Public Investment in Infrastructure and Productivity Growth: Evidence from the Venezuelan Manufacturing Sector

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1. Introduction

How important is public investment in infrastructure for development? Answers to this question vary broadly among economists. A long tradition in the study of development gives the provision of a broad array of public goods and services, among them the provision of infrastructure, a central role in the solution of collective action problems and in the generation of the necessary conditions for self-sustaining economic growth to be in place. An alternative view, however, has emphasized the scope for rent-seeking in the determination of public investment, and the resulting low social returns to a number of investment projects carried out by developing country governments.

Determining the quantitative significance of the efficiency effects from infrastructure investment is a key question for the design of adjustment policies in developing countries. Governments enacting fiscal adjustments have to face the question of how much to cut public investment vis-à-vis current expenditures. Cutting current expenditures often entails laying off public sector workers and cutting the operating expenditures of the existing state structure. As such, it can be a politically complex decision. In contrast, reducing public investment projects may simply entail not undertaking new investment projects that have yet to be initiated and thus do not have a political constituency to support them. It is thus no surprise that governments facing public adjustment programs often decide to maintain

current expenditures and significantly curtail public investment (World Bank, 1988, Roubini and Sachs, 1989).

When fiscal deficits are reduced by cutting productive public investments, the resulting fiscal adjustment will be illusory in that it does not take into account the reduction in government net worth arising from the lost revenues caused by the lower expected future national income (Easterly, 1998). This phenomenon has been recently studied for the case of Latin American economies by Easterly and Servén (2003). The articles in that book emphasize the cost to Latin America of the severe cutbacks in public investment in infrastructure that occurred during the fiscal adjustments of the eighties and nineties.

A fiscal adjustment will only be illusory, however, if the curtailed investment in infrastructure actually has significant effects on private sector productivity. If the project in question is a white elephant, cutting it is most likely to be the best fiscal policy one can follow. For the same reason, it is important to be able to identify the effect of infrastructure investment on productivity in an economic and not just in a statistical sense, to understand how large the expected effect of a cutback in infrastructure investment on government net worth and expected economic growth will be.

Estimating these effects, however, presents a daunting empirical problem. Precisely because of the political forces in action to determine the allocation of investment projects, spending on infrastructure is likely to be an endogenous variable, making identification of its effect on productivity growth difficult. If governments are more likely to invest in prosperous and economically

developed regions, then there will be a spurious positive correlation between investment in infrastructure and productivity growth; if policymakers try to use public investment to compensate for the backwardness of existing regions or to help out regions in crisis, in contrast, there will be a downward bias in the least squares estimate of the effect of infrastructure investment on productivity growth. It will be extremely difficult to find exogenous and excludable instruments for investment in infrastructure. For example, Calderón and Servén (2003) have used urban population and population densities as well as lagged values of infrastructure stocks to estimate the effect of infrastructure on per worker GDP. However, if investment in infrastructure is endogenous lagged infrastructure will be correlated with productivity shocks if these are persistent while the population and population densities may have a direct effect on production.

This paper addresses the question of endogeneity in the estimation of the effect of public infrastructure spending on productivity by using state-level variations in infrastcructure investments carried out by the Venezuelan Intergubernmental Decentralization Fund (Fondo Intergubernamental para la Descentralización) established in 1993 to finance local infrastructure projects carried out by state and municipal governments in Venezuela. The FIDES was created simultaneously with the approval of a 1993 law establishing a national value-added tax on goods and services. The political negotiation leading to the adoption of the law led the Velásquez administration to accept to distribute 15% of collected VAT revenues directly to state and municipal governments, with the condition that these resources be devoted to

investment projects that would be co-financed with the local government's own resources. Since its creation, the 15% rate has remained constant.

What is interesting about FIDES for our purposes is that it establishes that each state and local government receive a fraction of total national VAT revenues that is a function of its population, its territorial extension, and its initial level of development. The variation in FIDES-financed expenditures over time is thus a result of the interaction between this rule and changes in national tax collection. Both of these are clearly exogenous to state-level productivity (at after one controls for common nation-level productivity shocks by the introduction of time dummies). This variable is thus an ideal indicator of exogenous changes in infrastructure investment.

The rest of this paper proceeds ad follows. Section 2 describes the FIDES as well as its companion law, the Ley de Asignaciones Económicas Especiales (LAEE). Section 3 discusses our empirical methodology and some issues with our estimation strategy. Section 4 presents our results. Section 5 concludes.

2. The Intergubernmental Decentralization Fund and the Special Economic Assigments Law.

The Intergubernmental Decentralization Fund, which we will refer to by its Spanish acronym FIDES (Fondo Intergubernamental para la Descentralización) was created in November of 1993 as a result of the political discussion regarding the institution of the value added tax in Venezuela. The VAT reform, originally introduced by the Carlos Andrés Pérez administration before congress in 1989, had met significant political opposition and had been sidetracked in Congress. When Pérez was impeached in 1993, the caretaker

administration of Ramón Velásquez negotiated with Congress the approval of this law, subject to the proviso that 15% of VAT revenues would be directly allocated to regional governments for the carrying out of public investments.

The law contemplates a broad definition of areas in which the FIDES may serve to pay the cost of public investments. Particularly important is the list of areas in which these investments can be financed by FIDES, which includes "Projects of productive investment that promote the sustainable development of the community, states and municipalities; works of infrastructure and activities within the framework of national development plans" (FIDES, 2005, Article 22) Although these provisions allow for a broad definition of the type of investment projects, the law does specifically state that these resources must only be used for "programas y proyectos" (programs and projects), a term that in Venezuelan legislation is equivalent to capital expenditures. Projects typically financed include construction of schools, repairs to roads and acquisition of vehicles for use by the local police force.

The fact that these resources are indeed devoted to public investment projects may have to do more with the organizational details of the fund than with the letter of the law. Indeed, the 1999 Venezuelan constitution also requires states to devote at least 50% of their state revenues towards public investment, but no state in Venezuela currently obeys this prescription. The FIDES law, however, requires the directory of the fund to approve the list of investment projects and to only disburse the funds after approval and subject to coparticipation of the state or local government in funding the project.

The FIDES law is somewhat similar in structure to the Law of Special Economic Assignments (Ley de Asignaciones Económicas Especiales or LAEE), approved in 1996, which provides for states to receive 25% of government revenues derived from royalties on oil production. LAEE emerged out of a distinct political phenomenon, which was the set of negotiations undertaken by the Caldera (1993-1998) administration in seeking to gain the support of a working majority in Congress and the resulting concessions to te political forces of oil-producing states. Three oil producing states (Anzoátegui, Monagas and Zulia) receive 70% of the revenues assigned according to LAEE, whereas the remaining 20 states divide up the other 30%. The main distinction between LAEE and FIDES is that the former is much more targeted in the type of investment projects that can be financed through it. (A second distinction is that the approval and supervision of projects occurs within the Ministry of Interior and Justice and not by an autonomously run entity like FIDES, making standards much laxer). It is interesting to look at the list of projects that the LAEE law specifically restricts expenditures to:

1. Projects linked to counteracting the adverse environmental impact of minig and hydrocarbons production.
2. Financing of research and technological innovation.
3. Medical and educational infrastructure
4. Cultural preservation
5. Construction of homes for low and middle-income families
6. Construction and improvement of agricultural infrastructure, including roads that serve the agricultural sector

In contrast to FIDES, LAEE is not open-ended but quite restricted in its application. More importantly, investment of LAEE resources in non-agricultural infrastructure is not permitted by the law. The type of public goods and services that can be provided by LAEE, while important for welfare and human capital accumulation, should not have a very strong link with the productivity of the manufacturing sector. This fact will be key to our analysis.

3. Empirical Strategy

We will use a panel of manufacturing firms derived from the National Institute of Statistics' *Encuesta Industrial* to estimate the effect of FIDES and LAEE-financed public investment on firm-level productivity between 1996 and 2001. We will estimate a firm-level production function:

$$y_{it} = \alpha_0 + \alpha_1 k_{it} + \alpha_2 l_{it} + \alpha_3 a_{it} + \omega_{it} \quad (1)$$

Where y_{it} is the log of real value added, k_{it} is the log of the capital stock, l_{it} is employment, and a_{it} is the log of the firm's age measured in years. ω_{it} is the firm level productivity, which is determined according to:

$$\omega_{it} = \eta_i + \beta p_{it} + \varepsilon_{it} \quad (2)$$

So that firm-level productivity is composed by a firm-specific effect, the productivity effect of the stock of public infrastructure, p_{it} and a white noise term.

We do not observe the stock of public infrastructure. However, we do know that it evolves according to:

$$p_{it} = (1-\delta)\, p_{it-1} + i_t \qquad (3)$$

Where δ is the rate of depreciation and i_t is public investment in infrastructure. Let public investment in infrastructure be the sum of FIDES and non-FIDES investment (based on the discussion in section 2, we assume that no investment in the infrastructure that is relevant for manufacturing sector productivity comes from LAEE). The availability of greater resources from FIDES will impact public investment in infrastructure in two ways. First of all, according to the FIDES law, states must put down a minimum share of their own resources towards financing of these projects. Furthermore, the availability of FIDES may allow state governments to carry out projects that they would not otherwise have carried out with their own resources. On the other hand, states may simply use FIDES to carry out projects that they would have carried out anyway, so that the availability of FIDES resources may reduce non-FIDES investment. The total effect of FIDES resources on investment may thus be greater than or less than one. We summarize it in the multiplier γ, so that investment in infrastructure is:

$$i_{it} = \gamma f_{it} + n_{it} = \gamma f_{it} + n_0 + (n_{it} - n_{i0}) \qquad (4)$$

Where f_{it} is FIDES (or FIDES-induced) investment, n_{it} is infrastructure investment that is unrelated to FIDES and n_{i0} is its unconditional mean $E(n_{it})$. Note that since δf_{it} includes the direct and indirect effect of FIDES expenditures, n_{it} is by definition uncorrelated with f_{it}.

Taking first-differences of (2) and using (3) and (4) gives us:

$$\omega_{it} - \omega_{it-1} = \beta n_{i0} - \beta\delta\eta_i - \beta\delta\omega_{it-1} + \beta\gamma f_{it} + \beta(n_{it} - n_{i0}) + \varepsilon_{it} + (1-\beta\delta)\varepsilon_{it-1} \qquad (5)$$

Equation (5) tells us that changes in productivity are a combination of five terms: a firm-specific fixed effect $\beta n_{i0} - \beta\delta\eta_i$, a "convergence" effect $-\beta\delta\omega_{it-1}$ that depends on the initial level of productivity and is caused by the depreciation of public infrastructure, the effect of FIDES investment, captured by $\beta\gamma f_{it}$, and a linear combination of white-noise terms $\beta(n_{it} - n_0) + \varepsilon_{it} + (1-\beta\delta)\varepsilon_{it-1}$ that can be treated as a ole disturbance. This gives rise to the specification that we will present in the following section:

$$\omega_{it} = a_0 + a_1\omega_{it-1} + a_2 f_{it} + \chi_i + v_{it} \qquad (6)$$

where the expected value of a_2 equals $\beta\gamma$ and is positive. Note that f_{it} is uncorrelated with the error term v_{it}, , so that a_2 can be estimated consistently by panel methods as long as the fixed effect χ_i is differenced away.

Equation (6) represents a dynamic panel that can be estimated by the techniques of Arellano and Bond (1991). An alternative and simpler specification arises if we are willing to assume that the depreciation rate of public infrastructure is negligible. Here (5) becomes:

$$\omega_{it} - \omega_{it-1} = b_0 + b_2 f_{it} + \chi_i + v_{it} \qquad (7)$$

Which can be estimated through a conventional fixed-effects estimator.

In practice, our estimation strategy will be carried out in two steps. In the first step we will estimate ω_{it} by the Olley-Pakes (1996) semi-parametric method that allows to obtain consistent estimates of α_0,α_1,α_2 and α_3 that take into account the endogenous determination of firm-level capital and its likely correlation with productivity shocks arising from two forces: (i) the fact that firms that experience a positive productivity shock are likely to invest more,

and (ii) the fact that firms that experience a positive productivity shock are less likely to exit. The Olley-Pakes methodology consists of three steps. In the first step, we estimate the production function semi-parametrically as a function of k_{it},l_{it},a_{it} and private investment c_{it}. The basic ideas is that since investment is an increasing function of productivity then controlling for private investment will allow us to recover a consistent estimate of the coefficient on l_{it}. In the second step we estimate the probability of survival as a non-parametric function of k_{it},a_{it},and c_{it}. Using this estimate of the probability of survival, we can control for selection bias effects and estimate the production function coefficients on k_{it} and a_{it} by non-linear least squares. When we have all the parameter estimates for (1) we can simply calculate ω_{it} and go on to estimate (6) and (7) though an Arellano-Bond and a fixed-effects estimator.

4. Estimation Results

Table 1 shows the results of our baseline estimation of equations (6) and (7). All estimates include a set of year dummies. The dependent variable is constructed as outlined in the previous section; the dependent variable is the log of FIDES revenues over Gross State Product. The latter is estimated using UNDP's (various years) estimates of state-level income. The baseline estimation produces significant estimates of the effect of FIDES investment on productivity. The estimates indicate that a 1 percent increase in FIDES expenditures will lead to an increase of 0.2-.3 percent in firm-level productivity. The lagged productivity term is highly significant, favoring the specification of equation (6). The third and fourth column of Table 6 include

a control for LAEE expenditures. As mentioned above, we do not expect LAEE-financed investments to have a significant effect on productivity in the manufacturing sector, but it is worth testing whether they do or not. Furthermore, LAEE could affect the incentives for investment in non-FIDES induced manufacturing-relevant public sector infrastructure n_{it}. Even if the effect of LAEE is statistically insignificant, controlling for it may still be relevant for obtaining an accurate estimator of the FIDES effect. The reason is that the allocation rules for LAEE are very similar to those of FIDES, so that we may expect changes over time in both of these types of expenditures to be correlated. Even a small coefficient of LAEE in the productivity regression could then be consistent with a substantial omitted-variable bias term. The first-differenced regression does indeed display a significant increase in the estimated coefficient, from .20 to .35, while the Arellano-Bond regression displays a statistically negligible increase.

As noted in the previous section, implementation of the Olley-Pakes algorithm requires estimation of a survival probability function. In order to do this, it is necessary to have data on entry and exit of firms. However, the *Encuesta Industrial* is a random survey in which a firm may exit the sample because it is no longer operating or because it was no longer surveyed. When estimating survival probabilities, we take advantage of the fact that in the *Encuesta Industrial*'s sample all plants of more than 100 employees are always covered. In other words, the *Encuesta* becomes a census for plants with more than 100 employees. We thus estimate the survival probability function for firms with more than 100 employees and then use the coefficients

from that function to correct for selection bias for all firms. Note that this simply relies on the implicit assumption made when one estimates the production function (1) for the whole sample, which is that small and large firms have the same parameters in this production function. However, the doubt may naturally arise about how important is the approximation error induced by this method. In Table 2 we present the results of carrying out all three steps (instead of just the second one) of the Olley-Pakes algorithnm restricted to plants of more than 100 employees. The number of observations falls to roughly one-third of those used in the exercise with the whole sample, and there is a consequent loss in the statistical precision of the estimates. On the other hand, all coefficients remain positive, two of them experimenting substantial increases in the point estimate, with one of them significant at 5% and two others with borderline p-values. Even the lowest point estimate of Table 2 (0.18) implies an economically significant effect on productivity of increased allocations to FIDES.

The estimates presented to this moment tell us nothing about the way in which the effect of FIDES expenditures operate. What firms are more likely to reap the benefits of greater investment in public infrastructure? One can attempt to answer this question by noting that public investment can raise productivity by providing goods and services that private sector firms were incapable or unwilling to provide on their own. They may have been incapable of doing so because they were liquidity constrained, or they may have been unwilling to because of collective action problems. Firms that have greater access to capital are likely to be less liquidity constrained, so we can

test this hypothesis by testing whether less capital-intensive firms benefit less from public investment. Exporters are also likely to have greater access to international capital markets and thus we may expect exporting firms to benefit less from public investment in infrastructure. Firms with international ownership will also likely have access to credit through their foreign partners, so that we may also expect them to benefit less from public investment. We would also expect the payoff from public goods provision to be higher in economically less developed regions, in which the marginal product of both private and public capital should be higher.

We test each of these hypotheses in turn in the regressions reported in Tables 3-6. Table 3 introduces an interaction with capital intensity. As hypothesized, capital-intensive firms benefit less from public investment in infrastructure, with the interaction term being significant in all four specifications (one at 10%, two at 5% and one at 1%). Adding in an interaction with exports in Table 4 also delivers a significant coefficient estimate in all four specifications (two at 5% and two at 1%). Meanwhile, both the direct effect of FIDES investment and the interaction with capital intensity remain strongly significant.

Evidence on the effects of the level of development and domestic ownership are more mixed. Only two of the four coefficient estimates on the interaction between FIDES investment and the log of state per capita income are significant at 10%, and one of them has the wrong sign. However, this may be a very rough measure of the level of development, given that it is measured only at the state level and relies on imprecise estimates of per capita

income (there are no official Gross State Product data in Venezuela). An interaction with domestic ownership does display a positive coefficient, as hypothesized (Table 6) but is significant in just two of the four estimates (one at 10%, one at 1%). However, in both regressions in which the control for domestic ownership is significant, the direct effect of FIDES on productivity growth loses its significance, although the interaction terms remain significant. These include what is arguably the best specification in column 4, which controls for lagged productivity and for omitted variable bias coming from the effect of LAEE on public investment. This would imply that the effect of FIDES investment on productivity is explained by its effect on the productivity of labor intensive firms, non-exporters and domestically owned firms.

5. Concluding Comments

This paper has used expenditures of the Venezuelan Intergubernmental Decentralization Fund (FIDES) to estimate the effect of public infrastructure investment on the productivity of Venezuelan manufacturing firms. Because FIDES allocations are assigned to states through a rule that divides national VAT receipts according to the states' population, territorial expansion and initial level of development, and as that rule has remained remarkably stable over time, changes in FIDES expenditures basically come from the interaction between the parameters of the allocation rule and changes in national tax collection. This effect is exogenous at the state level and also generates sufficient variation over time so as to allow us to estimate its effect on firm-level productivity.

Our estimates indicate that a 1% increase in the allocation to FIDES expenditures generates an increase in productivity of the manufacturing sector between .2 and .35. Economically, this is a very significant effect. FIDES investment in 2006 is projected to amount to 1.7 trillion Bs., or roughly 0.75% of GDP. A 1% increase would thus amount to an additional allocation of 0.0075% of GDP. Given that manufacturing accounts for 17% of GDP, a 0.2% increase in value added in manufacturing would imply an increase of 0.034% of GDP. At the going VAT tax rate of 15%, this implies that the government would recover .0054% of GDP in additional tax receipts, or 72% of the initial investment *every year*. Cutting investment in infrastructure does appear to be a very bad deal both from a fiscal viewpoint as well as from the perspective of society as a whole.

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Table 1: Baseline Regressions				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.368547		0.355316
		8.59***		7.35***
FIDES	0.19643	0.315318	0.346379	0.330087
	2.07**	3.41***	1.99**	1.87*
LAEE			0.014325	0.029532
			0.27	0.74
Constant	-0.24681	-0.1241	-0.3031	-0.12417
	-2.12**	-8.37***	-1.7*	-7.03***
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	8865	5366	7239	4038
R2	0.049868		0.064626	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.

Table 2: Only Large Firms (More than 100 workers)				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.311162		0.301269
		5.78***		5.00***
FIDES	0.18406	0.265771	0.535811	0.468291
	1.28	1.68*	2.35**	1.61
LAEE			0.054386	0.057973
			0.73	1.19
Constant	-0.69037	0.000796	-0.45258	0.004448
	-4.62***	0.03	-2.1**	0.15
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	2739	2083	2261	1635
R2	0.058908		0.07758	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.

Table 3: Interaction with Capital-Intensity of Firms				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.363076		0.351925
		8.56***		7.35***
FIDES	0.203816	0.319992	0.369614	0.35682
	2.16**	3.48***	2.14**	2.02**
FIDES*(K/L)	-0.00039	-.0004302	-0.00052	-0.00048
	-2.76***	-2.31**	-2.19**	-1.93*
LAEE			0.017383	0.031257
			0.33	0.79
Constant	-0.23112	-0.10803	-0.30326	-0.12152
	-1.98**	-2.7***	-1.71*	-6.9***
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	8865	5366	7239	4038
R2	0.052276		0.067918	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.

Table 4: Interaction with firm exports				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.358281		0.354163
		8.49***		7.40***
FIDES	0.213278	0.338368	0.350838	0.372646
	2.26**	3.70***	2.03**	2.13**
FIDES*(K/L)	-0.00039	-0.00043	-0.00052	-0.00049
	-2.77***	-2.24**	-2.18**	-1.94*
FIDES*(Exports/Production)	-0.34967	-0.46586	-0.3962	-0.70253
	-2.29**	-2.91***	-1.98**	-2.75***
LAEE			0.017546	0.029071
			0.34	0.74
Constant	-0.21614	-0.11684	-0.25508	-0.1188
	-1.85*	-7.9***	-1.44	-6.75***
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	8865	5366	7239	4038
R2	0.054723		0.07098	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.

Table 5: Interaction with state per capita income				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.357693		0.354238
		8.48***		7.4***
FIDES	0.281627	0.379318	0.337159	0.367933
	2.72***	4.05***	1.95*	2.09**
FIDES*(K/L)	-0.0004	-0.00044	-0.00051	-0.00049
	-2.82***	-2.27**	-2.15**	-1.94*
FIDES*(Exports/Production)	-0.34806	-0.46225	-0.39596	-0.70245
	-2.28**	-2.89***	-1.97**	-2.75***
FIDES*(State per Capita Income (Log))	-0.16161	-0.14648	0.179727	-0.01399
	-1.66*	-1.74*	0.99	-0.1
LAEE			0.042036	0.027768
			0.71	0.63
Constant	-0.21167	-0.11107	-0.34074	-0.11864
	-1.81*	-7.19***	-1.74*	-6.54***
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	8865	5366	7239	4038
R2	0.055228		0.071216	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.

Table 6: Interaction with ownership of residents				
Dependent Variable	Change in Productivity	Productivity	Change in Productivity	Productivity
Lagged Productivity		0.358062		0.35799
		8.52***		7.5***
FIDES	0.251949	0.301163	0.206531	0.174466
	2.18**	2.82***	1.09	0.93
FIDES*(K/L)	-0.0004	-0.00043	-0.0005	-0.00048
	-2.79***	-2.24**	-2.1**	-1.93*
FIDES*(Exports/Production)	-0.34593	-0.46	-0.39377	-0.70606
	-2.27**	-2.88***	-1.96**	-2.78***
FIDES*(State per Capita Income (Log))	-0.15947	-0.13478	0.222212	0.023893
	-1.64	-1.59	1.22	0.17
FIDES*(Percent Ownership Residents)	0.000294	0.000745	0.000953	0.001297
	0.6	1.65	1.68*	2.73***
LAEE			0.043304	0.028027
			0.73	0.64
Constant	-0.64445	-0.09816	-0.31592	-0.09251
	-5.57***	-5.66***	-1.61	-4.53***
Method	Fixed Effects	Arellano-Bond	Fixed Effects	Arellano-Bond
Year Dummies	Yes	Yes	Yes	Yes
N	8864	5365	7238	4037
R2	0.055309		0.07208	

T-statistics below coefficient estimates. Asterisks denote significance levels: *-10%, **-5%, *** -1%.