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## **Fiscal policies in highly unequal societies: implications for agricultural growth**

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**Abstract:** *The paper discusses the economic effects of misallocation of public expenditures in favor of private goods rather than public goods. It first lays out certain key hypotheses regarding the consequences of the apparent public sector allocation inefficiency and the factors that explain this phenomenon. It then discusses existing empirical evidence that lends at least indirect support to these hypotheses. Finally, it presents new empirical evidence for the rural sector in Latin America which documents the extent of the misallocation of public expenditures, its consequences for agricultural growth and rural poverty, and the role of certain key politico-institutional factors in explaining the misallocation.*

**Key Words:** *public expenditure, public goods, agricultural growth, subsidies, social equity.*

**JEL:** *H40, H41, H42, O13, Q15, Q18.*

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A large share of the financial, human, and institutional government resources is often spent on private goods, not on public goods<sup>1</sup>. The literature has given relatively little attention to the economic consequences of this misallocation of public expenditures. This is so despite of the potentially large efficiency and equity losses arising from misguided allocations of public expenditures (which often comprise more than 20% of GDP). This paper first provides certain key hypotheses regarding: (i) the consequences of this apparent public sector allocation inefficiency, and (ii) the factors that explain this phenomenon. Next, it discusses existing empirical evidence that lends at least indirect support to such hypotheses. Finally, it presents new empirical evidence developed in a series of recent papers by the author and his associates for the rural sector in Latin America which documents the extent of the misallocation of public expenditures, its consequences for agricultural growth and rural poverty, and the role of certain key politico-institutional factors in explaining such misallocation.

Diverting part of the government resources to spending on private goods or subsidies means that the government either over-taxes the private sector or under-supplies public goods, or both. Efficiency losses associated with the inevitable distortions caused by raising more taxes than needed or by under-providing public goods are incurred. The under-provision of public goods may have serious negative consequences for the *productivity* of private investment, since public goods are important complementary assets with private capital. A low supply of public goods means scarcity of human capital,<sup>2</sup> underinvestment in research and development, less investment in infrastructure, and insufficient sanitary and environmental protection (World Bank, 2000). All these are important assets that contribute to increasing the productivity of private investments and which in general tend to be undersupplied by the private sector.

The biased structure of public expenditure allocation may have important *social equity* implications as well. For reasons to be discussed below, government expenditures for non-social

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<sup>1</sup> We use here a broad definition of public goods to include not only the traditional or pure public goods but also expenditures directed to mitigate market failures that affect economic efficiency or to reduce poverty. Prominent market failure with deep consequences for economic growth are those affecting the provision of research and development (R&D) and diffusion of technology, property rights imperfections, and capital market imperfections that impair the ability of the poor to optimally invest in human capital (Hoff and Stiglitz, 2000).

<sup>2</sup> Education and health care, though not pure public goods, have characteristics of public goods, especially in developing countries. The poor are generally unable to finance even highly profitable investments in human capital due to imperfections of capital markets. Without government intervention, such investments are often not realized.

subsidies tend to be directed toward the wealthier segments of society and, at the same time, have little effect in promoting employment and stimulating growth. The only significant assets of the poor are their labor force and, for the rural poor, their natural resources. The income of the poor is, thus, extremely dependent on their ability to enhance their human capital and to protect the natural assets, both of which are important public or semi-public goods. Over-taxation that spending in private goods may cause also has negative equity consequences. It is well known that in most developing countries the tax system is not progressive, especially because of its great reliance on indirect taxation and because of the prevalence of tax evasion.<sup>3</sup> So the additional taxes needed to finance subsidies to privileged individuals and firms are paid by the poor to a significant degree.

Apart from affecting the rate of agricultural growth, the heavy emphasis of governments on subsidizing the wealthy is likely to affect the *patterns of growth* of agriculture. In particular, a hypothesis that we have tested is that the existence of non-social subsidies tends to make agricultural growth much more dependent on land expansion than on intensification. In many countries, especially tropical ones, agricultural growth is linked to area expansion much more than to intensification.<sup>4</sup> This pattern of growth is often responsible for the large deforestation impacts attributed to agriculture by many studies (Barbier, 2004). When governments are prone to provide non-social subsidies, farmers respond by expanding farm size beyond optimal levels, which signals to government their disposition and financial capacity to offer bribes in exchange for such subsidies (Bulte, Damania, and López, 2004). Land expansion is a vehicle to promote subsidies, and knowing that governments are prone to subsidize induces farmers to expand land area. Thus, a vicious cycle between land expansion and subsidies exists.

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<sup>3</sup> “Given the low importance of personal income taxes and property taxes in Latin American countries, the direct distributive leverage of the tax system in most countries should be expected to be very small or even negative” (World Bank, 2004, p. 254). Income taxes and property taxes constitute more than 10.5% of GDP in developed countries while in Latin America they comprise only 3.7% of GDP (World Bank, 2004). Chu, Davoodi, and Gupta (2000), corroborates this finding. Even in a country such as Chile, which arguably has one of the most advanced tax institutions in Latin America, after tax income inequality as measured by the Gini coefficient is worse than before taxes and the after tax share of the bottom two quintiles is only marginally higher than before taxes (Repetto, 2005).

<sup>4</sup> Graham, Gauthier, and Mendonça de Barros (1987), for example, concluded that area expansion rather than yield increases accounts for practically all of the growth of Brazilian agriculture between 1950 and 1980. Similar findings have been documented elsewhere (see, for example, Barbier (2004) and López (1997)).

Many empirical studies have measured the impact of specific public goods such as R&D, rural roads, and other infrastructure on agriculture as well as on other sectors.<sup>5</sup> Here a broader approach is provided with the aim of evaluating the trade-offs between the provision of public goods vis-à-vis other types of government expenditures on economic efficiency and social equity. Without such an analysis, the conceptual and policy implications of findings pointing to the payoffs of certain specific public expenditures are, in part, overlooked.

At the policy level, there seems to be a consensus to some degree regarding the importance of an adequate provision of public goods for economic expansion and social equity. However, the same lack of a clear conceptual framework and the general weakness of empirical studies also imply a weakness in the policy recommendations. It is important to understand the deep roots of the documented insufficiency in the provision of certain public goods. Governments may have goals other than economic efficiency and social equity whose fulfillment requires committing government resources to subsidize the wealthy and politically powerful interests. The observed insufficiencies of the supply of public goods by governments in most developing countries have direct as well as indirect causes. The direct factors include the diversion of significant government resources toward private goods, which leaves fewer resources available for public good provision, and the indirect factors are, as we shall see, socio-political in nature. A better understanding of the quantitative significance of such factors is an important prerequisite to strengthen policy recommendations<sup>6</sup>.

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<sup>5</sup> See, for example, the survey by Alston et al. (2000) of studies documenting returns to agricultural R&D and extension; Psacharopoulos (1994) for returns to education; and the World Bank (2000) for an extensive review of studies measuring returns to various other public goods. Also, Fan et. al (2000) estimates the impact of a large number of public expenditure items in rural India providing recommendations to increase expenditures in certain specific items which they find have high returns.

<sup>6</sup> Policy recommendations can also be counterproductive because they may induce governments to increase taxes, which, given the weaknesses of the tax system discussed earlier, may have negative efficiency and equity effects. Alternatively, the frequent recommendation of increasing particular government expenditures that studies taking a piecemeal-approach to evaluating public expenditures often reach may, if heeded, contribute to create fiscal disequilibria. This could become very costly and cause an even greater undersupply of public goods over the long-run. Argentina is an important recent example of large fiscal disequilibria created in part by the efforts in the nineteen nineties to dramatically increase expenditures on education, social programs, and health while still maintaining massive subsidies to the wealthy (López, 2003).

### *Conceptual issues and earlier empirical evidence*

In this section we raise certain key conceptual issues and predictions and point to earlier empirical studies that provide at least indirect support to these predictions.

#### *Public expenditures: an analytical taxonomy*

Two categories of expenditures are classified as “public” goods. The first and obvious one are expenditures on *pure public goods*; that is, in goods that are characterized as being at least approximately non-rival and/or non-excludable (infrastructure of unrestricted public use, justice, police, etc). The second category, *expenditures to palliate the effects of market imperfections*, involves some more complex issues. From the viewpoint of economic growth and efficiency there are market failures that cause efficiency losses by inducing under-investment in certain assets at the aggregate level while the effect on other assets involves mainly distributional changes but not aggregate under-investment. We consider government expenditures directed to palliate the impact of market failure causing aggregate under-investment in certain assets as expenditures for public goods and expenditures directed to market failures that do not cause such an under-investment at the aggregate level as expenditures for private goods. In separating market failures that need intervention to prevent efficiency losses from those that do not we follow an analytical taxonomy proposed by López (2006) which we summarize below.

Under constant returns to scale the distribution of physical and financial capital among firms has no effect on the productivity of these assets. The reason for this is clear: under constant returns to scale the marginal value product of physical capital is constant and independent of the firm’s level of capital<sup>7</sup>. Therefore, credit market failure which limits the ability of certain firms (i.e., those that have more restricted market access) to invest in such assets will simply imply that the investment will be concentrated in those firms that have an advantage in the credit market. This

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<sup>7</sup> If the production function is linearly homogenous firm i variable profit function can be written as:

$\Pi^i = k^i \pi(p, w)$ , where  $k^i$  is the stock of capital of firm i and  $p$  is the output price,  $w$  is a vector of input prices, and  $\pi(\cdot)$  is a unit profit function (Diewert, 1973). Also, by Hotelling’s lemma, the level of output of firm i is  $q^i = k^i \partial \pi(p, w) / \partial p$ . Thus aggregate output  $Q = \sum_i q^i = \partial \pi(p, w) / \partial p \sum_i k^i$  is not affected by the

distribution of  $k$  across firms if all firms face the same output and input prices and if they have access to the same technology. Output will be determined by the total level of capital but not by how it is distributed across firms.

reallocation of investment, however, has no effect on either efficiency or on aggregate industry output.

While the assumption of constant returns to scale for firms is not only plausible but also follows from commonly accepted firm's behavioral assumptions, such an assumption is utterly unreasonable for individuals as producers. Individual workers can be regarded as producers of an intermediate output, labor productivity. Production of labor productivity by individuals occurs through a production function where the main variable or semi-variable input is human capital (education, skills, etc), which is combined with the workers fixed factor, his/her own life span and natural ability to absorb knowledge. Thus, given the existence of these important fixed factors, it is clear that the marginal productivity of human capital in the production of labor productivity for an individual declines rapidly beyond a certain point<sup>8</sup>. Assume that there are two types of workers: those that face credit market constraints to finance investments in human capital (which also have little or no accumulated savings) and those that can make the human capital investment unconstrained by financial restrictions. The latter group will choose the investment level at the point where the present value of the marginal value product of human capital equals its marginal cost. The financially constrained individuals, however, will have to invest less: only up to the level that their availability of financial resources allows them.

The implication of this observation for the impact of capital market failure is obvious: if a segment of individuals faces capital market restrictions, those that do not will not make up for the shortfall of investment in human capital that the capital-constrained individuals will not do. Individuals not facing credit constraints will quickly reach a rapidly declining marginal productivity of human capital, which eventually will limit their ability to further invest. That is, credit market imperfections affect not only the distribution of human capital among individuals but also the total level of investment in human capital and, therefore, the aggregate level of productivity "produced" by individuals. This is in sharp contrast to the case of physical capital discussed earlier, where credit market failure is likely to affect the distribution of capital across firms but not efficiency or output levels.

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<sup>8</sup> There is so much that an individual can learn given his/her natural cognitive and life span limitations.

Thus, if the rationale for government intervention is to promote economic efficiency and growth, there is ample justification for intervening in financing human capital investment for the segments of society that have imperfect access to capital markets (generally the poor) but there is little justification for public intervention in subsidizing investment in other forms of capital unless the distribution of capital among firms is a goal in itself. In addition, given that human capital investments are much harder to use as collateral than physical or financial assets, it is likely that the impact of capital market failure is much more intense for investments in human assets than in physical or financial ones. This reinforces the importance of public interventions in financing human capital investment vis-à-vis interventions to subsidize non-human assets. The implication of all this is that, while interventions to subsidize human capital investment for those individuals facing credit market failure is justified as a source of economic growth, subsidizing physical or financial capital accumulation is not. Thus we obtain the following general guidance for separating public expenditures: Government subsidies to human capital formation by (poor or semi poor) households which face credit constraints are considered “public good” provision, while subsidies to physical and financial capital accumulation are considered expenditures for private goods<sup>9</sup>.

One important observation: it appears that capital market failures of one form or another are universal and extremely difficult to eradicate. They are almost a natural structural feature in a market economy (Stiglitz, 2000). This practically rules out the possibility of first best intervention, which would consist in creating policies and/or institutions that remove the market failure at the source, and underlines the importance of relying on second best instruments, consisting in publicly financing investment in human capital for those that suffer the consequences of capital market failures.

Apart from credit market failures, there are other market failures which may lead to underinvestment in certain assets. One of them is the existence of externalities affecting the

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<sup>9</sup> One may argue that subsidies to physical capital if targeted to firms that face financial constraints (often the smallest) will affect distribution in favor of the poor. Most private subsidies, however, are often absorbed by the large rather than the micro firms. Moreover, it is well accepted that distribution programs in favor of the less wealthy segments of society should be channeled through social programs instead of programs geared to production. Even subsidies for human capital formation may also fail the public good test. For example most subsidies for tertiary education are appropriated by households that face few credit or financial constraints. But most subsidies to pre-school, primary and secondary education benefit households that do face such constraints.



environment and affecting the dispersion of disease among humans, animals and plants. The existence of such externalities means that without intervention there will be under-investment in natural capital and in health protection. Government expenditures for the environment and public health, as well as for the creation of institutions such as property rights to mitigate some of these externalities, are thus considered expenditures on public goods.

Finally, the existence of large positive externalities and coordination problems affecting the creation, diffusion and adaptation to local conditions of new knowledge has been recognized as an important market failure. The presence of such externalities is likely to cause under-investment in research and development (R&D) and technology diffusion (Hoff and Stiglitz, 2000). Thus, government expenditures directed to fill the R&D and extension gaps left by the private sector, as well as the creation of adequate institutions such as intellectual property rights which may in part mitigate such market failure, are also considered expenditures on public goods.

#### *Political motivation and the structure of public expenditures*

The political motivation of government to invest in public goods is fundamentally different from its motivation to invest in private goods, and such differences cause important socio-economic effects of the public/private good choice. By definition, the benefits of public or semi-public goods tend to disperse much more among the population than those of private goods. This implies that the political lobby targets private goods that wholly benefit particular lobby groups much more than they target public goods, of which the lobby group shares only a fraction of the benefits. The struggle by lobby groups to elicit subsidies from the government is often their prime motivation. It is well known that successful lobbies are typically constituted by small groups with a clear common interest and objectives (Olson, 1965). Most importantly, successful lobby groups often have enough financial means to bribe politicians and to contribute to their political campaigns, or they have enough social status to be able to affect public opinion through a variety of means.<sup>10</sup>

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<sup>10</sup> Deacon (2002) has empirically shown that less democratic governments (those that give less opportunity to their citizenry to participate in decision making and are prone to lobby pressures from the wealthy) tend to provide a lower share of public expenditures on public goods, instead placing more emphasis on non-social subsidies.

These requirements for constituting a successful lobby are often satisfied by economic elites and rarely by the poor.<sup>11</sup> The implication is, by now, a stylized fact: Government expenditures for private goods go almost always to the wealthy and only very rarely to the poor.<sup>12</sup> This is in sharp contrast with expenditures for public goods, which generally produce benefits that tend to disperse across all groups in society, poor and non-poor alike. The social equity effects of the composition of public expenditures are obvious: the greater the share of government expenditures in private goods, the worse, *ceteris paribus*, is income distribution and poverty. The more concentrated is income and wealth, the greater is the relative influence of the elites on public policy, as fewer people have the financial means required for successful lobbying, and the greater is the ability of a smaller elite to influence government. That is, the more concentrated is the political lobbying power of the elites. This concentration of political lobby induces a more biased allocation of public expenditures towards private goods in favor of the elites. Thus, a biased composition of public expenditures may be a cause *and* an effect of social inequity and poverty.

#### *Crowding-out and economic performance*

Government provision of private goods or non-social subsidies causes three forms of crowding-out with negative efficiency and equity effects,

(i) Subsidies crowd out the supply of public goods through the government *budget*, *human*, and *institutional* constraints. The budget crowding-out is obvious: government-provided subsidies compete with the provision of public goods, not only for government's financial resources but also for other scarce public resources. The administration of subsidy programs often absorbs a large share of the government's limited human capital. Scarce institutional capital is also usually preferentially allocated to subsidy programs. Governments forego investments in public goods which according to many studies have extremely large rates of return. The survey by Alston et al. (2000), for example, reviews hundreds of studies around the world estimating rates of return to agriculture R&D revealing extremely high and non-declining rates.

Psacharopoulos's (1994) survey does the same for studies measuring returns to education over

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<sup>11</sup> Recently, certain groups among the poor (some indigenous groups, grass-root organizations, etc.) have been able to become part of the lobby forces. But their capacity to effectively lobby governments is limited by group size, education, and other shortcomings.

<sup>12</sup> For an empirical illustration of this phenomenon see Calmon (2004) with dramatic evidence for Brazil.

many countries, also showing very high rates. Also, a study by Fan, Hazell, and Thorat (2000) found unusually high returns to a variety of public infrastructure investments in agriculture in India and China. The World Bank (2000) has gathered evidence also pointing to very high rates of return to certain investments in protecting the environment. Thus the persistence of such unusually large rates of return suggests that under-investment in public goods is likely to have large negative effects on per capita income. This conclusion is reinforced by further empirical evidence showing that subsidies have low or even negative economic rates of return and that they crowd out private investment.

(ii) Subsidies may *directly* crowd out private investments. Consider what is often regarded as a “desirable” subsidy: the government offers to pay a portion of the cost of a particular investment.<sup>13</sup> The subsidy is rationed as the funds are normally less than the demand. Assume for simplicity that their allocation among producers is transparent, not subject to corruption. Consider an investor who is able to extract a profitable return out of an investment (even in the absence of the subsidy) who potentially may qualify for the subsidy but who does not obtain the subsidy. The producer may go ahead with the investment (without getting the subsidy) anyway, since it is a profitable one. Alternatively, she/he may opt to postpone the investment and try again the following year in the hope of getting the subsidy. If the expected value of the subsidy is sufficiently large to compensate the foregone profits of one year, the producer may decide to delay the investment.<sup>14</sup> Thus, investments that are privately (and socially) profitable may be postponed as a consequence of the existence of the subsidy<sup>15</sup>.

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<sup>13</sup> This example is based on an actual irrigation-drainage public subsidy scheme for “small” projects (subsidy amount up to US\$275,000 per producer) in Chile that costs the government about US\$30 million per year, using parameters obtained from the program.

<sup>14</sup> Suppose the subsidy is 50% (the Chilean subsidy pays between 25% and 75% of the total investment) of the value of the investment cost and that the rate of return per annum of the investment is quite high, 20%. Assume further that the producer estimates that the probability of getting the subsidy the following year is 0.5 (in the Chile example, about 45% of the proposals are funded). A risk-neutral producer will decide to *delay* the investment for one year as the expected return of delaying the investment (25%) is higher than the return to implementing the investment (20%).

<sup>15</sup> There are two types of investors who actually get the subsidy: those who would have implemented the investment anyway and those who otherwise would not have because they would not be able to get high enough returns. For the former, the subsidy is ineffective. For the latter, the subsidy is effective insofar as it causes them to invest, but, in the absence of positive externalities associated with the investment, they do so at a low social return. Thus, the subsidy scheme does two things: (i) it increases consumption rather than investment by producers who are able to obtain the subsidy but who would have invested anyway, and (ii) it reallocates investment from those producers who could have potentially obtained high rates of return to producers who obtain a low social return but invest only because they are able to access the subsidy. The net effect on total investment is ambiguous, but the efficiency impact is negative as a consequence of effect (ii).

The above example is not just a curiosity. Empirical studies using detailed firm-level data have shown that subsidies and corporate tax concessions targeted to specific firms are at best ineffective in promoting investment and technology adoption and, in some instances, counterproductive (see Bregman, Fuss, and Regev (1999) for Israel, Fakin (1995) for Poland, Lee (1996) for Korea, Bergstrom (1998) for Sweden, Estache and Gaspar (1995) for Brazil, Harris (1991) for Ireland). Crowding-out of private investment due to the subsidies occurs.

(iii) Subsidies may *indirectly* crowd out private investment in the intermediate run. The third type of crowding-out of private investment, as a result of public expenditure biases toward subsidies, is long-run in nature. The low stock of public goods caused by continuous under-investment in public goods leads to low productivity of private investments over the long run. This, in turn, is translated into slower investment and slower productivity growth over the long run (World Bank, 2000).

### ***New empirical evidence for rural Latin America***

In this section we discuss the econometric evidence provided by three new studies applied to rural Latin America (López, 2005; López and Galinato, 2005; Allcott, Lederman and López, 2006). These studies used a new data set for rural public expenditures for fifteen countries in Latin America recently assembled by the Food and Agricultural Organization (FAO) with the support of the World Bank. The annual data for the fifteen countries cover the period 1985–2001.<sup>16</sup> An advantage of this data is that it is quite disaggregated while at the same time it has been measured using a reasonably consistent methodology across countries and over time. In addition, the public expenditure data, as provided, is comprehensive, covering the vast majority of the items in which the public sector spends money in the rural areas. The level of detail of the data allows the authors to obtain a fairly accurate measure of the evolution of the level and composition of government expenditures in rural areas over the period.

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<sup>16</sup> The countries included are: Argentina, Brazil, Costa Rica, Guatemala, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Dominican Republic, Ecuador, Honduras, Panama, Uruguay, and Venezuela. For a detailed description of the data see Kerrigan (2001).

*Result 1: Governments in Latin America spend a high portion of their total rural expenditures in non-social subsidies instead of public goods.* The simple (un-weighted) average share of (non-social) subsidies in total rural public expenditures over the period 1980-2001 has been about 40% (Table 1). This reflects quite a serious misallocation of resources, especially for the largest countries in the region- Argentina, Brazil and Mexico- where subsidies constitute an even greater portion of all rural expenditures. The share of subsidies has tended to decline over the period in most countries. In fact, the average share of all countries has continuously declined from 47% in 1980 to about 30% in 2001 (Figure 1).

*Result 2. Increasing the share of subsidies in public expenditures reduces agricultural growth significantly.* Tables 2 and 3 show that while increasing public expenditures in the rural sector significantly increases agricultural per capita GDP, raising the portion of such expenditures spent on subsidies has a large and statistically significant negative impact on agricultural GDP. It is important to emphasize that these two results are very robust. The results in Table 2 use five-year averages as periods of observation as a way to capture long run effects assuming that the lagged effects of the public expenditures on GDP take no more than five years. Using annual data (Table 3) the results still hold though the coefficients are much smaller, as expected, given that these results can be interpreted as short run. In addition to being robust to the observational length, the estimates are also robust to the method of estimation: Two-way fixed effects (FE), two-way random effects (RE) and GMM methods yield estimates which are qualitatively the same. The GMM estimates are particularly important because they account for possible simultaneous equation biases as well as for omitted variable biases through the systematic use of predetermined variables as instruments (in contrast to the FE and RE estimates, which use more or less ad-hoc instruments for the explanatory variables). In addition, Allcott, Lederman and López, 2006, used Three Stage Least Squares (TSLS) instead of GMM to deal with possible biases in the coefficients, again obtaining similar results (Table 4). Finally, the estimates are robust to the countries considered in the sample. An earlier study (López, 2005) used only a subset of 10 countries instead of the 15 used in estimating the results reported in Tables 2 and 3 obtaining similar estimates.

*Result 3. Historical wealth inequality in conjunction with government accountability, civil participation and transparency are key determinants of the composition and level of rural public expenditures.* Table 4 shows the TSLS estimates of the system of three endogenous variables, namely: per capita agricultural GDP, rural subsidy share and total rural government expenditures per capita. Apart from confirming the effects of public expenditures and share of subsidies on agricultural GDP reported earlier, the estimates in Table 4 show that the GINI coefficient of wealth distribution at the beginning of the period causes an increase in both total per capita rural public expenditures and the fraction of such expenditures which goes to non-social subsidies instead of public goods. This confirms our hypothesis that the greater the power of a smaller and wealthier elite, often associated with a more concentrated wealth distribution, the greater the bias of the composition of public expenditures in favor of such elite. This is perhaps one of the reasons why wealth and income concentration tend to perpetuate over time.

But this vicious circle of wealth concentration-biased public expenditure policy- more wealth concentration is not necessarily unbreakable. The estimates in Table 4 also show that greater civil participation and accountability may play an important role in reducing such public expenditure biases for a given level of inequality. Freedom of the press has a large and significant negative effect on government non-social subsidies. Also, ethno-linguistic fractionalization is a factor that significantly increases government subsidies. Both of these variables are associated with civil society participation and government accountability: freedom of the press is of course vital for citizens to be accurately informed about what governments do and a high degree of ethnical and linguistic fractionalization is a factor that conspires against an effective participation of the civil society in monitoring government policies<sup>17</sup>.

*Result 4. Increasing the public subsidy share causes agricultural growth to be more land-expansion based and may be a factor contributing to deforestation.* Table 5 shows various estimates of the determinants of agricultural land. While the total level of rural expenditures has no significant effect on agricultural land area, increasing the share of non-social subsidies has a positive and highly significant effect. Again this result is also significant and robust. This is

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<sup>17</sup> Interestingly, political competition appears to induce more non-social subsidies. This may reflect the fact that political parties tend to compete among each other for the favors of the elites by given them more benefits in order perhaps to elicit campaign contributions from them.

consistent with another result not reported in the tables here: subsidies not only have a negative impact on per capita agricultural GDP but also on yields, that is, on GDP per hectare. This result is thus consistent with our hypothesis that expanding land area has not only a purely productive value but it also has a value as a signal to government officers and politicians identifying the elites and identifying who can get the most out of subsidies and, therefore, can offer the greatest benefits to them.

### ***Conclusion***

The conceptual and empirical analyses summarized above strongly suggest that the pro-elite bias in the allocation of public resources is likely to be a factor of under-development. Such allocation bias not only retards agricultural growth and makes the pattern of growth much more extensive but also tends to perpetuate social inequality. Though we have not presented direct evidence of the negative impacts that such bias may have on the rural poor (attempts at rigorous econometric estimates of the poverty effects have been hampered by insufficient data), there is indirect evidence that is consistent with this hypothesis. In fact, the literature has often documented that non-social subsidies almost always benefit mainly wealthy producers instead of the poor. In addition, every dollar spent on subsidies is a dollar less spent on social programs or on public goods, both of which in general benefit the poor.

A second important result is that, while the historical patterns of wealth concentration tend to promote greater pro-elite biases in the allocation of tax-payers money, thus suggesting a possible vicious circle of wealth concentration-government expenditure biases-wealth concentration, such a circle is not unbreakable. Increased monitoring by the civil society and greater accountability of governments can go a long way in ameliorating the pro-elite biases of governments. A potentially powerful role contributing to eliminating or at least significantly reducing government pro-elite biases can be played by international financial institutions and by the economics profession as a whole. If the economics profession and international institutions finally start paying the attention to these issues that they deserve by empirically documenting them and by incorporating them explicitly in their policy advocacy, progress in removing at least the most perverse government pro-elite biases may be facilitated.

Table 1  
**Rural public expenditures in 15 Latin American countries**

<i>Country</i>	<i>Average Agricultural GDP per Capita</i>	<i>Average of Annual Changes in Agricultural GDP per Capita</i>	<i>Average of Percent Subsidies</i>	<i>Average of Rural Government Expenditures per Capita</i>	<i>Average of Total Government Expenditures per Capita</i>
Argentina	\$2,895	2.4%	59%	\$115	\$1,078
Brazil	\$1,482	4.7%	84%	\$230	\$1,254
Costa Rica	\$913	2.4%	47%	\$185	\$511
Dominican Republic	\$537	3.3%	28%	\$94	\$218
Ecuador	\$955	2.1%	40%	\$37	\$277
Guatemala	\$571	0.1%	10%	\$53	\$155
Honduras	\$233	1.9%	8%	\$17	\$151
Jamaica	\$347	1.2%	57%	\$28	\$847
Mexico	\$618	1.0%	46%	\$214	\$599
Nicaragua	\$339	-0.5%	19%	\$72	\$135
Panama	\$520	1.7%	49%	\$84	\$742
Peru	\$599	3.7%	39%	\$51	\$396
Paraguay	\$943	2.1%	26%	\$31	\$244
Uruguay	\$4,728	3.7%	13%	\$1,154	\$1,617
Venezuela	\$1,254	1.9%	30%	\$136	\$692

Source: Allcott, Lederman, and López (2006)



Table 2

**Determinants of long-run per capita agricultural GDP. Dependent variable: log of five-year average annual per capita agricultural GDP<sup>+</sup>**

Variables	Panel Regression	
	Fixed Effects	Random Effects
Average log of total per capita public expenditures in the rural sector	0.186*** (0.053)	0.202*** (0.051)
Average share of non-social subsidies in expenditures	-0.524*** (0.144)	-0.448*** (0.136)
Index of trade openness	0.002*** (0.001)	0.002** (0.001)
Predicted log of non-agricultural per capita GDP	0.137 (0.139)	0.321*** (0.097)
Predicted log of agricultural land per capita	0.609*** (0.236)	0.409*** (0.064)
Log of crop price index	0.010 (0.107)	0.038 (0.106)
Constant	4.287*** (1.144)	2.925*** (0.774)
Hausman test (Prob Chi square test)	0.514	

<sup>+</sup> Five year weighted averages for the dependent variable are used.

\*\*\* 5%, \*\* 10%, level of significance. There are 45 observations across 15 countries.

Source: López and Galinato, 2005.

Table 3

**Estimating per capita agricultural GDP, 1985-2001. Dependent variable: log of per capita agricultural GDP**

Variables	Generalized Method of Moments		Panel Regression	
	Estimated Coefficients	Long run elasticities	Fixed Effects	Random Effects
Lag of log of per capita agricultural GDP	0.346*** (0.074)			
Log of total per capita public expenditures in the rural sector	0.042*** (0.015)	0.064*** (0.024)	0.091*** (0.046)	0.099*** (0.046)
Share of expenditures on non-social subsidies in expenditures	-0.165*** (0.055)	-0.252*** (0.084)	-0.499*** (0.148)	-0.411*** (0.143)
Index of trade openness	0.0004 (0.001)	0.001 (0.001)	0.002*** (0.001)	0.002*** (0.001)
Predicted Log of per capita non-agriculture GDP	0.210*** (0.095)	0.321*** (0.146)	0.283*** (0.121)	0.390*** (0.091)
Predicted Land Area in agriculture per capita	0.437*** (0.159)	0.668*** (0.232)	0.777*** (0.174)	0.438*** (0.061)
Log of crop price index	0.016 (0.091)	0.024 (0.139)	-0.061 (0.140)	-0.058 (0.141)
Constant	0.010*** (0.003)	0.015*** (0.003)	3.339*** (0.996)	2.802*** (0.737)
Sargan test of over-identifying restrictions (Prob Chi square test)	0.895			
Arellano-Bond test autocovariance in residuals of order 2	0.542			
Hausman test (Prob Chi square test)			0.697	
Number of Observations	190		186	186

\*\*\* 5%, \*\* 10%, level of significance. There are 147 observations for 15 countries. The coefficients of the annual time dummies are not shown in the Table.

Source: López and Galinato, 2005

Table 4

**Three-stage least squares estimation of agricultural GDP per capita**

<i>Dependent Variable</i>	<i>log Ag GDP per Rural Subsidies</i>		<i>log Rural Gov't</i>		
<i>Independent Variables</i>	<i>Capita</i>	<i>Share</i>	<i>per Capita</i>		
log Rural Gov't per Capita	0.188 (0.000)**				
Rural Subsidies Share	-0.529 (0.000)**				
log Ag Area per Capita	0.193 (0.000)**	0.129 (0.002)**	0.206 (0.315)		
log Non-Ag GDP per Capita	0.157 (0.000)**	0.072 (0.010)**	1.460 (0.000)**		
Openness	-0.176 (0.029)**	0.180 (0.010)**	0.496 (0.145)		
log Agricultural Price Index	0.591 (0.007)**	-0.203 (0.064)*	-1.212 (0.034)**		
Mitch Dummy	-0.115 (0.390)	0.025 (0.707)	0.176 (0.620)		
Years of Democratic Stability	0.123 (0.000)**				
Suitable Soil - Best Crop	0.018 (0.000)**				
Suitable Soil - 2nd Best Crop	0.055 (0.000)**				
Percent Land Area in Tropics	0.441 (0.059)*				
Average Elevation	-0.001 (0.000)**				
log Average Precipitation	-0.545 (0.000)**				
Ethnolinguist. Fractionalization	0.019 (0.000)**	0.006 (0.000)**	-0.015 (0.025)**		
Election Year Dummy		-0.007 (0.696)	0.000 (0.996)		
Gini Coefficient		0.015 (0.025)**	0.150 (0.000)**		
Years of Democratic Stability		0.033 (0.000)**	-0.195 (0.000)**		
Political Competition		0.027 (0.005)**	0.066 (0.150)		
Presidential Regime Dummy		-0.092 (0.024)**	0.888 (0.000)**		
Proportionality		0.043 (0.035)**	0.141 (0.138)		
Freedom of the Press		-0.002 (0.000)**	-0.008 (0.006)**		
Students in U.S. 20-24 Years Ago		0.124 (0.000)**	0.318 (0.006)**		
Federal Country Dummy		0.326 (0.000)**	-1.549 (0.000)**		
Population Percent Seniors		-0.088 (0.001)**	-0.712 (0.000)**		
<i>R</i> <sup>2</sup>	0.951	0.850	0.818		
Observations	218	218	218		

P-values are in parenthesis, based on robust small-sample standard errors.

\* Significant at 10%

\*\* Significant at 5%

SOURCE: Allcott, Lederman, and López, 2006.

Table 5

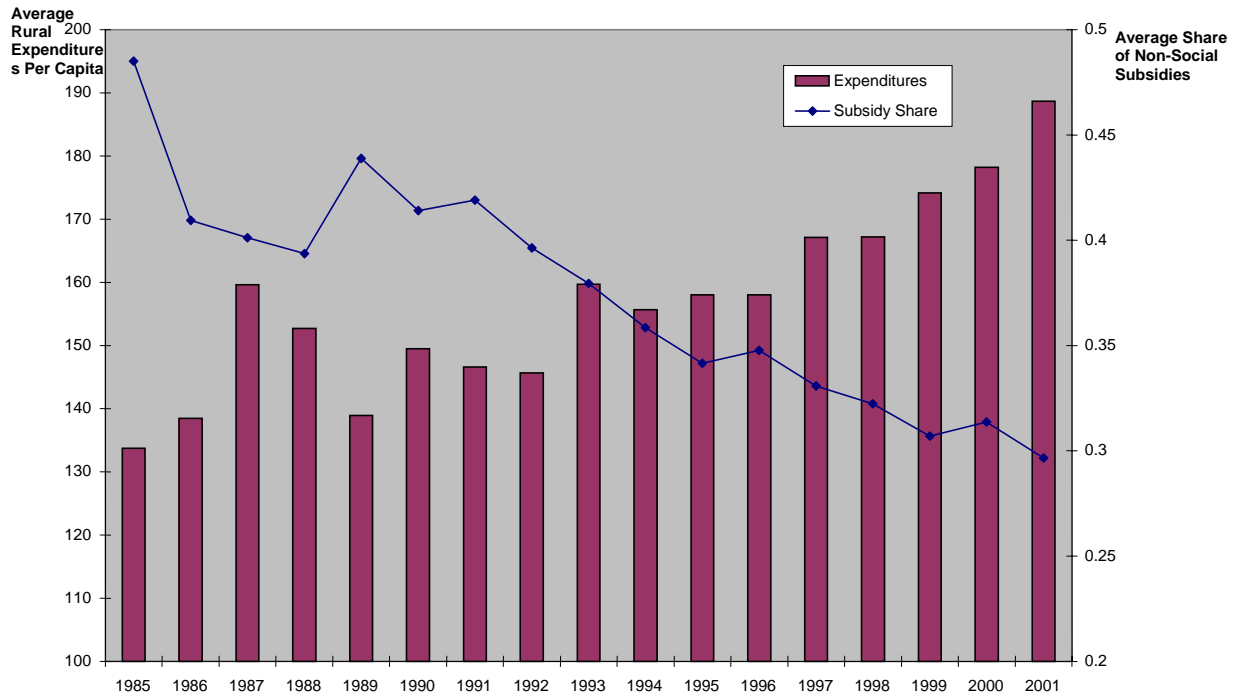
**Estimating the determinants of agricultural land area. Dependent variable: log of per capita agricultural land**

Variable	Panel Regression	
	Fixed Effects	Random Effects
Log of lagged agricultural GDP per capita	0.170*** (0.037)	0.230*** (0.045)
Log of total annual public expenditures per capita in the rural sector	-0.005 (0.022)	0.001 (0.027)
Share of non-social subsidies in public expenditures in the rural sector	0.211*** (0.073)	0.247*** (0.089)
Predicted log of non-agricultural GDP per capita	0.048 (0.057)	0.084 (0.068)
Index of trade openness	-0.0001 (0.0004)	-0.0003 (0.0005)
Log of crop price index	-0.022 (0.067)	0.012 (0.082)
Constant	-0.385 (0.502)	-1.146*** (0.598)
Hausman test (Prob Chi square test)	1.000	
Number of observations	186	

\*\*\*5% level of significance; \*\*10% level of significance. The coefficients of the annual time dummies are not shown in the Table.

Source: López and Galinato, 2005.

Figure 1. Trends in Rural Public Expenditures



Source: Allcott, Lederman and López, 2006

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