Institute for Advanced Development Studies

Development Research Working Paper Series

No. 9/2007

Corruption, privatisation and the distribution of income in Latin America

by:

Antonio Rodriguez
Carlyn Ramlogan

November 2007

The views expressed in the Development Research Working Paper Series are those of the authors and do not necessarily reflect those of the Institute for Advanced Development Studies. Copyrights belong to the authors. Papers may be downloaded for personal use only.

Corruption, privatisation and the distribution of income in Latin America

Antonio Rodriguez Andres

Universidad Catolica del Northe, Chile

Carlyn Ramlogan

University of Otago, New Zealand

Abstract

This paper presents some new evidence on income inequality in Latin America over the period 1980-1999, examining in particular the relationship between corruption, privatisation and inequality. Using a panel data methodology, we find that a reduction in corruption is associated with a rise in inequality. This suggests that while privatisation removes industries from government influence and government corruption, it worsens income inequality as new owners strive for efficiency and profits. The paper highlights the fact that structural reform policies aimed primarily at achieving positive and increasing growth rates do not adequately address the income distribution problem.

Key words: income inequality, corruption, privatisation, panel data, Latin America, instrumental variables.

JEL classifications: O15, O54

Antonio Rodriguez Andres
Departamento de Economía, Universidad Católica del Norte, Av. Angamos 0610, Antofagasta, Chile
Telephone: +56 55 355747 Email: arodriguez@ucn.cl

Carlyn Ramlogan
Department of Economics, University of Otago, PO Box 56, Dunedin, New Zealand
Tel: +64 3 479 5278 Email: cdobson@business.otago.ac.nz

Corruption, privatisation and the distribution of income in Latin America

1. Introduction

In broad terms, corruption is the abuse of public office for personal gain. Surveys of public opinion in Latin America highlight corruption as one of the major problems facing the region, along with unemployment, crime and inequality (Lagos, 2003). According to the 2005 Corruption Perception Index (CPI), levels of corruption are highest in Paraguay and Venezuela and lowest in Chile[1]. Though corruption is perceived to be a problem throughout the region, the International Country Risk Guide (ICRG)[2] reports that during the period 1980-2000 several countries, namely Bolivia, Ecuador, Guatemala and El Salvador, showed evidence of falling levels of corruption.

The origins of corruption and income inequality in Latin America go back to the early post colonial period and the development of key institutions (Engerman & Sokoloff, 2002; Acemoglu et al, 2002). At this time, a privileged few controlled the profitable activities and, to protect their interests, institutions were structured in such a way that most of the population were denied access to land, education and political power. The pattern of non-representative institutions survived the move to independence across the region as the Creole elite gained control of key institutions and shaped them to their advantage. This elite group was able to wield significant influence on the formation and implementation of government policies. For example, the failure to expand public education helped to protect the vested interests of the elite group.[3] This neglect continued into the 20th century with education being of low quality[4] and patterns of social exclusion and discrimination remaining (Kelley & Klein, 1981).

The opening up of the international economy exacerbated rather than reduced income differentials because the gains accrued to landholders (the elite). These gains were exaggerated by the fact that Latin America is rich in natural resources, the abundant productive factor in the region. Natural resources (rather than labour[5]) were more intensively used in the production of exportable goods. Consequently, returns to land grew relative to those of labour. Since the majority of the population were excluded from owning property, the income distribution problem worsened as the wealth of landowners increased. The natural outcome was that inequality increased over the early period of globalisation (Williamson, 1999)[6]. Furthermore, an abundance of natural resources increases opportunities for windfall gains thus raising the likelihood of corrupt practices (Ades & Di Tella, 1999, Leite & Weidman, 1999).

Bourguignon and Morrisson (2002) suggest that the distribution of income did not change from the time of independence to the mid 20th century, while Morley (2000) argues that since World War 2 the situation has worsened. Londono and Szekeley (2000) argue that inequality levels in the 1990s were similar to those in the 1930s. De Ferranti et al (2004) note that, as in the 19th century, authoritarianism may be the primary reason for the persistence of inequality in the 20th century. Although democratisation has taken place, the process is unconsolidated and the authors conclude that correcting institutional failures along with direct polices are essential to reduce inequality. Perry et al (2006) confirm the findings of De Ferranti et al and, after examining the evidence, conclude that Latin America entered the 20th century with high levels of inequality which persisted for the rest of the century. Finally, in a study of Argentina, Calvo et al (2002) indicate that inequality levels changed little during the 20th century.

While the above sheds light on the roots of inequality in Latin America, it also illustrates the close links between corrupt practices, institutions and inequality. It seems reasonable to conclude that if the basic principles of the early colonial period had been carried out in a more impartial manner, with less preferential treatment towards a few, then it is likely that the outcome with respect to inequality would have been different. The discussion also highlights the fact that corruption is entrenched in the political and economic operations of the region. The empirical literature on corruption and income inequality finds that higher levels of corruption increase income inequality. In a few studies, some Latin American countries have been included as part of a larger sample of both developing and developed countries (e.g. Li et al, 2000; Gupta et al, 2002; Gyimah-Brempong & Muñoz de Camacho, 2006). However, no study has yet examined income differences and corruption specifically across Latin American countries.

According to economic theory, corruption is expected to worsen income inequality (Mauro, 1997; Jain, 2001; Gupta et al, 2002). Corruption, in the form of tax evasions and exemptions, reduces tax revenues and funds for social programmes, including education and health. Furthermore, since the beneficiaries of tax evasion and exemptions are more likely to be the relatively wealthy, the tax burden falls almost exclusively on the poor, making the effective tax system regressive. The impact on social programmes can be more direct as funds may be siphoned out of poverty alleviation programmes in order to extend benefits to relatively wealthy population groups. Even when social programmes are not reduced, corruption may change the composition of social spending in a manner that benefits the rich at the expense of the poor; for example, expenditure on tertiary rather primary education. In a corrupt system, the allocation of public procurement contracts may lead to inferior public infrastructure, which also has implications for inequality and welfare.

In this study, we present new evidence on the relationship between income inequality and corruption for Latin America. In contrast to other empirical work and a priori expectations, we find that lower levels of corruption are associated with *higher* levels of inequality. This finding is partly explained by the privatisation process in the region (see Section 3). The structure of the paper is as follows. In Section 2 the model specification and data are described. The empirical results are presented and discussed in Section 3. Section 4 is the conclusion.

2. Model Specification and Data

Econometric estimation is conducted using four-year panel data over the period 1980-1999 for 19 Latin American countries,[7] with each observation of the dependent variable being the relevant four year average value. Panel data allows for many more degrees of freedom than cross-section and time series data. Moreover, it controls for omitted variable bias and reduces the problem of multicollinearity, thus improving the accuracy of parameter estimates. This approach also has the advantage of capturing possible idiosyncratic differences in income inequality by means of individual effects. A priori, a fixed effects model is preferred to a random effects model since we expect the explanatory variables to be correlated with the unobserved individual effects. All the countries of the region for which data is available are included in the study. There are some missing observations in the data and, consequently, the sample is unbalanced.

The empirical specification to be estimated is:

$$I_{it} = X_{it}\beta + A_i + \varepsilon_{it} \qquad (i = 1,....n; t = 1,.....T) \qquad (1)$$

where I is a measure of income inequality for country i at time t. X_{it} contains all regressors which vary across time and countries. It includes a corruption variable (*corupt*). The

parameter A_i contains a constant and individual specific variables that are invariant over time (for example, geographic location and history) and ε_{it} is the classical error term.

The dependent variable is a standard measure of income inequality, the Gini coefficient. The data on inequality is drawn from the United Nations World Income Inequality Database (WIID) (UNU-WIDER, 2005).[8] We use the new quality label provided in Version 2a of the WIID, which combines and improves the quality ratings in Deininger & Squire (1996) with older versions of the WIID. Data classified as the lowest quality is excluded. Furthermore, only data which covers both the entire population and the whole area of the country is employed. Gini coefficients are based on income rather than on consumption because of data limitations.[9] For each country, we have formed the longest possible series of observations.

The measure of corruption is the International Country Risk Guide (ICRG) corruption index published by Political Risk Services (PRS). This measure has been used by a number of scholars in the empirical literature (e.g. Fisman & Gatti, 2002) and it takes values from zero (most corrupt) to six (least corrupt). The measure has the advantage of having the broadest coverage for Latin American countries for the period of study.

The natural logarithm of real output per capita (*lgdp*) and real output per capita squared ($lgdp^2$) are included to test the classical Kuznets hypothesis (Kuznets, 1955; Lewis, 1954). According to this hypothesis, inequality rises with income at low levels but falls above a given level (inverted U hypothesis). In line with other studies (e.g. Bourguignon & Morrison, 1998; Li et al, 1998; De Janvry & Sadoulet, 2000; Morley, 2000; Reuveny & Li, 2003; Breen & García-Peñalosa, 2005), the model also includes the following variables: primary (*primary*) and secondary (*secondary*) gross school enrolment rates, the share of agriculture in total

output (*aggdp*), the ratio of broad money to output (*m2gdp*) and a variable to represent the distribution of land resources (*land*). Both land and education represent investment in human assests and hence should contribute to lowering inequality. Because of its labour intensive nature, an expansion of the agriculture sector is expected to increase employment levels and contribute to reducing inequality. Finally, *m2gdp* is included as an indicator of financial development – a more developed financial sector is expected to lower inequality by alleviating the credit constraints and increasing the accessibility of investment opportunities to low income households. Data for all these variables is taken from the Penn World Table, Version 6.1 (Heston, Summers, and Aten, 2002), World Bank's World Development Indicators (2003), and Frankema (2005).

An important potential issue in estimating equation (1) is the endogeneity of the control variables. Incorporating time invariant fixed effects into the model deals with this to some extent, but the inclusion of time varying factors means omitted variable bias is still a potential problem. Furthermore, if there is correlation between at least one explanatory variable and the error term, OLS estimates will suffer from simultaneity bias.[10] In order to deal with both potential problems, an instrumental variable (IV) methodology is adopted. It should be noted, however, that because of data limitations we only instrument for the corruption variable.

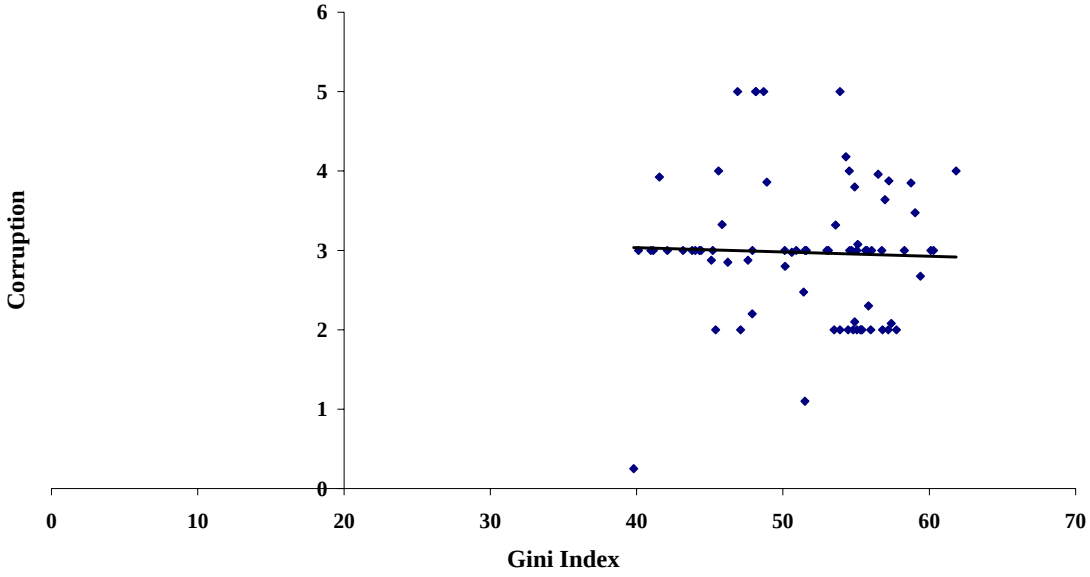
Table 1: Inequality in Latin America (Average Gini coefficients)

Country	1980-83	1984-87	1988-91	1992-95	1996-99
Argentina	40.98	41.55	45.60	45.83	47.90
Bolivia		51.50	53.50	51.41	60.10
Brazil	57.23	58.75	61.83	59.03	60.30
Chile	54.53	55.11	55.65	53.00	56.50
Columbia	55.75		55.05	58.29	57.40
Costa Rica	46.90		48.13	48.15	48.68
Dominican Republic		45.20	51.50	51.60	48.90
Ecuador		44.40		56.07	56.97
Guatemala		56.00	55.30		54.90
Honduras		54.80	55.33	55.05	53.90
Jamaica			54.45	59.40	56.75
Mexico		50.60	53.10	54.55	54.90
Nicaragua				53.90	54.30
Panama	47.60		57.75	56.80	57.20
Peru			50.90	54.70	50.12
Paraguay	45.10		39.80	55.85	55.40
El Salvador			47.10	50.15	53.60
Uruguay	42.10	40.13	41.14	43.17	43.79
Venezuela	45.40	46.23	44.29	44.01	47.91
Latin America (19)	48.40	49.48	51.20	52.83	53.66

Source: UNU-WIDER (2005)

Table 1 shows the four-year average values for the Gini coefficient. According to this measure, inequality increased steadily over the period for the region as a whole. There is also evidence of variation across individual countries and variation across the countries over different time periods. For example, the Gini index increased markedly for Panama from over 47 in the earliest period to 57 by 1996-99, while there were more modest increases for Costa Rica and Uruguay. No country experienced any large reduction in inequality over the period as a whole. For those countries for which start and end period data are available, Paraguay and Panama experienced the largest relative declines. In Figure 1 the graphical relationship between the Gini index and corruption is illustrated. Based on this rudimentary indicator we can conclude that a fall in the corruption index (rising corruption) is associated with a higher level of inequality, ceteris paribus.

Figure 1: Corruption and inequality



3. Empirical results and analysis

Table 2 shows the empirical results using OLS. A Hausman test rejects the random effects model in favour of the fixed effects model. Along with the fixed effects, the explanatory variables capture 85% of the variation in income inequality across countries. The result for corruption in Model 1 is particularly interesting as it indicates that a fall in corruption (a rise in the corruption index) is associated with a rise in the Gini coefficient.

Table 2. Panel data regression models using OLS

Dependent variable: Gini index

Independent variables	Model (1)	Model (2)
lgdp	-46.7849	-53.6396
	[0.4253]	[0.4780]
$lgdp^2$	22.2923	25.6610
	[0.4053]	[0.4591]
primary	-0.1044**	-0.1017**
	[2.3227]	[2.2612]
secondary	0.0788**	0.0683*
	[2.3072]	[1.8567]

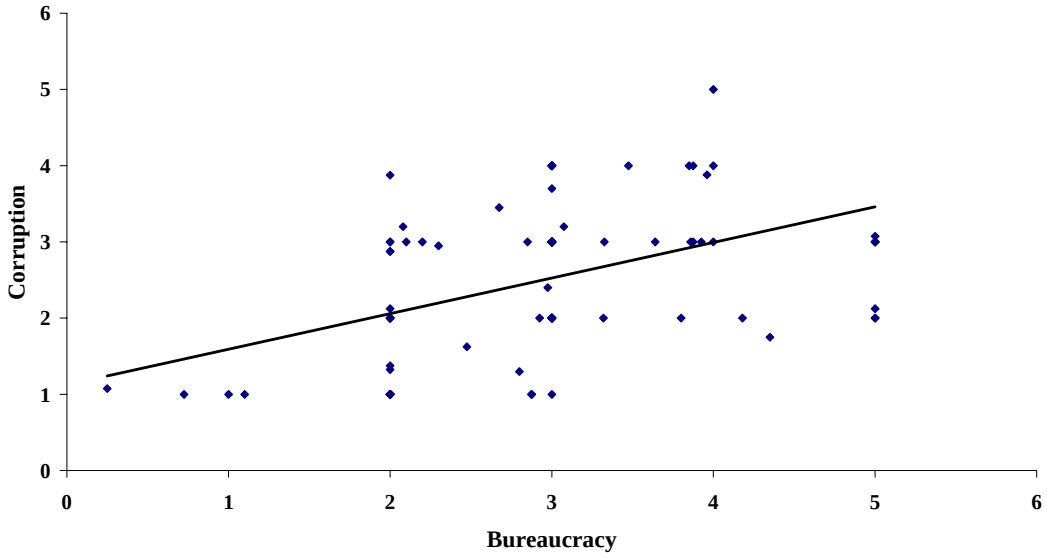
aggdp	-0.4844***	-0.3923***
	[4.4663]	[3.6735]
m2gdp	0.1050***	0.0798**
	[2.6283]	[2.0879]
land	30.1783*	35.8260**
	[1.7924]	[2.4305]
corupt	0.9375*	0.5665
	[1.8391]	[1.0456]
priv		1.5875**
		[2.0696]
Constant	53.5781**	50.7565**
	[2.1978]	[2.3522]
F- test	33.3657	23.4264
(p-value)	(0.000)	(0.000)
Hausman test	15.8026	20.1731
(p-value)	(0.0253)	(0.000)
Adjusted R^2	0.85	0.86
*N*umber of Observations	70	70

Robust t ratios in square brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 reports the results using IV methodology to correct for the possible endogeneity of the corruption variable. A valid instrument for *corupt* must be correlated with it and be uncorrelated with the error term. Three instruments are used – democracy, ethnicity[11] and the quality of bureaucracy in a country. The first two of these have been discussed elsewhere as instruments for corruption (see Gupta et al, 2002; Treisman, 2000). Bureaucracy measures the degree to which there is an established mechanism for recruitment and training, autonomy from political pressure, and strength and expertise to govern without drastic changes in policy or interruptions in government services when governments change. Given this definition, it is likely that corrupt practices may be more prevalent in countries with higher levels of bureaucracy as the government plays a larger role in the decisions making processes of non-governmental organisations. The bureaucracy index[12] can thus be interpreted as an indicator of the independence of key personnel in non-governmental organisations, including the central bank, judiciary and media houses. It seems likely that interference in such appointments has a direct impact on corruption. It also seems likely that such appointments

have little direct impact on inequality except via income, which is already included in the model. The relationship between corruption and bureaucracy is shown in Figure 2.

Figure 2: Corruption and bureaucracy



A potential issue in using bureaucracy as an instrument is that it may be correlated with the error term. The main source for such correlation comes via the region's historical legacies and, in particular, its socio-political culture. However, since these factors will already have been captured to a large extent by the fixed effects, we can be confident that bureaucracy is an appropriate instrument for corruption.

Table 3 reports statistical information on the validity of the instruments. The *F-1st* reports the F test statistic from the first stage regression and captures the relevance of the instruments. The high F-test statistic indicates that the instruments are not weak in the sense discussed in the econometric literature on instrumental variables methods (Bound et al, 1995; Staiger & Stock, 1997). Thus, the standard methods for statistical inference using the estimated

coefficients and standard errors are reliable. Furthermore, based on the test for overidentifying restrictions, the null hypothesis that the instruments are exogenous cannot be rejected. We therefore conclude that the IV regression is based on valid instruments. Under IV estimation, the corruption coefficient doubles in size and is statistically significant at the 5% level.

Table 3. Panel data regression models using IV
Dependent variable: Gini index

Independent variables	Model (1)	Model (2)
lgdp	-21.0859	-54.1105
	[0.2091]	[0.4693]
$lgdp^2$	8.8934	28.9350
	[0.1767]	[0.4503]
Primary	-0.1238**	-0.1057**
	[2.4235]	[2.1462]
Secondary	0.1099**	0.07115*
	[2.5766]	[1.8169]
aggdp	-0.4261***	-0.3561***
	[4.3792]	[3.5332]
m2gdp	0.1172***	0.0860**
	[3.1632]	[2.2361]
land	29.6487*	36.1692**
	[1.75411]	[2.5841]
corupt	1.8081**	1.1408
	[2.2437]	[1.2997]
priv		1.5305**
		[2.3216]
constant	60.0527***	47.1309**
	[2.7677]	[2.0636]
F-1st F-statistic	12.5***	11.625***
Test for overidentifiying restrictions	3.37	2.386
Adjusted R^2	0.85	0.86
*N*umber of Observations	70	70

Robust t ratios in brackets.
*significant at 10%; ** significant at 5%; *** significant at 1%

The inverse relationship between corruption and inequality is in contrast to other studies (e.g., Hindriks et al, 1998; Johnston, 1989; Gupta et al, 2002; Gyimah-Brempong, 2002). Why is less corruption associated with higher levels of inequality in Latin America? To appreciate this, one has to consider the role of government in the development of the region's economic

policies. The experiences of the 1930s and World War 2 pushed Latin American countries towards a policy of self reliance based on import substitution. Import substitution industrialisation (ISI) was an economy-wide-strategy where governments were expected to play an active and visible role.

The main instruments of ISI were quotas, import licences, tariffs, an overvalued exchange rate, foreign currency rationing, subsidies for inputs and transportation, tax breaks, and preferential interest rates. These instruments helped to create an environment suitable for corrupt activities. For example, restrictions on imports make import licenses very valuable since importers are willing to bribe officials in order to obtain them.[13] The availability of credit at preferential rates and foreign exchange allocation schemes also create incentives for rent seeking. Managers of state owned banks allocate credit and foreign exchange based on personal preferences and businessmen are willing to bribe managers in order to obtain the necessary credit and foreign exchange (Cardoso & Helwege, 1995). The provision of tax breaks and other benefits by the government have a similar impact. In sum, ISI promotes the growth of the government sector relative to the private sector and creates an environment which is conducive to corruption.

By the 1970s it was clear that the ISI policy had failed - inward looking policies were not sustainable and a reliance on the state had not produced the expected results. In the 1980s there was a recommendation that the region alter its development strategy towards one based on market forces with only a limited role for the state in economic affairs. This new approach to economic development resulted in the removal of preferential treatment by the state which had existed under ISI. The natural implication is that the potential for earning rents and, by extension, the need to bribe government officials becomes a non-issue. Moreover, the

liberalisation of the exchange rate and the privatisation of the financial sectors also reduced the potential to earn rents. In short, the implementation of an economic policy based on liberalisation and a reduced role for the state creates less room for rent-seeking activities and, to this extent, reduces activities that are associated with a high degree of government intervention in the production process. This view is shared by Rose-Ackerman (1999) who notes that the most obvious way to reduce rent-earning activities is to eliminate corrupt programmes.

Privatisation involves restructuring industries in an attempt to improve efficiency and profitability (though in some instances industries were restructured before privatisation). This includes laying-off workers. Unless these workers are absorbed by other industries or given some form of severance payment which lasts until alternative employment is obtained, there will be an increase in income inequality. Hence, to the extent that corruption coexists with state-owned enterprises and a high degree of protection, privatisation, and the opening up of markets, brings an end to such practices. However, the need for efficiency in newly privatised industries means a loss of jobs.

While privatisation removes industries from direct government influence and hence government corruption, it worsens income inequality through several channels. First of all, the increase in unemployment which follows privatisation hurts the lower class directly.[14] Furthermore, as privatisation often results in increased prices for previously public goods, the lower classes are the most affected as they are the principal beneficiaries of these goods. Beyond its effect on prices, consumer welfare may be adversely affected through decreased access, poorer distribution and a lower quality of goods and services. Privatisation may also result in the elimination of subsides to public services which are sometimes genuinely

redistributive (Chong & López-de-Silanes, 2003; Bayliss, 2002; Birdsall & Nellis, 2003). Also, to the extent that privatisation results in continued or increased corruption it can exacerbate inequality (Rose-Ackerman, 1999).

The relationship between privatisation and corruption can be seen informally in Figures 3 and 4. Data on privatisation is taken from the World Bank (1995), which defines privatisation as the contribution of state owned enterprises (SOEs) to GDP. This data is available up to 1991.[15] The data on corruption is from our original source (for consistency we use annual data up to 1991 where available). Figure 3 shows an inverse correlation between the contribution of state owned activity to GDP and the corruption index - an increase in state involvement in economic activity leads to rising corruption. Therefore, as the role of SOEs in the economy is reduced with privatisation, more privatisation implies less corruption. Figure 4 shows a negative relationship between privatisation and inequality – as the share of SOEs in economic activity falls, inequality rises. Therefore, if a fall in output by SOEs is consistent with a rise in privatisation, we may conclude that privatisation is positively associated with inequality.

Figure 3: Corruption and Privatisation

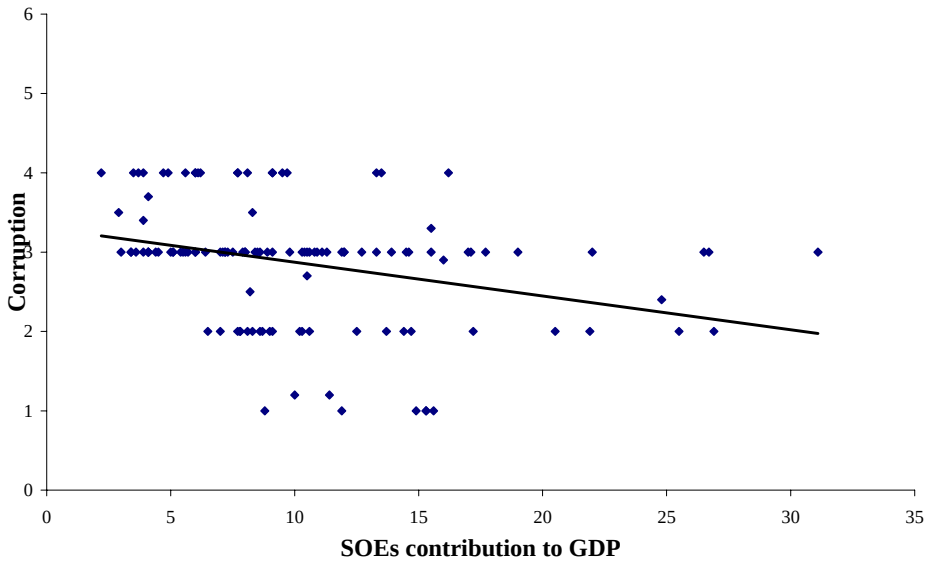
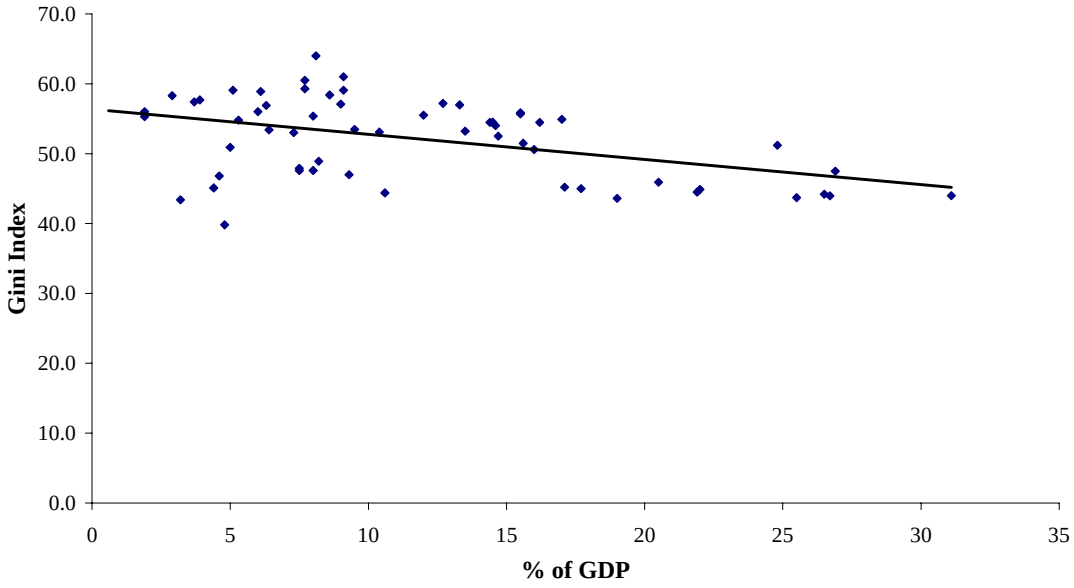


Figure 4: SOEs economic activity as a % of GDP and inequality



If the above discussion is valid, the inclusion of a privatisation variable in the empirical model should lessen the impact of the corruption variable. The privatisation variable (*priv*) takes the form of a dummy variable, which assumes a value of 1 starting in the year of significant privatisation activity and continuing thereafter, and zero otherwise.[16] When the privatisation

variable is included (Tables 2 and 3, Model (2)) the coefficient on corruption becomes statistically insignificant in both estimations. Although *corupt* is still positive, the coefficient falls in size by approximately 40%. In other words, once privatisation is controlled for the importance of corruption in explaining inequality is reduced. The privatisation variable is positively signed and is statistically significant. This result indicates that privatisation has had a regressive impact on income distribution and is consistent with the assertions of Berry (1998) and Bulmer-Thomas (1996). This does not mean that corruption is good for inequality or that privatisation is necessarily a problem. The policy of ISI exacerbated inequality so that by the late 1970s the region had the most unequal income distribution in the world. Given this, it would require a huge effort over a lengthy period to overcome inequality. Eliminating corruption is only one part of a much bigger process.

The privatisation process in many Latin American countries did not gain momentum until the 1990s. The move from a regulated to a non-regulated environment is a learning experience and adjustment costs are inevitable. In fact, little is known about the privatisation process both at the academic and managerial levels. The implication is that authorities must improvise and learn on the job. Generally, privatisation failures can be traced to substantial state participation in less than transparent processes, poor contract design, inadequate re-regulation, insufficient de-regulation, deficient corporate governance institutions, and a lack of competition (Chong & López-de-Silanes, 2003). It is especially important to define a clear regulatory framework before firms are put up for sale. Unfortunately, in many countries it is difficult to do this because of the limited experience with the implementation of modern regulatory legislation and the absence of skilled personnel to carry out such an undertaking. In this situation, the input of international institutions is important and essential. The World Bank, for example, has taken an active stance on this issue by providing financial and

technical support to countries engaged in the design of new regulations. In addition to skilled personnel and legislation, regulatory institutions need to maintain a certain degree of independence and not operate as mere agents of government.

Even when authorities are convinced of the benefits of a well-designed regulatory framework, new legislation is likely to become operational slowly. Chong & López-de-Silanes (2003, p. 41) note that "…..perfection in developing the regulatory framework may require a lot of time and this should not be used as an excuse for postponing the privatisation of money losing entities." A natural implication of this is the need for sound institutions and good governance. It takes time to build institutions that are credible and able to fulfil their role. The problem is exacerbated in regions like Latin America which has a history of coerced labour and one in which institutions played an important role in protecting the interests of the elite. Moreover, it must be noted that privatisation and the reduction of corrupt practices cannot be seen as an isolated venture but rather as part of an overall programme of reform.

If privatisation is properly undertaken as part of a wider programme of reform, it can produce efficiency gains, higher growth and an expansion in jobs. In addition, given that reform encourages competition, private firms will work towards enhancing efficiency, the gains of which can be passed on to consumers in the form of lower prices[17] and increased access. It has been argued that privatisation also results in infrastructure developments (McKenzie & Mookherjee, 2005) and has a dynamism of its own, which in turn serves to create a demand for better institutions so as to achieve increased transparency, better regulation and more protection for minority holders (Boubakri et al, 2005). There are also fiscal gains as privatisation impacts on the government budget by reducing subsidies to previously state-owned enterprises, obtaining revenue from their sales[18] and higher taxes. Chong & López-de-

Silanes (2003) argue that the gains from a well managed privatisation programme could be substantial not only for the privatised firm but for the society in general, while Kikeri & Nellis (2004) argues that privatisation should neither be abandoned nor reversed.

Turning to other results, the inclusion of the privatisation dummy in both the OLS and IV regressions does not alter the sign or significance of the other variables. The results for the income variables do not support the Kuznets hypothesis for Latin America – the coefficients are statistically insignificant and have incorrect signs. This finding is in line with the findings of others, including Ravallion (1995); Deininger & Squire (1988), Odekokun & Round (2004), and Angeles (2006). Indeed, Fields & Jakubson (1994) show that the estimated curve can go from an inverted U shaped to U shaped when allowing for fixed effects.

The coefficient on primary school enrolment rates reflects the widely accepted view that a rise in education serves to reduce income inequality (see for instance, Tinbergen, 1975; Sylwester, 2002; Chu, 2000). However, the positive coefficient on secondary school enrolment rates suggests that a higher level of education increases skill differentials and worsens inequality. The latter finding is a reflection of the fact that education above the primary school level remains largely a privilege for the more wealthy. A natural solution is the introduction of an education strategy which achieves a significant leap in both participation rates and quality across the school system and in particular at the secondary school level.

The result for the agriculture variable is not surprising as one would expect that growth in the labour intensive sector would contribute to higher levels of employment among lower income households and falling inequality (Franko, 2003). The variable *m2gdp* is an indicator of financial development; however, it can also be interpreted as a proxy for financial reform or

an indicator of macroeconomic policy[19]. The coefficient is statistically significant and suggests that a change in the *m2gdp* ratio by one unit stimulates a change in the Gini coefficient by at least 7%. The positive coefficient means that a more developed financial sector is associated with higher inequality. Similar results were found by Morley (2000), who noted that while the positive sign does not concur with the theory, it does support the assertion that inequality in the region widened after the implementation of reforms (Berry, 1998; Bulmer-Thomas, 1996). In line with the findings of Odekokun & Round (2004) and Angeles (2006), our results suggest that the abundance of land resources exacerbates the income inequality problem in the region. Similar conclusions were made by De Ferranti et al. (2004), who state that the unequal distribution of land still matters as a source of inequality in Latin America and suggest that there is scope for land reform. If, however, land reform is to be successful at alleviating poverty and reducing inequality it must be part of a package which embraces complementary agricultural policies.

Since the Gini coefficient is bounded between 0 and 100, OLS may be problematic since it assumes that the dependent variable is unbounded. In order to overcome this problem, the dependent variable is transformed using the formula log [gini/(100-gini)] to become unbounded. This also serves as a robustness test for the model. Tables 4 and 5 reveal no marked difference in the results compared to Tables 2 and 3. Perhaps this can be explained by the fact that Gini values for no country are very close to 0 or 100.

Table 4. Panel data regression models using OLS

Dependent variable: Gini index (unbounded)

Independent variables	Model (1)	Model (2)
lgdp	-1.7183	-2.0736
	[0.3864]	[0.4590]
$lgdp^2$	0.8149	0.9904
	[0.3665]	[0.4383]
primary	-0.0042**	-0.0041**
	[2.2954]	[2.2449]
secondary	0.0032**	0.0023
	[2.3079]	[1.5548]
aggdp	-0.0196***	-0.0158***
	[4.4739]	[3.6750]
m2gdp	0.0042***	0.0032**
	[2.6316]	[2.0895]
land	1.2106***	1.4450**
	[1. 7787]	[2.4297]
corupt	0.0381*	0.0231
	[1.88474]	[1.0456]
priv		0.0648**
		[2.3657]
constant	0.1422	0.0233
	[0.9842]	[0.2291]
F- test	32.9122	23.2008
(p-value)	(0.000)	(0.000)
Hausman test	15.7787	20.1701
(p-value)	(0.0457)	(0.000)
Adjusted R^2	0.95	0.95
*N*umber of Observations	70	70

Robust t ratios in square brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Panel data regression models using IV
Dependent variable: Gini index (unbounded)

Independent variables	Model (1)	Model (2)
lgdp	0.7639	-2.0318
	[0.1867]	[0.4434]
$lgdp^2$	0.3153	0.9709
	[0.1544]	[0.4241]
primary	-0.0050**	-0.0043**
	[2.4048]	[2.1317]
secondary	0.0044**	0.0029*
	[2.5797]	[1.7022]
aggdp	-0.0171***	-0.0144***
	[4.3647]	[3.5270]
m2gdp	0.0047***	0.0035**
	[3.1492]	[2.2310]
land	1.1922	1.4581**
	[1.7441]	[2.57641]
corupt	1.0728**	0.0456
	[2.2304]	0.0626
priv		1.5305**
		[23354]
constant	0.4091	-0.1164
	[0.46676]	[0.1259]
F-1st F-statistic	12.5***	11.625***
Test for overidentifiying restrictions	3.248	2.158
Adjusted R^2	0.92	0.86
*N*umber of Observations	70	70

Robust t ratios in brackets.
*significant at 10%; ** significant at 5%; *** significant at 1%

4. Conclusion

This paper has examined income inequality in Latin America and, more specifically, the relationship between inequality, corruption and privatisation. In contrast to other empirical work, these results for Latin America show that falling levels of corruption are associated with higher levels of inequality. However, a lower level of corruption per se does not worsen inequality but rather it is a development strategy focused around privatisation that serves as the conduit for the impact of corruption. With privatisation industries are removed from direct state control and associated corrupt practices. However, as private investors focus on efficiency and profitability, firms are restructured and inequality worsens.

The paper has argued that inequality is the outcome of the institutional structure and history of the countries in the region, and has persisted over time because little or nothing has been done to increase or enhance the assets of those affected. Progress in reducing inequality is only possible if policies are aimed directly at reducing inequality, in addition to the structural reform programmes which are aimed at increasing economic growth. In other words, growth must be accompanied by policies that promote human capital investment so that the productivity of the poorest groups can be increased. Investment in education is the key to increasing the assets of the poor and the key to achieving lower levels of inequality. The income distribution problem cannot be dismissed as a temporary and inevitable cost as economies strive towards positive and increasing economic growth. Rather, governments must design and implement privatisation (and reform) programmes that can achieve gains both in terms of distribution and efficiency (growth). The initial regressive impact of the reforms highlights the fact that relying primarily on markets to reduce inequality is insufficient and must be complemented with state intervention, particularly in terms of strengthening property rights in the rural sector. In other words, Latin America requires “good governance” from the state sector.

References

Acemoglu, D., Johnson, S., & Robinson, J.A. (2002). "Reversal of fortune: geography and institutions in the making of modern world income distribution." *Quarterly Journal of Economics* 117, 4, 1231-1294.

Ades, A. & Di Tella, R. (1999). "Rents, competition and corruption," *American Economic Review* 89, 4, 982-94

Angeles, L. (2006). "Income inequality and colonialism." *Forthcoming European Economic Review.*

Bayliss, K. (2002). "Privatization and poverty: the distributional impact of utility privatization." *Annals of Public and Cooperative Economics* 73, 4, 603-625.

Berry, A. (1998). *Poverty, economic reform and income distribution in Latin America*. London:Lynne Rienner Publishers Inc.

Birdsall, N., & Nellis, J. (2003). "Winners and losers: assessing the distributional impact of privatization." *World Development* 31, 1617-1633.

Boubakri, N., Cosset, J.C., & Smaoui, H. (2005). "Does privatisation lead to institutional change?" Unpublished manuscript.

Bound, J.D., Jaeger, D.A., & Baker, R. (1995). "Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak." *Journal of American Statistical Association* 90, 443-450.

Bourguignon, F., & Morrison, C. (1998). "Inequality and development: the role of dualism." *Journal of Development Economics* 57, 2, 233-257.

Bourguignon, F., & Morrison, C. (2002). "Inequality among world citizens: 1820-1992." *American Economic* Review 92, 4, 727-744.

Bowen, H., Leamer, E., & Sveikauskas, L. (1987). "Multicountry, multifactor tests of factor abundance theory." *American Economic Review* 77, 5 791-809.

Breen, R., & García-Peñalosa, C. (2005). “Income inequality and macroeconomic volatility: an empirical investigation.” *Review of Development Economics* 9, 3, 380-398.

Bulmer-Thomas,V. (1996). “Introduction”, in V. Bulmer-Thomas (ed.) *The new Economic Model in Latin America and its Impact on Income Distribution and Poverty*, pp. 7–26. New York: St Martin’s Press.

Cabelková, I. (2001). “Perceptions of corruption in Ukraine: are they correct?” *Cerge-EI Working Papers* 176, Economic Institute, Prague.

Calvo, E., Torre, J.C., & Szwarcberg, M. (2002). “The new welfare alliance.” Buenos Aires: Universidad di Tella, Department of Political Science.

Cardoso, E., & Helwege, A. (1995). L*atin America’s economy: diversity, trends and conflicts*. Cambridge, Massachusetts: MIT.

Chong, A., & López de Silanes, F. (2003). “The truth about privatization in Latin America: myths and reality.” *IADB Working Paper*, No.R-486.

Chu, H.J. (2000). “The impacts of educational expansion and schooling on income distribution.” *Quarterly Journal of Business and Economics* 39, 39-49.

De Ferranti, D., Perry, G., Ferreira, F., & Walton, M. (2004). *Inequality in Latin America-Breaking with History?* Washington DC: World Bank.

De Janvry, A., & Sadoulet, E. (2000). “Growth, poverty and inequality in Latin America: a causal analysis.” *Review of Income and Wealth* 46, 3, 267-87.

Deininger, K., & Squire, L. (1996). “A new dataset measuring income inequality.” *World Bank Economic Review* 10, 3, 565-591.

Deininger, K., & Squire, L. (1998). “New ways of looking at old issues: inequality and growth.” *Journal of Development Economics* 57, 2, 259-287.

Engerman, S.L., & Sokoloff, K.L. (2002). “Factor endowments, inequality and paths of development among new world economies.” *NBER Working Paper* 9259.

Estache, A., Gómez-Lobo, A., & Leipziger, D. (2001). "Utilities privatisation and the poor: lesson and evidence from Latin America." *World Development* 29, 7, 1179-1198.

Fields, G.S., Jakubson, G. H. (1994). "New evidence on the Kutznets curve." Mimeo. Department of Economics, Cornell University.

Fisman, R., & Gatti, R. (2002). "Decentralization and corruption: evidence across countries." *Journal of Public Economics* 83, 3, 325-345.

Frankema, E. (2005). "The colonial origins of inequality: a global investigation of land distribution." Presented at a symposium on poverty, inequality in Latin America, *Ibero-American Institute for Economic Research*.

Franko, P. (2003). The *puzzle of Latin American development*. Oxford, Rowman and Little field Publishers, Inc.

Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). "Does corruption affect income inequality and poverty?" *Economics of Governance* 3, 1, 23-45.

Gyimah-Brempong, K. (2002). "Corruption, economic growth and income inequality in Africa." *Economics of Governance* 3, 3,183-209.

Gyimah-Brempong, K., & Muñoz de Camacho, S. (2006)."Corruption, growth, and income distribution: are there regional differences?" *Economics of Governance* 7, 3, 245-269.

Heston, A., Summers, R., & Aten, B. (2002). Penn World Table 6.1. Center for International Comparisons at the University of Pennsylvania, October.

Hindriks, J., Keen, M., & Muthoo, A. (1998). "Corruption, extortion and evasion." *Journal of Public Economics* 74, 3, 395-430.

Jain, A.K. (2001). "Corruption: a review." *Journal of Economic Surveys* 15, 1, 71-121.

Johnston, M. (1989). "Corruption, inequality and change" in: *Corruption, development and inequality: soft touch or hard graft*, ed: Peter M. Ward. London: Routledge.

Jong-Sung, Y., & Khagram, S. (2005). “A comparative study of inequality and corruption.” *American Sociological Review* 70, 1, 136-157.

Kelly, J & Klein, H. (1981). *Revolution and the rebirth of inequality: a theory applied to the national revolution in Bolivia*. Berkeley: University of California Press.

Kikeri, S., & Nellis, J. (2004). “An assessment of privatization.” *World Bank Research Observer* 19, 1, 87-118.

Kuznets, S. (1955). “Economic growth and income inequality.” *American Economic Review* 45, 1, 1-28.

Lagos, M. (2003). “Public opinion of corruption in Latin America” in Global Corruption Report, Transparency International 2003, 282-284.

La Porta, R., & López de Silanes, F. (1997). “The benefits of privatisation: evidence from Mexico.” *NBER Working Paper* 6215.

Leamer, E. (1984). *Sources of international comparative advantage*. Cambridge, MA: MIT Press.

Leite, C. & Weidman, J. (1999). Does Mother Nature corrupt? Natural resources, corruption and economic growth. *International Monetary Fund Working Paper* No. 99/85.

Lewis, W.A (1954). “Economic development with unlimited supplies of labour.” *Manchester School* 22, 139-191.

Li, H., Squire, L., & Zou, H.F. (1998). “Explaining international and intertemporal variations in income inequality.” *Economic Journal* 108, 1, 26-43.

Li, H., Xu, L.C., & Zou, H.F. (2000). “Corruption, income distribution, and growth.” *Economics and Politics* 12, 2, 155-181.

Londono, J.L. & Szekely, M. (2000). “Persistent poverty and excess inequality: Latin America 1970-95” Journal of Appled Economics 3, 1, 93-134

Mauro, P. (1997). “The effects of corruption on growth, investment, and government expenditure” in *A cross-country analysis in Corruption and the Global Economy,* ed: K. A. Elliot. Washington: Institute for International Economics.

Mckenzie, D., & Mookherjee, D. (2005). “Paradox and Perception: evidence from four Latin American Countries” in *Reality Check: the distributional impact of privatisation in developing countries*. Eds: J. Nellis & N. Birdsall. Washington DC: Centre for Global development.

Morley, S. (2000). “The effects of growth and economic reform on income distribution in Latin America.” *CEPAL Review* 71, August, 23-40.

Ocampo, J.A. (1998). “Income distribution, poverty and social expenditure in Latin America.” *CEPAL Review 65,* August, 7-14.

Odekokun, M.O., & Round, J.I. (2004). “Determinants of income inequality and its effects on economic growth: evidence from African countries.” *African Development Review* 16, 2, 287-327

Perry, G., Arias O., Lopez, J., Maloney S., & Serven, L. (2006). *Poverty reduction and growth*: *virtuous and vicious circles*. Washington DC: World Bank

Ravallion, M. (1995). “Growth and poverty: evidence for developing countries in the 1980s.” *Economics Letters* 48, 3-4, 411-417.

Reuveny, R., & Li, Q. (2003). “Economic openness, democracy and income inequality an empirical analysis.” *Comparative Political Studies* 36, 5, 575-601.

Rivas, A. (2005). “Does trade increase inequality? A cross region comparisons.” Presented at a symposium on poverty, inequality in Latin America. *Ibero-American Institute for Economic Research*.

Rodrik, D. (1997). “*Has globalization gone too far?*” Washington D.C, Institute for International Economics.

Rose-Ackerman, S. (1999). *Corruption and Government- Causes, Consequence and Reform.* Cambridge: Cambridge University Press.

Staiger, D., Stock, J.H. (1997). "Instrumental variables regressions with weak instruments." *Econometrica* 65, 557-586.

Sylwester, K. (2002). "Can education expenditures reduce income inequality?" *Economics of Education Review* 21, 1, 43-52.

Szekeley, M. (2003). "The 1990s in Latin America: another decade of persistent inequality with somewhat lower poverty." *Journal of Applied Economics* 6, 2, 317-339.

Tinbergen, J. (1975). *Income Distribution*. North-Holland, Amsterdam.

Treisman, D. (2000). "The causes of corruption: a cross national study". *Journal of Public Economics* 76, 3, 399-457.

United Nations. (2005). World Income Inequality Database, Version 2.a, WIDER, Helsinki, Finland; http://www.wider.unu.edu/wiid/wiid.htm.

Williamson, J.G. (1999). "Real wage inequality and globalization in Latin America before 1940." *Revista de Historia Económica* XVII (special issue), 101-142.

World Bank. (1995). *Bureaucrats in Business*. Washington, D.C.: Oxford University Press.

World Bank (2003). World Development Indicators CD-ROM. The World Bank, Washington, D.C.

Notes

[1] Available at http://www.transparency.org/policy_research/surveys_indices/cpi/2005.

[2] Corruption might be influenced by the perception of corruption. In some cases, corruption perceptions might reinforce or diminish corruption (see, Cabelková, 2001).

[3] They were generous for universities and other higher learning institutions which were geared towards providing education to the children of the elite.

[4] Several other reasons are cited in De Ferranti et al. (2004, Chapter 4) for the neglect of education in the 20th century.

[5] Leamer (1984) and Bowen et al (1987) show that the abundant factor in most countries of the region is not labour but some natural resource; furthermore, labour skills in the region are ranked at an intermediate level on a world scale.

[6] Lewis (1954) provided a similar basis for rising inequality in his labour surplus model.

[7] Countries included in the sample are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, Uruguay, and Venezuela.

[8] Available on http://www.wider.unu.edu/wiid/wiid.htm.

[9] Inequality data are far from perfect. Differences in data sources, definitions and time periods might cause measurement errors in a pooled sample. Nevertheless, it is the only database available for analysing Latin American countries.

[10] Jong-sung & Khagram (2005) provide a discussion of the channels through which inequality affects corruption.

[11] Source: http://www.prsgroup.com/ICRG_Methodology.aspx.

[12] Source: http://www.prsgroup.com/ICRG_Methodology.aspx.

[13] In general, the protection of domestic industries from international competition creates the potential for lucrative rents, which entrepreneurs are willing to pay for in the form of bribes (Mauro, 1997).

[14] This is so for several reasons: lower income workers are more likely to be laid off than the higher income ones; dismissed low income workers have more difficulty finding employment; if they do obtain alternative employment it may be less remunerative; and if both unskilled and skilled labour have been laid off, there is a greater chance that alternative employment will be obtained by skilled individuals.

[15] Because of the short time span for this variable it is not used in the econometric estimation.

[16] While there are number of ways of representing privatisation, no consistent definition was available over the entire period under consideration.

[17] It has been suggested that poor householders do not mind a reasonable price increase if it is associated with an improvement in the quality of the service. There are examples where, prior to privatisation, poor householders have an illegal connection to water but the quality is compromised; with privatisation there is a rise in cost though water quality is not compromised. In some instances households even end up paying less with privatisation (Estache et al, 2001) because of increased competition.

[18] Based on their own calculations, La Porta & López -de-Silanes (1997) conclude that the additional revenues received by the government in Mexico as a result of privatisation was probably large enough to offset society's cost of job losses.

[19] Openness is another explanatory variable often included in models of inequality (Rodrik, 1997; Ocampo, 1998; Reuveny & Li, 2003; Rivas 2000), however, when included in the model the coefficient is statistically insignificant. Similar results were obtained by Szekeley, (2003) and Odekokum & Round (2004).