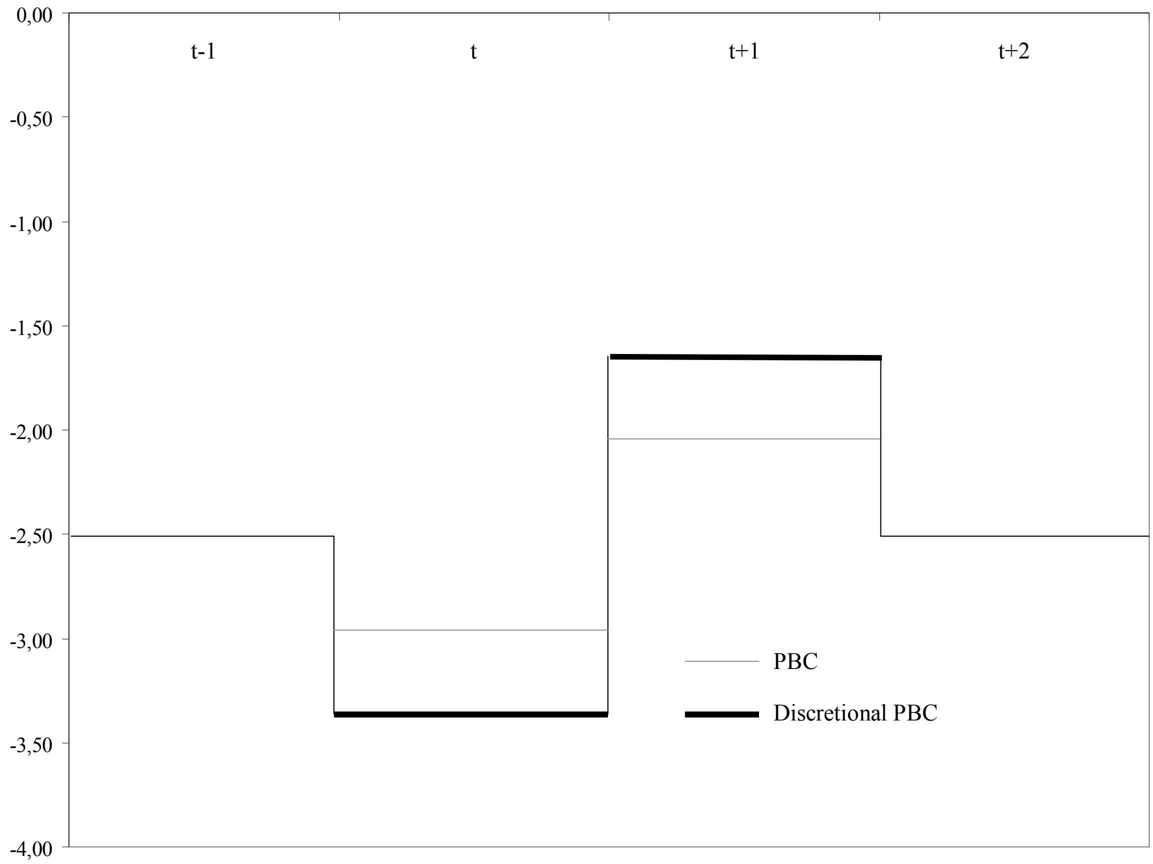
Given that the coefficients of *pbc* and *pbc_checks* (*pbc_checksd*) are of the similar magnitude but opposite sign, we formally test the hypothesis that the coefficient of *pbc* is equal to minus the coefficient of *pbc_checks* (*pbc_checksd*). The F-tests in Table 4 do not allow to reject this.[10] Columns (4) and (6) present the estimates with the discretional component of cycles.

The effects of discretional PBC are significant at the 1% level, as are those of standard PBC in column (2). However, once we isolate the discretional component, the estimated impact is larger for a country with no effective checks and balances: in contrast to the base estimate of 0.30 p.p. of GDP using *pbc*, the effect is 0.48 p.p. of GDP according to *pbc_disd*, and 0.85 p.p. of GDP according to *pbc_dis*. Part of the difference is due to different time periods: when *pbc_disd* in (4) is restricted to the same period as (6), the coefficient rises to 0.66 p.p. of GDP. As to the remainder, *pbc_disd* captures average rather than marginal effects, showing the influence of political constraints with switch from a low rule of law to a high rule of law country. In what follows we focus on *pbc_dis*.

There are elections on average every four years. Figure 1 depicts the time path around a year of elections *t* of the average budget surplus implied by *pbc* (-0.45) and by the discretional component *pbc_dis* (-0.85), around the mean value of *bal*= –2.50 in the 1982-2001 period (a common set of observations are used for comparability).

[10] This also avoids multicollinearity, given the pair-wise correlation of 0.90 between *pbc* and *pbc_checks*, and 0.77 between *pbc* and *pbc_checksd*.

Figure 1. Time Path of Budget Balance around Elections



B. OECD and non-OECD countries

Our aim now is to review the Schuknecht (1996) conjecture that stronger PBC in developing countries might be related to weaker checks and balances there.

Effective checks and balances are indeed smaller in developing countries: *checks* equals 0.32 in non-OECD countries, compared to 0.64 in OECD countries (see Table 3). Consequently, discretionality is larger in non-OECD countries, which implies stronger PBC in non-OECD countries: multiplying the average degree of discretionality in each group by the coefficient estimate in column (6) of Table 4 implies that PBC in developing countries have an impact of -0.6 p.p. of GDP in non-OECD countries, against -0.3 p.p. of GDP in OECD countries. This agrees with Shi and Svensson (2002a, b), though the channel is that conjectured by Schuknecht (1996): larger checks and balances moderate cycles in developed countries.

Table 5. Discretional PBC in OECD Countries

Dependent variable: *bal*	(1)	(2)	(3)	(4)	(5)	(6)
bal(-1)	0.781 (35.26)***	0.781 (35.29)***	0.783 (35.38)***	0.783 (35.41)***	0.777 (23.97)***	0.777 (23.99)***
lngdp_pc	0.672 (1.35)	0.675 (1.36)	0.678 (1.36)	0.678 (1.37)	0.375 (0.41)	0.384 (0.42)
Gdpr	0.153 (6.28)***	0.153 (6.29)***	0.153 (6.31)***	0.154 (6.31)***	0.198 (4.81)***	0.199 (4.84)***
Trade	-0.004 (-0.55)	-0.004 (--0.55)	-0.004 (-0.57)	-0.004 (-0.57)	-0.002 (-0.11)	-0.002 (-0.12)
pop65	-0.023 (-0.30)	-0.023 (-0.31)	-0.026 (-0.34)	-0.026 (-0.34)	0.229 (1.42)	0.228 (1.42)
pop1564	0.028 (0.61)	0.028 (0.61)	0.028 (0.60)	0.278 (0.60)	-0.956 (-0.81)	-0.097 (-0.82)
ln(1+pi)	-2.882 (-1.24)	-2.886 (-1.24)	-2.818 (-1.22)	-2.828 (-1.22)	-2.947 (-0.76)	-2.999 (-0.77)
ln(1+pi)sq	2.710 (0.68)	2.721 (0.68)	2.614 (0.66)	2.629 (0.66)	5.025 (0.88)	5.161 (0.90)
checks					-0.441 (-0.50)	-0.456 (-0.51)
checksd			-0.116 (-0.16)	-0.120 (-0.17)		
ele	-0.225 (-1.87)*					
ele(+1)	0.246 (2.03)**					
pbc		-0.236 (-3.40)***	-0.703 (-3.15)***		-1.250 (-3.03)***	
pbc_checks					1.396 (2.25)**	
pbc_checksd			0.730 (2.20)**			
pbc_dis						-1.061 (-4.02)***
pbc_disd				-0.675 (-4.06)***		
constant	-8.238 (-1.42)	-8.248 (-1.42)	-8.217 (-1.42)	-8.218 (-1.42)	-0.549 (-0.05)	-0.518 (-0.05)
Method of estimation	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects
R^2 within	0.7348	0.7348	0.7366	0.7366	0.7100	0.7097
R^2 between	0.9821	0.9820	0.9824	0.9824	0.9770	0.9771
R^2 overall	0.8466	0.8465	0.8474	0.8474	0.8504	0.8503
No. countries	23	23	23	23	23	23
No. observations	779	779	779	779	387	387
p-value F-test:						
ele = -*ele(+1)*	0.9152	-	-	-	-	-
pbc= - *pbc_checks*	-	-	-	-	0.5519	-
pbc= - *pbc_checksd*	-	-	0.8461	-	-	-

Notes: t statistics in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level. To control for time effects, dummies are included for each five-year period from 1960-64 to 1995-99, while the years 2000-01 are the base level. These coefficients are not reported.

Table 6. Discretional PBC in Non-OECD Countries

Dependent variable: *bal*	(1)	(2)	(3)	(4)	(5)	(6)
bal(-1)	0.483	0.482	0.472	0.472	0.199	0.205
	(15.90)***	(15.91)***	(14.43)***	(14.45)***	(4.62)***	(4.75)***
lngdp_pc	0.021	0.033	0.172	0.173	-0.093	-0.016
	(0.04)	(0.07)	(0.34)	(0.34)	(-0.09)	(-0.02)
Gdpr	0.057	0.056	0.069	0.069	0.056	0.056
	(2.21)***	(2.18)**	(2.44)**	(2.44)**	(1.80)*	(1.80)*
Trade	0.010	0.010	0.010	0.010	0.029	0.277
	(1.43)	(1.43)	(1.22)	(1.22)	(2.50)**	(2.37)**
pop65	0.301	0.297	0.188	0.186	-0.190	-0.222
	(1.36)	(1.34)	(0.74)	(0.74)	(-0.33)	(-0.39)
pop1564	0.021	0.021	0.027	0.027	-0.071	-0.048
	(-0.34)	(0.34)	(0.40)	(0.41)	(-0.44)	(-0.30)
ln(1+pi)	1.219	1.209	1.322	1.325	0.079	0.083
	(1.57)	(1.56)	(1.64)	(1.64)	(0.09)	(0.09)
ln(1+pi)sq	-0.133	-0.128	-0.155	-0.155	-0.010	-0.004
	(-0.61)	(-0.59)	(-0.68)	(-0.68)	(-0.04)	(-0.02)
Checks					-0.698	-0.756
					(-0.75)	(-0.81)
Checksd			0.970	0.972		
			(0.48)	(0.48)		
Ele	-0.270					
	(-1.21)					
ele(+1)	0.439					
	(1.97)*					
Pbc		-0.355	-0.396		-0.317	
		(-2.67)***	(-2.54)**		(-0.96)	
pbc_checks					-0.631	
					(-0.75)	
pbc_checksd			0.191			
			(0.34)			
pbc_dis						-0.697
						(-3.00)***
pbc_disd				-0.405		
				(-2.61)***		
Constant	-6.066	-6.102	-7.179	-7.211	0.657	-0.940
	(-1.19)	(-1.20)	(-1.23)	(-1.24)	(0.06)	(-0.08)
Method of estimation	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects
R^2 within	0.3232	0.3230	0.3082	0.3080	0.1933	0.1882
R^2 between	0.2728	0.2764	0.3275	0.3310	0.2812	0.3196
R^2 overall	0.3489	0.3504	0.3743	0.3757	0.2279	0.2438
No. countries	44	44	41	41	41	41
No. observations	796	796	709	709	473	473
p-value F-test:						
ele = - ele(+1)	0.6379	-	-	-	-	-
pbc = - pbc_checks	-	-	-	-	0.1029	-
pbc = - pbc_checksd	-	-	0.6957	-	-	-

Notes: t statistics in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level. To control for time effects, dummies are included for each five-year period from 1960-64 to 1995-99, while the years 2000-01 are the base level. These coefficients are not reported.

Discretional PBC do not give the slightest hint that cycles are different in OECD and non-OECD countries.[11] However, as a sensitivity test we divide the estimates into

[11] For example, breaking down *pbc_dis* in column (6) of Table 1 into *pbc_dis_oecd=pbc_dis*oecd* and *pbc_dis_noecd=pbc_dis*(1-oecd)*, the coefficients are –0.856 (t=-2.31) and –0.850 (t=-3.99). With p-value 0.9875, an F-test cannot reject the hypothesis that both coefficients are identical.

separate two groups. Table 5 shows the same estimates as Table 1, but restricted to OECD countries, while Table 6 shows non-OECD countries.

The results for OECD countries basically parallel those for the complete set of democracies. The differences appear for non-OECD countries, where our measures of legislative checks and balances in columns (3) and (5) of Table 6 are not statistically significant. Part of the explanation might be a threshold effect: when using the variable *checksd=vetoplayer*lawd*, this variable mostly takes value zero in non-OECD countries because they have low values for rule of law, so a veto player might be ineffective unless a certain minimum threshold of rule of law is surpassed.

What is clear from Tables 5 and 6 is that the model works a lot better in OECD countries, in great extent due to the larger persistence of the budget surplus in OECD countries, which makes it more predictable.

C. Budget Balance, Expenditures and Revenues: Persistence Effects

Besides the direct effect of checks and balances on the level of electoral cycles, we additionally consider their indirect effect on persistence, given the observation in Tsebelis (2002) that more veto players should lead to more persistence of policies.

Column (1) of Table 7 only differs from column (6) of Table 4 in the inclusion of the lagged term *bal(-1)_dis=bal(-1)*(1-checks)*, where the past surplus interacts with the current degree of discretionary power. More discretion (less effective checks and balances) decreases the persistence of budget surpluses (deficits), which can help explain why the budget balance in OECD countries has more persistence than non-OECD countries. As in the literature on the costs of coalition governments and divided government, this might be an indication of how checks and balances can make it harder for governments to adjust the budget surplus (or deficit) in any year. However, this specific variable does not explain the variation within the group of OECD or non-OECD countries, something that is discussed further in the next Sub-section.

Table 7. Discretional PBC in All Democracies: Budget Balance, Expenditure and Revenues

Dependent variable: *y*	*y = bal*		*y= texp*		*y= trg*	
	(1)	(2)	(3)	(4)	(5)	(6)
y(-1)	0.791	1.099	0.720	0.995	0.569	0.440
	(11.87)***	(9.11)***	(9.61)***	(9.15)***	(6.71)***	(5.48)***
Lngdp_pc	0.342	-1.74	-1.737	-0.474	-2.091	-1.379
	(0.48)	(-0.61)	(-1.21)	(-0.21)	(-1.63)	(-0.80)
Gdpr	0.105	0.159	-0.111	-0.118	0.003	0.004
	(4.25)***	(4.35)***	(-2.26)**	(-4.22)***	(0.06)	(0.20)
Trade	0.016	0.027	0.014	0.041	0.002	0.017
	(1.75)*	(1.56)	(0.74)	(3.30)	(0.12)	(1.97)**
pop65	0.258	2.988	1.422	5.615	1.859	-0.120
	(1.42)	(0.96)	(3.89)***	(1.70)*	(5.61)***	(-0.07)
pop1564	0.058	0.101	0.181	-0.685	0.157	-2.481
	(0.66)	(0.11)	(1.02)	(-0.96)	(0.98)	(-3.22)***
ln(1+pi)	1.096	3.996	-2.245	-1.540	0.044	-2.681
	(1.52)	(2.21)**	(-1.57)	(-0.80)	(0.03)	(-2.23)**
ln(1+pi)sq	-0.141	-0.862	0.396	0.401	0.139	0.770
	(-0.71)	(-2.32)**	(1.00)	(1.09)	(0.39)	(2.26)**
Checks	0.326	2.835	-1.088	-18.201	0.825	-0.895
	(0.46)	(1.94)*	(-0.37)	(-3.40)***	(0.29)	(-0.26)
pbc_dis	-0.787	-0.697	0.645	0.637	-0.231	-0.682
	(-4.33)***	(-6.01)***	(1.79)*	(2.51)**	(-0.71)	(-1.75)*
y(-1)_dis	-0.604	-1.041	-0.007	-0.645	0.093	-0.053
	(-5.34)***	(-5.30)****	(-0.07)	(4.14)***	(0.93)	(-0.48)
Constant	-12.783	-0.176	-0.979	0.096	1.843	0.380
	(-1.65)*	(-0.71)	(-0.06)	(0.57)	(0.13)	(2.79)***
Method of estimation	Fixed-effects	Arellano-Bond Two-Step	Fixed-effects	Arellano-Bond Two-Step	Fixed-effects	Arellano-Bond Two-Step
R^2 within	0.3773	-	0.3006	-	0.2228	-
R^2 between	0.3392	-	0.8497	-	0.7606	-
R^2 overall	0.3557	-	0.7621	-	0.6867	-
Sargan Test[b]	-	1.000	-	1.000	-	1.0000
2nd Order Serial Correlation Test[c]	-	0.1107	-	0.9598	-	0.6452
No. countries	64	62	64	62	64	62
No. observations	860	725	868	733	860	725

Notes: For fixed effects estimates, t statistics in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level. To control for time effects, dummies are included for each five-year period from 1980-84 to 1995-99, while the years 2000-01 are the base level. These coefficients are not reported. For GMM estimates, z statistics in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level. The instruments used in GMM regressions are two lags of the dependent variable and one lag of covariates. Reported coefficients correspond to the lagged first difference of the dependant variable (second lag not reported) and the first difference of covariates (lagged differences not reported). All instruments are treated as strictly exogenous. (a) Using heteroskedastic-consistent estimator of the variance-covariance matrix of the parameter estimates. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. In one-step estimations p-values come from the one step homoskedastic estimator. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

To track the possible sources of discretional PBC in the budget surplus, columns (3) and (5) show the results with total expenditure (*texp*) and total revenue and grants (*trg*) as dependant variables. The discretional PBC cycle is related to a tendency of expenditure to go up, and revenues to go down, in election years (a pattern that is reversed after elections). These effects are not always statistically significant by themselves in the FE estimates. However, it is clear that their combined effect leads to a significant electoral cycle in the budget in column (1). In this sense, the budget surplus is a more sensitive indicator of PBC than its components.

All the regressions so far use country fixed effects. The use of fixed effects estimators in a regression with lagged dependent variables, as in our case with *bal(-1)*, introduces a potential bias. Since the order of the bias is 1/T, were T is the length of the panel, we expect a small bias.[12] The Arellano-Bond procedure addresses this bias. Nevertheless, it makes use of the lagged values of the explanatory variables as instruments, and this reduces the set of observations. To make sure the estimates are robust to different econometric methodologies, results from the two methods are reported.

Columns (2), (4) and (6) were carried out with the GMM estimator using the Arellano-Bond procedure. We used the one step heteroskedastic-consistent estimator of the variance-covariance matrix of the parameter estimates and the two-step estimator, presenting the best results according to the Sargan test and the second order correlation test. The results from the GMM estimates confirm the results from FE estimates for the relevant variables. Indeed, the GMM estimates of Table 7 show more clearly that effective checks and balances have significant impacts on PBC in the budget surplus, expenditures and revenues. On the other hand, effective checks and balances do not affect the persistence of revenues, only of the budget surplus and expenditures.

D. Rich Established Democracies and Poor Young Democracies

Given the fact that voters in established democracies might behave as fiscal conservatives that punish deficit spending, Brender and Drazen (2004) designed a filter variable *newd* to take into account whether a country is a new democracy or not. We classify a country as *newd* if, according to Brender and Drazen (2004), any of the elections in the sample period belongs to the first four competitive elections.

[12] There are on average between 13 and 14 observations per country in columns (1), (3) and (5).

The fact that new democracies have lower effective checks and balances than old democracies (*checks* of 0.34 vs. 0.55) can help explain the results in Brender and Drazen (2004) on PBC being significant in new democracies. Taking into account *newd*, we present estimates for the two most typical groups: OECD countries that are established democracies (19 out of 23 OECD countries fall into that category) and non-OECD countries that are new democracies (32 out of 44 non-OECD countries).

Table 8. Discretional PBC in Established OECD Democracies

Dependent variable: *bal*	Total (1)	Total (2)	Parliamentary (3)	Proportional (4)	Majoritarian (5)
bal(-1)	0.716	0.774	0.716	0.722	0.767
	(10.75)***	(5.29)***	(10.54)***	(10.14)***	(1.74)*
lngdp_pc	-0.104	0.573	-0.447	-0.437	-0.044
	(-0.12)	(0.17)	(-0.48)	(-0.43)	(-0.02)
gdpr	0.231	0.235	0.235	0.238	0.228
	(5.12)***	(3.15)***	(4.98)***	(4.66)***	(2.02)*
trade	-0.002	-0.020	-0.007	-0.017	-0.011
	(-0.16)	(-0.83)	(-0.48)	(-0.90)	(-0.18)
pop65	0.517	0.483	0.566	0.534	1.658
	(2.90)***	(0.61)	(3.07)***	(2.75)***	(1.48)
pop1564	0.021	0.223	0.092	0.143	-0.642
	(0.14)	(0.58)	(0.59)	(0.80)	(-0.75)
ln(1+pi)	4.719	8.600	4.732	4.224	21.956
	(1.17)	(0.99)	(1.14)	(0.97)	(0.69)
ln(1+pi)sq	-9.611	-16.442	-9.421	-8.557	-30.952
	-1.33	(-1.50)	(-1.28)	(-1.10)	(-0.10)
checks	-0.954	-0.373	-0.816	-0.833	-9.359
	(-0.93)	(-0.25)	(-0.78)	(-0.72)	(-2.11)**
pbc_dis	-0.817	-0.749	-0.821	-0.802	-0.912
	(-2.89)***	(-3.32)***	(-2.76)***	(-2.41)**	(-1.91)*
bal(-1)_dis	0.218	-0.382	0.208	0.202	-0.387
	(1.17)	(-1.03)	(1.09)	(0.97)	(-0.37)
Constant	-7.138	0.022	-8.864	-11.219	25.137
	(-0.60)	(0.31)	(-0.71)	(-0.84)	(0.38)
Method of estimation	Fixed-effects	Arellano-Bond One-Step[a]	Fixed-effects	Fixed-effects	Fixed-effects
R^2 within	0.7844	-	0.7836	0.7797	0.8739
R^2 between	0.8790	-	0.8353	0.7996	0.9918
R^2 overall	0.8292	-	0.8065	0.7900	0.3091
Sargan Test[b]	-	1.000			
2nd Order Serial Correlation Test[c]	-	0.2276			
No. countries	19	19	18	16	3
No. observations	319	279	302	266	53

Note: For fixed effects estimates and GMM estimates, see notes below Table 4.

Table 9. Discretional PBC in Young Non-OECD Democracies

Dependent variable: *bal*	Total (1)	Total (2)	Presidential (3)	Parliamentary (4)	Proportional (5)	Majoritarian (6)
bal(-1)	0.347	0.263	0.307	0.415	0.274	1.040
	(1.73)*	(1.07)	(1.22)	(1.14)	(1.21)	(2.68)**
lngdp_pc	-1.948	1.490	-3.489	-1.834	-1.728	-12.802
	(-1.00)	(0.35)	(-1.55)	(-0.34)	(-0.80)	(-1.37)
Gdpr	0.114	0.097	0.126	0.038	0.106	0.106
	(2.88)***	(1.27)	(2.77)***	(0.40)	(2.41)**	(1.06)
Trade	-0.005	0.002	-0.008	-0.032	-0.005	0.009
	(-0.26)	(0.06)	(-0.35)	(-0.72)	(-0.24)	(0.18)
Pop65	0.081	9.437	0.709	-0.187	0.154	-1.326
	(0.12)	(1.84)	(0.86)	(-0.09)	(0.21)	(-0.29)
Pop1564	-0.005	-1.264	0.306	0.678	0.008	-1.050
	(-0.02)	(-1.31)	(0.13)	(0.71)	(0.04)	(-0.90)
ln(1+pi)	1.294	0.256	1.330	-14.020	1.027	12.236
	(1.25)	(0.16)	(1.19)	(-1.38)	(0.93)	(0.88)
ln(1+pi)sq	-0.391	-0.214	-0.407	10.888	-0.349	-95.469
	(-1.46)	(-0.87)	(-1.42)	(1.58)	(-1.22)	(-1.37)
Checks	-2.485	-1.952	-1.981	-1.170	-3.693	5.427
	(-1.96)**	-(1.49)	(-1.27)	(-0.48)	(-2.52)**	(1.92)*
Pbc_dis	-0.626	-0.755	-0.583	-0.986	-0.807	0.107
	(-2.01)**	(-2.91)***	(-1.70)*	(-1.08)	(-2.26)**	(0.26)
bal(-1)_dis	-0.423	0.327	-0.396	-0.084	-0.344	-1.140
	(1.44)	(1.03)	(-1.10)	(-0.10)	(-1.04)	(-2.13)**
Constant	12.398	0.037	18.960	-23.638	10.192	158.757
	(0.81)	(0.27)	(1.13)	(-0.48)	(0.60)	(1.41)
Method of estimation	Fixed-effects	Arellano-Bond One-Step[a]	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects
R^2 within	0.1379	-	0.1410	0.3828	0.1481	0.6023
R^2 between	0.0394	-	0.2876	0.9269	0.0263	0.5365
R^2 overall	0.0011	-	0.0176	0.8230	0.0249	0.4363
Sargan Test[b]	-	1.000				
2nd Order Serial Correlation Test[c]	-	0.1134				
No. countries	30	28	24	6	26	4
No. observations	294	235	251	43	255	39

Note: For fixed effects estimates and GMM estimates, see notes below Table 4.

Columns (1) and (2) of Table 8 show that PBC are significant even if one restricts the sample to rich established democracies, where Shi and Svensson (2002a) and Brender and Drazen (2004) note that voters are more informed and experienced. The main difference with column (1) of Table 7 is that the degree of discretion does not significantly affect the persistence of the budget deficit. Similar remarks hold for poor new democracies in Table 9.

Persson and Tabellini (2002) focus on the effects of different forms of government (presidential or parliamentary) and electoral rules (proportional or majoritarian) on PBC. The approach followed here in principle attempts to reduce these institutional differences to a common metric of veto players (Tsebelis (2002)).

The finding in Persson and Tabellini (2002) of stronger PBC in countries with presidential systems can be linked in our framework to lower effective checks and balances compared to countries with parliamentary systems (*checks* of 0.33 vs. 0.60).[13] We cannot explain differences between countries with proportional or majoritarian electoral rules, because they do not differ much according to checks and balances (*checks* of 0.46 vs. 0.41).

Introducing dummies to condition discretional PBC for form of government or electoral rules leads to find that cycles do not differ significantly between these groups. Given the large standard errors of coefficients, we do not present the full results, but rather show the sensitivity of the estimates in Tables 8 and 9 when they are restricted to subgroups of countries. The results on discretional PBC in Table 8 for rich established democracies remain unchanged, except for the subset of presidential countries where there are insufficient degrees of freedom to run a separate regression. As for poor new democracies in Table 9, we are not able to get significant results for parliamentary and majoritarian countries, but we have few observations (and large standard errors).

Our results always show clear evidence of discretional PBC in countries with proportional electoral rules, but this might be simply due to the fact that this is the group with the most observations (in our complete sample, 55 of the 67 countries have this electoral rule). In poor new democracies, presidential countries have significant discretional PBC, and in rich established democracies, parliamentary and majoritarian countries have significant discretional PBC.

VI. Final remarks

Aggregate electoral cycles are more controversial than electoral cycles in the composition of government spending, due to the weak evidence on aggregate PBC in OECD countries. Following the insight in Alesina and Rosenthal (1995) that divided government moderates executive discretion, we use the Henisz political constraints index to derive the presence of a legislative veto player, and combine it with the degree of rule of law to have a measure of the effective checks and balances that the executive faces and isolate the discretional component of PBC.

Given the literature on how coalition governments and divided government can make it harder to adjust to shocks (Roubini and Sachs (1989), Alt and Lowry (1994)), we also control for the influence of effective checks and balances on the persistence of the budget surplus. Though we find that less discretion indeed increases the persistence

[13] 18 of the 37 presidential systems are in Latin America, a region characterized by developing countries that are almost all new democracies

of the budget surplus, this result vanishes when we consider OECD and non-OECD countries separately.

Our main finding is that effective checks and balances play a significant role in moderating PBC in OECD countries, reducing the size of cycles. After conditioning for this, discretional PBC are still present in the countries with the best-informed and experienced voters, namely, OECD countries that are established democracies. This points to a promising path using more detailed measures of veto players and budget institutions.

Our results complement those of Alt and Lassen (2004), who find electoral cycles in fiscal balance in advanced industrialized democracies when there is low transparency, while no such cycles can be observed with high transparency. Together with asymmetric information and learning by voters (and policy players), the message here is that discretionality matters. Incidentally, transparency might not be independent from checks and balances, since the requirement of reliable information on government activities is usually a demand of opposition parties.

Finally, our results can be given an econometric interpretation. There is a errors-in-variables problem in the existing literature if the discretionary component of PBC is the relevant variable. We can also give an omitted variable interpretation, where effective checks and balances is the missing variable. This omission is particularly serious in OECD countries that are established democracies, because they are positively correlated with high checks and balances, biasing the estimate of PBC downwards.

References

Akhmedov, Akhmed And Zhuravskaya, Ekaterina (2004), "Opportunistic Political Cycles: Test in a Young Democracy Setting", *Quarterly Journal of Economics*, 119, 1301-1338.

Alesina, Alberto, And Rosenthal, Howard (1995), *Partisan Politics, Divided Government and the Economy* (Cambridge, UK: Cambridge University Press).

Alesina, Alberto, Roubini, Nouriel And Cohen, Gerald D. (1997), *Political Cycles and the Macroeconomy* (Cambridge, MA: MIT Press).

Alt, James E., And Lassen, David D. (2004), "The Electoral Cycle in Debt is Where You Can't See It: Fiscal Transparency and Electoral Policy Cycles in Advanced Industrialized Democracies" (Manuscript, Harvard University and University of Copenhagen).

Alt, James E., And Lowry, Robert C. (1994), "Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States", *American Political Science Review*, 88, 811-828.

Arellano, Manuel And Bond, Stephen (1991), "Some Tests Of Specification For Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58, 277-297.

Brender, Adi And Drazen, Allan (2003), "Where Does The Political Budget Cycle Really Come From?" (Discussion Paper 4049, CEPR).

Brender, Adi And Drazen, Allan (2004) "Political Budget Cycles In New Versus Established Democracies" (Working Paper 10539, NBER).

Drazen, Allan (2001), "Laying Low During Elections: Political Pressure And Monetary Accommodation" (Manuscript, University of Maryland).

Henisz, Witold J. (2000), "The Institutional Environment For Growth", *Economics and Politics*, 12, 1-31.

Henisz, Witold J. (2002), "Polcon_2002 Codebook" (Manuscript, University Of Pennsylvania).

Kydland, Finn E., And Prescott, Edward C. (1977), "Rules Rather Than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, 85, 473-91.

Lohmann, Suzanne (1998a), "Rationalizing the Political Business Cycle: A Workhorse Model", *Economics and Politics*, 10, 1-17.

Lohmann, Suzanne (1998b), "Institutional Checks and Balances and the Political Control of the Money Supply", *Oxford Economic Papers*, 30, 360-377.

Persson, Torsten, Roland, Gerard And Tabellini, Guido (1997), "Separation of Powers and Political Accountability", *Quarterly Journal of Economics*, 112, 1163-1202.

Persson, Torsten And Tabellini, Guido (2002), "Do Electoral Cycles Differ Across Political Systems?" (Manuscript, IGIER and Bocconi University).

Rogoff, Kenneth (1990), "Equilibrium Political Budget Cycles", *American Economic Review* , 80, 21-36.

Rogoff, Kenneth and Sibert, Anne (1988), "Elections and Macroeconomic Policy Cycles", *Review of Economic Studies*, 55, 1-16.

Roubini, Nouriel And Sachs, Jeffrey D. (1989), "Political and Economic Determinants of Budget Deficits in the Industrial Democracies", *European Economic Review*, 33, 903-33.

Saporiti, Alejandro D. And Streb, Jorge M. (2004), "Separation of Powers and Political Budget Cycles" (Manuscript, Universidad del CEMA).

Schuknecht, Ludger (1996), "Political Business Cycles in Developing Countries", *Kyklos*, 49, 155-70.

Shi, Min And Svensson, Jakob (2002a), "Conditional Political Budget Cycles" (Discussion Paper 3352, CEPR).

Shi, Min And Svensson, Jakob (2002b), "Political Budget Cycles in Developed and Developing Countries" (Manuscript, IIES, Stockholm University).

Stein, Ernesto H., Streb, Jorge M. And Ghezzi, Piero (2004), "Real Exchange Rate Cycles around Elections", *Economics & Politics*, forthcoming.

Streb, Jorge M. (2005), "Signaling in Political Budget Cycles. How Far are You Willing to Go?", *Journal of Public Economic Theory*, 7, 229-252.

Tufte, Edward R. (1978), *Political Control of the Economy* (Princeton, NJ: Princeton University Press).

Tsebelis, George (2002), *Veto Players. How Political Institutions Work* (New York, NY: Russell Sage Foundation).

Chapter 3
Conditional Political Budget Cycles in Argentine Provinces

I. Introduction

In this paper, we investigate the presence of electoraly-motivated manipulations in fiscal outcomes in Argentine provinces. We empirically address two main questions:

Are political budget manipulations present in executive election periods in Argentine provinces? And, are there any systematic differences in the size and composition of expenditures and revenues in provinces politically aligned with the federal executive?

The political budget cycles literature relates elections and policy makers' behavior conjecturing that by rising public expenditures in election periods the incumbent can increase his chance of reelection. The first generation studies were based on the idea of adaptive expectations, assuming that in the future the voter will act partly based on what happened in the past. Thus, he or she can systematically be deceived. Later on, following the trend in economic analysis, rational expectations were introduced in formal models. Rational voters builds conjectures related to the competency of the politician and by increasing spending the incumbent can signal his level of competence. Regarding the incumbent motivations, there is a division between opportunist politicians and partisan politicians; namely, those who want to rule for the sake of power itself and those who want to do so in order to put their preferred policies into practice.

In Argentina, the literature has not yet deeply analyzed the phenomenon of budget cycles in election times. Meloni (2001) explores this issue by analyzing the change in provincial current expenditure and its relation with the votes obtained by the governing party. However, this study was not explicitly performed within the framework of the political budget cycle theory.

Considering the federal organization of Argentine provinces, it might seem relevant to sort out evidence about the existence of cycles in fiscal variables that may represent some kind of opportunist behavior on the part of the incumbent looking for reelection. This paper empirically analyzes the evidence of cycles in fiscal balance, expenditures and revenues in 22 Argentine provinces during the period between 1985 and 2001, using econometric methods for panel data. We consider the executive election date as the main explanatory variable for budget cycles. The rest of this paper is structured as follows. The next section briefly summarizes the theoretical framework on political budget cycles. Section III presents the data set. Section IV describes the empirical specification and econometric techniques. The empirical results and discussion are reported in section V. Finally, Section VI concludes.

II. The Political Budget Cycle

A. Previous Literature

The first models that formalize the political behavior that generates cycles in economic variables in relation to the electoral calendar can be separated into two different views. One of them, called `Opportunistic Political Business Cycle´ makes emphasis on the opportunistic nature of the politician. This means that they have no other preference but to hold office, for which reason they act in such a manner to maximize the chances of being re-elected. The pioneering work of Nordhaus (1975) is within this trend, depicting the politician as a manipulator of pre-electoral outcomes. Lindbeck (1976) also follows this line.

There is another branch of the literature, the one in `Partisan Political Business Cycle´ that stresses the partisan nature – as an ideological aspect- of the incumbent (Hibbs 1977). In this case, cycles in economic variables are originated in the ideological preferences of the politician.

First generation models are based on adaptive expectations. This behavior is sometimes called `myopic´ (or irrational) on the part of the voter since, once the politician adopts expansive policies, the voter does not remember or does not take into account those recessive policies adopted by the incumbent in the past that they are likely to repeat in the future. It is worth noting that these models are based on the assumption of a negative relation between unemployment and inflation; that is, the possibility of exploiting a `Phillips curve´.

Models based on rational expectations (Kydland and Prescott 1977; and Barro and Gordon 1983) started to appear in the 80s. During the 90s -as well as in the present work- emphasis is made on fiscal policy rather than on monetary policy as the generator of cycles. Among the papers that are representative of this period are those by Rogoff and Sibert (1988) and Rogoff (1990). Here, the opportunist politician manipulates the expenditure policy during electoral years with the sole purpose of showing that they are competent, thus increasing their chances of winning the elections.

Recently, the literature has explored not only the level effect on fiscal variables but also the so-called composition effect; that is, how expenditure components (such as consumption and investment) change during this cycle of electoral origin. Among the contributions, those of Schucknecht (2000) and Block (2002) can be mentioned. Research into how institutional variables can impose (or relax) constraints on the cycle is not less relevant. That is, how strong institutions should temper the cycle and how, on the other hand, weak institutions would make way for the opportunist politician to distort policies. This kind of study, based on the exploration of institutional variables and their effects on the level and composition of the cycle can be seen in Shi and Svensson (2002) and in Block (2002).

This paper follows the line of models called `opportunist –rational´ that, according to the definition by Alesina, Rubini and Cohen (1997), present the following distinctive characteristics:

(i) Short-term manipulation of fiscal or monetary policy.
(ii) Strengthening of policies after the elections.
(iii) Non-systematic effects on unemployment.
(iv) Politicians struggling for re-election.

B. Theoretical Framework

According to the Rogoff (1990) approach, opportunistic politicians generates cycles in the economic variables while trying to show their competency, which cannot be directly observed by the voter. In this way, they are trying to increase their chances of being re-elected. One of the main issues is asymmetry in information: if the voters were able to directly observe the capacity or ability of the politician, their decision would be obvious.

The fact is that if ability is not easily observable then there is some possibility that the politicians manipulate fiscal policy in such a manner that they might seem to have more competency than the one they really have, thus augmenting the chances of winning the election. Rogoff´s model could be outlined as follows: the politician produces a public good using two inputs, taxes and their competency. The latter can be thought of as a parameter of productivity, since capable incumbents need fewer resources to make more things and vice-versa.

The voters observe taxes and expenditure (which have different grades of visibility) and use that information to make inferences about the politician’s capacity, which is not directly observable since other factors also influence elections vote is probabilistic and, there is some likelihood q that the politicians might be re-elected, and

(1-q) that might not. This information is known by them, for which reason they are tempted to take political steps so as to augment their chances for re-election *q*.
Rogoff concludes that given the informational asymmetries regarding the politician's capacity, expenditure will be increased by competent politicians - particularly the most clearly perceived by the voter- so as to pretend to be the most capable politician. In equilibrium, this behavior increases reelection chances of competent politicians.

Some aspects of visible and non-visible expenditures are worth noting. We have so far only referred to biases in expenditure towards its most visible components. Which type of expenditure are the most visible is not a clear-cut classification. Rogoff states that at election times, expenditure biases towards current expenditure, and this means an increase in current expenditure as a percentage of total expenditure. This point of view is not universally shared and empirical evidence appears divided.

Schuknecht (2000) assumes that the bias in expenditure in developing countries is towards capital goods. He states that starting great public works right before the elections, and then bringing them to a halt immediately after seems to be easier than increasing current expenditure, since the latter can entail short and long term commitments.

In the same vein, Krueger and Turán (1993) -when analyzing the electoral process in Turkey- argue that there are pre-electoral increases in both investment and infrastructure programs.

The empirical analysis in Schuknecht´s study is performed using relative per capita levels of expenditures. Current expenditure and capital expenditure (as percentage of per capita GDP), both increase before elections. Nevertheless, the composition effect, that is, the current (or capital) expenditure as a percentage of total expenditure is not directly analyzed. Consequently, what is in fact found out that total expenditure increases before elections. However, nothing clear can be stated regarding the bias of the composition effect. Similarly, the work by Krueger and Turán does not test the composition effect either.

On the other hand, Block (2002) follows Rogoff´s line of thought and argues that the bias in the composition effect moves towards current expenditure. However, he admits that the evidence accounting for his hypothesis becomes stronger when only the richest countries in the sample – controlling by per capita GDP– are taken into account.

In this paper we follow the approach presented by Block (2002) using current expenditure as percentage of total expenditures in order to test the possible bias in the expenditure composition ("composition effect") in election periods.

The idea that electoral budget cycles can be found at a sub-national level lies in the federal organization of Argentina. The Argentine Constitution, under sections 122 and 123 states: *`The provinces provide their own local institutions and are governed by them. They choose their governors, legislators and the rest of the provincial officers, without intervention of the Federal Government´* and *`each province writes its own constitution....regulating its scope and content in the institutional, political, administrative, economic and financial orders´*. The fiscal autonomy of provinces from the federal government is a factor that allows the potential existence of electoral budget cycles at a local level.

III. Data

We construct a panel data set to test the existence of electoral cycles in provincial fiscal variables. Our data set includes data on provincial government budget balance, spending and revenues, political data on provincial executive election dates and political party in power, per capita Gross Geographic Product (GGP) and GGP growth. Our database has annual observations for 22 provinces for the period between 1985 and 2001, averaging four provincial executive elections.

Two provinces were excluded from the original sample. First, the City of Buenos Aires is excluded from the analysis since it was only in the year 1996 that the elections for Chief of Government (i.e. governor) were held. Up to that moment, the City Mayor was directly appointed by the national executive power. Second, the province of Corrientes is the other exception, because it had to undergo two federal interventions during the 90s. The first one, in 1991, was due to disagreement between the provincial electors; and the one in 1999 was due to serious social disturbances. Both provinces were excluded from the database to perform the econometric estimation.

The source of the fiscal data is the Ministry of Economy (*"Dirección Nacional de Coordinación Fiscal con las Provincias, Secretaría de Hacienda del Ministerio de Economía y Producción de la Nación")*. Geographic Gross Product (GGP) estimates were taken from Mirabella (2002), who approach the provincial GGP using residential electricity consumption. Table 1 presents the variables used for the estimates and Table 2 presents descriptive statistics of the dependent fiscal variables.

Table 1: Definition of Variables

Dependent Variables (fiscal variables). (All values expressed in constant 1993 Argentine Pesos deflated by the combined prices index -wholesale-consumer- from INDEC)

DEF_{it}: Fiscal Balance [Deficit (-) Surplus (+)] divided by provincial GGP in province i year t
Source: MECON

TEit: Total Public Expenditure divided by GGP from province I
in year t. Source: own elaboration based on Ministry of Economy (MECON)

CE_{it}: Current Expenditure divided by public total expenditure in province i in year t. Source: MECON

TR_{it} : Total Provincial Revenue divided by GGP in the province i in year t (includes revenue from provincial taxes, federal revenue sharing –"coparcicipación federal"- and other federal transfers –"aportes del tesoro"- Source: MECON
PTR_{it}: Revenue from Provincial Taxes divided by provincial GGP in province i in year t. Source: MECON

FRit : Provincial revenues from federal revenue sharing ("coparticipation federal") plus transfers from federal government divided by provincial GGP in province i in year t. Source: MECON

Control Variables

$GGP_{it:}$: Natural log of per capita Geographic Gross Product of province i during year t
Source: Mirabella (2002) and National Institute of Statistics and Census (INDEC)

$GROWTH_{it}$: GGP Growth rate in the province i between the year t and the t-1
Source: Mirabella (2002).

Election Variables

ELE_{it}: Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and 0 otherwise.
Source: own elaboration based on "Guia Electoral".
$PBC_{i,t}$: Political Budget Cycle dummy. Variable assuming value 1 if $ELE_{i,t}$ is equal to 1; –1 if $ELE_{i,t-1}$ is equal to 1 and 0 otherwise. Source: own elaboration based on "Guia Electoral".

$ELE{+}1_{it}$: Post Election dummy. Binary variable that assumes value 1 if $ELE_{i,t-1}$ is equal to 1 and 0 otherwise.
Source: own elaboration based on "Guia Electoral".

ELE_UNAL_{it}: Conditional Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and the provincial and federal executive governments were unaligned (different political party), and 0 otherwise. Source: own elaboration based on "Guia Electoral".
ELE_AL_{it}: Conditional Election dummy. Binary variable that assumes value 1 if in province i elections were held during the year t and the provincial and federal executive governments were aligned (same political party), and 0 otherwise. Source: own elaboration based on "Guia Electoral".
PBC_UNAL_{it}: Conditional Political Budget dummy. Binary variable that assumes value 1 if ELE_UNAL_{it1} is equal to 1; -1 if $ELE\_UNAL_{i,t-1}$ is equal to 1 and 0 otherwise. Source: own elaboration based on "Guia Electoral".

PBC_AL_{it}: Conditional Political Budget dummy. Binary variable that assumes value 1 if ELE_AL_{it1} is equal to 1; -1 if $ELE\_AL_{i,t-1}$ is equal to 1 and 0 otherwise. Source: own elaboration based on "Guia Electoral".

Table 2: Fiscal Variables: Descriptive Statistics

	Mean	Std. Dev.	Min.	Max.	No. Obs
DEF	-0.022	0.031	-0.155	0.058	374
TE	0.237	0.123	0.052	0.812	374
CE	0.807	0.091	0.445	0.952	374
TR	0.215	0.113	0.046	0.825	374
PTR	0.028	0.014	0.004	0.121	374
FR	0.186	0.110	0.024	0.704	374

The electoral budget cycle is analyzed through the variables fiscal balance, total expenditure, expenditure composition[1], total provincial revenue, revenue from provincial taxes and revenue from the federal government[2]. The period of analysis ranges from 1985 to 2001.

IV. Empirical Analysis

The theoretical and empirical literature on political budget cycles suggests that the timing of elections should influence fiscal outcomes. The relationship between a fiscal variable, y_{it} , and the electoral cycle can be stated as follows:

$$y_{i,t} = \alpha + \Sigma^{k}_{j=1} \beta_j y_{i\,t-j} + \Sigma^{m}_{j=1} \gamma_j x_{j\,i\,t} + \delta_1 e + \eta_i + \varepsilon_{it} \qquad (1)$$

for i = 1..N, t = 1...T, j= 1 ...k, where ***e*** is a binary election variable indicating if an election took place in province i during the year t; *x* is a vector of control variables that in our estimations include per capita Geographic Gross Product (GGP) and the growth rate of the Geographic Gross Product (GROWTH).

This specification represents a standard dynamic panel, where the dependent variable is a function of its own lagged levels, of set of controls (x_j), of the time when elections take place and of a specific effect per province (η_i). The term ε_{it} is a random error that is assumed iid.

Assuming that the unobserved province-specific effects are identical across provinces, that the error term is not serially correlated, and that the explanatory variables are strictly exogenous then it is possible to estimate this relation consistently

[1] Ratio of current expenditure relative to total public expenditure. The most important component of current expenditure are salaries of provincial public servants. On the other hand, construction is the most important item of capital expenditure.

[2] Provincial revenues from federal revenue sharing ("coparticipation federal") plus special (discretional) transfers from federal government (“Aportes del Tesoro Nacional” – ATN).

through OLS. However, these assumptions may not hold in the panel, particularly the assumption of equality of the unobservable effects per province. This being so, then OLS estimates are inconsistent since the lagged dependent variable is correlated to the error term $w_{i,t} = \eta_i + \varepsilon_{it}$.

It is possible to control the specific effects using the panel data Fixed Effects (FE) estimator. However, the transformed error term will still be correlated with the lagged dependent variable. The bias will depend on T (the length of the panel); and provided T tends to infinite, the FE estimator of the coefficients will be consistent.

Considering these problems, the Generalized Method of Moments (GMM) designed for dynamic models by Arellano and Bond (1991) is performed in the estimations. The Arellano-Bond strategy consists in the differentiation of the equations to eliminate the specific effects and solve the inconsistency using the lagged values of the dependent variable as instruments. Assuming the error term is not serially correlated, the dependent variable lagged two periods or more constitute valid instruments for the new dependent variable in differences. Likewise, the same can be said for the control variables.

It will be assumed in our particular case that the vector from variables x_{jit} is slightly exogenous or predetermined; that is to say, it is not correlated with future realizations of the error term. The elections variable will be considered strictly exogenous.

Estimates are performed using three methods: OLS, Fixed Effects and GMM Arellano-Bond for dynamic panel data. The GMM method seems to be preferable due to the characteristics previously mentioned. Nevertheless, since it makes use of the lagged values of the variables as instruments, the set of observations available is smaller. For this reason and for comparative purposes, results from the three methods are reported.

The political cycle is modeled including the binary variable ELE that assumes value 1 in election years, and 0 in the rest of the years.

As usual in the empirical literature, the variable PBC (Political Budget Cycle) is also used, taking value 1 during the election year, -1 in the following year and 0 in the remaining ones. This variable imposes the restriction that the pre-electoral increase in spending or deficit is equivalent in magnitude to the posterior contraction.

Additionally, we also run the non-restricted regressions with the election dummy ELE and the post election dummy ELE+1, and test the validity of the restriction imposed by the use of PBC.

Our analysis includes six fiscal outcomes as dependent variables to test the electoral manipulation, its origins and consequences: ratio of provincial budget balance to GGP (DEF), ratio of total public expenditure to GGP (TE), current public expenditure relative to total public expenditure (CE), total provincial revenue relative to GGP (TR), revenue from provincial taxes relative to GGP (PTR) and provincial revenues from federal revenue sharing plus transfers from federal government relative to GGP (FR). Two basic controls will be included in the regressions: the per capita geographic gross product (GGP) and growth rate of the GGP (GROWTH).

V. Unconditional Budget Cycles

This section presents the empirical analysis of electoral cycles in fiscal variables, focusing on the provincial budget surplus, expenditures and revenues. We first present the unconditional results of elections over the fiscal variables. We then look at the conditional results, controlling for the alignment between the provincial and federal executives.

A. Budget Balance

Table 3 shows the main unconditional results with respect to the provincial budget balance (deficit); that is equation (1) including the election dummies ELE and PBC and using as controls the GGP and the growth of GGP per capita[3].

In the columns 1 to 3, with the three different estimation methods, ELE has the expected negative sign, although is not statistically significant in any case.

In columns 4, 5 and 6 the results are obtained making use of the variable PBC as a regressor for the elections. In this case, the coefficients estimated by OLS, Fixed Effects (FE) and GMM are significantly negative, suggesting that the level of electoral cycle – defined as the increase in deficit during the election year and the contraction in the following- is approximately 0.6% of GGP. For GMM estimation the Sargan test is reported, where the null hypothesis is that the instrumental variables are uncorrelated with the residuals. In addition, the serial correlation test is presented, where the null hypothesis is the absence of second order serial correlation in the first-difference residuals. Estimates satisfy both tests (no rejection of null hypothesis).

[3] Full econometric estimation results presented in the Chapter 3 Appendix.

Table 3: Elections and Fiscal Balance

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	-0.0037	-0.0031	-0.0030			
	(-1.17)	(-0.91)	(-0.97)			
PBC				-0.0064	-0.0060	0.0062
				(-3.22)**	(-3.08)**	(-3.33)**
F-test[a]		2.07			2.07	
p-value		0.0045			0.0045	
Sargan test[b]			283.73			285.22
p-value			0.9994			0.9993
Serial Corr[c]			-0.04			0.210
p-value			0.9677			0.8359
No.obs.	308	304	302	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.36			0.38		

Notes: Dependent variable DEF is ratio of government surplus to Geographic Gross Product (PBG).
Estimated Regressions:

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 4: Elections and Fiscal Balance

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM
ELE	0.0020 (0.60)	0.0023 (0.66)	0.0016 (0.50)
ELE+1	0.0140 (3.98)***	0.0135 (4.07)***	0.0141 (4.34)***
F-test: *ELE =-ELE+1*	8.27	7.71	8.78
p-value	0.0043	0.0059	0.0030
F-test[a]		2.11	
p-value		0.0036	
Sargan test[b]			277.02
p-value			0.9998
Serial Corr[c]			1.25
p-value			0.2131
No. obs.	308	308	308
No. provinces	22	22	22
R^2 (adj.)	0.40		

Notes: Dependent variable DEF is ratio of government surplus to Geographic Gross Product (PBG).
Estimated Regressions:

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

The PBC variable is meant to capture both pre and post-electoral effects. However as Persson and Tabellini (2002) remark, pre and post electoral effects may differ, so we check if the restriction that the coefficient estimate of ELE is equal to the coefficient estimate of minus ELE in *t+1*, is not rejected by the data. Estimate results are presented in Table 4.

Table 4 shows that the electoral dummy ELE is non significant and the post electoral dummy ELE+1 is positive and significant. In all estimates, the F test soundly rejects the restriction imposed by the PBC variable, that the post-electoral contraction in the budget surplus as a percentage of GGP is of the same size as the pre-electoral expansion. We can interpret the results as follows: a) there is no evidence of surplus falling in election periods, b) the restriction that surplus falls below its trend, and then jumps above it, is not supported by the data and, c) the significant effect of PBC is driven by the jump of surplus in post electoral periods.

B. Expenditures: Total and Composition

Tables 5 and 6 show the effects of the electoral cycle over total public expenditure in the provinces, measured as a proportion of GGP.

In the OLS and GMM regressions, the coefficients are positive and significant for ELE, with a value indicating that the expenditure over GGP increases approximately one percentage point during the year of elections. We found a short run cycle in spending, approximately of 0.6-0.8 percentage points of GGP, in the OLS, FE and GMM regressions with PBC as explanatory variable.

Results in Table 6 also suggest that the PBC significance is due to reductions in expenditure in the post election years, and the F tests does not reject the null hypothesis of equality between ELE and -ELE+1.

Tables 7 and 8 shows the estimates performed to evaluate the "composition effect" in provincial expenditure around elections. The dependent variable CE represents the expenditure in consumption goods as a proportion of total provincial expenditure. None of the estimates present statistically significant results to provide evidence supporting the hypothesis of a shift in spending towards consumption goods or investment goods in election years. The case of the PBC shows similar results, even though the coefficient estimated by GMM shows some evidence of a slight bias towards capital goods in electoral years and towards consumption goods in post electoral years.

Table 5: Elections and Total Expenditure

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE	0.0115 (2.50)**	0.0057 (1.50)	0.0100 (2.34)***			
PBC				0.0082 (3.15)***	0.0057 (2.55)**	0.0074 (2.83)***
F-test[a] p-value		11.30 0.0000			11.47 0.0000	
Sargan test[b] p-value			254.35 1.0000			250.02 1.0000
Serial Corr.[c] p-value			1.00 0.3166			1.41 0.1600
No. obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.90			0.90		

Notes: Dependent variable TE is the ratio of total provincial expenditure to Geographic Gross Product (PBG).

Estimated Regressions:

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \; \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 6: Elections and Total Expenditure

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM
ELE	0.0086 (1.63)	0.0026 (0.64)	0.0074 (1.59)
ELE+1	-0.0078 (-1.44)	-0.0087 (-2.26)**	-0.0073 (-1.61)
F-test: *ELE =-ELE+1*	0.01	0.88	0.00
p-value	0.9271	0.3484	0.9961
F-test[a]		11.51	
p-value		0.0000	
Sargan test[b]			249.74
p-value			1.0000
Serial Corr[c]			1.42
p-value			0.1568
No. obs.	308	308	308
No. provinces	22	22	22
R^2 (adj.)	0.90		

Notes: Dependent variable TE is the ratio of total provincial expenditure to Geographic Gross Product (PBG).

Estimated Regressions:

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i\,=}\,\eta\ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 7: Elections and Composition Effect

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0000 (0.00)	0.0014 (0.21)	-0.0058 (-0.90)			
PBC				-0.0039 (-0.99)	-0.0025 (-0.65)	-0.0066 (-1.69)*
F-test[a]		2.18			2.16	
p-value		0.0025			0.0028	
Sargan test[b]			244.93			243.05
p-value			1.0000			1.0000
Serial Corr.[c]			-0.89			-0.52
p-value			0.3739			0.6014
No. obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.60			0.60		

Notes: Dependent variable CE is the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 8: Elections and Composition Effect

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS	GMM
ELE	0.0039	0.0046	-0.0016
	(0.53)	(0.66)	(-0.23)
ELE+1	0.0108	0.0090	0.0112
	(1.64)	(1.37)	(1.67)*
F-test: *ELE =-ELE+1*	1.60	1.49	0.76
p-value	0.2073	0.2228	0.3831
F-test[a]		2.15	
p-value		0.0030	
Sargan test[b]			244.37
p-value			1.0000
Serial Corr[c]			-0.36
p-value			0.7182
No. obs.	308	308	308
No. provinces	22	22	22
R^2 (adj.)	0.58		

Notes: Dependent variable CE is the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \; \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

C. Revenues: Total, Federal and Provincial

To track the possible changes in fiscal revenues around elections Tables 9, 10, 11, 12, 13 and 14 present the estimates considering as dependent variables total provincial revenue (TR) and its components: revenue from federal sources (FR), that includes federal tax sharing and other federal transfers (mostly discretional) and revenue from provincial taxes (PTR).

Tables 9 to 12 show the results with total revenue (TR) and federal revenue (FR) as dependant variables. The electoral years are related to a significant tendency of revenues to go up, explained by the increase in federal revenue, and is important to note that federal revenue is 90% of total provincial revenues.

The PBC variable is non significant in all regressions, so there is no evidence of cycles around elections. The most significant effect is the revenue increase in election years, and the discretional transfers from the federal government could explain that. The federal tax sharing is mostly determined by fixed coefficients and cannot be easily manipulated.

Results in Tables 13 and 14 show non significant manipulations in provincial taxes; in all regressions revenue from this source is not sensitive to the election and PBC dummy variables. This seems reasonable, because in most provinces local taxes are a very small part of total revenues. Changes (reductions) in this variable may have a non relevant effect over the voter's perceptions about competency of the incumbent, reducing his incentives to engage in electoral manipulations over provincial taxes.

Table 9: Elections and Total Revenue

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0111 (2.62)*	0.0051 (1.59)	0.0095 (2.44)**			
PBC				0.0025 (0.90)	0.0004 (0.21)	0.0019 (0.83)
F-test[a] p-value		17.19 0.0000			17.41 0.0000	
Sargan test[b] p-value			270.19 0.9999			273.64 0.9999
Serial Corr.[c] p-value			1.25 0.2096			0.98 0.3289
No. obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.89			0.89		

Notes: Dependent variable TR is the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$TR_{it} = \alpha + \beta_1 TR_{t-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 10: Elections and Total Revenue

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM
ELE	0.0138 (2.91)***	0.0070 (2.08)**	0.0125 (3.05)***
ELE+1	0.0075 (1.44)	0.0055 (1.75)*	0.0085 (2.07)**
F-test: *ELE =-ELE+1*	6..30	5.59	9.76
p-value	0.0126	00187	0.0018
F-test[a]		17.18	
p-value		0.0000	
Sargan test[b]			274.97
p-value			0.9999
Serial Corr[c]			1.00
p-value			0.3194
No. obs.	305	305	302
No. provinces	22	22	22
R^2 (adj.)	0.89		

Notes: Dependent variable TR is the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$TR_{it} = \alpha + \beta_1 TR_{t-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 11: Elections and Revenue from Federal Government[4]

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0114 (2.89)***	0.0053 (1.74)*	0.0097 (2.73)***			
PBC				0.0028 (1.09)	0.0004 (0.23)	-0.0023 (1.06)
F-test[a]		15.51			15.76	
p-value		0.0000			0.0000	
Sargan test[b]			254.86			258.41
p-value			1.0000			1.0000
Serial Corr.[c]			1.49			1.25
p-value			0.1355			0.2115
No. obs.	308	308	308	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.90			0.90		

Notes: Dependent variable FR is the ratio of federal revenues to Gross Geographic Product (PBG).
Estimated Regressions:

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{FR}$

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{FR}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \; \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

[4]Provincial revenues from revenue sharing ("coparticipation") plus (discretional) transfers from federal government (i.e."Aportes del Tesoro Nacional" – ATN).

Table 12: Elections and Revenue from Federal Government[5]

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM
ELE	0.0138 (3.25)***	0.0073 (2.28)**	0.0124 (3.33)***
ELE+1	0.0071 (1.54)*	0.0057 (1.92)*	0.0078 (2.09)**
F-test: *ELE =-ELE+1*	8.03	6.69	10.92
p-value	0.0049	0.0102	0.0456
F-test[a]		15.55	
p-value		0.0000	
Sargan test[b]			258.52
p-value			1.0000
Serial Corr[c]			1.30
p-value			0.1944
No. obs.	308	308	308
No. provinces	22	22	22
R^2 (adj.)	0.91		

Notes: Dependent variable FR is the ratio of federal revenues to Gross Geographic Product (PBG).
Estimated Regressions:

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \gamma_4 ELE{+}1_{it} + \eta_i + \varepsilon_{it}$

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

[5]Provincial revenues from revenue sharing ("coparticipation") plus (discretional) transfers from federal government.

Table 13: Elections and Revenue from Provincial Taxes

Equation Estimation Method	1 OLS	2 FIXED EFFECTS	3 GMM	4 OLS	5 FIXED EFFECTS	6 GMM
ELE	0.0002 (0.23)	0.0002 (0.22)	0.0002 (0.23)			
PBC				-0.0002 (-0.55)	-0.0002 (-0.51)	-0.0003 (-0.70)
F-test[a] p-value		3.30 0.0000			3.30 0.0000	
Sargan test[b] p-value			338.55 0.8362			340.42 0.8476
Serial Corr.[c] p-value			0.26 0.7969			-0.09 0.9280
No. obs.	308	308	308	308	308	308
No.° provinces	22	22	22	22	22	22
R^2 (adj.)	0.84			0.84		

Notes: Dependent variable PTR is the ratio of provincial revenues to Geographic Gross Product (PBG).
Estimated Regressions:

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 14: Elections and Revenue from Provincial Taxes

Equation	1	2	3
Estimation Method	OLS	FIXED EFFECTS.	GMM
ELE	0.0005	0.0004	0.0005
	(0.66)	(0.56)	(0.66)
ELE+1	0.0009	0.0008	0.0011
	(1.10)	(1.12)	(1.51)
F-test: *ELE =-ELE+1*	1.30	1.049	1.78
p-value	0.2559	0.3083	0.1823
F-test[a]		3.28	
p-value		0.0000	
Sargan test[b]			344.69
p-value			0.7708
Serial Corr[c]			-0.13
p-value			0.8958
No. obs.	304	304	302
No. provinces	22	22	22
R^2 (adj.)	0.84		

Notes: Dependent variable PTR is the ratio of provincial revenues to Geographic Gross Product (PBG).
Estimated Regressions:

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

VI. Conditional Findings: Political Alignment Between Provincial and Federal Executives

The results reported in the previous section suggest that there are some systematic increase in expenditures and federal revenues in electoral years, but no electoral or cyclical effects were detected over the budget balance. Decisions over spending are clearly taken at provincial level, but the federal revenues are not a decision variable for the provincial executive. If this is so, how can the provincial executive manipulate at the same time expenditures and federal revenues? What can explain this pattern?

In this section, we will focus on explaining these facts, looking for differences in the behavior of incumbents conditioning for the political alignment between the provincial and federal executive. Our conjecture is that when both executives are members of the same political party (political alignment), the more probable the federal executive increases the discretional transfers to the province, allowing the provincial executive to increase spending without significant effects over the budget balance.

When both executives (provincial and federal) are not aligned, and with an aligned candidate running for the provincial election, the federal government is not interested in increasing the discretional transfers to the incumbent. On the contrary, probably the federal government can reduce the transfers, rending spending manipulations more difficult to the provincial executive and inducing budget deficits.

We then look at the sensitivity of the previous results when conditioned to political alignment between provincial and federal executives. The conditional election variables ELE_UNAL, ELE_AL and the conditional cycle variables PBC_UNAL, PBC_AL are now included in the regressions to estimate the differential effect of political alignment.

A. Budget Balance

Table 15 presents the results with the budget balance as the dependent variable. In columns 1 to 3 the coefficients estimates for the conditional election variable are presented. The coefficients associated to the unaligned provinces are all negative and significant at 10% in OLS and GMM regressions and marginally significant (11%) in FE. The election year has no significant effect over fiscal balance in aligned provinces.

The regression results indicates that while the election increases the deficit between 0.8 to 1.0 percentage points in unaligned provinces, the election effect is not relevant in aligned provinces.

Table 15: Elections and Fiscal Balance conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	-0.0106	-0.0091	-0.0084			
	(-1.93)*	(-1.61)	(-1.80)*			
ELE_AL	-0.0003	-0.0002	0.0003			
	(-0.09)	(-0.04)	(0.09)			
PBC_UNAL				-0.0085	-0.0079	-0.0091
				(-2.34)**	(-2.51)**	(-3.19)***
PBC_AL				-0.0052	-0.0048	-0.0043
				(-2.31)**	(-1.97)*	(-1.82)*
F-test[a]		2.03			2.07	
p-value		0.0056			0.0045	
Sargan test[b]			283.40			284.92
p-value			0.9994			0.9993
Serial Corr[c]			-0.19			0.10
p-value			0.8472			0.9165
No. obs.	308	304	302	308	308	308
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.37			0.38		

Notes: Dependent variable DEF is ratio of government surplus to Geographic Gross Product (PBG).
Estimated Regressions:

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$DEF_{it} = \alpha + \beta_1 DEF_{it-1} + \beta_2 DEF_{it-2} + \beta_3 DEF_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \; \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

The conditional PBC coefficient estimates, columns 4 to 6, result in all cases negative and significant for aligned and unaligned provinces. These results are driven mostly by an increase in budget surplus in post electoral years in both aligned an unaligned provinces, and are consistent with those obtained in the unconditional regressions.

B. Expenditures: Total and Composition

Table 16 shows the effects of the conditional electoral variables over total public expenditure. Results in columns 1 to 3 show that in electoral years, when the province is politically aligned with federal government spending rises significantly. Depending on estimation method, the increasing in spending ranges between 0.8 to 1.4 percentage points of GGP. For unaligned provinces the estimates are non-significant in all regressions.

The estimated coefficients for the conditional PBC variable are significant, but the effect is driven, as in the unconditional estimates, by the spending contraction in the post electoral period in both, aligned and unaligned provinces.Regarding the composition of expenditures, Table 17, in columns 1 to 3, shows a positive and significant increase in current spending in electoral years for unaligned provinces. However, there are no significant effects over spending composition in aligned provinces. The coefficients associated to the conditional cycle variable, in columns 4 to 6, are non significant in all specifications.

These results suggest that an important shift happens in the expenditure composition towards current goods in unaligned provinces during electoral years. The magnitude of the shift is approximately 1.9 percentage points of total expenditure, reassigned from investment to consumption goods.

Table 16: Elections and Total Expenditure conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	0.0062	0.0005	0.0015			
	(0.70)	(0.07)	(0.28)			
ELE_AL	0.0140	0.0082	0.0101			
	(3.05)***	(1.81)*	(2.59)***			
PBC_UNAL				0.0107	0.0073	0.0034
				(2.10)**	(1.99)**	(1.05)
PBC_AL				0.0068	0.0049	0.0045
				(2.31)**	(1.74)*	(1.87)*
F-test[a]		11.29			11.42	
p-value		0.0000			0.0000	
Sargan test[b]			354.41			350.88
p-value			0.5287			0.5813
Serial Corr[c]			-0.61			-0.59
p-value			0.5406			0.5567
No. obs.	308	308	286	308	308	286
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.90			0.90		

Notes: Dependent variable TE is ratio of total provincial expenditure to Geographic Gross Product (PBG).
Estimated Regressions:

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TE_{it} = \alpha + \beta_1 TE_{it-1} + \beta_2 TE_{it-2} + \beta_3 TE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \; \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 17: Elections and Composition Effect conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	0.0190	0.0195	0.0198			
	(1.85)*	(1.76)*	(1.82)*			
ELE_AL	-0.0092	-0.0072	-0.0084			
	(-1.16)	(-0.92)	(-1.12)			
PBC_UNAL				0.0012	0.0031	0.0012
				(0.20)	(0.49)	(0.20)
PBC_AL				-0.0068	-0.0058	-0.0073
				(-1.41)**	(-1.19)	(-1.57)
F-test[a]		2.14			2.17	
p-value		0.0030			0.0026	
Sargan test[b]			235.44			230.71
p-value			1.0000			1.0000
Serial Corr[c]			-0.09			0.01
p-value			0.9250			0.9897
No. obs.	308	308	286	308	308	286
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.60			0.60		

Notes: Dependent variable CEis the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$CE_{it} = \alpha + \beta_1 CE_{it-1} + \beta_2 CE_{it-2} + \beta_3 CE_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \ \forall$ i, t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

C. Revenues: Total, Federal and Provincial

Tables 18, 19 and 20 present the conditional estimates considering as dependent variables the total provincial revenue (TR), revenue from federal source (FR) and revenue from provincial taxes (PTR).

There is a strong positive relationship between elections in aligned provinces and federal revenues in the data, independent of the estimation technique. In politically aligned provinces, a positive and significant effect over revenues is present in electoral years, explained by the increase in discretional federal revenues. The magnitude of the effect is important, from 0.8 to 1.6 percentage points of GGP of increase in federal revenues depending on the estimation technique.

By contrast, for the conditional election dummy in unaligned provinces, the estimated coefficients are non significant in all cases. The conditional cycle dummy is non significant in all regressions, suggesting that there is no evidence of cycles around elections, independently of political alignment.

Results in Table 20 are similar to those obtained in the unconditional regressions. For aligned or unaligned provinces, in all regressions revenue from provincial taxes is not sensitive to the election dummy or the PBC dummy.

To sum up, the findings reported above fit the conjectures about the behavior of federal and provincial governments considering the political alignment. If the provincial executive is aligned with the federal government, the discretional transfers from this source are bigger in electoral years, and the provincial incumbent is able to increase the total expenditures proportionally, without increasing the fiscal deficit. Our empirical results show that discretional transfers from the federal governments allows the provincial incumbent to increase the spending in 0.8 – 1.4 percentage points of GGP.

On the other side, if the provincial executive is unaligned, the federal transfers remain approximately constant. With constant revenues from provincial taxes, if the incumbent increases the spending he also increases the fiscal deficit, but in this case he is constrained by the borrowing alternatives. The other alternative action available to the incumbent is to change the expenditure composition, from investment goods to more visible consumption goods. Our empirical results suggest that this last alternative appears to be the more relevant discretional decision for unaligned provincial executives. Estimates show that the redirection of spending toward consumption goods in electoral years is about 1.9 percentage points of total expenditure for unaligned provinces.

Table 18: Elections and Total Revenue conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	0.0005	-0.0067	-0.0061			
	(0.08)	(-1.25)	(-1.20)			
ELE_AL	0.0162	0.0108	0.0090			
	(3.37)***	(-2.85)***	(2.57)*			
PBC_UNAL				-0.00005	-0.0014	-0.0057
				(-0.01)	(-0.46)	(-1.96)*
PBC_AL				0.0039	0.0014	-0.0003
				(1.16)	(0.62)	(-0.15)
F-test[a]		17.60			17.36	
p-value		0.0000			0.0000	
Sargan test[b]			364.10			373.00
p-value			0.3863			0.2693
Serial Corr[c]			-0.75			-1.09
p-value			0.4523			0.2770
No. obs.	308	308	286	308	308	286
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.89			0.89		

Notes: Dependent variable TR is the ratio of current expenditure to total provincial expenditure.
Estimated Regressions:

$TR_{it} = \alpha + \beta_1 TR_{t-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$TR_{it} = \alpha + \beta_1 TR_{it-1} + \beta_2 TR_{it-2} + \beta_3 TR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_i = \eta \ \forall$ i, t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

Table 19: Elections and Revenue from Federal Government[6] conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	0.0007	-0.0066	-0.0064			
	(0.11)	(-1.30)	(-1.35)			
ELE_AL	0.0166	0.0110	0.0082			
	(3.66)***	(3.07)***	(2.49)**			
PBC_UNAL				0.0003	-0.0014	-0.0051
				(0.08)	(-0.50)	(-1.88)*
PBC_AL				0.0042	0.0015	-0.0004
				(1.30)	(0.68)	(-0.21)
F-test[a]		15.94			15.72	
p-value		0.0000			0.0000	
Sargan test[b]			346.63			353.74
p-value			0.6431			0.5387
Serial Corr[c]			-0.36			-0.58
p-value			0.7156			0.5629
No. obs.	308	308	286	308	308	286
No. provinces	22	22	22	22	22	22
R^2 (adj.)	0.91			0.90		

Notes: Dependent variable FR is the ratio of federal revenues to Gross Geographic Product (PBG).
Estimated Regressions:

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \gamma_4 ELE+1_{it} + \eta_i + \varepsilon_{it}$

$FR_{it} = \alpha + \beta_1 FR_{it-1} + \beta_2 FR_{it-2} + \beta_3 FR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.
In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged two or more periods are used as instruments. One lag of the dependent variable is included.
* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level
(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

[6] Provincial revenues from revenue sharing ("coparticipation") plus special (discretional) transfers from federal government.

Table 20: Elections and Revenue from Provincial Taxes conditional on alignment of provincial and federal government

Equation Estimation Method	1 OLS	2 FIXED EFFECTS.	3 GMM	4 OLS	5 FIXED EFF.	6 GMM
ELE_UNAL	0.0003	0.0001	0.0008			
	(0.29)	(0.13)	(0.82)			
ELE_AL	0.0001	0.0001	-0.0002			
	(0.14)	(0.19)	(-0.34)			
PBC_UNAL				0.0000	0.0000	0.0000
				(0.00)	(0.04)	(0.15)
PBC_AL				-0.0004	0.0003	-0.0005
				(-0.98)	(-0.68)	(-1.05)
F-test[a]		3.29			3.28	
p-value		0.0000			0.0000	
Sargan test[b]			337.35			338.36
p-value			0.8475			0.8380
Serial Corr[c]			0.33			-0.02
p-value			0.7379			0.9852
N° obs.	308	308	308	308	308	308
N° provinces	22	22	22	22	22	22
R^2 (adj.)	0.84			0.84		

Notes: Dependent variable PTR is the ratio of provincial revenues to Geographic Gross Product (PBG).
Estimated Regressions:

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 ELE_{it} + \eta_i + \varepsilon_{it}$

$PTR_{it} = \alpha + \beta_1 PTR_{it-1} + \beta_2 PTR_{it-2} + \beta_3 PTR_{it-3} + \gamma_1 PBG_{it} + \gamma_2 CREC_{it} + +\gamma_3 PBC_{it} + \eta_i + \varepsilon_{it}$

The coefficient estimates on the lagged dependent variables add up to a value less than unity. OLS imposes the restriction $\eta_{i} = \eta \ \forall$ i. t statistics reported in parentheses, calculated using heteroskedastic-consistent standard errors for OLS.

In GMM estimation (Arellano-Bond One Step) z statistics in parentheses. The election dummy variables are treated as strictly exogenous. Variables CREC and PBG are treated as predetermined and levels lagged one or more periods are used as instruments. Two lags of the dependent variable are included.

* significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

(a) F-test is an F test of the null hypothesis that all province-specific effects in the FE-specification are equal. (b) P-values for rejecting the null hypothesis in test of the over identifying restrictions, asymptotically distributed as a χ^2 under the null hypothesis of instruments uncorrelated with the residuals. (c) P-values for rejecting the null hypothesis in test for second order serial correlation in the first-difference residuals, asymptotically distributed as N(0,1) under the null of no serial correlation.

VII. Conclusions

This paper presents empirical evidence of systematic effects in fiscal balance, public expenditures and revenues in Argentine provinces as a function of elections and political alignment. Our findings are consistent with the predictions of the theoretical literature on rational opportunist political cycles: there are fiscal policy manipulations during elections, and there is a strengthening of the policies after elections.

The data also reveals that there are important systematic differences between provinces in the size and composition of the electoral manipulations, depending on the political alignment with the federal executive. Specifically, the political alignment between provincial and federal executives implies more discretional transfer of federal revenues and increases the election induced provincial spending without increasing the fiscal deficit. Politically unaligned provinces are constrained by constant federal transfers and fiscal deficits are more frequent in election years. In addition, an important spending switch from capital goods to consumption goods is present in election years for unaligned provinces.

Finally, we believe that our conditional findings fit the predictions of the theoretical models of opportunistic rational behavior and reveals that the institutional and political features are important issues to explain the electoral motivated policy cycles. It is highly likely that further work in the identification of institutional control variables as the effective division of powers and institutional development of the provinces could contribute to study the quantitative effects of electoral cycles more in depth.

References

Alesina A.; Roubini N. and Cohen G (1997): "Political Cycles and the macroeconomy"; Cambridge: MIT Press.

Arellano, M., and S. Bond (1991): "Some Tests of Specifications for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*) 58:277-97.

Block S (2002): "Elections, Electoral Competitiveness, and Political Budget Cycles in Developing Countries"; CID Working Paper N° 78.

Hibbs, D. (1977): "Political Parties and Macroeconomic Policy," American Political Science Review, 71:467-87.

Krueger, A. and I. Turan (1993*):* "The Politics and Economics of Turkish Policy Reform in the 1980's," in R.Bates and A. Krueger, eds., Political and Economic Interactions in Economic Policy Reform: Evidence from Eight Countries, Oxford: Basil Blackwell.

Lindbeck, A. (1976): "Stabilization Policies in Open Economies with Endogenous Politicians," *American Economic Review Papers and Proceedings*, p. 1-19.

Meloni, O. (2001): "Gobernadores y elecciones: ¿Es "negocio" ser austero? Evidencia a partir de Data en Panel"; XXXVI Reunión Anual de la AAEP.

Mirabella de Sant, M.(2002):"Diferencias de bienestar entre provincias de Argentina";XXXVII Reunión Anual de la AAEP.

Nordhaus, W.(1975): "The Political Business Cycle," *Review of Economic Studies* 42:169-90.

Persson, Torsten and Tabellini, Guido (2002), "Do Electoral Cycles Differ Across Political Systems?" (Manuscript, IGIER and Bocconi University).

Rogoff, K.(1990): "Equilibrium political budget cycles"; American Economic Review; v. 80; N° 1; p. 21-36.

Shi M. and Svensson J.(2001): "Conditional Political Business Cycles"; Working Paper; IIES Stockholm University.

Schucknecht, L.(2000) "Fiscal Policy Cycles and Public Expenditure in Developing Countries"; Public Choice, 102 115 130.

Appendix
Chapter 3
Econometric Estimation Output

TABLES 3 and 4 - Elections and Fiscal Balance

```
. *OLS
. regress  def def_1 def_2 def_3 growth lggp ele, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   21.28
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3627
                                                       Root MSE      =  .02471

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4501836   .0612624     7.35   0.000      .3296268    .5707405
       def_2 |   .0273253   .0706419     0.39   0.699     -.1116893    .1663398
       def_3 |   .1371861   .0657659     2.09   0.038      .0077669    .2666053
        grow |   .0964675   .0203988     4.73   0.000       .056325    .1366099
        lggp |   .0008223   .0022823     0.36   0.719      -.003669    .0053136
         ele |  -.0036922   .0031471    -1.17   0.242     -.0098854     .002501
       _cons |  -.0178905   .0197735    -0.90   0.366     -.0568022    .0210212
------------------------------------------------------------------------------

. regress  def def_1 def_2 def_3 grow lggp pbc, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   25.03
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3817
                                                       Root MSE      =  .02434

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4580231   .0589188     7.77   0.000      .3420781    .5739681
       def_2 |   .0400662   .0694408     0.58   0.564     -.0965847    .1767171
       def_3 |   .1196514   .0653006     1.83   0.068     -.0088522     .248155
        grow |   .0877438   .0202285     4.34   0.000      .0479367    .1275509
        lggp |   .0008499   .0022743     0.37   0.709     -.0036257    .0053254
         pbc |  -.0064528   .0020012    -3.22   0.001     -.0103908   -.0025147
       _cons |  -.0190134   .0196672    -0.97   0.334      -.057716    .0196891
------------------------------------------------------------------------------

. regress  def def_1 def_2 def_3 grow lggp ele ele1,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   23.47
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3965
                                                       Root MSE      =  .02408

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4963217   .0581574     8.53   0.000      .3818737    .6107697
       def_2 |    .043854   .0675271     0.65   0.517     -.0890327    .1767407
       def_3 |   .0789868   .0658754     1.20   0.231     -.0506495    .2086232
        grow |   .0823988   .0196784     4.19   0.000      .0436736    .1211239
        lggp |   .0009685   .0022395     0.43   0.666     -.0034385    .0053756
         ele |   .0019633   .0032787     0.60   0.550     -.0044889    .0084155
        ele1 |   .0140562   .0035301     3.98   0.000      .0071093    .0210031
       _cons |  -.0238065   .0195584    -1.22   0.224     -.0622954    .0146824
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    8.27
            Prob > F =    0.0043

. regress  def def_1 def_2 def_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   22.53
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3704
                                                       Root MSE      =  .02456

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4554651   .0581458     7.83   0.000      .3410413    .5698889
       def_2 |   .0587623   .0716794     0.82   0.413     -.0822939    .1998184
       def_3 |   .0998277   .0707205     1.41   0.159     -.0393415    .2389969
        grow |   .0965407   .0200904     4.81   0.000      .0570053     .136076
        lggp |   .0008047   .0022336     0.36   0.719     -.0035908    .0052002
       ele_1 |  -.0079034   .0031948    -2.47   0.014     -.0141905   -.0016164
       _cons |  -.0168815   .0192939    -0.87   0.382     -.0548496    .0210865
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  def def_1 def_2 def_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2168                         Obs per group: min =        14
       between = 0.1758                                        avg =      14.0
       overall = 0.1926                                        max =        14

                                                F(6,280)           =     12.92
corr(u_i, Xb)  = -0.2074                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3177049    .057287     5.55   0.000      .2049371    .4304727
       def_2 |  -.0530212   .0610658    -0.87   0.386     -.1732275    .0671851
       def_3 |    .024791   .0575514     0.43   0.667     -.0884974    .1380794
        grow |   .0828221   .0199167     4.16   0.000      .0436166    .1220276
        lggp |   .0237088   .0111388     2.13   0.034      .0017824    .0456352
         ele |  -.0030769    .003379    -0.91   0.363     -.0097283    .0035745
       _cons |  -.2222733   .0965414    -2.30   0.022     -.4123124   -.0322341
-------------+----------------------------------------------------------------
     sigma_u |  .01619047
     sigma_e |  .02383394
         rho |   .3157495   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.07             Prob > F = 0.0045

. xtreg  def def_1 def_2 def_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2402                         Obs per group: min =        14
       between = 0.1815                                        avg =      14.0
       overall = 0.2099                                        max =        14
```

```
                                                F(6,280)           =     14.75
corr(u_i, Xb)  = -0.2075                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3254006   .0558988     5.82   0.000     .2153653    .4354359
       def_2 |   -.039916   .0602769    -0.66   0.508    -.1585694    .0787373
       def_3 |   .0106597   .0563708     0.19   0.850    -.1003047    .1216241
        grow |   .0739673   .0198411     3.73   0.000     .0349106    .1130241
        lggp |   .0240468   .0109716     2.19   0.029     .0024495    .0456441
         pbc |   -.005962   .0019374    -3.08   0.002    -.0097757   -.0021483
       _cons |  -.2258234   .0950851    -2.37   0.018    -.4129958    -.038651
-------------+----------------------------------------------------------------
     sigma_u |  .01616389
     sigma_e |  .02347551
         rho |  .32161581   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.07             Prob > F = 0.0045

. xtreg  def def_1 def_2 def_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2606                         Obs per group: min =        14
       between = 0.1755                                        avg =      14.0
       overall = 0.2205                                        max =        14

                                                F(7,279)           =     14.05
corr(u_i, Xb)  = -0.2158                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3626414   .0568463     6.38   0.000     .2507393    .4745436
       def_2 |  -.0362964   .0595818    -0.61   0.543    -.1535834    .0809906
       def_3 |  -.0304867   .0576452    -0.53   0.597    -.1439614    .0829881
        grow |   .0681588    .019719     3.46   0.001     .0293419    .1069756
        lggp |   .0246348   .0108446     2.27   0.024     .0032873    .0459824
         ele |     .00233   .0035477     0.66   0.512    -.0046536    .0093137
        ele1 |   .0134629   .0033113     4.07   0.000     .0069445    .0199812
       _cons |  -.2346324   .0940198    -2.50   0.013    -.4197106   -.0495542
-------------+----------------------------------------------------------------
     sigma_u |  .01631482
     sigma_e |  .02319926
         rho |   .3309053   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.11             Prob > F = 0.0036

. test ele=-ele1

 ( 1)  ele + ele1 = 0

       F(  1,   279) =    7.71
            Prob > F =    0.0059

. xtreg def def_1 def_2 def_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2296                         Obs per group: min =        14
       between = 0.1707                                        avg =      14.0
       overall = 0.1995                                        max =        14

                                                F(6,280)           =     13.91
corr(u_i, Xb)  = -0.2044                        Prob > F           =    0.0000
```

```
------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3204663   .0563163     5.69   0.000     .2096092    .4313233
       def_2 |  -.0205643   .0623507    -0.33   0.742       -.1433    .1021714
       def_3 |  -.0139053   .0583848    -0.24   0.812    -.1288342    .1010235
        grow |   .0827858   .0197053     4.20   0.000     .0439964    .1215752
        lggp |   .0236165   .0110473     2.14   0.033     .0018702    .0453629
       ele_1 |  -.0081503   .0034749    -2.35   0.020    -.0149907     -.00131
       _cons |  -.2204952   .0957485    -2.30   0.022    -.4089734    -.032017
-------------+----------------------------------------------------------------
     sigma_u |  .01624652
     sigma_e |  .02363812
         rho |  .32082923   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.14             Prob > F = 0.0031

.
. *GMM
. xtabond def l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =     81.59

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3408471   .0566994     6.01   0.000     .2297183    .4519759
         L2D |  -.0208584   .0558308    -0.37   0.709    -.1302847    .0885679
grow         |
          D1 |   .0475126    .046633     1.02   0.308    -.0438864    .1389115
          LD |    .016412   .0204578     0.80   0.422    -.0236846    .0565085
lggp         |
          D1 |     .04739   .0457473     1.04   0.300    -.0422731    .1370532
          LD |  -.0469277   .0442286    -1.06   0.289    -.1336142    .0397587
ele          |
          D1 |  -.0030125   .0030957    -0.97   0.330      -.00908     .003055
_cons        |   .0007439    .000439     1.69   0.090    -.0001166    .0016044
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   283.73     Prob > chi2 = 0.9994

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.96   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.04   Pr > z = 0.9677

. xtabond def l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =     94.84

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
```

```
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3450258   .0551634     6.25   0.000     .2369075    .4531441
         L2D |  -.0058309   .0546304    -0.11   0.915    -.1129046    .1012427
grow         |
          D1 |   .0553255   .0456648     1.21   0.226     -.034176    .1448269
          LD |   .0277843   .0203464     1.37   0.172     -.012094    .0676626
lggp         |
          D1 |   .0283867    .044903     0.63   0.527    -.0596215    .1163949
          LD |  -.0306544   .0433259    -0.71   0.479    -.1155715    .0542628
pbc          |
          D1 |  -.0061786   .0018565    -3.33   0.001    -.0098174   -.0025399
_cons        |    .000723   .0004296     1.68   0.092    -.0001191     .001565
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   285.22     Prob > chi2 = 0.9993

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.18   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.21   Pr > z = 0.8359

. xtabond def l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    103.48

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3785501   .0564379     6.71   0.000     .2679338    .4891663
         L2D |    -.01835   .0548835    -0.33   0.738    -.1259197    .0892198
grow         |
          D1 |   .0466037   .0458397     1.02   0.309    -.0432405     .136448
          LD |   .0323178   .0204377     1.58   0.114    -.0077395     .072375
lggp         |
          D1 |   .0358335   .0450477     0.80   0.426    -.0524583    .1241254
          LD |  -.0394206   .0435052    -0.91   0.365    -.1246892    .0458479
ele          |
          D1 |   .0016323   .0032359     0.50   0.614      -.00471    .0079745
ele1         |
          D1 |   .0141011    .003246     4.34   0.000     .0077391    .0204631
_cons        |   .0008327   .0004321     1.93   0.054    -.0000142    .0016796
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   277.02     Prob > chi2 = 0.9998

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.40   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.25   Pr > z = 0.2131

. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =    8.78
         Prob > chi2 =    0.0030
```

```
. xtabond def l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =     84.27

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3477119   .0565205     6.15   0.000     .2369337      .45849
         L2D |  -.0147656   .0559278    -0.26   0.792     -.124382    .0948509
grow         |
          D1 |   .0433804   .0466379     0.93   0.352    -.0480282     .134789
          LD |   .0126031   .0204134     0.62   0.537    -.0274065    .0526127
lggp         |
          D1 |   .0567226   .0452583     1.25   0.210     -.031982    .1454273
          LD |  -.0541481   .0437954    -1.24   0.216    -.1399854    .0316893
ele_1        |
          D1 |  -.0072052   .0033172    -2.17   0.030    -.0137068   -.0007036
_cons        |   .0007185    .000441     1.63   0.103    -.0001459    .0015829
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   276.99     Prob > chi2 = 0.9998
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -13.21   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.59   Pr > z = 0.1118
```

TABLES 5 and 6 - Elections and Total Expenditure

```
. *OLS
. regress  te te_1 te_2 te_3 grow lggp ele, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  127.26
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8975
                                                       Root MSE      =  .03556

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .8529785    .121196     7.04   0.000     .6144797    1.091477
        te_2 |  -.1169038   .1443267    -0.81   0.419     -.400921    .1671133
        te_3 |   .1654418   .0681497     2.43   0.016     .0313317     .299552
        grow |  -.1441292   .0274022    -5.26   0.000    -.1980534    -.090205
        lggp |   .0015893   .0037383     0.43   0.671    -.0057672    .0089458
         ele |   .0114646     .00458     2.50   0.013     .0024518    .0204774
       _cons |   .0078443   .0348913     0.22   0.822    -.0608174    .0765061
------------------------------------------------------------------------------

. regress  te te_1 te_2 te_3 grow lggp pbc, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  115.39
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8984
                                                       Root MSE      =  .03542

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .8758927   .1205354     7.27   0.000      .638694    1.113091
        te_2 |  -.1268693   .1412937    -0.90   0.370    -.4049177    .1511792
        te_3 |   .1526218   .0657014     2.32   0.021     .0233295    .2819141
        grow |  -.1394992   .0269941    -5.17   0.000    -.1926203   -.0863781
        lggp |   .0014448   .0036981     0.39   0.696    -.0058325    .0087221
         pbc |   .0082134   .0026115     3.15   0.002     .0030743    .0133525
       _cons |   .0120095   .0346679     0.35   0.729    -.0562126    .0802317
------------------------------------------------------------------------------

. regress  te te_1 te_2 te_3 grow lggp ele ele1,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  118.04
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8984
                                                       Root MSE      =  .03547

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .8744431   .1288108     6.79   0.000      .620956     1.12793
        te_2 |  -.1257908   .1460104    -0.86   0.390    -.4131252    .1615435
        te_3 |    .152989   .0654962     2.34   0.020     .0240987    .2818792
        grow |  -.1395424   .0269902    -5.17   0.000    -.1926564   -.0864284
        lggp |   .0014549   .0036944     0.39   0.694    -.0058152    .0087251
         ele |   .0086581   .0053059     1.63   0.104    -.0017835    .0190996
        ele1 |  -.0078012    .005399    -1.44   0.150     -.018426    .0028236
       _cons |   .0117077   .0342289     0.34   0.733    -.0556516    .0790669
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    0.01
            Prob > F =    0.9271

. regress  te te_1 te_2 te_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  116.88
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8958
                                                       Root MSE      =  .03586

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |    .866813   .1196696     7.24   0.000      .631318    1.102308
        te_2 |  -.1362872   .1422076    -0.96   0.339    -.4161343    .1435598
        te_3 |   .1712412   .0734229     2.33   0.020      .026754    .3157285
        grow |  -.1519528   .0270019    -5.63   0.000    -.2050892   -.0988164
        lggp |   .0014792   .0037438     0.40   0.693    -.0058881    .0088464
       ele_1 |   .0017953   .0042057     0.43   0.670    -.0064809    .0100716
       _cons |   .0111131   .0350294     0.32   0.751    -.0578204    .0800465
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  te te_1 te_2 te_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3810                         Obs per group: min =        14
       between = 0.7690                                        avg =      14.0
       overall = 0.6013                                        max =        14

                                                F(6,280)           =     28.72
corr(u_i, Xb)  = 0.6280                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |     .47562   .0472501    10.07   0.000     .3826095    .5686305
        te_2 |  -.1371475   .0525041    -2.61   0.009    -.2405003   -.0337947
        te_3 |  -.1069057   .0418403    -2.56   0.011    -.1892671   -.0245443
        grow |  -.1179495   .0225352    -5.23   0.000    -.1623093   -.0735896
        lggp |  -.0282712   .0127286    -2.22   0.027    -.0533271   -.0032152
         ele |   .0057427   .0038351     1.50   0.135    -.0018066     .013292
       _cons |   .4229095   .1145549     3.69   0.000     .1974114    .6484075
-------------+----------------------------------------------------------------
     sigma_u |  .08462865
     sigma_e |  .02712363
         rho |   .9068474   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    11.30             Prob > F = 0.0000

. xtreg  te te_1 te_2 te_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3902                         Obs per group: min =        14
       between = 0.7525                                        avg =      14.0
       overall = 0.5922                                        max =        14
```

```
                                                F(6,280)           =     29.86
corr(u_i, Xb)  = 0.6150                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .4894211   .0470915    10.39   0.000     .3967228    .5821193
        te_2 |  -.1395606   .0516395    -2.70   0.007    -.2412115   -.0379096
        te_3 |  -.1182188   .0418429    -2.83   0.005    -.2005853   -.0358522
        grow |  -.1124959   .0225231    -4.99   0.000     -.156832   -.0681599
        lggp |  -.0295899    .012621    -2.34   0.020    -.0544339   -.0047458
         pbc |   .0057465   .0022564     2.55   0.011     .0013048    .0101881
       _cons |   .4357615   .1134771     3.84   0.000      .212385     .659138
-------------+----------------------------------------------------------------
     sigma_u |  .08470662
     sigma_e |  .02692198
         rho |  .90825408   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    11.47             Prob > F = 0.0000

. xtreg  te te_1 te_2 te_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3921                         Obs per group: min =        14
       between = 0.7295                                        avg =      14.0
       overall = 0.5751                                        max =        14

                                                F(7,279)           =     25.71
corr(u_i, Xb)  = 0.5971                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |    .497696   .0479183    10.39   0.000     .4033686    .5920234
        te_2 |  -.1474147    .052323    -2.82   0.005    -.2504126   -.0444168
        te_3 |  -.1227199   .0421252    -2.91   0.004    -.2056435   -.0397963
        grow |  -.1116561   .0225456    -4.95   0.000    -.1560371   -.0672751
        lggp |  -.0307563   .0126846    -2.42   0.016    -.0557259   -.0057867
         ele |   .0025798   .0040573     0.64   0.525    -.0054069    .0105666
        ele1 |   -.008665   .0038406    -2.26   0.025    -.0162252   -.0011049
       _cons |   .4482897   .1142822     3.92   0.000      .223325    .6732545
-------------+----------------------------------------------------------------
     sigma_u |  .08528202
     sigma_e |  .02692765
         rho |  .90934139   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    11.51             Prob > F = 0.0000

. test ele=-ele1

 ( 1)  ele + ele1 = 0

       F(  1,   279) =    0.88
            Prob > F =    0.3484

. xtreg te te_1 te_2 te_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3782                         Obs per group: min =        14
       between = 0.7292                                        avg =      14.0
       overall = 0.5681                                        max =        14

                                                F(6,280)           =     28.38
corr(u_i, Xb)  = 0.5971                         Prob > F           =    0.0000
```

```
------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .4804651   .0474058    10.14   0.000     .3871481     .573782
        te_2 |  -.1400705   .0528345    -2.65   0.008    -.2440737   -.0360672
        te_3 |  -.1180047   .0440876    -2.68   0.008    -.2047899   -.0312195
        grow |  -.1215008   .0224652    -5.41   0.000     -.165723   -.0772786
        lggp |  -.0297466   .0127572    -2.33   0.020    -.0548588   -.0046344
       ele_1 |   .0039702   .0040691     0.98   0.330    -.0040398    .0119802
       _cons |    .438336   .1146815     3.82   0.000     .2125887    .6640833
-------------+----------------------------------------------------------------
     sigma_u |  .08593566
     sigma_e |  .02718584
         rho |  .90902645   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    11.61             Prob > F = 0.0000

.
. *GMM
. xtabond te l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    261.18

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .6642248   .0520248    12.77   0.000      .562258    .7661915
         L2D |  -.2526925   .0519487    -4.86   0.000      -.35451    -.150875
grow         |
          D1 |  -.1017775   .0638095    -1.60   0.111    -.2268418    .0232868
          LD |   .1231811   .0287537     4.28   0.000     .0668249    .1795374
lggp         |
          D1 |  -.0872688    .062897    -1.39   0.165    -.2105447     .036007
          LD |  -.0131114   .0604702    -0.22   0.828    -.1316307     .105408
ele          |
          D1 |   .0100806   .0043157     2.34   0.020      .001622    .0185392
_cons        |   .0022204   .0005992     3.71   0.000     .0010461    .0033947
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   254.35     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.70   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.00   Pr > z = 0.3166

. xtabond te l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    262.49

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
```

```
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .6816699   .0517816    13.16   0.000     .5801799    .7831599
         L2D |  -.2665863   .0507628    -5.25   0.000    -.3660795    -.167093
grow         |
          D1 |  -.1016196   .0638553    -1.59   0.112    -.2267738    .0235345
          LD |   .1157484     .02918     3.97   0.000     .0585566    .1729401
lggp         |
          D1 |  -.0825743   .0629637    -1.31   0.190    -.2059809    .0408323
          LD |  -.0163862   .0604938    -0.27   0.786    -.1349519    .1021794
pbc          |
          D1 |   .0073755   .0026063     2.83   0.005     .0022673    .0124837
_cons        |   .0021614   .0005987     3.61   0.000      .000988    .0033349
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   250.02     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.86   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.41   Pr > z = 0.1600

. xtabond te l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    261.95

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .6826108   .0533813    12.79   0.000     .5779854    .7872361
         L2D |   -.265755   .0528449    -5.03   0.000    -.3693291   -.1621809
grow         |
          D1 |  -.1016882   .0640968    -1.59   0.113    -.2273157    .0239392
          LD |   .1155703    .029261     3.95   0.000     .0582198    .1729208
lggp         |
          D1 |  -.0823109    .063254    -1.30   0.193    -.2062865    .0416647
          LD |   -.016232   .0607757    -0.27   0.789    -.1353502    .1028863
ele          |
          D1 |   .0073918   .0046407     1.59   0.111    -.0017038    .0164873
ele1         |
          D1 |  -.0073544   .0045725    -1.61   0.108    -.0163164    .0016077
_cons        |    .002157   .0006031     3.58   0.000      .000975     .003339
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   249.74     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -10.20   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.42   Pr > z = 0.1568

. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =    0.00
         Prob > chi2 =    0.9961
```

```
. xtabond te l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    250.92

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .6882782   .0531348    12.95   0.000     .5841358    .7924205
         L2D |  -.2839229   .0512149    -5.54   0.000    -.3843022   -.1835436
grow         |
          D1 |   -.087486    .064571    -1.35   0.175    -.2140429    .0390709
          LD |   .1358809   .0288623     4.71   0.000     .0793119    .1924499
lggp         |
          D1 |  -.1172843   .0627715    -1.87   0.062    -.2403143    .0057457
          LD |    .011062   .0605704     0.18   0.855    -.1076537    .1297777
ele_1        |
          D1 |   .0038208   .0046096     0.83   0.407    -.0052139    .0128555
_cons        |   .0021637   .0006088     3.55   0.000     .0009705     .003357
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   248.75     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -10.29   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.72   Pr > z = 0.0848
```

TABLES 7 and 8 - Elections and Composition Effect

```
. *OLS
. regress  ce ce_1 ce_2 ce_3 grow lggp ele, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   68.17
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.5964
                                                       Root MSE      =  .04868

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |    .597824   .0629698     9.49   0.000     .4739073    .7217407
        ce_2 |  -.0213287   .0697938    -0.31   0.760    -.1586743     .116017
        ce_3 |   .1615112   .0522125     3.09   0.002     .0587634     .264259
        grow |   .0682283   .0422724     1.61   0.108    -.0149585    .1514152
        lggp |  -.0076872   .0052917    -1.45   0.147    -.0181006    .0027262
         ele |   .0000105   .0068845     0.00   0.999    -.0135374    .0135585
       _cons |   .2929964    .058347     5.02   0.000     .1781766    .4078161
------------------------------------------------------------------------------

. regress  ce ce_1 ce_2 ce_3 grow lggp pbc, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   67.85
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.5976
                                                       Root MSE      =   .0486

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5959227   .0627891     9.49   0.000     .4723615    .7194839
        ce_2 |  -.0103155   .0694357    -0.15   0.882    -.1469564    .1263255
        ce_3 |    .154159   .0525895     2.93   0.004     .0506694    .2576485
        grow |   .0619434   .0422938     1.46   0.144    -.0212857    .1451724
        lggp |   -.007643   .0052931    -1.44   0.150    -.0180592    .0027731
         pbc |  -.0038566   .0039057    -0.99   0.324    -.0115425    .0038293
       _cons |   .2911026   .0585234     4.97   0.000     .1759358    .4062695
------------------------------------------------------------------------------

. regress  ce ce_1 ce_2 ce_3 grow lggp ele ele1,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   57.92
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.5998
                                                       Root MSE      =  .04855

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .6108055   .0649001     9.41   0.000     .4830884    .7385227
        ce_2 |  -.0137019   .0694034    -0.20   0.844    -.1502811    .1228773
        ce_3 |   .1427931   .0535513     2.67   0.008     .0374092    .2481769
        grow |   .0602011   .0417522     1.44   0.150    -.0219632    .1423655
        lggp |  -.0074531   .0052384    -1.42   0.156    -.0177616    .0028555
         ele |   .0039174   .0074204     0.53   0.598    -.0106852      .01852
        ele1 |    .010833   .0066074     1.64   0.102    -.0021697    .0238357
       _cons |   .2854962   .0585507     4.88   0.000     .1702741    .4007183
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    1.60
            Prob > F =    0.2073

. regress  ce ce_1 ce_2 ce_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   74.50
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.6071
                                                       Root MSE      =  .04802

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .6079164    .063583     9.56   0.000     .4827928    .7330399
        ce_2 |  -.0003787   .0705679    -0.01   0.996    -.1392477    .1384903
        ce_3 |   .1317214   .0521353     2.53   0.012     .0291255    .2343173
        grow |   .0686702   .0403819     1.70   0.090    -.0107963    .1481368
        lggp |  -.0076549   .0051607    -1.48   0.139    -.0178105    .0025007
       ele_1 |  -.0197734   .0069432    -2.85   0.005    -.0334368   -.0061101
       _cons |   .2954732   .0567027     5.21   0.000     .1838893     .407057
------------------------------------------------------------------------------


.
. *FE
. xtreg  ce ce_1 ce_2 ce_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3691                         Obs per group: min =        14
       between = 0.9242                                        avg =      14.0
       overall = 0.5915                                        max =        14

                                                F(6,280)           =     27.30
corr(u_i, Xb)  = 0.5274                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .4984037   .0555412     8.97   0.000     .3890724    .6077351
        ce_2 |  -.0463806   .0640028    -0.72   0.469    -.1723684    .0796072
        ce_3 |   .1227309   .0530716     2.31   0.021     .0182609    .2272008
        grow |   .0790595   .0386179     2.05   0.042     .0030412    .1550779
        lggp |  -.0134477   .0224803    -0.60   0.550    -.0576995     .030804
         ele |   .0013865   .0066562     0.21   0.835     -.011716     .014489
       _cons |   .4740116   .1804386     2.63   0.009     .1188232    .8291999
-------------+----------------------------------------------------------------
     sigma_u |  .02265106
     sigma_e |  .04678539
         rho |  .18988946   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.18             Prob > F = 0.0025

. xtreg  ce ce_1 ce_2 ce_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3699                         Obs per group: min =        14
       between = 0.9239                                        avg =      14.0
       overall = 0.5927                                        max =        14
```

```
                                                F(6,280)           =     27.40
corr(u_i, Xb)  = 0.5258                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .4960342   .0550021     9.02   0.000     .3877641    .6043044
        ce_2 |  -.0365872   .0640198    -0.57   0.568    -.1626085    .0894341
        ce_3 |   .1183684   .0534819     2.21   0.028     .0130907     .223646
        grow |    .073767   .0389992     1.89   0.060    -.0030019     .150536
        lggp |  -.0136598   .0224256    -0.61   0.543    -.0578038    .0304843
         pbc |  -.0025314    .003918    -0.65   0.519    -.0102439    .0051811
       _cons |   .4736657    .180086     2.63   0.009     .1191713      .82816
-------------+----------------------------------------------------------------
     sigma_u |  .02249727
     sigma_e |  .04675418
         rho |  .18800595   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.16             Prob > F = 0.0028

. xtreg  ce ce_1 ce_2 ce_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3733                         Obs per group: min =        14
       between = 0.9385                                        avg =      14.0
       overall = 0.5967                                        max =        14

                                                F(7,279)           =     23.74
corr(u_i, Xb)  = 0.5514                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5094768   .0560442     9.09   0.000     .3991537       .6198
        ce_2 |  -.0405547   .0640459    -0.63   0.527    -.1666293    .0855199
        ce_3 |   .1060174   .0543826     1.95   0.052    -.0010348    .2130696
        grow |   .0706142   .0390503     1.81   0.072    -.0062564    .1474848
        lggp |  -.0107449   .0225325    -0.48   0.634    -.0551002    .0336103
         ele |   .0046506   .0070621     0.66   0.511    -.0092511    .0185522
        ele1 |   .0089791   .0065703     1.37   0.173    -.0039546    .0219128
       _cons |   .4473069   .1812163     2.47   0.014      .090582    .8040317
-------------+----------------------------------------------------------------
     sigma_u |  .02252725
     sigma_e |  .04671307
         rho |   .1886821   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.15             Prob > F = 0.0030

. test ele=-ele1
 ( 1)  ele + ele1 = 0

       F(  1,   279) =    1.49
            Prob > F =    0.2228

. xtreg ce ce_1 ce_2 ce_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3877                         Obs per group: min =        14
       between = 0.9431                                        avg =      14.0
       overall = 0.6036                                        max =        14

                                                F(6,280)           =     29.55
corr(u_i, Xb)  = 0.5532                         Prob > F           =    0.0000
```

```
------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5064715   .0543087     9.33   0.000     .3995664    .6133766
        ce_2 |  -.0247478   .0624277    -0.40   0.692    -.1476349    .0981394
        ce_3 |   .0898578   .0534849     1.68   0.094    -.0154258    .1951415
        grow |   .0772384   .0378411     2.04   0.042     .0027493    .1517276
        lggp |  -.0101332   .0221414    -0.46   0.648     -.053718    .0334516
       ele_1 |  -.0194332   .0066483    -2.92   0.004    -.0325203   -.0063462
       _cons |   .4520359   .1776843     2.54   0.011     .1022692    .8018026
-------------+----------------------------------------------------------------
     sigma_u |  .02273794
     sigma_e |  .04609108
         rho |  .19573466   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     2.23             Prob > F = 0.0019

.
. *GMM
. xtabond ce l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    142.57

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |   .5204356   .0568682     9.15   0.000     .4089759    .6318952
         L2D |  -.0343043   .0569018    -0.60   0.547    -.1458298    .0772211
grow         |
          D1 |   .0892711   .0950972     0.94   0.348     -.097116    .2756583
          LD |   -.069051   .0411043    -1.68   0.093     -.149614    .0115121
lggp         |
          D1 |   .0052189   .0929107     0.06   0.955    -.1768827    .1873206
          LD |  -.0666234   .0900221    -0.74   0.459    -.2430635    .1098168
ele          |
          D1 |  -.0057964   .0064121    -0.90   0.366    -.0183639     .006771
_cons        |   .0049174    .001014     4.85   0.000       .00293    .0069048
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   244.93     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.35   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.89   Pr > z = 0.3739

. xtabond ce l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    145.08

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
```

```
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |   .5213213   .0559603     9.32   0.000     .4116411    .6310014
         L2D |  -.0292606   .0561441    -0.52   0.602    -.1393011    .0807799
grow         |
          D1 |   .0920027   .0947985     0.97   0.332     -.093799    .2778045
          LD |  -.0585332   .0416931    -1.40   0.160    -.1402502    .0231838
lggp         |
          D1 |  -.0067717   .0926874    -0.07   0.942    -.1884357    .1748924
          LD |   -.056363   .0897739    -0.63   0.530    -.2323166    .1195905
pbc          |
          D1 |  -.0065655   .0038776    -1.69   0.090    -.0141655    .0010344
_cons        |   .0048776    .001011     4.82   0.000     .0028961    .0068591
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   243.05     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.41   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.52   Pr > z = 0.6014

. xtabond ce l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    145.53

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |   .5329169   .0572878     9.30   0.000     .4206349    .6451989
         L2D |  -.0366249    .057022    -0.64   0.521     -.148386    .0751362
grow         |
          D1 |   .0879901   .0952772     0.92   0.356    -.0987497      .27473
          LD |  -.0559375   .0419735    -1.33   0.183     -.138204     .026329
lggp         |
          D1 |  -.0017589   .0931851    -0.02   0.985    -.1843983    .1808805
          LD |  -.0604062   .0902535    -0.67   0.503    -.2372998    .1164874
ele          |
          D1 |  -.0015722   .0068145    -0.23   0.818    -.0149284    .0117839
ele1         |
          D1 |   .0111912   .0066819     1.67   0.094    -.0019051    .0242874
_cons        |   .0048946   .0010158     4.82   0.000     .0029037    .0068854
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   244.37     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.55   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.36   Pr > z = 0.7182

. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =    0.76
         Prob > chi2 =    0.3831
```

```
. xtabond ce l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    148.01

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |   .5460397   .0559632     9.76   0.000     .4363538    .6557256
         L2D |  -.0449919   .0550667    -0.82   0.414    -.1529206    .0629368
grow         |
          D1 |   .0807695   .0943044     0.86   0.392    -.1040637    .2656027
          LD |  -.0788889   .0406327    -1.94   0.052    -.1585274    .0007497
lggp         |
          D1 |   .0262696   .0910579     0.29   0.773    -.1522006    .2047398
          LD |  -.0790056   .0883866    -0.89   0.371    -.2522403     .094229
ele_1        |
          D1 |  -.0148937   .0067283    -2.21   0.027     -.028081   -.0017064
_cons        |   .0046604   .0010169     4.58   0.000     .0026673    .0066536
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   242.60     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.32   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.50   Pr > z = 0.6165
```

TABLES 9 and 10 - Elections and Total Revenue

```
. *OLS
. regress tr tr_1 tr_2 tr_3 grow lggp ele, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   72.19
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8920
                                                       Root MSE      =   .0332

------------------------------------------------------------------------------
             |               Robust
          tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   1.007357   .1669972     6.03   0.000      .678727    1.335987
        tr_2 |   -.280931   .2239186    -1.25   0.211    -.7215751    .1597131
        tr_3 |    .158464   .0864167     1.83   0.068    -.0115934    .3285214
        grow |   -.051079   .0274964    -1.86   0.064    -.1051884    .0030304
        lggp |   .0007143   .0031351     0.23   0.820    -.0054552    .0068839
         ele |   .0111455    .004261     2.62   0.009     .0027604    .0195306
       _cons |   .0141335   .0306862     0.46   0.645    -.0462533    .0745202
------------------------------------------------------------------------------

. regress tr tr_1 tr_2 tr_3 grow lggp pbc, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   65.81
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8903
                                                       Root MSE      =  .03347

------------------------------------------------------------------------------
             |               Robust
          tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   1.011438   .1685758     6.00   0.000      .679702    1.343175
        tr_2 |   -.299546   .2214875    -1.35   0.177     -.735406     .136314
        tr_3 |   .1719821   .0842619     2.04   0.042     .0061651    .3377991
        grow |   -.053444   .0276693    -1.93   0.054    -.1078938    .0010058
        lggp |   .0006089   .0031729     0.19   0.848    -.0056351    .0068528
         pbc |   .0024608    .002744     0.90   0.371     -.002939    .0078606
       _cons |   .0179009   .0312325     0.57   0.567    -.0435607    .0793626
------------------------------------------------------------------------------

. regress tr_1 tr_2 tr_3 grow lggp ele ele1,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   77.98
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8930
                                                       Root MSE      =   .0331

------------------------------------------------------------------------------
             |               Robust
          tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .9937757   .1704347     5.83   0.000     .6583768    1.329175
        tr_2 |  -.2660834   .2282896    -1.17   0.245    -.7153353    .1831684
        tr_3 |   .1580741   .0865007     1.83   0.069    -.0121509    .3282991
        grow |  -.0556565   .0270965    -2.05   0.041    -.1089799   -.0023332
        lggp |   .0008512    .003169     0.27   0.788     -.005385    .0070873
         ele |   .0137865   .0047429     2.91   0.004     .0044529    .0231202
        ele1 |   .0075717    .005269     1.44   0.152    -.0027971    .0179405
       _cons |   .0101636   .0305855     0.33   0.740    -.0500258     .070353
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    6.30
            Prob > F =    0.0126

. regress trtr_1 tr_2 tr_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =   65.24
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8901
                                                       Root MSE      =  .03349

------------------------------------------------------------------------------
             |               Robust
          tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   1.001558   .1695455     5.91   0.000     .6679135    1.335203
        tr_2 |  -.2998994   .2223525    -1.35   0.178    -.7374615    .1376628
        tr_3 |   .1814686   .0844263     2.15   0.032     .0153281    .3476092
        grow |    -.05567   .0278415    -2.00   0.046    -.1104586   -.0008815
        lggp |   .0006317    .003206     0.20   0.844    -.0056773    .0069406
       ele_1 |  -.0029734   .0039099    -0.76   0.448    -.0106675    .0047207
       _cons |   .0183559   .0314147     0.58   0.559    -.0434643    .0801762
------------------------------------------------------------------------------

.
.
. *FE
. xtreg tr tr_1 tr_2 tr_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4882                         Obs per group: min =        14
       between = 0.9475                                        avg =      14.0
       overall = 0.5713                                        max =        14

                                                F(6,280)           =     44.51
corr(u_i, Xb)  = 0.6137                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5988355   .0416372    14.38   0.000     .5168737    .6807972
        tr_2 |  -.2727789   .0490768    -5.56   0.000    -.3693852   -.1761727
        tr_3 |  -.1350257   .0384525    -3.51   0.001    -.2107184    -.059333
        grow |  -.0559339   .0186706    -3.00   0.003    -.0926865   -.0191813
        lggp |  -.0076158   .0100646    -0.76   0.450    -.0274277    .0121962
         ele |   .0051387    .003222     1.59   0.112    -.0012036    .0114811
       _cons |   .2346181   .0887453     2.64   0.009     .0599255    .4093107
-------------+----------------------------------------------------------------
     sigma_u |  .07997137
     sigma_e |  .02275159
         rho |  .92512213   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    17.19             Prob > F = 0.0000

. xtreg tr tr_1 tr_2 tr_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4836                         Obs per group: min =        14
       between = 0.9417                                        avg =      14.0
       overall = 0.5554                                        max =        14
```

```
                                                F(6,280)          =     43.70
corr(u_i, Xb)  = 0.6010                         Prob > F          =    0.0000

------------------------------------------------------------------------------
         tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5962759   .0420166    14.19   0.000     .5135674    .6789843
        tr_2 |  -.2815121   .0489819    -5.75   0.000    -.3779317   -.1850926
        tr_3 |   -.129584   .0385897    -3.36   0.001    -.2055468   -.0536211
        grow |  -.0580038   .0188756    -3.07   0.002    -.0951599   -.0208476
        lggp |  -.0078138   .0101177    -0.77   0.441    -.0277301    .0121025
         pbc |   .0004041   .0019049     0.21   0.832    -.0033457    .0041539
       _cons |   .2387625   .0891719     2.68   0.008     .0632301    .4142948
-------------+----------------------------------------------------------------
     sigma_u |  .08059363
     sigma_e |  .02285287
         rho |  .92557934   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    17.41            Prob > F = 0.0000

. xtreg trtr_1 tr_2 tr_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4938                         Obs per group: min =        14
       between = 0.9606                                        avg =      14.0
       overall = 0.5816                                        max =        14

                                                F(7,279)           =     38.87
corr(u_i, Xb)  = 0.6222                         Prob > F           =    0.0000

------------------------------------------------------------------------------
         tr|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5906884   .0417431    14.15   0.000      .508517    .6728599
        tr_2 |  -.2623382   .0492571    -5.33   0.000    -.3593009   -.1653756
        tr_3 |  -.1337519   .0383177    -3.49   0.001    -.2091804   -.0583234
        grow |  -.0599213   .0187403    -3.20   0.002    -.0968115    -.023031
        lggp |  -.0062672    .010057    -0.62   0.534    -.0260644      .01353
         ele |   .0070712    .003394     2.08   0.038     .0003902    .0137522
        ele1 |   .0054775   .0031235     1.75   0.081    -.0006712    .0116262
       _cons |    .220364    .088791     2.48   0.014     .0455785    .3951494
-------------+----------------------------------------------------------------
     sigma_u |  .07961596
     sigma_e |  .02266774
         rho |  .92501649   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    17.18            Prob > F = 0.0000

. test ele=-ele1

 ( 1)  ele + ele1 = 0

       F(  1,   279) =    5.59
            Prob > F =    0.0187

. xtregtrtr_1 tr_2 tr_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4846                         Obs per group: min =        14
       between = 0.9470                                        avg =      14.0
       overall = 0.5572                                        max =        14

                                                F(6,280)           =     43.87
corr(u_i, Xb)  = 0.6028                         Prob > F           =    0.0000
```

```
------------------------------------------------------------------------------
          it |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5911466   .0420922    14.04   0.000     .5082893    .6740038
        tr_2 |  -.2812704    .048933    -5.75   0.000    -.3775937   -.1849472
        tr_3 |  -.1250099    .038729    -3.23   0.001    -.2012468    -.048773
        grow |  -.0579308   .0186826    -3.10   0.002    -.0947069   -.0211547
        lggp |  -.0073739   .0101109    -0.73   0.466    -.0272769    .0125291
       ele_1 |  -.0024626   .0032909    -0.75   0.455    -.0089406    .0040154
       _cons |    .235504   .0890983     2.64   0.009     .0601165    .4108916
-------------+----------------------------------------------------------------
     sigma_u |  .08055516
     sigma_e |  .02283188
         rho |  .92564008   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    17.50             Prob > F = 0.0000

.
. *GMM
. xtabond it l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    268.76

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
it           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
it           |
          LD |   .7139933   .0506127    14.11   0.000     .6147942    .8131923
         L2D |  -.2993771   .0483703    -6.19   0.000    -.3941812    -.204573
grow         |
          D1 |  -.0576599   .0589354    -0.98   0.328    -.1731712    .0578514
          LD |    .111362    .025856     4.31   0.000     .0606853    .1620388
lggp         |
          D1 |  -.0320426   .0577771    -0.55   0.579    -.1452835    .0811984
          LD |   -.053781   .0558419    -0.96   0.336     -.163229    .0556671
ele          |
          D1 |   .0095186    .003906     2.44   0.015      .001863    .0171741
_cons        |    .002413   .0005494     4.39   0.000     .0013363    .0034898
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   270.19     Prob > chi2 = 0.9999

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.33   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.25   Pr > z = 0.2096

. xtabond it l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    261.15

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
```

```
------------------------------------------------------------------------------
it           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
it           |
          LD |   .7187746   .0508761    14.13   0.000     .6190594    .8184898
         L2D |  -.3142351   .0481481    -6.53   0.000    -.4086036   -.2198665
grow         |
          D1 |  -.0472061   .0590767    -0.80   0.424    -.1629943    .0685821
          LD |   .1147523   .0263393     4.36   0.000     .0631282    .1663765
lggp         |
          D1 |  -.0489422   .0579701    -0.84   0.399    -.1625614    .0646771
          LD |  -.0374842   .0559705    -0.67   0.503    -.1471844     .072216
pbc          |
          D1 |   .0019902   .0023928     0.83   0.406    -.0026996    .0066801
_cons        |   .0022855    .000549     4.16   0.000     .0012095    .0033615
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   273.64     Prob > chi2 = 0.9999

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.24   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.98   Pr > z = 0.3289

. xtabond it l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    280.15

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
it           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
it           |
          LD |   .7011586   .0502729    13.95   0.000     .6026256    .7996916
         L2D |  -.2851209   .0482156    -5.91   0.000    -.3796218     -.19062
grow         |
          D1 |  -.0580364   .0581288    -1.00   0.318    -.1719667    .0558939
          LD |   .1213578   .0259548     4.68   0.000     .0704874    .1722283
lggp         |
          D1 |  -.0375077   .0570538    -0.66   0.511    -.1493311    .0743158
          LD |  -.0497497   .0551136    -0.90   0.367    -.1577704     .058271
ele          |
          D1 |   .0124942   .0041004     3.05   0.002     .0044575    .0205308
ele1         |
          D1 |   .0084908   .0040986     2.07   0.038     .0004578    .0165238
_cons        |   .0024929   .0005433     4.59   0.000      .001428    .0035578
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   274.97     Prob > chi2 = 0.9999

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.22   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.00   Pr > z = 0.3194
.
. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =    9.76
         Prob > chi2 =    0.0018
```

```
. xtabond it l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    263.49

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14
One-step results
------------------------------------------------------------------------------
it           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
it           |
          LD |   .7136762   .0515131    13.85   0.000     .6127124      .81464
         L2D |  -.3121723   .0484659    -6.44   0.000    -.4071637   -.2171808
grow         |
          D1 |   -.043272   .0587091    -0.74   0.461    -.1583397    .0717957
          LD |   .1189453   .0257069     4.63   0.000     .0685607    .1693298
lggp         |
          D1 |   -.057316   .0569039    -1.01   0.314    -.1688457    .0542137
          LD |  -.0301892   .0550328    -0.55   0.583    -.1380515    .0776732
ele_1        |
          D1 |  -.0017399   .0042163    -0.41   0.680    -.0100036    .0065239
_cons        |   .0022668   .0005479     4.14   0.000     .0011929    .0033408
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   276.45     Prob > chi2 = 0.9998

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.13   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.88   Pr > z = 0.3768
```

TABLES 11 and 12 - Elections and Revenue from Federal Government

```
. *OLS
. regress  fr fr_1 fr_2 fr_3 grow lggp ele, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  131.61
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9049
                                                       Root MSE      =  .03052

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   1.004842   .1443267     6.96   0.000     .7208247    1.288859
        fr_2 |  -.2122897   .1985607    -1.07   0.286    -.6030325    .1784532
        fr_3 |   .1084967   .0781301     1.39   0.166    -.0452537    .2622471
        grow |  -.0498083    .025191    -1.98   0.049    -.0993811   -.0002355
        lggp |  -.0004904    .003127    -0.16   0.875     -.006644    .0056632
         ele |   .0113934   .0039385     2.89   0.004     .0036429    .0191439
       _cons |   .0182307   .0305493     0.60   0.551    -.0418866    .0783479
------------------------------------------------------------------------------

. regress  fr fr_1 fr_2 fr_3 grow lggp pbc, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  119.05
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9030
                                                       Root MSE      =  .03081

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   1.008407   .1462416     6.90   0.000     .7206219    1.296193
        fr_2 |  -.2309958   .1985459    -1.16   0.246    -.6217095     .159718
        fr_3 |   .1225613   .0766267     1.60   0.111    -.0282305    .2733532
        grow |  -.0518731   .0256435    -2.02   0.044    -.1023363   -.0014098
        lggp |  -.0006274   .0031662    -0.20   0.843    -.0068581    .0056033
         pbc |   .0027726   .0025483     1.09   0.277    -.0022422    .0077874
       _cons |   .0223104   .0311374     0.72   0.474    -.0389641    .0835849
------------------------------------------------------------------------------

. regress  fr fr_1 fr_2 fr_3 grow lggp ele ele1,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  122.71
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9058
                                                       Root MSE      =  .03042

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .9891585   .1484102     6.67   0.000     .6971016    1.281215
        fr_2 |  -.1942327   .2037218    -0.95   0.341    -.5951374    .2066719
        fr_3 |   .1068462   .0783029     1.36   0.173    -.0472463    .2609387
        grow |  -.0543071   .0250902    -2.16   0.031    -.1036823   -.0049319
        lggp |  -.0003557   .0031491    -0.11   0.910    -.0065528    .0058414
         ele |   .0138578   .0042657     3.25   0.001     .0054633    .0222522
        ele1 |   .0071179   .0046235     1.54   0.125    -.0019807    .0162165
       _cons |   .0144918   .0303717     0.48   0.634    -.0452767    .0742604
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    8.03
            Prob > F =    0.0049

. regress  fr fr_1 fr_2 fr_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  117.48
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9029
                                                       Root MSE      =  .03083

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .9940371   .1472625     6.75   0.000     .7042428    1.283832
        fr_2 |  -.2296705   .2000504    -1.15   0.252     -.623345    .1640039
        fr_3 |   .1345786   .0779217     1.73   0.085    -.0187618     .287919
        grow |   -.054518   .0256805    -2.12   0.035    -.1050541   -.0039819
        lggp |   -.000635    .003203    -0.20   0.843    -.0069381    .0056681
       ele_1 |  -.0038346   .0037698    -1.02   0.310     -.011253    .0035838
       _cons |   .0232096   .0312747     0.74   0.459    -.0383351    .0847544
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  fr fr_1 fr_2 fr_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4508                         Obs per group: min =        14
       between = 0.8928                                        avg =      14.0
       overall = 0.6720                                        max =        14

                                                F(6,280)           =     38.30
corr(u_i, Xb)  = 0.6993                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5847009   .0443512    13.18   0.000     .4973967     .672005
        fr_2 |  -.2077448   .0521033    -3.99   0.000    -.3103086    -.105181
        fr_3 |  -.1474463    .039764    -3.71   0.000    -.2257207   -.0691719
        grow |  -.0452483   .0175997    -2.57   0.011    -.0798927   -.0106038
        lggp |  -.0154633   .0096178    -1.61   0.109    -.0343955     .003469
         ele |   .0052995   .0030445     1.74   0.083    -.0006936    .0112925
       _cons |   .2719578   .0849833     3.20   0.002     .1046705    .4392452
-------------+----------------------------------------------------------------
     sigma_u |  .07463975
     sigma_e |  .02151267
         rho |   .9233007   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    15.51             Prob > F = 0.0000

. xtreg  fr fr_1 fr_2 fr_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4449                         Obs per group: min =        14
       between = 0.8817                                        avg =      14.0
       overall = 0.6561                                        max =        14
```

```
                                                F(6,280)           =     37.41
corr(u_i, Xb)  = 0.6870                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5799352   .0448884    12.92   0.000     .4915736    .6682968
        fr_2 |  -.2158632   .0521866    -4.14   0.000    -.3185911   -.1131353
        fr_3 |  -.1418172   .0399137    -3.55   0.000    -.2203862   -.0632482
        grow |  -.0472567   .0178163    -2.65   0.008    -.0823276   -.0121857
        lggp |  -.0158394   .0096719    -1.64   0.103    -.0348782    .0031995
         pbc |   .0004165   .0018057     0.23   0.818     -.003138     .003971
       _cons |   .2777569   .0854076     3.25   0.001     .1096343    .4458794
-------------+----------------------------------------------------------------
     sigma_u |   .0753887
     sigma_e |   .0216267
         rho |  .92396341   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    15.76             Prob > F = 0.0000

. xtreg  fr fr_1 fr_2 fr_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4579                         Obs per group: min =        14
       between = 0.9099                                        avg =      14.0
       overall = 0.6823                                        max =        14

                                                F(7,279)           =     33.67
corr(u_i, Xb)  = 0.7090                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5738351   .0445019    12.89   0.000      .486233    .6614373
        fr_2 |  -.1935724   .0523787    -3.70   0.000    -.2966799   -.0904649
        fr_3 |  -.1474734   .0395749    -3.73   0.000    -.2253766   -.0695701
        grow |  -.0495832    .017661    -2.81   0.005     -.084349   -.0148175
        lggp |  -.0140664   .0095996    -1.47   0.144    -.0329633    .0048305
         ele |   .0072865   .0032021     2.28   0.024     .0009832    .0135897
        ele1 |   .0056745   .0029569     1.92   0.056    -.0001462    .0114953
       _cons |   .2573784   .0849196     3.03   0.003     .0902138    .4245429
-------------+----------------------------------------------------------------
     sigma_u |  .07433849
     sigma_e |  .02141034
         rho |   .9234031   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    15.55             Prob > F = 0.0000

. test ele=-ele1

 ( 1)  ele + ele1 = 0

       F(  1,   279) =    6.69
            Prob > F =    0.0102

. xtreg fr fr_1 fr_2 fr_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4474                         Obs per group: min =        14
       between = 0.8895                                        avg =      14.0
       overall = 0.6592                                        max =        14

                                                F(6,280)           =     37.79
corr(u_i, Xb)  = 0.6903                         Prob > F           =    0.0000
```

```
------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5722638   .0446705    12.81   0.000     .4843313    .6601964
        fr_2 |   -.215896   .0520624    -4.15   0.000    -.3183795   -.1134126
        fr_3 |  -.1346562   .0401207    -3.36   0.001    -.2136326   -.0556798
        grow |  -.0471067   .0176013    -2.68   0.008    -.0817543    -.012459
        lggp |  -.0152872   .0096545    -1.58   0.114    -.0342919    .0037174
       ele_1 |  -.0035662   .0031072    -1.15   0.252    -.0096826    .0025502
       _cons |    .273778   .0852407     3.21   0.001      .105984     .441572
-------------+----------------------------------------------------------------
     sigma_u |  .07535224
     sigma_e |  .02157805
         rho |  .92421147   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =    15.93             Prob > F = 0.0000

.
. *GMM
. xtabond fr l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    267.16

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |   .7235389    .052213    13.86   0.000     .6212032    .8258746
         L2D |  -.2624027   .0488318    -5.37   0.000    -.3581113   -.1666942
grow         |
          D1 |  -.0632153   .0539575    -1.17   0.241    -.1689701    .0425394
          LD |    .085278   .0236323     3.61   0.000     .0389594    .1315965
lggp         |
          D1 |  -.0199589   .0528216    -0.38   0.706    -.1234874    .0835696
          LD |  -.0494736   .0511049    -0.97   0.333    -.1496373    .0506901
ele          |
          D1 |   .0097197   .0035651     2.73   0.006     .0027323    .0167071
_cons        |   .0017769   .0005019     3.54   0.000     .0007931    .0027607
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   254.86     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.18   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.49   Pr > z = 0.1355

. xtabond fr l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    257.36

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
```

```
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |   .7270714   .0526907    13.80   0.000     .6237995    .8303434
         L2D |  -.2765132   .0488825    -5.66   0.000    -.3723211   -.1807053
grow         |
          D1 |  -.0532748   .0542056    -0.98   0.326    -.1595159    .0529662
          LD |   .0879425   .0241098     3.65   0.000     .0406882    .1351968
lggp         |
          D1 |  -.0355654   .0531379    -0.67   0.503    -.1397138    .0685829
          LD |  -.0345157   .0513627    -0.67   0.502    -.1351847    .0661534
pbc          |
          D1 |   .0023271   .0021952     1.06   0.289    -.0019755    .0066297
_cons        |    .001648   .0005025     3.28   0.001     .0006631    .0026329
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   258.41     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.14   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.25   Pr > z = 0.2115

. xtabond fr l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    278.28

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |     .70871   .0519173    13.65   0.000     .6069539    .8104661
         L2D |  -.2466791   .0487802    -5.06   0.000    -.3422866   -.1510716
grow         |
          D1 |  -.0631314   .0532212    -1.19   0.236     -.167443    .0411801
          LD |   .0944206   .0237134     3.98   0.000     .0479431    .1408981
lggp         |
          D1 |  -.0255887    .052176    -0.49   0.624    -.1278518    .0766744
          LD |  -.0451149   .0504519    -0.89   0.371    -.1439988    .0537689
ele          |
          D1 |   .0124454   .0037407     3.33   0.001     .0051138    .0197769
ele1         |
          D1 |    .007851   .0037595     2.09   0.037     .0004826    .0152195
_cons        |   .0018506   .0004965     3.73   0.000     .0008775    .0028237
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   258.52     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.13   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.30   Pr > z = 0.1944

. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =   10.92
         Prob > chi2 =    0.0010
```

```
. xtabond fr l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    260.19

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |   .7153949   .0530404    13.49   0.000     .6114376    .8193522
         L2D |  -.2702834   .0490696    -5.51   0.000    -.3664579   -.1741088
grow         |
          D1 |  -.0482444   .0537563    -0.90   0.369    -.1536049    .0571161
          LD |   .0922413   .0235113     3.92   0.000       .04616    .1383226
lggp         |
          D1 |   -.044831   .0520502    -0.86   0.389    -.1468474    .0571855
          LD |  -.0255652   .0504065    -0.51   0.612    -.1243602    .0732298
ele_1        |
          D1 |  -.0033428   .0038497    -0.87   0.385    -.0108879    .0042024
_cons        |   .0016022   .0005006     3.20   0.001      .000621    .0025833
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   260.82     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -9.00   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.16   Pr > z = 0.2458
```

TABLES 13 and 14 - Elections and Revenue from Provincial Taxes

```
. *OLS
. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp ele, robust

Regression with robust standard errors                Number of obs =     308
                                                      F(  6,   301) =  132.20
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.8422
                                                      Root MSE      =  .00561

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |    .942762    .144488     6.52   0.000     .6584275    1.227096
       ptr_2 |  -.3730599   .1568082    -2.38   0.018    -.6816391   -.0644808
       ptr_3 |   .2536957   .0794738     3.19   0.002     .0973011    .4100903
        grow |  -.0033285   .0048578    -0.69   0.494     -.012888     .006231
        lggp |   .0026659   .0009725     2.74   0.006     .0007522    .0045796
         ele |   .0001689   .0007483     0.23   0.822    -.0013037    .0016416
       _cons |  -.0178248   .0074551    -2.39   0.017    -.0324954   -.0031541
------------------------------------------------------------------------------

. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp pbc, robust

Regression with robust standard errors                Number of obs =     308
                                                      F(  6,   301) =  128.07
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.8424
                                                      Root MSE      =  .00561

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .9453385    .144014     6.56   0.000     .6619368     1.22874
       ptr_2 |  -.3809934   .1547589    -2.46   0.014    -.6855398    -.076447
       ptr_3 |   .2592307   .0804054     3.22   0.001     .1010028    .4174587
        grow |   -.003823   .0047544    -0.80   0.422    -.0131792    .0055331
        lggp |   .0026665   .0009774     2.73   0.007      .000743    .0045899
         pbc |  -.0002816   .0005121    -0.55   0.583    -.0012894    .0007261
       _cons |  -.0177999    .007467    -2.38   0.018    -.0324942   -.0031057
------------------------------------------------------------------------------

. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp ele ele1,robust

Regression with robust standard errors                Number of obs =     308
                                                      F(  7,   300) =  114.91
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.8430
                                                      Root MSE      =   .0056

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .9415359   .1426356     6.60   0.000     .6608429    1.222229
       ptr_2 |  -.3741504   .1539818    -2.43   0.016    -.6771716   -.0711292
       ptr_3 |   .2574332   .0800395     3.22   0.001     .0999233    .4149431
        grow |  -.0039038   .0047272    -0.83   0.410    -.0132066    .0053989
        lggp |   .0026621   .0009674     2.75   0.006     .0007583    .0045659
         ele |   .0004969   .0007576     0.66   0.512    -.0009939    .0019878
        ele1 |   .0009575   .0008671     1.10   0.270    -.0007489    .0026639
       _cons |  -.0181551   .0074988    -2.42   0.016     -.032912   -.0033983
------------------------------------------------------------------------------

. test ele=-ele1
```

```
 ( 1)  ele + ele1 = 0

       F(  1,   300) =    1.30
            Prob > F =    0.2559

. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp ele_1, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  6,   301) =  125.68
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8435
                                                       Root MSE      =  .00559

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .9546462   .1469553     6.50   0.000     .6654564    1.243836
       ptr_2 |  -.3821857   .1534544    -2.49   0.013    -.6841649   -.0802064
       ptr_3 |   .2529327   .0776832     3.26   0.001     .1000618    .4058037
        grow |  -.0037868   .0048006    -0.79   0.431    -.0132338    .0056603
        lggp |   .0026233   .0009849     2.66   0.008     .0006851    .0045615
       ele_1 |    .001259   .0007054     1.78   0.075    -.0001291    .0026471
       _cons |  -.0177284   .0074827    -2.37   0.018    -.0324535   -.0030033
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  ptr ptr_1 ptr_2 ptr_3 grow lggp ele,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5246                         Obs per group: min =        14
       between = 0.9070                                        avg =      14.0
       overall = 0.7956                                        max =        14

                                                F(6,280)           =     51.50
corr(u_i, Xb)  = 0.5065                         Prob > F           =    0.0000

------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .7615754   .0479806    15.87   0.000      .667127    .8560239
       ptr_2 |  -.3799457   .0562935    -6.75   0.000     -.490758   -.2691335
       ptr_3 |   .1011362   .0482906     2.09   0.037     .0060776    .1961949
        grow |      -.006   .0044446    -1.35   0.178    -.0147491    .0027491
        lggp |      .0077   .0023265     3.31   0.001     .0031205    .0122796
         ele |   .0001654    .000737     0.22   0.823    -.0012853    .0016161
       _cons |  -.0515511   .0197267    -2.61   0.009    -.0903826   -.0127196
-------------+----------------------------------------------------------------
     sigma_u |  .00462312
     sigma_e |  .00520647
         rho |  .44086209   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     3.30             Prob > F = 0.0000

. xtreg  ptr ptr_1 ptr_2 ptr_3 grow lggp pbc,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5250                         Obs per group: min =        14
       between = 0.9060                                        avg =      14.0
       overall = 0.7953                                        max =        14
```

```
                                                F(6,280)          =     51.58
corr(u_i, Xb)  = 0.5007                         Prob > F          =    0.0000

------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |    .763964   .0478951    15.95   0.000     .6696838    .8582441
       ptr_2 |  -.3867665   .0560174    -6.90   0.000    -.4970352   -.2764978
       ptr_3 |   .1059282   .0484006     2.19   0.029      .010653    .2012035
        grow |   -.006467   .0044717    -1.45   0.149    -.0152695    .0023355
        lggp |   .0077662    .002328     3.34   0.001     .0031836    .0123488
         pbc |  -.0002204   .0004341    -0.51   0.612    -.0010749    .0006342
       _cons |   -.052095   .0197446    -2.64   0.009    -.0909617   -.0132284
-------------+----------------------------------------------------------------
     sigma_u |  .00461705
     sigma_e |  .00520454
         rho |  .44039739   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     3.30             Prob > F = 0.0000

. xtreg  ptr ptr_1 ptr_2 ptr_3 grow lggp ele ele1,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5268                         Obs per group: min =        14
       between = 0.9050                                        avg =      14.0
       overall = 0.7955                                        max =        14

                                                F(7,279)          =     44.36
corr(u_i, Xb)  = 0.4922                         Prob > F          =    0.0000

------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .7613549   .0479597    15.87   0.000     .6669461    .8557636
       ptr_2 |  -.3811856   .0562794    -6.77   0.000    -.4919719   -.2703994
       ptr_3 |   .1051559   .0484029     2.17   0.031     .0098746    .2004372
        grow |   -.006579   .0044727    -1.47   0.142    -.0153837    .0022256
        lggp |   .0078497   .0023293     3.37   0.001     .0032645    .0124349
         ele |   .0004351   .0007752     0.56   0.575    -.0010908     .001961
        ele1 |   .0007915   .0007082     1.12   0.265    -.0006026    .0021857
       _cons |  -.0531774   .0197716    -2.69   0.008    -.0920978    -.014257
-------------+----------------------------------------------------------------
     sigma_u |  .00459919
     sigma_e |  .00520415
         rho |   .4385246   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     3.28             Prob > F = 0.0000

. test ele=-ele1

 ( 1)  ele + ele1 = 0

       F(  1,   279) =    1.04
            Prob > F =    0.3083

. xtreg ptr ptr_1 ptr_2 ptr_3 grow lggp ele_1, fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5281                         Obs per group: min =        14
       between = 0.9093                                        avg =      14.0
       overall = 0.7978                                        max =        14

                                                F(6,280)          =     52.21
corr(u_i, Xb)  = 0.5150                         Prob > F          =    0.0000
```

```
------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .7724179   .0481472    16.04   0.000     .6776415    .8671943
       ptr_2 |  -.3878745   .0552707    -7.02   0.000    -.4966733   -.2790756
       ptr_3 |   .1005916    .047777     2.11   0.036     .0065439    .1946393
        grow |  -.0064194    .004407    -1.46   0.146    -.0150944    .0022556
        lggp |   .0075677   .0023198     3.26   0.001     .0030012    .0121342
       ele_1 |   .0010658   .0007395     1.44   0.151    -.0003899    .0025215
       _cons |   -.050653   .0196658    -2.58   0.011    -.0893645   -.0119414
-------------+----------------------------------------------------------------
     sigma_u |  .00461188
     sigma_e |  .00518773
         rho |  .44143963   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 280) =     3.28             Prob > F = 0.0000

.
. *GMM
. xtabond ptr l(0).ele , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    235.51

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr          |
          LD |   .6402529   .0477316    13.41   0.000     .5467006    .7338051
         L2D |  -.3534784     .04877    -7.25   0.000    -.4490658    -.257891
grow         |
          D1 |    .008156   .0106523     0.77   0.444     -.012722    .0290341
          LD |   .0218891   .0045774     4.78   0.000     .0129175    .0308607
lggp         |
          D1 |  -.0114323   .0105563    -1.08   0.279    -.0321221    .0092576
          LD |  -.0002762   .0102463    -0.03   0.978    -.0203585    .0198062
ele          |
          D1 |   .0001608   .0007098     0.23   0.821    -.0012303    .0015519
_cons        |   .0006998   .0001023     6.84   0.000     .0004992    .0009003
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   338.55     Prob > chi2 = 0.8362

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.33   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.26   Pr > z = 0.7969

. xtabond ptr l(0).pbc , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    238.17

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
```

```
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr          |
          LD |   .6448356   .0472877    13.64   0.000     .5521535    .7375177
         L2D |  -.3611368   .0481671    -7.50   0.000    -.4555426   -.2667311
grow         |
          D1 |   .0091225   .0105771     0.86   0.388    -.0116082    .0298532
          LD |   .0226823   .0046351     4.89   0.000     .0135977    .0317668
lggp         |
          D1 |  -.0133987    .010491    -1.28   0.202    -.0339607    .0071634
          LD |   .0016247   .0101629     0.16   0.873    -.0182943    .0215438
pbc          |
          D1 |  -.0003034   .0004311    -0.70   0.482    -.0011484    .0005416
_cons        |   .0006944   .0001015     6.84   0.000     .0004955    .0008932
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   340.42     Prob > chi2 = 0.8176

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.15   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.09   Pr > z = 0.9280

. xtabond ptr l(0).ele ele1, lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    241.45

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr          |
          LD |   .6365623   .0473277    13.45   0.000     .5438018    .7293229
         L2D |  -.3548191   .0483149    -7.34   0.000    -.4495146   -.2601236
grow         |
          D1 |     .00824   .0105553     0.78   0.435    -.0124479     .028928
          LD |   .0234205   .0046409     5.05   0.000     .0143244    .0325165
lggp         |
          D1 |  -.0124237   .0104739    -1.19   0.236    -.0329521    .0081047
          LD |   .0005377   .0101594     0.05   0.958    -.0193743    .0204497
ele          |
          D1 |    .000493   .0007432     0.66   0.507    -.0009636    .0019497
ele1         |
          D1 |   .0011093   .0007332     1.51   0.130    -.0003277    .0025463
_cons        |   .0007102   .0001016     6.99   0.000      .000511    .0009094
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   344.69     Prob > chi2 = 0.7708

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.17   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.13   Pr > z = 0.8958

. test D1.ele=-D1.ele1

 ( 1)  D.ele + D.ele1 = 0

           chi2(  1) =    1.78
         Prob > chi2 =    0.1823
```

```
. xtabond ptr l(0).ele_1 , lags(2)  pre(grow, lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(7)       =    240.63

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr          |
          LD |    .654307   .0476871    13.72   0.000      .560842     .747772
         L2D |  -.3644378   .0477916    -7.63   0.000    -.4581075   -.2707681
grow         |
          D1 |   .0084525   .0105253     0.80   0.422    -.0121766    .0290816
          LD |   .0222522   .0045305     4.91   0.000     .0133725    .0311319
lggp         |
          D1 |   -.012632   .0102835    -1.23   0.219    -.0327874    .0075234
          LD |    .000438   .0099595     0.04   0.965    -.0190822    .0199582
ele_1        |
          D1 |     .00121   .0007525     1.61   0.108    -.0002649     .002685
_cons        |   .0007078   .0001015     6.97   0.000     .0005087    .0009068
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   338.54     Prob > chi2 = 0.8363

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.03   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.18   Pr > z = 0.8538
```

TABLE 15 - Elections and Fiscal Balance conditional on alignment of provincial and federal government

```
.
. *OLS
. regress  def def_1 def_2 def_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   18.62
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3681
                                                       Root MSE      =  .02464

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4480437   .0617306     7.26   0.000      .326564    .5695235
       def_2 |   .0265503   .0704657     0.38   0.707    -.1121194      .16522
       def_3 |   .1342168   .0660242     2.03   0.043     .0042876    .2641459
        grow |   .0958032   .0203864     4.70   0.000     .0556848    .1359216
        lggp |   .0009753   .0023021     0.42   0.672    -.0035551    .0055057
     ele_nal |  -.0105915   .0054873    -1.93   0.055      -.02139     .000207
      ele_al |  -.0003116    .003355    -0.09   0.926    -.0069139    .0062907
       _cons |  -.0193228   .0199505    -0.97   0.334    -.0585834    .0199377
------------------------------------------------------------------------------

. test ele_nal=ele_al

 ( 1)  ele_nal - ele_al = 0

       F(  1,   300) =    2.95
            Prob > F =    0.0869

.
. regress  def def_1 def_2 def_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   21.55
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3830
                                                       Root MSE      =  .02435

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4627852   .0584999     7.91   0.000     .3476631    .5779073
       def_2 |   .0383323   .0692571     0.55   0.580    -.0979589    .1746235
       def_3 |   .1185021   .0654454     1.81   0.071    -.0102881    .2472924
        grow |   .0884154   .0201296     4.39   0.000     .0488023    .1280285
        lggp |   .0008753   .0022786     0.38   0.701    -.0036087    .0053594
     pbc_nal |  -.0085363   .0036535    -2.34   0.020    -.0157261   -.0013465
      pbc_al |  -.0052224   .0022566    -2.31   0.021    -.0096632   -.0007817
       _cons |  -.0192706   .0197101    -0.98   0.329    -.0580582    .0195169
------------------------------------------------------------------------------

. test pbc_al=pbc_nal

 ( 1) - pbc_nal + pbc_al = 0

       F(  1,   300) =    0.61
            Prob > F =    0.4344

.
. regress  def def_1 def_2 def_3 grow lggp ele_nal ele_al ele1_nal
ele1_al,robust
```

```
Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   18.31
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.4024
                                                       Root MSE      =  .02405

------------------------------------------------------------------------------
             |               Robust
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .4906409    .058432     8.40   0.000     .3756493    .6056326
       def_2 |   .0441476   .0669999     0.66   0.510    -.0877053    .1760005
       def_3 |   .0758215   .0661612     1.15   0.253    -.0543809    .2060238
        grow |   .0810632   .0194898     4.16   0.000     .0427081    .1194183
        lggp |   .0011404   .0022679     0.50   0.615    -.0033228    .0056036
     ele_nal |  -.0050489   .0054465    -0.93   0.355    -.0157674    .0056695
      ele_al |   .0053321   .0035467     1.50   0.134    -.0016477    .0123118
    ele1_nal |   .0126689   .0054326     2.33   0.020     .0019777    .0233601
     ele1_al |   .0149723   .0038884     3.85   0.000     .0073201    .0226245
       _cons |  -.0254291   .0198264    -1.28   0.201    -.0644465    .0135883
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  def def_1 def_2 def_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2217                         Obs per group: min =        14
       between = 0.1807                                        avg =      14.0
       overall = 0.1970                                        max =        14

                                                F(7,279)           =     11.35
corr(u_i, Xb)  = -0.2134                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3167075   .0572156     5.54   0.000     .2040785    .4293366
       def_2 |  -.0525461   .0609854    -0.86   0.390    -.1725962    .0675039
       def_3 |   .0233805   .0574846     0.41   0.685    -.0897782    .1365391
        grow |    .081999   .0198999     4.12   0.000      .042826     .121172
        lggp |   .0241361   .0111286     2.17   0.031     .0022293    .0460428
     ele_nal |  -.0091026   .0056708    -1.61   0.110    -.0202657    .0020604
      ele_al |  -.0001709   .0040272    -0.04   0.966    -.0080984    .0077566
       _cons |  -.2259702   .0964533    -2.34   0.020    -.4158388   -.0361017
-------------+----------------------------------------------------------------
     sigma_u |  .01618276
     sigma_e |  .02380216
         rho |  .31612005   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.03             Prob > F = 0.0056

. test ele_nal=ele_al

 ( 1)  ele_nal - ele_al = 0

       F(  1,   279) =    1.75
            Prob > F =    0.1872

.
. xtreg  def def_1 def_2 def_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22
```

```
R-sq:  within  = 0.2419                         Obs per group: min =        14
       between = 0.1776                                        avg =      14.0
       overall = 0.2087                                        max =        14

                                                F(7,279)           =     12.72
corr(u_i, Xb)  = -0.2181                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |   .3298263   .0562128     5.87   0.000     .2191713    .4404813
       def_2 |  -.0418431   .0603655    -0.69   0.489    -.1606727    .0769866
       def_3 |   .0096215   .0564232     0.17   0.865    -.1014477    .1206908
        grow |   .0744957   .0198654     3.75   0.000     .0353906    .1136008
        lggp |   .0244439   .0109902     2.22   0.027     .0028096    .0460782
     pbc_nal |  -.0079502   .0031667    -2.51   0.013     -.014184   -.0017165
      pbc_al |  -.0047893   .0024372    -1.97   0.050    -.0095868    8.28e-06
       _cons |  -.2292877   .0952479    -2.41   0.017    -.4167835   -.0417919
-------------+----------------------------------------------------------------
     sigma_u |  .01627861
     sigma_e |  .02349101
         rho |  .32442006   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.07             Prob > F = 0.0046

. test pbc_nal=pbc_al

 ( 1)  pbc_nal - pbc_al = 0

       F(  1,   279) =    0.63
            Prob > F =    0.4279

.
. xtreg  def def_1 def_2 def_3 grow lggp ele_nal ele_al ele1_nal ele1_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.2661                         Obs per group: min =        14
       between = 0.1835                                        avg =      14.0
       overall = 0.2266                                        max =        14

                                                F(9,277)           =     11.16
corr(u_i, Xb)  = -0.2185                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         def |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       def_1 |    .359114    .057382     6.26   0.000     .2461538    .4720742
       def_2 |  -.0344669   .0596956    -0.58   0.564    -.1519815    .0830478
       def_3 |  -.0320873   .0576502    -0.56   0.578    -.1455755    .0814008
        grow |   .0667094   .0197935     3.37   0.001     .0277446    .1056743
        lggp |   .0249521   .0108543     2.30   0.022     .0035848    .0463194
     ele_nal |  -.0041232   .0057258    -0.72   0.472    -.0153948    .0071483
      ele_al |   .0054027   .0041545     1.30   0.195    -.0027756    .0135811
    ele1_nal |   .0123814    .004699     2.63   0.009     .0031312    .0216316
     ele1_al |   .0142442   .0039573     3.60   0.000     .0064539    .0220345
       _cons |  -.2373958   .0941035    -2.52   0.012    -.4226447   -.0521468
-------------+----------------------------------------------------------------
     sigma_u |  .01625373
     sigma_e |  .02319634
         rho |  .32930193   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 277) =     2.06             Prob > F = 0.0048

.
.
. *GMM
```

```
. xtabond def l(0).ele_nal ele_al , lags(2)  pre(grow, lag(1,.)) pre(lggp,
lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =     84.54

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3408507   .0564977     6.03   0.000     .2301172    .4515842
         L2D |  -.0186403   .0556472    -0.33   0.738    -.1277068    .0904262
grow         |
          D1 |   .0517557    .046549     1.11   0.266    -.0394787      .14299
          LD |     .01787   .0204059     0.88   0.381    -.0221249    .0578649
lggp         |
          D1 |   .0419703   .0457179     0.92   0.359    -.0476351    .1315756
          LD |  -.0411702   .0442312    -0.93   0.352    -.1278618    .0455215
ele_nal      |
          D1 |  -.0083771   .0046536    -1.80   0.072     -.017498    .0007439
ele_al       |
          D1 |   .0003532   .0037823     0.09   0.926      -.00706    .0077664
_cons        |   .0006791   .0004395     1.55   0.122    -.0001823    .0015405
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   283.40     Prob > chi2 = 0.9994

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.70   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.19   Pr > z = 0.8472

. test D1.ele_nal=D1.ele_al

 ( 1)  D.ele_nal - D.ele_al = 0

           chi2(  1) =    2.37
         Prob > chi2 =    0.1238

.
. xtabond def l(0).pbc_nal pbc_al , lags(2)  pre(grow, lag(1,.)) pre(lggp,
lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =     97.05

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3503589   .0551863     6.35   0.000     .2421957    .4585221
         L2D |   -.007449   .0545239    -0.14   0.891    -.1143138    .0994158
grow         |
          D1 |   .0608424   .0457483     1.33   0.184    -.0288226    .1505074
```

```
          LD |   .0291702   .0203258     1.44   0.151    -.0106677    .0690081
lggp         |
          D1 |   .0237321   .0449345     0.53   0.597     -.064338    .1118021
          LD |  -.0261715   .0433608    -0.60   0.546    -.1111572    .0588142
pbc_nal      |
          D1 |  -.0090788   .0028501    -3.19   0.001    -.0146649   -.0034926
pbc_al       |
          D1 |  -.0042633   .0023424    -1.82   0.069    -.0088544    .0003277
_cons        |   .0007186   .0004287     1.68   0.094    -.0001216    .0015588
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   284.92     Prob > chi2 = 0.9993

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -11.96   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.10   Pr > z = 0.9165

. test D1.pbc_nal=D1.pbc_al

 ( 1)  D.pbc_nal - D.pbc_al = 0

           chi2(  1) =    1.79
         Prob > chi2 =    0.1810

.
. xtabond def l(0).ele_nal ele_al ele1_nal ele1_al, lags(2)  pre(grow,
lag(1,.)) pre(lggp, lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(10)      =    106.17

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
def          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
def          |
          LD |   .3792731   .0566973     6.69   0.000     .2681484    .4903977
         L2D |  -.0182932   .0549103    -0.33   0.739    -.1259153    .0893289
grow         |
          D1 |   .0516656   .0459368     1.12   0.261    -.0383688       .1417
          LD |   .0337473   .0204248     1.65   0.098    -.0062846    .0737793
lggp         |
          D1 |   .0305162    .045106     0.68   0.499    -.0578899    .1189223
          LD |  -.0331017   .0435865    -0.76   0.448    -.1185297    .0523264
ele_nal      |
          D1 |  -.0034857   .0047616    -0.73   0.464    -.0128184    .0058469
ele_al       |
          D1 |   .0048919    .003899     1.25   0.210      -.00275    .0125339
ele1_nal     |
          D1 |   .0149939   .0047189     3.18   0.001     .0057451    .0242428
ele1_al      |
          D1 |   .0135665   .0039398     3.44   0.001     .0058446    .0212884
_cons        |   .0007661   .0004355     1.76   0.079    -.0000874    .0016196
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   276.69     Prob > chi2 = 0.9998

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z = -12.24   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.08   Pr > z = 0.2792
```

TABLE 16 - Elections and Total Expenditure conditional on alignment of provincial and federal government.

```
. *OLS
. regress  te te_1 te_2 te_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  111.40
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8978
                                                       Root MSE      =  .03557

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .8539374   .1215124     7.03   0.000     .6148128    1.093062
        te_2 |   -.119193   .1445241    -0.82   0.410    -.4036024    .1652165
        te_3 |   .1676242   .0684653     2.45   0.015     .0328912    .3023573
        grow |   -.144725   .0272205    -5.32   0.000    -.1982923   -.0911577
        lggp |   .0016833   .0037043     0.45   0.650    -.0056065     .008973
     ele_nal |    .006153   .0088279     0.70   0.486    -.0112195    .0235254
      ele_al |   .0140205   .0045969     3.05   0.002     .0049742    .0230668
       _cons |   .0068581   .0346684     0.20   0.843    -.0613659    .0750822
------------------------------------------------------------------------------

.
. regress  te te_1 te_2 te_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  101.40
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8985
                                                       Root MSE      =  .03545

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |    .877509   .1210146     7.25   0.000      .639364    1.115654
        te_2 |  -.1254512   .1414914    -0.89   0.376    -.4038924    .1529901
        te_3 |   .1502828   .0648306     2.32   0.021     .0227026    .2778631
        grow |  -.1405096   .0272827    -5.15   0.000    -.1941994   -.0868198
        lggp |   .0014054   .0037177     0.38   0.706    -.0059106    .0087214
     pbc_nal |   .0107453   .0051104     2.10   0.036     .0006886     .020802
      pbc_al |   .0067668   .0029336     2.31   0.022     .0009938    .0125398
       _cons |   .0122931    .034825     0.35   0.724    -.0562391    .0808253
------------------------------------------------------------------------------

.
. regress  te te_1 te_2 te_3 grow lggp ele_nal ele_al ele1_nal ele1_al,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   96.27
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8995
                                                       Root MSE      =   .0354

------------------------------------------------------------------------------
             |               Robust
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .8804366   .1304036     6.75   0.000      .623808    1.137065
        te_2 |  -.1261447   .1471834    -0.86   0.392    -.4157952    .1635058
        te_3 |   .1517482   .0650154     2.33   0.020     .0238007    .2796956
        grow |    -.14437   .0269612    -5.35   0.000    -.1974284   -.0913116
        lggp |   .0015851   .0036576     0.43   0.665    -.0056129    .0087831
```

```
     ele_nal |   .0033287   .0093622     0.36   0.722    -.0150957     .021753
      ele_al |   .0111605   .0052609     2.12   0.035     .0008072    .0215138
    ele1_nal |  -.0153207   .0079202    -1.93   0.054    -.0309073    .0002659
     ele1_al |  -.0027616   .0056323    -0.49   0.624    -.0138456    .0083225
       _cons |   .0097218   .0340566     0.29   0.775    -.0573001    .0767437
------------------------------------------------------------------------------

.
.
.
. *FE
. xtreg  te te_1 te_2 te_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3833                         Obs per group: min =        14
       between = 0.7705                                        avg =      14.0
       overall = 0.6013                                        max =        14

                                                F(7,279)           =     24.77
corr(u_i, Xb)  = 0.6281                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .4770493   .0472696    10.09   0.000     .3839988    .5700997
        te_2 |  -.1393148   .0525461    -2.65   0.008    -.2427519   -.0358777
        te_3 |  -.1056939    .041856    -2.53   0.012    -.1880876   -.0233002
        grow |  -.1187113    .022547    -5.27   0.000    -.1630951   -.0743274
        lggp |  -.0279396   .0127324    -2.19   0.029    -.0530034   -.0028758
     ele_nal |   .0004721   .0064768     0.07   0.942    -.0122776    .0132218
      ele_al |   .0082504   .0045688     1.81   0.072    -.0007434    .0172442
       _cons |   .4199735   .1145877     3.67   0.000     .1944072    .6455398
-------------+----------------------------------------------------------------
     sigma_u |  .08465536
     sigma_e |  .02712268
         rho |  .90690664   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    11.29             Prob > F = 0.0000

.
. xtreg  te te_1 te_2 te_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3908                         Obs per group: min =        14
       between = 0.7483                                        avg =      14.0
       overall = 0.5904                                        max =        14

                                                F(7,279)           =     25.57
corr(u_i, Xb)  = 0.6123                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .4905815   .0472002    10.39   0.000     .3976677    .5834953
        te_2 |  -.1387299   .0517279    -2.68   0.008    -.2405564   -.0369033
        te_3 |  -.1196374   .0419784    -2.85   0.005    -.2022719   -.0370028
        grow |  -.1129704   .0225688    -5.01   0.000    -.1573971   -.0685437
        lggp |  -.0299444   .0126541    -2.37   0.019     -.054854   -.0050349
     pbc_nal |   .0073168   .0036847     1.99   0.048     .0000635    .0145702
      pbc_al |   .0048557   .0027983     1.74   0.084    -.0006527    .0103642
       _cons |   .4387467   .1137557     3.86   0.000     .2148183    .6626752
-------------+----------------------------------------------------------------
     sigma_u |  .08470989
     sigma_e |  .02695613
```

```
         rho |  .90804906   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    11.42             Prob > F = 0.0000

.
. xtreg  te te_1 te_2 te_3 grow lggp ele_nal ele_al ele1_nal ele1_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4004                         Obs per group: min =        14
       between = 0.7163                                        avg =      14.0
       overall = 0.5684                                        max =        14

                                                F(9,277)           =     20.56
corr(u_i, Xb)  = 0.5865                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          te |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        te_1 |   .5054411   .0479296    10.55   0.000     .4110887    .5997936
        te_2 |  -.1485521   .0521958    -2.85   0.005     -.251303   -.0458013
        te_3 |  -.1251661   .0420609    -2.98   0.003    -.2079658   -.0423665
        grow |  -.1158163   .0225742    -5.13   0.000     -.160255   -.0713775
        lggp |   -.031298   .0126577    -2.47   0.014    -.0562155   -.0063804
     ele_nal |  -.0039277   .0065996    -0.60   0.552    -.0169194    .0090641
      ele_al |   .0055675   .0047452     1.17   0.242    -.0037738    .0149087
    ele1_nal |   -.015121   .0054274    -2.79   0.006    -.0258051   -.0044369
     ele1_al |  -.0044441   .0045695    -0.97   0.332    -.0134395    .0045513
       _cons |   .4521684   .1140153     3.97   0.000     .2277219    .6766149
-------------+----------------------------------------------------------------
     sigma_u |  .08531184
     sigma_e |  .02683879
         rho |  .90994223   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 277) =    11.50             Prob > F = 0.0000

.
.
. *GMM
. xtabond te l(0).ele_nal ele_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    218.00

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .3542436   .0342517    10.34   0.000     .2871114    .4213757
grow         |
          D1 |  -.0610862   .0510332    -1.20   0.231    -.1611095    .0389371
          LD |  -.0134358   .0516954    -0.26   0.795     -.114757    .0878853
         L2D |   .0458159   .0205939     2.22   0.026     .0054526    .0861792
lggp         |
          D1 |  -.0744527   .0501499    -1.48   0.138    -.1727447    .0238394
          LD |   .0327572    .052699     0.62   0.534     -.070531    .1360454
         L2D |  -.0438775     .04678    -0.94   0.348    -.1355646    .0478095
ele_nal      |
          D1 |   .0015802    .005632     0.28   0.779    -.0094584    .0126187
```

```
ele_al       |
          D1 |   .0101126   .0039015     2.59   0.010     .0024657    .0177595
_cons        |   .0032027    .000501     6.39   0.000     .0022207    .0041847
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   354.41     Prob > chi2 = 0.5287

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.76   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.61   Pr > z = 0.5406

.
. xtabond te l(0).pbc_nal pbc_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    213.11

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .3574712   .0346565    10.31   0.000     .2895457    .4253966
grow         |
          D1 |   -.058509   .0506359    -1.16   0.248    -.1577536    .0407356
          LD |  -.0090566   .0515688    -0.18   0.861    -.1101296    .0920164
         L2D |   .0446451   .0205946     2.17   0.030     .0042805    .0850097
lggp         |
          D1 |  -.0730087   .0496266    -1.47   0.141    -.1702751    .0242577
          LD |    .023525   .0532392     0.44   0.659     -.080822    .1278719
         L2D |  -.0334326   .0467877    -0.71   0.475    -.1251348    .0582695
pbc_nal      |
          D1 |    .003445   .0032815     1.05   0.294    -.0029866    .0098765
pbc_al       |
          D1 |   .0045548   .0024308     1.87   0.061    -.0002094     .009319
_cons        |   .0031332   .0005037     6.22   0.000      .002146    .0041205
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   350.88     Prob > chi2 = 0.5813

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.66   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.59   Pr > z = 0.5567

.
. xtabond te l(0).ele_nal ele_al ele1_nal ele1_al, lags(1)  pre(grow,
lag(2,.)) pre(lggp, lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(11)      =    219.12

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
```

```
te           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
te           |
          LD |   .3642079   .0349848    10.41   0.000     .2956389    .4327769
grow         |
          D1 |  -.0624094   .0513818    -1.21   0.225    -.1631159    .0382971
          LD |   -.007328   .0521566    -0.14   0.888     -.109553     .094897
         L2D |   .0470332   .0206934     2.27   0.023     .0064748    .0875916
lggp         |
          D1 |  -.0741531   .0503219    -1.47   0.141    -.1727822    .0244761
          LD |   .0255778   .0534345     0.48   0.632    -.0791519    .1303074
         L2D |   -.034831   .0478941    -0.73   0.467    -.1287016    .0590397
ele_nal      |
          D1 |  -.0000804   .0058109    -0.01   0.989    -.0114695    .0113087
ele_al       |
          D1 |    .010124   .0040844     2.48   0.013     .0021187    .0181294
ele1_nal     |
          D1 |   -.006566   .0048799    -1.35   0.178    -.0161304    .0029984
ele1_al      |
          D1 |   .0014815   .0039938     0.37   0.711    -.0063462    .0093092
_cons        |   .0031005   .0005069     6.12   0.000      .002107    .0040941
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   352.06     Prob > chi2 = 0.5639

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.70   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.70   Pr > z = 0.4836

.
.
```

TABLE 17 - Elections and Composition Effect conditional on alignment of provincial and federal government

```
.
. *OLS
. regress  ce ce_1 ce_2 ce_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   61.36
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.6031
                                                       Root MSE      =  .04835

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5995961    .061782     9.71   0.000      .478015    .7211771
        ce_2 |  -.0213828   .0680687    -0.31   0.754    -.1553353    .1125698
        ce_3 |   .1608774   .0507902     3.17   0.002     .0609272    .2608277
        grow |   .0693663   .0414834     1.67   0.096     -.012269    .1510017
        lggp |  -.0080006   .0052204    -1.53   0.126    -.0182739    .0022727
     ele_nal |   .0190341   .0103003     1.85   0.066    -.0012359    .0393041
      ele_al |  -.0092474   .0079625    -1.16   0.246    -.0249168     .006422
       _cons |   .2947636   .0573407     5.14   0.000     .1819227    .4076045
------------------------------------------------------------------------------

.
. regress  ce ce_1 ce_2 ce_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   59.98
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.5989
                                                       Root MSE      =   .0486

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5976495   .0624706     9.57   0.000     .4747134    .7205857
        ce_2 |  -.0133118   .0690227    -0.19   0.847    -.1491417    .1225181
        ce_3 |   .1532459   .0522022     2.94   0.004     .0505171    .2559747
        grow |   .0601375   .0420054     1.43   0.153    -.0225249       .1428
        lggp |  -.0077647   .0052582    -1.48   0.141    -.0181124     .002583
     pbc_nal |    .001249   .0062511     0.20   0.842    -.0110525    .0135506
      pbc_al |  -.0068275   .0048365    -1.41   0.159    -.0163452    .0026903
       _cons |   .2940792   .0581322     5.06   0.000     .1796808    .4084777
------------------------------------------------------------------------------

. regress  ce ce_1 ce_2 ce_3 grow lggp ele_nal ele_al ele1_nal ele1_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   46.85
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.6068
                                                       Root MSE      =  .04829

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |      .6113   .0640376     9.55   0.000     .4852768    .7373232
        ce_2 |  -.0117046   .0684177    -0.17   0.864    -.1463477    .1229385
        ce_3 |    .142987   .0521572     2.74   0.006     .0403439    .2456301
        grow |    .062752   .0411132     1.53   0.128    -.0181569    .1436609
        lggp |  -.0077523   .0051948    -1.49   0.137    -.0179754    .0024707
     ele_nal |   .0229098    .010766     2.13   0.034     .0017229    .0440968
```

```
      ele_al |  -.0054081   .0084171    -0.64   0.521    -.0219725    .0111564
    ele1_nal |   .0138903    .008527     1.63   0.104    -.0028904    .0306711
     ele1_al |   .0087037   .0078404     1.11   0.268     -.006726    .0241333
       _cons |    .285859   .0582352     4.91   0.000     .1712548    .4004633
------------------------------------------------------------------------------

.
.
. regress  ce ce_1 ce_2 ce_3 grow lggp ele_1_nal ele_1_al, robust

Regression with robust standard errors                 Number of obs =     307
                                                       F(  7,   299) =   63.23
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.6059
                                                       Root MSE      =  .04819

------------------------------------------------------------------------------
             |               Robust
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .6061938   .0635952     9.53   0.000     .4810429    .7313447
        ce_2 |  -.0017324   .0705638    -0.02   0.980     -.140597    .1371323
        ce_3 |   .1347668    .052169     2.58   0.010     .0321018    .2374317
        grow |   .0683599   .0405587     1.69   0.093    -.0114568    .1481766
        lggp |  -.0073873   .0050994    -1.45   0.148    -.0174227     .002648
   ele_1_nal |  -.0220308   .0109319    -2.02   0.045     -.043544   -.0005175
    ele_1_al |   -.017825    .007972    -2.24   0.026    -.0335135   -.0021366
       _cons |   .2932242   .0562071     5.22   0.000     .1826126    .4038359
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  ce ce_1 ce_2 ce_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3783                         Obs per group: min =        14
       between = 0.9245                                        avg =      14.0
       overall = 0.5972                                        max =        14

                                                F(7,279)           =     24.25
corr(u_i, Xb)  = 0.5238                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5030042   .0552797     9.10   0.000     .3941859    .6118225
        ce_2 |  -.0473224   .0636497    -0.74   0.458     -.172617    .0779723
        ce_3 |   .1199319   .0527954     2.27   0.024      .016004    .2238597
        grow |   .0812057   .0384184     2.11   0.035      .005579    .1568324
        lggp |  -.0143168   .0223597    -0.64   0.523     -.058332    .0296984
     ele_nal |   .0195942   .0111393     1.76   0.080    -.0023335     .041522
      ele_al |  -.0072665   .0078704    -0.92   0.357    -.0227595    .0082264
       _cons |   .4806433    .179468     2.68   0.008     .1273599    .8339267
-------------+----------------------------------------------------------------
     sigma_u |  .02246686
     sigma_e |  .04652605
         rho |   .1890887   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.14             Prob > F = 0.0030

.
. xtreg  ce ce_1 ce_2 ce_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22
```

```
R-sq:  within  = 0.3728                         Obs per group: min =        14
       between = 0.9206                                        avg =      14.0
       overall = 0.5932                                        max =        14

                                                F(7,279)           =     23.69
corr(u_i, Xb)  = 0.5188                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .4976502   .0549923     9.05   0.000     .3893977    .6059026
        ce_2 |  -.0399575   .0640558    -0.62   0.533    -.1660516    .0861366
        ce_3 |   .1173338   .0534622     2.19   0.029     .0120933    .2225743
        grow |   .0719694   .0390114     1.84   0.066    -.0048246    .1487634
        lggp |  -.0144201    .022424    -0.64   0.521    -.0585619    .0297217
     pbc_nal |   .0031389   .0063482     0.49   0.621    -.0093575    .0156353
      pbc_al |  -.0058203   .0048717    -1.19   0.233    -.0154103    .0037697
       _cons |   .4826527   .1801676     2.68   0.008     .1279922    .8373132
-------------+----------------------------------------------------------------
     sigma_u |  .02257763
     sigma_e |  .04673016
         rho |  .18925469   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     2.17             Prob > F = 0.0026

.
. xtreg  ce ce_1 ce_2 ce_3 grow lggp ele_nal ele_al ele1_nal ele1_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3827                         Obs per group: min =        14
       between = 0.9392                                        avg =      14.0
       overall = 0.6028                                        max =        14

                                                F(9,277)           =     19.08
corr(u_i, Xb)  = 0.5487                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5139267   .0558756     9.20   0.000     .4039319    .6239214
        ce_2 |  -.0404036   .0639201    -0.63   0.528    -.1662344    .0854273
        ce_3 |   .1033572   .0541931     1.91   0.058    -.0033254    .2100397
        grow |   .0736409    .039063     1.89   0.060     -.003257    .1505389
        lggp |  -.0115245   .0224492    -0.51   0.608    -.0557172    .0326683
     ele_nal |   .0232328   .0114591     2.03   0.044     .0006748    .0457908
      ele_al |   -.004182   .0082449    -0.51   0.612    -.0204127    .0120487
    ele1_nal |   .0107419   .0091966     1.17   0.244    -.0073623     .028846
     ele1_al |    .007824   .0079533     0.98   0.326    -.0078327    .0234806
       _cons |   .4522695    .180622     2.50   0.013     .0967033    .8078357
-------------+----------------------------------------------------------------
     sigma_u |  .02229704
     sigma_e |  .04652836
         rho |   .1867579   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 277) =     2.09             Prob > F = 0.0040

.
. xtreg  ce ce_1 ce_2 ce_3 grow lggp ele_1_nal ele_1_al,fe

Fixed-effects (within) regression               Number of obs      =       307
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.3874                         Obs per group: min =        13
       between = 0.9402                                        avg =      14.0
       overall = 0.6023                                        max =        14
```

```
                                                F(7,278)          =     25.12
corr(u_i, Xb)  = 0.5479                         Prob > F          =    0.0000

------------------------------------------------------------------------------
          ce |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ce_1 |   .5036629   .0545102     9.24   0.000     .3963578     .610968
        ce_2 |  -.0270155   .0627164    -0.43   0.667    -.1504749    .0964439
        ce_3 |   .0968443   .0536343     1.81   0.072    -.0087365    .2024252
        grow |   .0764725   .0380743     2.01   0.046      .001522     .151423
        lggp |  -.0093118    .022347    -0.42   0.677    -.0533026    .0346789
   ele_1_nal |  -.0253947   .0111714    -2.27   0.024     -.047386   -.0034034
    ele_1_al |  -.0151406   .0078785    -1.92   0.056    -.0306498    .0003686
       _cons |   .4433675   .1794741     2.47   0.014     .0900666    .7966684
-------------+----------------------------------------------------------------
     sigma_u |  .02271984
     sigma_e |  .04624685
         rho |  .19442504   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 278) =     2.22             Prob > F = 0.0019

.
. *GMM
. xtabond ce l(0).ele_nal ele_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    116.02

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |   .4244163   .0481967     8.81   0.000     .3299525    .5188802
grow         |
          D1 |   .0437274   .0978521     0.45   0.655    -.1480591    .2355139
          LD |  -.0248147   .0993933    -0.25   0.803     -.219622    .1699925
         L2D |  -.1247953   .0389633    -3.20   0.001    -.2011619   -.0484286
lggp         |
          D1 |   .0241884   .0960115     0.25   0.801    -.1639907    .2123675
          LD |  -.0579368   .1011588    -0.57   0.567    -.2562044    .1403308
         L2D |  -.0017364   .0898229    -0.02   0.985     -.177786    .1743132
ele_nal      |
          D1 |   .0198176    .010916     1.82   0.069    -.0015773    .0412126
ele_al       |
          D1 |  -.0084013   .0074824    -1.12   0.262    -.0230664    .0062639
_cons        |   .0035316   .0010719     3.29   0.001     .0014307    .0056326
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   235.44     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.11   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.09   Pr > z = 0.9250

.
. xtabond ce l(0).pbc_nal pbc_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))
```

```
Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    112.68

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |     .41893   .0483384     8.67   0.000     .3241886    .5136715
grow         |
          D1 |   .0658286   .0973504     0.68   0.499    -.1249746    .2566318
          LD |  -.0115323   .0994981    -0.12   0.908     -.206545    .1834804
         L2D |  -.1214897   .0391498    -3.10   0.002    -.1982219   -.0447574
lggp         |
          D1 |  -.0120289   .0951552    -0.13   0.899    -.1985297    .1744719
          LD |  -.0310876   .1026825    -0.30   0.762    -.2323417    .1701664
         L2D |   .0020614   .0902111     0.02   0.982    -.1747491    .1788719
pbc_nal      |
          D1 |   .0012497   .0062639     0.20   0.842    -.0110272    .0135267
pbc_al       |
          D1 |  -.0073465   .0046828    -1.57   0.117    -.0165246    .0018316
_cons        |   .0036662   .0010789     3.40   0.001     .0015517    .0057808
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   230.71     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.15   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.01   Pr > z = 0.9897

.
.
. xtabond ce l(0).ele_1_nal ele_1_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       285
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    114.89

Time variable (t): y                            Obs per group: min =        12
                                                               avg =  12.95455
                                                               max =        13

One-step results
------------------------------------------------------------------------------
ce           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ce           |
          LD |    .428159   .0488848     8.76   0.000     .3323466    .5239713
grow         |
          D1 |   .0587193    .096841     0.61   0.544    -.1310856    .2485241
          LD |  -.0271393   .0998154    -0.27   0.786    -.2227739    .1684954
         L2D |  -.1077007   .0399224    -2.70   0.007    -.1859472   -.0294542
lggp         |
          D1 |   .0098829   .0941948     0.10   0.916    -.1747356    .1945015
          LD |  -.0340245   .1004902    -0.34   0.735    -.2309816    .1629326
         L2D |  -.0076788   .0901485    -0.09   0.932    -.1843667     .169009
ele_1_nal    |
          D1 |  -.0214231   .0109311    -1.96   0.050    -.0428476    1.45e-06
ele_1_al     |
```

```
          D1 |  -.0089575   .0077136    -1.16   0.246    -.0240759    .0061609
_cons        |   .0034386   .0010808     3.18   0.001     .0013202     .005557
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   233.23     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -8.04   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.01   Pr > z = 0.9901

.
.
```

TABLE 18 - Elections and Total Revenue conditional on alignment of provincial and federal government

```
.
. *OLS
. regress  tr tr_1 tr_2 tr_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   62.69
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8932
                                                       Root MSE      =  .03307

------------------------------------------------------------------------------
             |               Robust
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   1.009453   .1677577     6.02   0.000     .6793225    1.339584
        tr_2 |  -.2862726   .2245212    -1.28   0.203    -.7281084    .1555632
        tr_3 |   .1631853   .0863944     1.89   0.060    -.0068305    .3332011
        grow |  -.0519202   .0272518    -1.91   0.058    -.1055491    .0017087
        lggp |   .0008989   .0030511     0.29   0.768    -.0051053    .0069032
     ele_nal |   .0004781   .0063636     0.08   0.940    -.0120449    .0130011
      ele_al |   .0162604   .0048283     3.37   0.001     .0067587    .0257621
       _cons |   .0122643   .0301458     0.41   0.684    -.0470598    .0715883
------------------------------------------------------------------------------

.
. regress  tr tr_1 tr_2 tr_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =   58.50
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8905
                                                       Root MSE      =   .0335

------------------------------------------------------------------------------
             |               Robust
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   1.012568   .1688137     6.00   0.000     .6803589    1.344777
        tr_2 |  -.3035379   .2220007    -1.37   0.173    -.7404138    .1333379
        tr_3 |   .1742855   .0845343     2.06   0.040     .0079302    .3406408
        grow |  -.0524522   .0278074    -1.89   0.060    -.1071745    .0022701
        lggp |   .0006539   .0031627     0.21   0.836      -.00557    .0068779
     pbc_nal |  -.0000464   .0047776    -0.01   0.992    -.0094483    .0093554
      pbc_al |   .0039302   .0033777     1.16   0.246    -.0027167    .0105772
       _cons |   .0175292   .0311409     0.56   0.574     -.043753    .0788114
------------------------------------------------------------------------------

.
. regress  tr tr_1 tr_2 tr_3 grow lggp ele_nal ele_al ele1_nal ele1_al,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   62.76
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8945
                                                       Root MSE      =  .03298

------------------------------------------------------------------------------
             |               Robust
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .9943475   .1721787     5.78   0.000     .6555074    1.333188
        tr_2 |  -.2661339   .2315013    -1.15   0.251    -.7217184    .1894505
        tr_3 |   .1605942   .0873215     1.84   0.067    -.0112508    .3324392
        grow |  -.0585203   .0272922    -2.14   0.033      -.11223   -.0048105
        lggp |   .0010462   .0030872     0.34   0.735    -.0050293    .0071216
```

```
     ele_nal |   .0031448   .0068274     0.46   0.645    -.0102913    .0165809
      ele_al |   .0189662   .0052129     3.64   0.000     .0087075    .0292249
    ele1_nal |   .0038419   .0078429     0.49   0.625    -.0115927    .0192765
     ele1_al |   .0102612   .0058747     1.75   0.082    -.0012999    .0218224
       _cons |   .0078894   .0300726     0.26   0.793    -.0512923     .067071
------------------------------------------------------------------------------

.
.
. *FE
. xtreg  tr tr_1 tr_2 tr_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5016                         Obs per group: min =        14
       between = 0.9384                                        avg =      14.0
       overall = 0.5627                                        max =        14

                                                F(7,279)           =     40.12
corr(u_i, Xb)  = 0.6027                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .6013849   .0411699    14.61   0.000     .5203418    .6824281
        tr_2 |  -.2775477   .0485447    -5.72   0.000    -.3731081   -.1819873
        tr_3 |  -.1328645   .0380194    -3.49   0.001    -.2077059   -.0580231
        grow |  -.0574305   .0184644    -3.11   0.002    -.0937778   -.0210832
        lggp |  -.0069166   .0099524    -0.69   0.488    -.0265079    .0126748
     ele_nal |  -.0067297   .0053694    -1.25   0.211    -.0172995      .00384
      ele_al |   .0108026   .0037947     2.85   0.005     .0033327    .0182725
       _cons |   .2286671   .0877537     2.61   0.010     .0559237    .4014106
-------------+----------------------------------------------------------------
     sigma_u |  .08015312
     sigma_e |  .02249053
         rho |  .92701321   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    17.60             Prob > F = 0.0000

.
. xtreg  tr tr_1 tr_2 tr_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4847                         Obs per group: min =        14
       between = 0.9476                                        avg =      14.0
       overall = 0.5585                                        max =        14

                                                F(7,279)           =     37.48
corr(u_i, Xb)  = 0.6039                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5974332   .0420769    14.20   0.000     .5146046    .6802617
        tr_2 |  -.2845449   .0491842    -5.79   0.000    -.3813642   -.1877256
        tr_3 |  -.1274304   .0387248    -3.29   0.001    -.2036604   -.0512004
        grow |  -.0575113   .0189014    -3.04   0.003    -.0947189   -.0203038
        lggp |  -.0072853   .0101497    -0.72   0.473    -.0272649    .0126944
     pbc_nal |  -.0014398   .0030999    -0.46   0.643    -.0075419    .0046623
      pbc_al |   .0014785   .0023797     0.62   0.535    -.0032059    .0061629
       _cons |   .2340775   .0894564     2.62   0.009     .0579824    .4101727
-------------+----------------------------------------------------------------
     sigma_u |  .08050632
     sigma_e |  .02287047
         rho |  .92532352   (fraction of variance due to u_i)
```

```
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    17.36             Prob > F = 0.0000

. regress  tr tr_1 tr_2 tr_3 grow lggp ele_nal ele_al ele1_nal ele1_al,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   62.76
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8945
                                                       Root MSE      =  .03298

------------------------------------------------------------------------------
             |               Robust
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .9943475   .1721787     5.78   0.000     .6555074    1.333188
        tr_2 |  -.2661339   .2315013    -1.15   0.251    -.7217184     .1894505
        tr_3 |   .1605942   .0873215     1.84   0.067    -.0112508     .3324392
        grow |  -.0585203   .0272922    -2.14   0.033      -.11223    -.0048105
        lggp |   .0010462   .0030872     0.34   0.735    -.0050293     .0071216
     ele_nal |   .0031448   .0068274     0.46   0.645    -.0102913     .0165809
      ele_al |   .0189662   .0052129     3.64   0.000     .0087075     .0292249
    ele1_nal |   .0038419   .0078429     0.49   0.625    -.0115927     .0192765
     ele1_al |   .0102612   .0058747     1.75   0.082    -.0012999     .0218224
       _cons |   .0078894   .0300726     0.26   0.793    -.0512923      .067071
------------------------------------------------------------------------------

.
.
. *GMM
. xtabond tr l(0).ele_nal ele_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    183.08

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
tr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tr           |
          LD |   .3500565   .0315188    11.11   0.000     .2882808    .4118322
grow         |
          D1 |   .0255954   .0458895     0.56   0.577    -.0643463    .1155372
          LD |   .0594925   .0465128     1.28   0.201    -.0316708    .1506559
         L2D |   .0162432   .0187645     0.87   0.387    -.0205345    .0530209
lggp         |
          D1 |   -.056169   .0450179    -1.25   0.212    -.1444025    .0320646
          LD |  -.0451783   .0473647    -0.95   0.340    -.1380113    .0476548
         L2D |   .0365996   .0421273     0.87   0.385    -.0459684    .1191676
ele_nal      |
          D1 |  -.0061026   .0051061    -1.20   0.232    -.0161104    .0039052
ele_al       |
          D1 |   .0090788   .0035288     2.57   0.010     .0021624    .0159951
_cons        |   .0033951    .000453     7.49   0.000     .0025072     .004283
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   364.10     Prob > chi2 = 0.3863

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -4.47   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
```

```
         H0: no autocorrelation   z =  -0.75   Pr > z = 0.4523

. xtabond tr l(0).pbc_nal pbc_al , lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    179.14

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
tr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tr           |
          LD |   .3357761   .0313136    10.72   0.000     .2744025    .3971497
grow         |
          D1 |    .032752    .045178     0.72   0.468    -.0557953    .1212992
          LD |   .0583417   .0461052     1.27   0.206    -.0320229    .1487062
         L2D |    .012797   .0186396     0.69   0.492     -.023736      .04933
lggp         |
          D1 |  -.0671218   .0441787    -1.52   0.129    -.1537104    .0194668
          LD |  -.0295629   .0476002    -0.62   0.535    -.1228577    .0637318
         L2D |   .0305214   .0419206     0.73   0.467    -.0516415    .1126843
pbc_nal      |
          D1 |  -.0057203    .002923    -1.96   0.050    -.0114493    8.76e-06
pbc_al       |
          D1 |  -.0003357   .0021771    -0.15   0.877    -.0046029    .0039314
_cons        |   .0034825   .0004526     7.69   0.000     .0025953    .0043696
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   373.00     Prob > chi2 = 0.2693

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -4.21   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -1.09   Pr > z = 0.2770

.
. xtabond tr l(0). ele_nal ele_al ele1_nal ele1_al, lags(1)  pre(grow,
lag(2,.)) pre(lggp, lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(11)      =    212.53

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
tr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tr           |
          LD |   .3475647   .0306374    11.34   0.000     .2875165    .4076128
grow         |
          D1 |    .009285   .0446843     0.21   0.835    -.0782947    .0968646
          LD |   .0445231   .0453884     0.98   0.327    -.0444364    .1334827
         L2D |   .0122236   .0182512     0.67   0.503    -.0235482    .0479954
lggp         |
          D1 |  -.0521419   .0436858    -1.19   0.233    -.1377644    .0334807
          LD |  -.0207505   .0464785    -0.45   0.655    -.1118467    .0703457
```

```
         L2D |   .0066651   .0417441     0.16   0.873    -.0751518     .088482
ele_nal      |
          D1 |  -.0024982   .0050867    -0.49   0.623    -.0124679    .0074715
ele_al       |
          D1 |     .01353   .0035753     3.78   0.000     .0065226    .0205374
ele1_nal     |
          D1 |   .0089831   .0041688     2.15   0.031     .0008125    .0171537
ele1_al      |
          D1 |    .013825   .0034746     3.98   0.000      .007015     .020635
_cons        |   .0034533   .0004423     7.81   0.000     .0025864    .0043202
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   369.15     Prob > chi2 = 0.3175

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -4.46   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.58   Pr > z = 0.5640

.
.
```

TABLE 19 - Elections and Revenue from Federal Government conditional on alignment of provincial and federal government

```
. *OLS
. regress  fr fr_1 fr_2 fr_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  115.80
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9061
                                                       Root MSE      =  .03036

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |    1.00824   .1446013     6.97   0.000     .7236783    1.292801
        fr_2 |  -.2187173   .1986039    -1.10   0.272    -.6095505     .172116
        fr_3 |   .1128744   .0775378     1.46   0.147    -.0397124    .2654612
        grow |  -.0507363   .0249693    -2.03   0.043    -.0998733   -.0015992
        lggp |  -.0002838   .0030505    -0.09   0.926    -.0062868    .0057192
     ele_nal |   .0006585   .0058137     0.11   0.910    -.0107823    .0120993
      ele_al |   .0165713   .0045323     3.66   0.000     .0076522    .0254904
       _cons |    .016237   .0300383     0.54   0.589    -.0428754    .0753494
------------------------------------------------------------------------------

.
. regress  fr fr_1 fr_2 fr_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  103.34
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9032
                                                       Root MSE      =  .03083

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   1.010338   .1464464     6.90   0.000      .722146    1.298531
        fr_2 |  -.2361745   .1991115    -1.19   0.237    -.6280066    .1556575
        fr_3 |   .1252573   .0767807     1.63   0.104    -.0258397    .2763543
        grow |  -.0509198    .025696    -1.98   0.048     -.101487   -.0003526
        lggp |  -.0005945   .0031477    -0.19   0.850    -.0067889    .0055998
     pbc_nal |   .0003441   .0041343     0.08   0.934    -.0077919      .00848
      pbc_al |   .0042087   .0032478     1.30   0.196    -.0021827    .0106002
       _cons |   .0220303   .0309912     0.71   0.478    -.0389573     .083018
------------------------------------------------------------------------------

. regress  fr fr_1 fr_2 fr_3 grow lggp ele_nal ele_al ele1_nal ele1_al,robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  9,   298) =   99.72
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.9074
                                                       Root MSE      =  .03027

------------------------------------------------------------------------------
             |               Robust
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .9900392    .149949     6.60   0.000     .6949461    1.285132
        fr_2 |  -.1932028   .2066576    -0.93   0.351    -.5998959    .2134902
        fr_3 |   .1078675   .0783245     1.38   0.169    -.0462716    .2620066
        grow |  -.0573516   .0251816    -2.28   0.023    -.1069079   -.0077953
        lggp |  -.0001107   .0030843    -0.04   0.971    -.0061803     .005959
     ele_nal |   .0031823   .0061115     0.52   0.603    -.0088448    .0152094
```

```
      ele_al |   .0190761   .0048024     3.97   0.000     .0096253     .028527
    ele1_nal |      .0032   .0066132     0.48   0.629    -.0098146    .0162145
     ele1_al |    .009921     .00539     1.84   0.067    -.0006863    .0205283
       _cons |    .011899   .0300007     0.40   0.692    -.0471411    .0709391
------------------------------------------------------------------------------

.
.
.
. *FE
. xtreg  fr fr_1 fr_2 fr_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4671                         Obs per group: min =        14
       between = 0.8886                                        avg =      14.0
       overall = 0.6649                                        max =        14

                                                F(7,279)           =     34.93
corr(u_i, Xb)  = 0.6902                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5892793    .043795    13.46   0.000     .5030687    .6754899
        fr_2 |   -.213446   .0514539    -4.15   0.000    -.3147332   -.1121589
        fr_3 |  -.1464361   .0392417    -3.73   0.000    -.2236835   -.0691887
        grow |  -.0468293   .0173763    -2.70   0.007    -.0810345   -.0126241
        lggp |  -.0148224   .0094936    -1.56   0.120    -.0335106    .0038657
     ele_nal |  -.0065903   .0050604    -1.30   0.194    -.0165518    .0033711
      ele_al |   .0110163    .003586     3.07   0.002     .0039571    .0180754
       _cons |     .26652   .0838845     3.18   0.002     .1013932    .4316469
-------------+----------------------------------------------------------------
     sigma_u |  .07481693
     sigma_e |  .02122926
         rho |  .92548566   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    15.94             Prob > F = 0.0000

.
. xtreg  fr fr_1 fr_2 fr_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.4463                         Obs per group: min =        14
       between = 0.8889                                        avg =      14.0
       overall = 0.6600                                        max =        14

                                                F(7,279)           =     32.12
corr(u_i, Xb)  = 0.6910                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          fr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fr_1 |   .5818032   .0449729    12.94   0.000     .4932739    .6703324
        fr_2 |  -.2199583   .0524566    -4.19   0.000    -.3232193   -.1166973
        fr_3 |  -.1392907   .0400564    -3.48   0.001    -.2181419   -.0604395
        grow |  -.0467731   .0178366    -2.62   0.009    -.0818846   -.0116617
        lggp |   -.015308   .0096994    -1.58   0.116    -.0344012    .0037852
     pbc_nal |   -.001471   .0029299    -0.50   0.616    -.0072385    .0042964
      pbc_al |   .0015274   .0022599     0.68   0.500    -.0029212    .0059759
       _cons |   .2730504   .0856513     3.19   0.002     .1044455    .4416554
-------------+----------------------------------------------------------------
     sigma_u |  .07530624
     sigma_e |  .02163946
         rho |  .92372636   (fraction of variance due to u_i)
```

```
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =    15.72             Prob > F = 0.0000

.
. xtreg tr tr_1 tr_2 tr_3 grow lggp ele_nal ele_al ele1_nal ele1_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5132                         Obs per group: min =        14
       between = 0.9240                                        avg =      14.0
       overall = 0.5583                                        max =        14

                                                F(9,277)           =     32.45
corr(u_i, Xb)  = 0.5952                         Prob > F           =    0.0000

------------------------------------------------------------------------------
          tr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_1 |   .5905748   .0411159    14.36   0.000     .5096354    .6715142
        tr_2 |  -.2586676   .0487209    -5.31   0.000    -.3545778   -.1627575
        tr_3 |  -.1376176   .0378614    -3.63   0.000    -.2121502    -.063085
        grow |  -.0641876   .0185117    -3.47   0.001    -.1006291   -.0277461
        lggp |  -.0067447   .0099218    -0.68   0.497    -.0262765    .0127871
     ele_nal |  -.0058484   .0054614    -1.07   0.285    -.0165995    .0049027
      ele_al |   .0133248   .0039312     3.39   0.001      .005586    .0210636
    ele1_nal |  -.0001588   .0043569    -0.04   0.971    -.0087357     .008418
     ele1_al |   .0095074   .0037683     2.52   0.012     .0020894    .0169255
       _cons |   .2246446   .0875908     2.56   0.011     .0522164    .3970729
-------------+----------------------------------------------------------------
     sigma_u |  .08014266
     sigma_e |  .02230825
         rho |  .92808936   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 277) =    17.83             Prob > F = 0.0000

.
. *GMM
. xtabond fr l(0).ele_nal ele_al, lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    185.37

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |   .3738862   .0329054    11.36   0.000     .3093929    .4383795
grow         |
          D1 |   .0229733   .0429132     0.54   0.592     -.061135    .1070815
          LD |   .0590242   .0435073     1.36   0.175    -.0262485     .144297
         L2D |   .0055715   .0174559     0.32   0.750    -.0286414    .0397844
lggp         |
          D1 |  -.0627462   .0421046    -1.49   0.136    -.1452697    .0197773
          LD |  -.0372138   .0443214    -0.84   0.401    -.1240821    .0496545
         L2D |   .0462688   .0394034     1.17   0.240    -.0309605     .123498
ele_nal      |
          D1 |  -.0064311   .0047781    -1.35   0.178     -.015796    .0029338
ele_al       |
          D1 |   .0082487   .0033091     2.49   0.013      .001763    .0147344
```

```
_cons        |    .002559   .0004199     6.09   0.000      .001736    .0033819
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   346.63     Prob > chi2 = 0.6431

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.19   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.36   Pr > z = 0.7156

.
.
. xtabond fr l(0).pbc_nal pbc_al, lags(1)  pre(grow, lag(2,.)) pre(lggp,
lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(9)       =    179.93

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
fr           |
          LD |   .3576535   .0327499    10.92   0.000     .2934649    .4218421
grow         |
          D1 |   .0281981   .0423676     0.67   0.506    -.0548409    .1112371
          LD |   .0574934   .0432459     1.33   0.184    -.0272671    .1422538
         L2D |   .0023443   .0173902     0.13   0.893    -.0317399    .0364285
lggp         |
          D1 |  -.0715109   .0414332    -1.73   0.084    -.1527186    .0096967
          LD |  -.0241315   .0446573    -0.54   0.589    -.1116582    .0633951
         L2D |   .0403942   .0393127     1.03   0.304    -.0366572    .1174456
pbc_nal      |
          D1 |  -.0051577   .0027407    -1.88   0.060    -.0105293    .0002139
pbc_al       |
          D1 |  -.0004197   .0020449    -0.21   0.837    -.0044275    .0035881
_cons        |   .0026318   .0004205     6.26   0.000     .0018076     .003456
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   353.74     Prob > chi2 = 0.5387

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.04   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.58   Pr > z = 0.5629

.
. xtabond fr l(0).ele_nal ele_al ele1_nal ele1_al , lags(1)  pre(grow,
lag(2,.)) pre(lggp, lag(2,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       286
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(11)      =    211.37

Time variable (t): y                            Obs per group: min =        13
                                                               avg =        13
                                                               max =        13

One-step results
------------------------------------------------------------------------------
fr           |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
fr           |
          LD |   .3721047   .0321465    11.58   0.000     .3090987    .4351108
grow         |
          D1 |   .0082227   .0420188     0.20   0.845    -.0741327     .090578
          LD |   .0460954    .042689     1.08   0.280    -.0375735    .1297644
         L2D |   .0019717   .0170738     0.12   0.908    -.0314923    .0354358
lggp         |
          D1 |  -.0592305   .0410833    -1.44   0.149    -.1397522    .0212912
          LD |  -.0157837   .0437323    -0.36   0.718    -.1014974    .0699301
         L2D |   .0202422    .039256     0.52   0.606    -.0566981    .0971825
ele_nal      |
          D1 |  -.0033791   .0047862    -0.71   0.480    -.0127598    .0060017
ele_al       |
          D1 |   .0122515   .0033712     3.63   0.000     .0056441    .0188589
ele1_nal     |
          D1 |    .007472   .0039281     1.90   0.057    -.0002269     .015171
ele1_al      |
          D1 |   .0126459   .0032706     3.87   0.000     .0062357    .0190561
_cons        |   .0025978   .0004122     6.30   0.000       .00179    .0034056
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(357) =   347.76     Prob > chi2 = 0.6270

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -5.30   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.04   Pr > z = 0.9697
```

TABLE 20 - Elections and Revenue from Provincial Taxes conditional on alignment of provincial and federal government

```
.
. *OLS
. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp ele_nal ele_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  112.99
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8422
                                                       Root MSE      =  .00562

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .9428694   .1447413     6.51   0.000     .6580326    1.227706
       ptr_2 |  -.3730106    .157066    -2.37   0.018    -.6821013     -.06392
       ptr_3 |   .2532924   .0795903     3.18   0.002     .0966665    .4099184
        grow |  -.0033364   .0048706    -0.69   0.494    -.0129213    .0062485
        lggp |    .002668   .0009754     2.74   0.007     .0007486    .0045874
     ele_nal |   .0002664   .0009324     0.29   0.775    -.0015684    .0021012
      ele_al |   .0001219   .0008605     0.14   0.887    -.0015715    .0018152
       _cons |  -.0178357   .0074739    -2.39   0.018    -.0325436   -.0031278
------------------------------------------------------------------------------

. regress  ptr ptr_1 ptr_2 ptr_3 grow lggp pbc_nal pbc_al, robust

Regression with robust standard errors                 Number of obs =     308
                                                       F(  7,   300) =  113.08
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.8425
                                                       Root MSE      =  .00561

------------------------------------------------------------------------------
             |               Robust
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .9464471   .1443851     6.56   0.000     .6623113    1.230583
       ptr_2 |  -.3815714   .1550447    -2.46   0.014    -.6866842   -.0764585
       ptr_3 |    .258749   .0803934     3.22   0.001     .1005425    .4169555
        grow |  -.0039578   .0048465    -0.82   0.415    -.0134952    .0055795
        lggp |   .0026596   .0009787     2.72   0.007     .0007337    .0045855
     pbc_nal |  -1.40e-06   .0010759    -0.00   0.999    -.0021186    .0021158
      pbc_al |  -.0004472   .0004581    -0.98   0.330    -.0013488    .0004544
       _cons |  -.0177302   .0074854    -2.37   0.018    -.0324607   -.0029997
------------------------------------------------------------------------------

.
.
.
. *FE
. xtreg  ptr ptr_1 ptr_2 ptr_3 grow lggp ele_nal ele_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5246                         Obs per group: min =        14
       between = 0.9070                                        avg =      14.0
       overall = 0.7956                                        max =        14

                                                F(7,279)           =     43.99
corr(u_i, Xb)  = 0.5065                         Prob > F           =    0.0000

------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
       ptr_1 |   .7615601   .0481035    15.83   0.000     .6668682    .8562519
       ptr_2 |  -.3799494   .0563961    -6.74   0.000    -.4909653   -.2689334
       ptr_3 |   .1011669   .0485239     2.08   0.038     .0056476    .1966863
        grow |      -.006   .0044526    -1.35   0.179    -.0147649     .002765
        lggp |   .0077006   .0023316     3.30   0.001     .0031108    .0122904
     ele_nal |   .0001572   .0012493     0.13   0.900     -.002302    .0026164
      ele_al |   .0001693   .0008805     0.19   0.848     -.001564    .0019026
       _cons |  -.0515562   .0197718    -2.61   0.010     -.090477   -.0126353
-------------+----------------------------------------------------------------
     sigma_u |   .0046232
     sigma_e |  .00521579
         rho |  .43998939   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     3.29             Prob > F = 0.0000

. xtreg  ptr ptr_1 ptr_2 ptr_3 grow lggp pbc_nal pbc_al,fe

Fixed-effects (within) regression               Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

R-sq:  within  = 0.5253                         Obs per group: min =        14
       between = 0.9071                                        avg =      14.0
       overall = 0.7959                                        max =        14

                                                F(7,279)           =     44.11
corr(u_i, Xb)  = 0.5064                         Prob > F           =    0.0000

------------------------------------------------------------------------------
         ptr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ptr_1 |   .7649158   .0480094    15.93   0.000     .6704092    .8594224
       ptr_2 |  -.3871655   .0561041    -6.90   0.000    -.4976065   -.2767245
       ptr_3 |   .1051567   .0484995     2.17   0.031     .0096853    .2006281
        grow |  -.0065774   .0044847    -1.47   0.144    -.0154056    .0022508
        lggp |   .0076987   .0023361     3.30   0.001     .0031001    .0122973
     pbc_nal |   .0000305   .0007047     0.04   0.965    -.0013567    .0014178
      pbc_al |  -.0003677   .0005432    -0.68   0.499    -.0014369    .0007016
       _cons |  -.0514966   .0198169    -2.60   0.010    -.0905062    -.012487
-------------+----------------------------------------------------------------
     sigma_u |  .00462108
     sigma_e |  .00521195
         rho |  .44012564   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(21, 279) =     3.28             Prob > F = 0.0000

.
. *GMM
.
. xtabond ptr l(0).ele_nal ele_al , lags(2)  pre(grow, lag(1,.)) pre(lggp,
lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    235.98

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr          |
          LD |   .6402771   .0477628    13.41   0.000     .5466637    .7338905
         L2D |  -.3542546   .0488073    -7.26   0.000    -.4499151   -.2585941
grow         |
```

```
         D1 |   .0076223   .0106768     0.71   0.475    -.0133037    .0285484
         LD |     .02173   .0045843     4.74   0.000     .0127449    .0307151
lggp        |
         D1 |  -.0107819     .01059    -1.02   0.309    -.0315378    .0099741
         LD |  -.0010354   .0102877    -0.10   0.920     -.021199    .0191281
ele_nal     |
         D1 |   .0008757   .0010659     0.82   0.411    -.0012133    .0029648
ele_al      |
         D1 |  -.0002924   .0008692    -0.34   0.737    -.0019959    .0014111
_cons       |   .0007099   .0001029     6.90   0.000     .0005083    .0009115
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   337.35     Prob > chi2 = 0.8475

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.37   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   0.33   Pr > z = 0.7379

. xtabond ptr l(0).pbc_nal pbc_al , lags(2)  pre(grow, lag(1,.)) pre(lggp,
lag(1,.))

Arellano-Bond dynamic panel-data estimation     Number of obs      =       308
Group variable (i): id                          Number of groups   =        22

                                                Wald chi2(8)       =    237.61

Time variable (t): y                            Obs per group: min =        14
                                                               avg =        14
                                                               max =        14

One-step results
------------------------------------------------------------------------------
ptr          |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ptr         |
         LD |   .6454538   .0474125    13.61   0.000      .552527    .7383806
        L2D |  -.3618317   .0482875    -7.49   0.000    -.4564735   -.2671898
grow        |
         D1 |   .0083689   .0106442     0.79   0.432    -.0124934    .0292311
         LD |   .0224597   .0046561     4.82   0.000     .0133338    .0315856
lggp        |
         D1 |  -.0128237   .0105429    -1.22   0.224    -.0334874      .00784
         LD |   .0010048   .0102152     0.10   0.922    -.0190166    .0210261
pbc_nal     |
         D1 |   .0000999   .0006629     0.15   0.880    -.0011993    .0013992
pbc_al      |
         D1 |  -.0005707   .0005444    -1.05   0.295    -.0016377    .0004963
_cons       |   .0006956   .0001017     6.84   0.000     .0004963    .0008948
------------------------------------------------------------------------------
Sargan test of over-identifying restrictions:
         chi2(365) =   338.36     Prob > chi2 = 0.8380

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -7.19   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.02   Pr > z = 0.9852

.
```