

Do Corrupt Countries Receive Less Foreign Capital After All?

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Abstract:

Investigating the relationship between foreign capital and corruption in developing countries over the period 1989 to 2004, this paper adopts a new methodology that studies concomitantly private and public external capital flows. I find that a structural break occurred during the 90s. Before that date, private capital flows avoided corrupt countries whereas public flows were indifferent to this issue. The results evidence a shift in the determinants of foreign public funding. In the most recent period, the allocation of foreign public capital was in line with the IFIs conditionality, especially concerning corruption. Corrupt countries receive less foreign capital after all. (JEL F30, F21, O19)

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This paper contributes to the literature about corruption and international capital flows in two respects. First, I examine the impact of the dramatic changes in the composition of international capital flows during the 90s on the relationship between foreign capital and corruption. During this period, FDI to developing countries roughly doubled as a percentage of GDP. In the meantime, the World Bank followed by other IFIs placed the anti-corruption policy at the forefront of their agenda. I study the evolution of the relationship between corruption and international capital flows over this changing period. More precisely, I investigate if more corrupt countries have gained less, or as much as less corrupt ones.

The second contribution of this paper is to adopt a methodology that considers simultaneously all sources of foreign capital flows, including both private and public external financing. Corrupt bureaucracies do not necessarily care about the origin of funds, provided they can pursue their rent-seeking activities. Even though private and public flows do not share the same motivations, from the recipient countries' point of view, they can both be used to finance balance of payment constraints, and they can both be embezzled to finance corruption. I argue that corruption amongst officials in the recipient countries can be associated with foreign public and/or foreign private flows, independantly of their source. Therefore, it is important to study the relationship between corruption and these two types of capital.

As noted for instance by Mauro (2004), corruption in developing countries has been remarkably persistent since 1984. Confronted to such a persistence, one can wonder if international donors and investors exert a pressure again corruption in developing countries. Do they take corruption into account in their allocation process? The aim of this paper is to investigate these questions. Now that the international community has recognized corruption as harmful to growth and development, I want to check if developing countries were sent a clear signal from capital exporters regarding corruption. To do so, this study addresses simultaneously private and public foreign capital flows and investigates the changes in their determinants since the end of the 1980s. It complements Wei (2000, 2001) and Wei and Wu

(2002) that focus on private flows, and Alesina and Weder (2002) that address the issue from the public flows stance.

This paper establishes a clear structural break in the determinants of foreign public capital. These flows were indifferent to the issue of corruption until the end of the 90s, but then have exhibited a strong aversion. They are also now more directed to the poorest countries, no matter their size. Finally, this study evidences that an eviction/substitution effect between private and public flows occurred in the 90s and then disappeared in the 2000s.

The remainder of this paper is organized as follows. In the first section, the relationship between corruption and international capital flows is examined. The second section presents the methodology and the data. The third section discusses the econometric results and the fourth section concludes.

I. How Do International Capital Flows Interrelate With Corruption?

The World Bank has a short and straightforward definition of corruption: it is the abuse of public office for private gain (World Bank, 1997). This definition is widely used by scholars in the academic community (Bardhan, 1997; Tanzi, 1998), and will be retained in the course of this paper. As noted by Tanzi (1998), since the beginning of the 90s, corruption has emerged as a key issue in development economics. The detrimental effects of corruption on growth are now well documented. Murphy et al. (1991, 1993), Shleifer and Vishny (1993), Mauro (1995), Ades and Di Tella (1997), Tanzi and Davoodi (1997) or Gupta et al. (2001) have all shown that corruption leads to a sub-optimal allocation of resources, deters investment, decreases productivity and consequently reduces growth. It increases uncertainties and can be considered as a tax that reduces incentives to invest.

Until the beginning of the 90s, governance was not at the centre stage of the IFIs' policy discussion agenda. However, following World Bank President James D. Wolfensohn's speech about "the cancer of corruption" in October 1996 (Wolfensohn, 1996), corruption has now emerged as a key issue for foreign donors. The International Monetary Fund (IMF)

followed by bilateral donors has also endorsed this stance (IMF, 2000). A way of encouraging developing countries to tackle the problem of corruption is by linking foreign capital flows with the implementation of anti-corruption policy. The recently launched new American aid program called Millennium Challenge Account explicitly pursues this objective.

Based on the above considerations, we should expect that both private and public capital exporters to avoid corrupt countries. Other things being equal, high foreign capital flows should be associated with low corruption. An important cohort of papers has started to investigate this issue. A first stream deals with the linkage between private capital flows and corruption. A second stream focuses on foreign public financing and corruption. In the first category, Wei (2000) uses the 1993 bilateral stocks of FDI between twelve source countries and forty-five host countries, and shows that corruption in host countries significantly affects their ability to attract FDI. These results are confirmed by Wei (2001) for the three-year 1994-1996 average stocks of FDI between thirteen source countries and thirty host countries. Taking annual bilateral flows of FDI for the years 1996 to 1998 between seven source countries and eighty-nine host countries, Habib and Zurawicki (2002) also find a negative association between FDI and corruption. Foreign direct investors tend to avoid corrupt countries. When correcting for endogeneity, these results are confirmed by Busse and Hefeker (2007) over the period 1984-2003. Finally, focusing on opacity instead of corruption and looking at equity portfolio between 1996 and 2000, Gelos and Wei (2005) establish that international funds prefer more transparent countries. In the same vein, Alfaro et al. (2005) investigate the relationship between foreign equity flows and the overall institutional quality rather than specifically corruption.

The second stream of research concentrates on official capital flows and asks: “Do corrupt governments receive less foreign aid?”, that is precisely Alesina and Weder (2002)’s title. Svensson (2000) works out a model showing how aid may have an adverse impact on developing economies by increasing rent-seeking activities. He tests this model for sixty-six countries from 1980 to 1994 and finds that under certain circumstances foreign aid may

be associated with increased corruption. Furthermore, donors do not discriminate against corrupt countries. These results are corroborated by Alesina and Weder (2002) over the period 1975-1995. They also evidence different behaviors among donors, Scandinavian and Australian donors being careful to allocate funds to less corrupt economies, while the vast majority of donors pay no attention to this criterion. In the same vein, using panel data for fifty-six countries from 1970 to 1993, Burnside and Dollar (2000) finds that total and bilateral aids do not favor good policy, contrary to multilateral aid. In addition, they substantiate a strong correlation between bilateral aid and government consumption. Similarly, Knack (2001) evidences a link between higher level of aid and lower quality of governance. Alesina and Dollar (2000) regress bilateral aid and FDI on a set of economic and political variables over the period 1970-1994. They show that bilateral donors help developing countries not according to the recipient countries' needs but according to their own strategic interests. In particular, the variable rule of law is not significant for bilateral aid but influences FDI significantly.

Mauro (2004) stresses the necessity of strong outside intervention in order to help countries to break out of the vicious circle of corruption. However, if this stance is not shared by everyone, such policy might have no impact on corrupt countries. Corrupt bureaucracies might even be tempted to replace some virtuous types of foreign flows with less cautious sources of funds. As Wei (2001) noticed regarding the Foreign Corrupt Practices Act of 1977: "the United States law has not been very effective in reducing corruption in foreign countries, mainly because companies from other countries are too eager to pick up the business". In the absence of international consensus, anticorruption policy can hardly deliver results. Therefore, it appears necessary to investigate if foreign capital taken as a whole discriminate against corruption. What is the nature of the signal, if any, sent by capital exporters to developing countries? Do they discriminate against corrupt bureaucracies? Do the less corrupt countries attract more easily external capital flows?

In addition, in order to check the validity of the opposite and separate findings found

in the existing literature, it is important to use the same extended database, including the post-1995 period after corruption emerged as a key issue and after important structural changes took place in the composition of international capital flows as shown in table 1. Foreign investors and donors may differ in their appreciation of the situation. Some types of international capital flows may respond very negatively to a given level of corruption, while other types react less radically. Alternatively, even though every kind of flows had the same attitude vis-à-vis corruption, some might unwittingly impact the level of corruption indirectly, for instance by favoring government expenditure and rent-seeking activities as modeled in Alesina and Angeletos (2005) and evidenced in Tanzi and Davoodi (1997).

[Table 1 about here.]

The next sections empirically investigate these issues using the Global Development Finance database over the period 1984-2004. After having presented the methodology and data, we analyze the overall signal sent to developing countries by capital exporters. Using a system of simultaneous equations, we concomitantly study the relationship between corruption and aggregate private and public resources. This allows to analyze the possible interaction between external private and public financing. To my knowledge, among the literature about corruption, this is the first paper that explicitly allows for a direct interaction between public and private foreign capital¹. Then, the stability of this relationship is examined over various sub-periods, and the impact of the structural changes that occurred in the 90s are empirically investigated

II. Methodology and data

Corruption is naturally difficult to assess. Due to its secrecy and illegal character, it is almost impossible to measure objectively. The level of corruption needs to be estimated by relying on expert opinions or by conducting polls of citizens and businessmen involved

¹Mayer (2006) investigates the influence of aid on FDI, in order to analyze the impact of policy on FDI.

in the country surveyed. Providers of such indicators have flourished since the mid-90s. This paper uses the ICRG corruption index provided by the PRS group and based on the judgment of specialists. This index aims at evaluating the degree of corruption within the political system. Countries are rated on a 0-6 scale, the lower the scores the higher the level of corruption. To facilitate the interpretation of coefficients, we invert the scale by taking 6 minus the original index, so that a higher number corresponds to more corruption. I chose the ICRG index because it has been consistently available since 1984, which allows cross-country and time comparisons. Starting with Knack and Keefer (1995), it has been widely used in the academic literature. Other indices exist such as the control of corruption index built by Kaufmann et al. (2006) or the corruption perception index of Transparency International. They are highly correlated² strengthening confidence in their reliability.

In order to test if other things being equal, high foreign capital flows are associated with low corruption, I build the specifications of the system of simultaneous equations 1 drawing on the literature on determinants of international capital flows.

$$(1) \quad \begin{cases} \log(PRI_{it}) = a_0 + corruption_{it}a_1 + x'_{it}\alpha_x + \log(PUB_{it})\alpha_{pub} + u_{it} \\ \log(PUB_{it}) = \beta_0 + corruption_{it}\beta_1 + y'_{it}\beta_y + \log(PRI_{it})\beta_{pri} + v_{it} \\ corruption_{it} = \gamma_0 + corruption_{it-1}\gamma_1 + z'_{it}\gamma_z + w_{it} \end{cases}$$

where i indexes countries, t indexes time, PRI_{it} and PUB_{it} represents respectively the private and public net resources flows to recipient country i at time t . $Corruption_{it}$ is the ICRG corruption index mentioned above. x_{it} and y_{it} are vectors of controlling variables likely to influence respectively private and public foreign capital flows. PRI is the sum of net flows on debt to private creditors plus net direct foreign investment and portfolio equity flows. PUB is the sum of net multilateral flows (excluding IMF), net bilateral flows and official grants. PRI and PUB do not include short-term debt flows. A quick glance at the data

²See for instance Herzfeld and Weiss (2003).

on external capital flows to developing countries shows that although it exhibits a strong increase in constant terms, it has fluctuated between 2 and 6 percent of GDP since 1984. An important feature of the past decade is the growing importance of private flows, mainly FDI, at the expense of official funding. Among the latter, bilateral loans even present a total net outflow since the mid 90s.

Dependant variables as well as some right-hand-side variables are log-transformed. In Burnside and Dollar (2000), the dependant variable is expressed as a percentage of gross domestic product, and taken in logarithm in Alesina and Dollar (2000). I retain the latter specification for private flows³. Dealing with aid, Alesina and Weder (2002) work on a per capita basis in logarithm. I chose this approach for public flows. Most papers use flows as opposed to stocks of capital. However, dealing with FDI and bank loans, Wei (2001) pleads in favor of stocks, arguing that economic agents optimize their stock of capital in a given country and not the flows of a given year. Conversely, one can think of stocks as a by-product of the past, whereas net flows better measure the foreign capital exporters' anticipation. Constrained by data availability, this paper adopts only the flow specification.

The choice of the control variables is derived from the existing theoretical and empirical literature on the determinants of external finance. Dealing with both public and private flows, I respectively control for variables that appear in Alesina and Weder (2002) and in Busse and Hefeker (2007).

The $\log(\text{GDP per capita})$ variable is used both in papers on public and private flows. In the former, GDP per capita is expected to be negatively associated with public flows, since the richer the country the less official development finance it needs. In the latter, the sign of GDP per capita is more ambiguous. It reflects the potential demand in the host country and proxies for the level of infrastructure development, all of which encourage foreign private investment. But conversely, it is also likely to be associated with higher wage rates that may deter FDI. I take the logarithm of the initial GDP per capita at the beginning of a period.

³This allows to avoid non-stationarity problems and based on visual inspection, it is more normally distributed than other specifications.

Identified either by the Sachs and Warner (1995) index or by the ratio imports plus exports to GDP, a measure of openness is also regularly found in the literature. It can be considered as a proxy of the recipient country's willingness to follow sound economic policy. One can expect official financing and private investors to favor such policy. The Sachs and Warner index has been updated by Wacziarg and Welch (2003) to include the 1990-99 period. However, it does not fit perfectly with our sample and I prefer to retain the Trade to GDP ratio so as not to exclude too many countries.

Public and private flows could possibly be influenced by the political situation in the recipient country, especially before the fall of the Berlin Wall. In the same vein as Alesina and Dollar (2000) or Alesina and Weder (2002), I introduce the Freedom House index⁴. In addition to reflect the level of democracy, it can also be considered as a proxy for the overall institutional quality of the recipient country. Therefore one can expect a positive association with private capital flows as established by Alfaro et al. (2005). Due to the way it is built, this index can overlap with the corruption index. Consequently, I pay a special attention to their pair-wise correlation and I also test the model without this variable. Drawn on the official flows literature, I control for the colonial history of the recipient country with a dummy variable that takes the value of one if the country was ever colonized. Former colonies are likely to receive more from their colonizer.

Controlling for the local economic environment in the private flows equation, I include the annual GDP growth rate, the inflation rate, the export growth rate, the foreign exchange volatility as explanatory variables. Finally, in order to take into account the traditional small-country bias, I also add the population in the public flows equation.

Compared to Wei (2001), I chose not to include the tax rate variable because there are too many missing observations. I either don't consider the distance and linguistic tie variables, since I do not work on a bilateral basis. Data definitions and sources are listed in appendix

⁴Freedom House indices were originally measured on a one-to-seven scale, one denoting the highest and seven the lowest degree of freedom. As for the ICRG corruption index, the original grades is inverted by taking seven minus the freedom index, so as to interpret the results more readily: the higher the score the higher the level of freedom.

A.

As noted by Mauro (1995), the corruption variable could be endogenous. For instance, experts' assessment may be influenced by the economic performance of a surveyed country. It is also possible that foreign capital flows influence the institutional environment of the recipient countries. In both cases, the estimated level of corruption could be partly determined by these flows, which would result in inconsistent estimators of the regressions. Consequently, I add a third equation in the system 1, in order to instrument the corruption variable. Starting with Mauro (1995), the literature has emphasized ethno-linguistic fractionalization as a good instrument for corruption. This index measures the probability that two randomly selected persons from a given country do not belong to the same ethno-linguistic group. Following La Porta et al. (1998, 1999), the origin of a country's legal system⁵ being likely to influence government efficiency, it is also a good candidate as instrument variable. Acemoglu et al. (2001) adopt a different stance and estimate that the underlying cause for institution efficiency pertains more to the climatic environment of the country and its consequences on European settler mortality during the time of colonization. So as to retain as many countries as possible in the sample, I chose to instrument the corruption with the legal system variables and the lagged corruption.

Most variables dealing with the quality of institutions including corruption exhibits very little variation over time and much of the interesting variation is across countries. This rules out the possibility to work in first-difference, since it would eliminate most of the information about the corruption variable. This suggests working mainly with cross-section data. However, it is possible to study temporal comparison provided it is based on long term spans. Therefore allowing for this small time variation and the inertia that characterize corruption, I use long term five-year averages. This specification helps to eliminate short term business cycle variations. Since our interest lies in the persistence of corruption, I have studied the longest possible period for which data are available. The initial data set is a

⁵Common law, French civil law, German civil law, Scandinavian law or socialist law.

pooled cross section of one hundred and forty four developing countries, and four five-year periods from 1985 to 2004. Each observation refers to a country's performance averaged over a five-year period (1985-1989, 1990-1994, 1995-1999, 2000-2004). In order to be included in the sample, a country must have observations for any single year and for all the variables in the period under consideration. This restrictive selection process is chosen so as to get consistent data when taking the average. It ends up with fifty-four countries per period⁶.

I retained these four time periods first because of the recent emergence of corruption in the international arena in the mid 90s, and second because of the radical political and economic changes that took place around these cut-off dates. 1985-1989 corresponds to the debt crisis period and to the Soviet Union area that was marked by East-West competition vis-à-vis the third world countries. 1990-1994 is characterized by the collapse of communism, the end of the debt crisis, and the reopening of international capital markets to developing and former communist countries. 1995-1999 is the era of emerging market crises (Mexico in 1995, Asia 1997, Russia 1998), combined with the awareness of the negative consequences of corruption on development. As robustness check, I also test equation system 1 with alternative cut-off dates and various time-length.

Taking the log of net financial flows excludes observations with a zero or negative value. So as to avoid a possible sample selection bias, I replace the dependant variable $\log(y)$ by $\log[y+\text{abs}(\min(y))]$. Furthermore, alternative non-log specifications as in Burnside and Dollar (2000) are also investigated. Results are consistent and similar to those found in the log specification.

Data sources are from Global Development Finance (World Bank) for external capital flows and World Development Indicators (World Bank) for the other economic variables as well as for the population. The ICRG corruption index is taken from the PRS Group database. The Freedom House index is provided by the non governmental organization Freedom House. All currency variables are expressed in constant year 2000 U.S. dollars. While Levine

⁶Their list is given in appendix B.

and Renelt (1991) advocates the use of purchasing power parity (PPP) conversion rate, I prefer to convert data at foreign exchange rate, sharing Roodman (2004)'s view that the opportunity cost for the recipient country of not receiving this external finance is better approximated using the exchange rate, and would be underestimated if converted at PPP rate. Summary statistics and the correlation matrix of the explanatory variables are given in tables 2 and 3.

[Table 2 about here.]

[Table 3 about here.]

III. Econometric Results

A. *Period 1990-2004*

In the “base” specification, the dependent variables private and public net external resource flows are taken in logarithm and expressed as a proportion of respectively the GDP and the population. The sample is based on the fifty-four countries that are available for each of the four sub-periods. Since the lagged value of the corruption index is used as instrument, the 1985-1989 period is not included. Results for the pooled cross section regressions are reported in table 4⁷.

[Table 4 about here.]

All coefficients have the expected sign. Regarding the private flows equation, as suggested in the literature, the trade openness and the export growth rate variables are significantly associated with more inflows. Inflation rate has a negative impact but is only significant in the OLS regression. Over the period 1990-2004, developing countries with more sound economic environment received more external private funding. Proxying for the democratic situation

⁷Pooled regression of three sub-period means (1990-1994, 1995-1999 and 2000-2004) and fifty-four countries.

and more generally for the institutional quality of the recipient country, the Freedom House index is highly significant. This conforms to Alfaro et al. (2005)'s outcome, showing that institutional quality is an important factor in explaining international capital flows. In addition, private inflows seem to be negatively affected by the existence of foreign public funding in the recipient country. This can be due to the fact that the poorest countries, those that receive more official funding are also much less attractive for foreign private investment, either because the local demand is not sufficient and/or because the local infrastructure is not enough developed. But it can also be explained by the fact that public flows do not take into consideration the economic policy followed by the recipient countries.

Turning to the public flows equation, the GDP per capita variable is significantly negative, meaning that poorer countries receive more official funding. As usually found in the aid allocation literature, the population has also a significant negative impact, which can be explained by the traditional small-country bias. The colony dummy variable is significantly positive which suggests that being a former colony helps to attract foreign public money⁸. Finally, one can note the significant 1990-94 period coefficient, suggesting some time variations in the determinants of capital flows.

Concerning specifically the ICRG corruption variable, I find a significant negative coefficient for private and public flows (only in the 3SLS regression for the latter). In the long run, controlling for size, level of economic development, economic and political environments, more corrupt countries tend to receive fewer external resources. It is important to note that this result is obtained after controlling for the democratic and institutional quality environment, represented by the Freedom House index. Over the whole period 1990-2004, when considering the total external resources devoted to developing countries, including FDI, aid and other types of foreign capital, I cannot argue that the most corrupt countries were favored. On the contrary, private and public external financing seem to have exerted a pressure on these countries by discriminating against corruption. This finding is consistent with most

⁸However, since almost all countries are former colonies, except China, Ethiopia, Hungary, Iran and Thailand, we must be careful when interpreting the meaning of this coefficient.

papers about private flows but it differs from the existing research on public capital. The latter, that does not cover the post-2000 period, shows at best an absence of link between corruption and public flows. These results are robust to the exclusion of the Freedom House variable as well as to the exclusion of all non significant variables.

B. Sub-periods 1990-94, 1995-99 and 2000-2004

Due to the dramatic changes in the size and the composition of international capital flows to developing countries that occurred during the 90s and due to the emergence of the anti-corruption policies over that period, one can suspect that the relationship between corruption and external financing may have changed. Consequently, the next paragraphs investigate the validity of this result in the different sub-periods and test the system of equations 1 over the years 1990-94, 1995-99 and 2000-2004 by introducing interaction dummy variables between each explanatory variable and the periods 1995-1999 and 2000-2004. Results are presented in table 5. For clarity, instead of reporting all coefficients in a single column with their interactive dummy variable, I directly report coefficients for each period with their Wald test p-value. Coefficients for the column 1995-99 are the sum of coefficients 1990-94 plus 1995-99 interactive dummy variables, and coefficients for the column 2000-04 are the sum of coefficients 1990-94 plus 2000-04 interactive dummy variables. For reasons of space, the third equation with the corruption as dependant variable is not reported.

[Table 5 about here.]

The joint Wald test of zero restrictions on all dummy variables rejects the hypothesis of stability at the five percent level for respectively private and public flows. I also perform a pairwise Wald test of coefficient restriction. The equality of coefficient hypothesis is rejected at the usual level when comparing the periods 1990-1994 and 2000-2004. Both tests reject the hypothesis of temporal stability of the relationship between foreign capital and corruption,

and suggest that structural changes occurred between 1990 and 2004⁹.

Regarding private flows, for any of the three periods, the economic policy as proxied by the trade openness indicator is a significant factor. Foreign private investors have consistently allocated funds to more opened economies during these fifteen years. Other economic variables have the expected sign but are not significant. The democratic environment is significantly positive from 1995-99. One can also note that the relationship between private and public flows has changed over that period. It went from significantly negative between 1990 and 1999 to non significant in 2000-04. Until the end of the 90s, private capital tended to avoid those countries that received more public capital. This eviction or substitution effect has disappeared in the most recent period. As explained below, this could be due to an evolution in the composition of public flows as well as a change in the policy of donors about country selectivity in the allocation of resources.

Concerning public flows, the GDP per capita is first non significant and then is highly significant in the last two periods. The initial level of development has recently gained more importance in determining the public fund allocation. On the other hand, the small-country bias disappeared over the years 2000-2004. As mentioned above, the relationship between private and public also exhibits noticeable changes. Private capital were negatively associated with foreign public funding in 1995-1999, meaning that external private money tended to avoid those countries receiving foreign public money. On the contrary, in 2000-04, there is no significant interaction between each other (p-value: 0.78 for private and 0.73 for public).

Overall, the factors that influence external public flows have recently changed. First, they are now directed to the poorest countries. Second, they probably have become more consistent with the factors that drive the allocation of foreign private capital. An explanation to this evolution can be found in the growing proportion of grants in the total foreign

⁹Wald tests that all coefficients are stable across the three periods: p-value 0.036 for private flows and 0.038 for public flows. Wald tests that 1990-94 and 2000-04 coefficients are equal: p-value 0.073 for private flows and 0.018 for public flows.

public flows at the expense of bilateral flows (see table 1). The latter are likely to be more influenced by donors' strategic interests than by the recipient countries' situation (Alesina and Dollar, 2000). A second possible reason is the change in the multilateral institution's understanding of conditionality. For instance, recognizing that its previous prescriptions had often failed, the World Bank has decided to modify the set of conditions required to grant loans. As explained in World Bank (2005), its policy-based lending has moved from short-term macroeconomic adjustment to long-term economic development policy. This could explain why public financing has been more in line with private funding from year 2000. Concerning the democratic environment, like for the whole 1990-2004 period, I do not find any significant association with public flows.

Looking now more specifically at the corruption index variable, I perform a series of Wald tests of coefficient restriction on the corruption coefficients and their related interaction dummy variables. I cannot reject the hypothesis of equality of the corruption coefficient across the three periods for private flows (p-value: 0.875). On the contrary for public flows, it is rejected at the ten-percent level (p-value: 0.081), mainly due to an important difference between the periods 1995-99 and 2000-04. Contrary to public flows, the relationship between private flows and corruption has been quite stable between 1990 and 2004. Then, the hypothesis that the corruption coefficient is zero is tested for each period (see table 5 for p-value in parentheses). For private and public flows, the corruption coefficient is significantly different from zero in 1990-94 and 2000-04. However, this hypothesis cannot be rejected in 1995-99 (p-value: 0.11 for private and 0.51 for public). Contrary to the periods 1990-1994 and 2000-04, the allocation of foreign capital flows was not especially associated with low corruption over the years 1995-99.

One could suspect that these outcomes are driven by the end of communism and the liberalization of the Chinese economy. These events dramatically modified international capital flows over the past two decades. While Eastern Europe Communist countries, ex-USSR and China attracted massive foreign capital during the 90s, they also experienced

increasing corruption. However, apart for Hungary, results presented above in table 5 already control de facto for the impact of Eastern Europe Communist countries and ex-USSR, since due to missing data, these countries are not included in the sample. Concerning China, I introduce a dummy variable in order to isolate its effects. As shown in table 6, its coefficient is significantly positive in the period 1995-99 for private flows, even after controlling for the size of the economy. Regarding corruption, after controlling for the China effect, the coefficient for the corruption variable is now significantly negative in all periods including 1995-99 (p-value: 0.07). The Chinese effect partly explains why private capital were less sensitive to corruption in the mid 90s. However, this has no impact on public flows. The latter did not pay attention to the corruption during the period 1995-99.

[Table 6 about here.]

At first glance, this result is quite surprising, since it corresponds to the period when corruption began to be addressed as a central issue in the international arena. One would have expected that from 1995, public flows exhibit a certain aversion against corruption. However, this anti-corruption stance was not easily and rapidly translated into practice. Studying for instance the World Bank conditionality over the period 1990-2004 (World Bank, 2005), I find that the share of conditions related to public sector governance was at its minimum in 1995-99. And for most countries, rule of law and anti-corruption conditions only started to be progressively implemented over the period 2000-04. This may explain why public flows were not associated with low corruption in 1995-99.

C. Robustness Checks

I perform several robustness checks. First, these regressions are tested with different samples. Table 7 presents results after excluding possible outliers as identified by the method of Hadi (1994)¹⁰. I also test these regressions with all available observations without imposing

¹⁰Using the Hadi (1994) outlier detection method, five countries are identified as outlier: Botswana, Brazil, Jordan, Nicaragua, Zimbabwe.

any restriction to the samples (see table 8).

[Table 7 about here.]

[Table 8 about here.]

Another robustness check consists in defining other cut-off periods with different lengths of time. In addition to the three five-year periods from 1990 to 2004 used above, I also test the system of equations 1 over four four-year periods from 1989 to 2004 and over two seven-year periods from 1991 to 2004 (see table 9).

[Table 9 about here.]

Finally I regress the system of equations 1 with the OLS, 2SLS and SURE estimation methods. Outcomes are presented in table 10.

[Table 10 about here.]

Results are generally robust and consistent with the three four-year periods presented above. Concerning private flows, the trade openness and the freedom index are highly significant, especially from 1995. It is also confirmed that private capital was negatively associated with public flows until the end of the 90s, but this relationship disappeared thereafter. Concerning public flows, important changes in their determinants are evidenced as well. It appears that the poorest countries has started to receive more from the mid-90s. The small country bias while prevalent at the beginning of the period, became non-significant thereafter.

Now, turning more specifically to the corruption variable, as above, the coefficient for the public flows equation becomes highly negatively significant in the last period. The attitude of public flows vis-à-vis corruption has clearly changed after 2000, and went from indifference to rejection. However, for the private flows equation results are not as clear. Depending on the size and the dates of the samples, results for the corruption variable change. Although negative, the coefficient of the corruption variable is often non-significant after 1995.

These results are consistent with those found in the existing literature. For FDI, Wei (2000) or Wei (2001) find over the period 1993 and 1994-96 a significantly negative association with corruption. However, as evidenced in Busse and Hefeker (2007) with more recent data, the impact of corruption is not always significant. For aid, and based on data earlier to 1995 Alesina and Weder (2002), Svensson (2000), Burnside and Dollar (2000) or Knack (2001) substantiate at best an absence of relationship with corruption. Regarding, the democratic environment and the institutional quality as proxied by the Freedom House index, these outcomes are in line with those established by Alfaro et al. (2005) over the period 1984-98.

IV. Conclusion

This paper analyzes the determinants of foreign capital –both private and public, to developing countries and more particularly the link between corruption and total external resources. Taking into account the possible interactions between foreign private and public financing, this is the first study that addresses concomitantly both of these sources of financing. In view of the important changes that occurred in the composition of foreign capital and considering the anti-corruption campaign launched by the IFIs after 1995, the stability of this linkage has been investigated from year 1989 to year 2004. A structural break is evidenced during the 1990s.

In most cases, foreign private capital has exhibited a significant negative relationship with corruption as usually found in the literature. However, in the most recent period this aversion is not as strong as it was in the beginning of the 90s. Private flows have also been consistently associated with higher trade openness, and from the mid-90s they have been concerned with more democratic and better institutional environment. Concerning the private-public relationship, this study shows that each other went into opposite directions until the mid-90s. Foreign private capital were invested where public funds did not go and reciprocally. Thereafter, this eviction/substitution effect stopped.

Public flows exhibit significant changes in their determinants as well. From the mid-90s,

they have started to significantly allocate more funds to the poorest countries. Meanwhile, the small country bias has disappeared. From that date, the smallest countries don't receive more than commanded by their size. Concerning corruption the evolution is still more striking. Whereas this issue had no impact on the allocation of public funding until the end of the 90s, from that date, the corruption variable has become extremely significant. More corrupt countries tend to receive less public flows.

Compared to the results found by Alesina and Weder (2002) over an earlier period, this study evidences that finally the allocation of public flows is now in line with the IFIs stance. In the most recent period, poorest and less corrupt countries have received more. Meanwhile, public and private funding are not anymore mutually exclusive. Public capital does not favor anylonger countries with the worst economic environment. This is good news since it shows that conditionality has started to be effectively implemented. Overall capital exporters including private and public financing, now provide strong incentives to promote good governance and better economic policy. Provided private flows adopt the same strong aversion against corruption as they used to do in the beginning of the 90s, this raises hope to win the fight against corruption in developing countries.

V. Appendices

A Data Descriptions and Sources

Colonized country dummy variable: 1 if the country was ever colonized for a relatively long period of time, 0 otherwise. CEPII.

Exports of goods and services: annual percentage growth. World Bank, World Development Indicators.

Foreign exchange rate volatility: standard deviation of the change in monthly log nominal exchange rate with respect to U.S. dollar. The nominal exchange rate is the monthly end-of-period exchange rate from the IMF's International Financial Statistics (AE.ZF).

Freedom House index: average of the political rights and civil liberties indices. Freedom House.

Gross domestic product (constant year 2000 U.S. dollars). World Bank, World Development Indicators.

Gross domestic product growth rate (annual percentage). World Bank, World Development Indicators.

Gross domestic product per capita (in constant year 2000 U.S. dollars). World Bank, World Development Indicators.

Inflation rate: GDP deflator (annual percentage). World Bank, World Development Indicators.

ICRG corruption: a measure of corruption within the political system that is a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process. PRS Group.

Legal origins: Common law, French civil law, German civil law, Scandinavian law or socialist law. La Porta et al. (1999)

Population. World Bank, World Development Indicators.

Private net resource flows (constant 2000 U.S. dollar): sum of net flows on debt to private creditors plus net direct foreign investment and portfolio equity flows. World Bank, Global Development Finance.

Public net resource flows (constant 2000 U.S. dollar): sum of net flows on multilateral and bilateral loans plus grants. World Bank, Global Development Finance.

Trade openness: sum of exports and imports of good and services measured as a share of gross domestic product. World Bank, Global Development Finance.

B Sample

Sample: 54 countries

Argentina, Burkina Faso, Bangladesh, Bolivia, Brazil, Botswana, Chile, China, Cote d'Ivoire, Congo, Colombia, Costa Rica, Dominican Republic, Algeria, Ecuador, Egypt, Ethiopia, Gabon, Ghana, Gambia, Guinea-Bissau, Guatemala, Honduras, Hungary, Indonesia, India, Iran, Jordan, Sri Lanka, Morocco, Madagascar, Mexico, Mali, Mozambique, Malawi, Malaysia, Nigeria, Nicaragua, Pakistan, Panama, Peru, Philippines, Paraguay, Senegal, El Salvador, Syria, Togo, Thailand, Trinidad and Tobago, Uganda, Uruguay, Venezuela, Zambia, Zimbabwe,

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Table 1: International capital flows as a percentage of total aggregate net resources

Year	FDI	Commercial loans	Portfolio	Other private creditors	Multilateral loans	Bilateral loans	Grants
1984	16.2%	21.2%	-1.0%	8.8%	20.4%	18.0%	16.5%
1985	21.7%	6.2%	6.9%	9.0%	20.8%	16.1%	19.3%
1986	17.8%	11.4%	1.9%	8.9%	23.7%	15.7%	20.6%
1987	18.5%	17.0%	-0.1%	5.3%	22.2%	16.1%	21.1%
1988	27.4%	9.7%	5.4%	8.9%	18.8%	10.3%	19.5%
1989	33.0%	-0.3%	7.9%	6.7%	18.3%	14.3%	20.1%
1990	26.2%	8.0%	4.5%	4.4%	18.6%	10.2%	28.1%
1991	30.7%	4.1%	14.4%	0.5%	13.6%	10.0%	26.7%
1992	32.1%	11.0%	13.1%	9.3%	8.9%	7.8%	17.9%
1993	33.8%	2.6%	34.2%	5.2%	7.9%	4.6%	11.6%
1994	44.4%	4.1%	28.8%	2.4%	5.4%	2.0%	12.9%
1995	47.7%	13.0%	17.3%	0.8%	5.3%	4.9%	11.1%
1996	49.2%	11.7%	29.7%	0.8%	5.0%	-4.0%	7.5%
1997	54.4%	14.1%	22.2%	0.6%	5.2%	-2.2%	5.6%
1998	56.9%	16.6%	15.7%	-1.8%	7.5%	-1.1%	6.1%
1999	72.1%	-2.8%	17.0%	-0.6%	7.2%	-0.9%	7.8%
2000	77.1%	-2.4%	15.8%	-1.6%	5.4%	-3.2%	8.9%
2001	86.1%	-5.3%	8.5%	-2.9%	7.5%	-3.7%	9.8%
2002	87.7%	-1.6%	9.1%	-3.6%	0.7%	-5.5%	13.2%
2003	69.2%	4.2%	22.2%	-2.5%	0.6%	-6.9%	13.2%
2004	60.7%	11.3%	23.2%	-1.3%	0.7%	-4.7%	10.2%

Table 2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Log(PRI/GDP)	162	0.06	0.03	-0.02	0.16
Log(PUB/POP)	162	5.07	0.21	4.33	5.73
ICRG corruption index	162	3.27	0.85	1	5.8
Log(initial GDP per capita)	162	6.77	1.11	4.74	8.73
Trade openness	162	67.39	34.13	15.56	216.27
Freedom House index	162	3.2	1.42	0	6
Colony dummy	162	0.91	0.29	0	1
Foreign exchange rate volatility	162	0.14	0.14	0	0.86
Log(Inflation rate)	162	5.51	1.68	2.47	13.01
GDP growth rate	162	3.73	2.4	-5.92	10.86
Export growth rate	162	6.88	6.03	-6.97	32.13
Log(Population)	162	16.61	1.54	13.82	20.97

Table 3: Correlation matrix

	Log(PRI/ GDP)	Log(PUB/P OP)	ICRG corruption index	Log(initial GDP per capita)	Trade openness	Freedom House index	Colony dummy	Foreign exchange rate volatility	Log(Infla- tion rate)	GDP growth rate	Export growth rate
Log(PUB/POP)	-0.19	1.00									
ICRG corruption index	-0.24	-0.18	1.00								
Log(initial GDP per capita)	0.24	-0.19	-0.20	1.00							
Trade openness	0.30	0.03	-0.07	0.23	1.00						
Freedom House index	0.33	0.04	-0.20	0.40	0.12	1.00					
Colony dummy	-0.16	0.22	0.08	0.06	0.03	0.16	1.00				
Foreign exchange rate volatility	-0.20	0.13	-0.01	0.00	-0.22	-0.13	-0.02	1.00			
Log(Inflation rate)	-0.11	0.00	0.22	-0.10	0.01	0.02	0.05	0.13	1.00		
GDP growth rate	0.19	-0.13	-0.06	-0.13	0.10	-0.05	-0.15	-0.41	-0.18	1.00	
Export growth rate	0.17	0.00	-0.03	-0.19	-0.11	-0.01	-0.13	-0.23	-0.08	0.52	1.00
Log(Population)	-0.05	-0.37	0.14	-0.22	-0.43	-0.29	-0.32	0.05	-0.17	0.25	0.21

162 observations

Table 4: Impact of the corruption on private and public capital flows between 1990 and 2004, pooled cross-section

	OLS		3SLS		
	Log(PRI/GDP)	Log(PUB/POP)	Log(PRI/GDP)	Log(PUB/POP)	ICRG corruption index
ICRG corruption index	-0.007** (0.002)	-0.037 (0.019)	-0.010*** (0.004)	-0.062** (0.030)	
Log(initial GDP per capita)	0.001 (0.002)	-0.055*** (0.014)	-0.000 (0.002)	-0.061*** (0.014)	
Trade openness	0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	-0.000 (0.001)	
Freedom House Index	0.005*** (0.001)	0.009 (0.012)	0.005*** (0.001)	0.000 (0.015)	
Foreign exchange rate volatility	0.010 (0.015)		0.007 (0.015)		
Log(Inflation rate)	-0.002** (0.001)		-0.002 (0.001)		
GDP growth rate	0.000 (0.001)		0.000 (0.001)		
Exports growth Rate	0.001** (0.000)		0.001** (0.000)		
period=1990-94	-0.015*** (0.005)	0.104** (0.038)	-0.011* (0.006)	0.136*** (0.049)	
period=1995-99	0.003 (0.005)	0.018 (0.036)	0.004 (0.005)	0.016 (0.039)	
Log(PUB/POP)	-0.021* (0.010)		-0.040* (0.023)		
Log(Population)		-0.049*** (0.011)		-0.051*** (0.012)	
Colony dummy		0.076 (0.052)		0.122** (0.058)	
Log(PRI/GDP)		-0.859 (0.607)		0.638 (1.910)	
English legal Origins					0.325 (0.291)
French legal Origins					0.177 (0.281)
ICRG lagged t-1					0.577*** (0.058)
Constant	0.160** (0.056)	6.299*** (0.253)	0.273** (0.130)	6.364*** (0.263)	1.272*** (0.289)
Adj. R ²	0.33	0.29	0.35	0.28	0.41
Observations	162	162	162	162	162

Standard errors in parentheses (Robust for OLS regressions)

* p<0.10, ** p<0.05, *** p<0.01

Table 5: 3SLS pooled cross-section over three 5-year periods with period-dummy variables

Dependant variable: Log(PRI/GDP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.008 *	-0.006	-0.009 *
	(0.09)	(0.11)	(0.06)
Log(initial GDP per capita)	0.000	0.000	0.001
	(0.93)	(0.94)	(0.78)
Trade openness	0.000 *	0.000 ***	0.000 **
	(0.09)	(0.00)	(0.02)
Freedom House index	0.002	0.009 ***	0.005 **
	(0.46)	(0.00)	(0.04)
Foreign exchange rate volatility	0.012	0.019	0.006
	(0.62)	(0.62)	(0.80)
Log(Inflation rate)	0.000	-0.003	-0.003
	(0.82)	(0.15)	(0.19)
GDP growth rate	0.000	-0.001	0.001
	(0.93)	(0.69)	(0.67)
Export growth rate	0.001	0.001	0.001
	(0.22)	(0.28)	(0.30)
Log(PUB/POP)	-0.071 ***	-0.062 ***	-0.005
	(0.01)	(0.00)	(0.78)
<hr/>			
Dependant variable: Log(PUB/POP)	1990-94	1995-99	2000-04
ICRG corruption index	-0.057 *	-0.018	-0.121 ***
	(0.09)	(0.52)	(0.00)
Log(initial GDP per capita)	-0.012	-0.045 **	-0.087 ***
	(0.62)	(0.03)	(0.00)
Trade openness	0.000	0.001	0.000
	(0.91)	(0.43)	(0.90)
Freedom House index	-0.014	0.026	0.013
	(0.53)	(0.17)	(0.48)
Log(Population)	-0.070 **	-0.035 **	-0.013
	(0.02)	(0.05)	(0.45)
Colony dummy	0.043	0.113	0.098
	(0.65)	(0.15)	(0.23)
Log(PRI/GDP)	-2.781	-2.422 ***	-0.351
	(0.44)	(0.00)	(0.73)
<hr/>			
Observations:	162	162	162

In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported

Table 6: 3SLS pooled cross-section over three 5-year periods with period-dummy variables and China dummy variable

Dependant variable: Log(PRI/GDP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.008 *	-0.007 *	-0.009 *
	(0.06)	(0.07)	(0.08)
Log(initial GDP per capita)	0.000	-0.001	0.001
	(0.91)	(0.80)	(0.70)
Trade openness	0.000 *	0.000 ***	0.000 **
	(0.09)	(0.00)	(0.01)
Freedom House index	0.002	0.011 ***	0.005 **
	(0.46)	(0.00)	(0.03)
Foreign exchange rate volatility	0.012	0.018	0.008
	(0.62)	(0.61)	(0.73)
Log(Inflation rate)	0.000	-0.003 *	-0.003
	(0.80)	(0.08)	(0.15)
GDP growth rate	0.000	-0.003	0.001
	(0.90)	(0.20)	(0.74)
Export growth rate	0.001	0.001	0.001
	(0.20)	(0.28)	(0.41)
Log(PUB/POP)	-0.067 ***	-0.057 ***	0.003
	(0.01)	(0.00)	(0.87)
China dummy	0.000	0.058 **	0.016
	(1.00)	(0.01)	(0.52)

Dependant variable: Log(PUB/POP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.058 *	-0.016	-0.118 ***
	(0.09)	(0.58)	(0.00)
Log(initial GDP per capita)	-0.014	-0.046 **	-0.088 ***
	(0.56)	(0.03)	(0.00)
Trade openness	0.000	0.001	0.000
0.006	(0.73)	(0.50)	(0.81)
Freedom House index	-0.018	0.024	0.011
	(0.43)	(0.22)	(0.53)
Log(Population)	-0.077 ***	-0.036 **	-0.014
	(0.00)	(0.04)	(0.42)
Colony dummy	0.056	0.105	0.098
	(0.54)	(0.19)	(0.23)
Log(PRI/GDP)	-1.777	-2.070 **	-0.040
	(0.58)	(0.01)	(0.97)

Observations:	162	162	162
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In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported

Table 7: 3SLS pooled cross-section over three 5-year periods with period-dummy variables - Hadi outliers excluded

Dependant variable: Log(PRI/GDP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.008 * (0.07)	-0.005 (0.23)	-0.013 ** (0.02)
Log(initial GDP per capita)	-0.001 (0.86)	0.000 (0.93)	0.005 (0.18)
Trade openness	0.000 * (0.09)	0.000 *** (0.00)	0.000 ** (0.05)
Freedom House index	0.003 (0.28)	0.010 *** (0.00)	0.003 (0.18)
Foreign exchange rate volatility	0.015 (0.57)	0.010 (0.79)	-0.030 (0.33)
Log(Inflation rate)	-0.001 (0.68)	-0.003 (0.13)	-0.003 (0.16)
GDP growth rate	0.001 (0.65)	-0.001 (0.78)	0.004 * (0.07)
Export growth rate	0.001 (0.32)	0.000 (0.49)	0.000 (0.68)
Log(PUB/POP)	-0.061 ** (0.05)	-0.061 *** (0.00)	0.020 (0.37)
<hr/>			
Dependant variable: Log(PUB/POP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.026 (0.44)	0.032 (0.18)	-0.099 *** (0.00)
Log(initial GDP per capita)	-0.016 (0.43)	-0.050 *** (0.00)	-0.092 *** (0.00)
Trade openness	-0.001 (0.22)	0.000 (0.65)	0.000 (0.42)
Freedom House index	-0.012 (0.53)	0.026 (0.10)	0.024 (0.10)
Log(Population)	-0.077 *** (0.00)	-0.035 ** (0.02)	-0.006 (0.69)
Colony dummy	0.046 (0.55)	0.092 (0.16)	0.086 (0.20)
Log(PRI/GDP)	-0.673 (0.82)	-1.500 ** (0.03)	0.384 (0.66)
<hr/>			
Observations:	147	147	147

In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported

Table 8: 3SLS pooled cross-section over three 5-year periods with period-dummy variables - All available observations

Dependant variable: Log(PRI/GDP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.002 (0.66)	-0.004 (0.29)	-0.007 (0.17)
Log(initial GDP per capita)	-0.002 (0.62)	0.001 (0.68)	0.004 (0.25)
Trade openness	0.000 *** (0.00)	0.000 *** (0.00)	0.000 *** (0.00)
Freedom House index	0.004 (0.11)	0.008 *** (0.00)	0.007 *** (0.00)
Foreign exchange rate volatility	0.028 * (0.06)	0.021 (0.55)	0.042 ** (0.05)
Log(Inflation rate)	-0.001 (0.66)	0.000 (0.96)	0.000 (0.81)
GDP growth rate	0.000 (0.72)	0.002 (0.26)	0.003 * (0.06)
Export growth rate	0.001 *** (0.00)	0.000 (0.91)	0.002 *** (0.00)
Log(PUB/POP)	-0.085 *** (0.00)	-0.062 *** (0.00)	0.002 (0.88)
Dependant variable: Log(PUB/POP)	1990-94	1995-99	2000-04
		=coef 1990-94 + dummy 1995-99	=coef 1990-94 + dummy 2000-04
ICRG corruption index	-0.017 (0.49)	-0.002 (0.92)	-0.091 *** (0.00)
Log(initial GDP per capita)	-0.029 (0.15)	-0.044 ** (0.02)	-0.081 *** (0.00)
Trade openness	0.000 (0.89)	0.001 * (0.08)	0.000 (0.98)
Freedom House index	-0.007 (0.66)	0.031 ** (0.04)	0.009 (0.54)
Log(Population)	-0.092 *** (0.00)	-0.044 *** (0.00)	-0.030 ** (0.04)
Colony dummy	0.050 (0.41)	0.044 (0.44)	0.005 (0.93)
Log(PRI/GDP)	1.277 (0.50)	-2.149 *** (0.00)	-0.097 (0.88)
Observations:	218	218	218

In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported

Table 9: 3SLS pooled cross-section with period-dummy variables - over 4-year and 7-year periods

Dependant variable: Log(PRI/GDP)	over four 4-year periods				over two 7-year periods	
	1989-92	1993-96 =coef 1989-92 + dummy 1993-96	1997-2000 =coef 1989-92 + dummy 1997-00	2001-04 =coef 1989-92 + dummy 2001-04	1991-97	1998-2004 =coef 1991-97 + dummy 1998-04
ICRG corruption index	-0.003 (0.50)	-0.010 *** (0.01)	-0.004 (0.32)	-0.007 (0.17)	-0.007 (0.19)	-0.006 (0.27)
Log(initial GDP per capita)	-0.002 (0.55)	0.001 (0.79)	0.005 (0.15)	0.000 (0.95)	-0.002 (0.47)	0.005 * (0.10)
Trade openness	0.000 ** (0.03)	0.000 (0.27)	0.000 ** (0.01)	0.000 ** (0.02)	0.000 *** (0.00)	0.000 *** (0.00)
Freedom House index	0.001 (0.64)	0.004 * (0.08)	0.007 *** (0.01)	0.006 ** (0.01)	0.005 ** (0.02)	0.005 ** (0.02)
Foreign exchange rate volatility	0.003 (0.86)	-0.021 (0.41)	-0.011 (0.70)	0.007 (0.75)	0.026 (0.48)	-0.005 (0.86)
Log(Inflation rate)	-0.001 (0.73)	0.001 (0.69)	-0.003 * (0.08)	-0.002 (0.23)	0.000 (0.84)	0.000 (0.94)
GDP growth rate	0.001 (0.70)	0.001 (0.38)	0.002 (0.21)	0.001 (0.58)	0.001 (0.65)	0.002 (0.31)
Export growth rate	0.000 (0.94)	0.000 (1.00)	0.000 (0.59)	0.001 (0.44)	0.001 ** (0.03)	0.001 ** (0.03)
Log(PUB/POP)	-0.061 * (0.06)	-0.085 *** (0.00)	0.004 (0.84)	-0.018 (0.29)	-0.102 *** (0.00)	0.002 (0.92)
Dependant variable: Log(PUB/POP)	1989-92	1993-96 =coef 1989-92 + dummy 1993-96	1997-2000 =coef 1989-92 + dummy 1997-00	2001-04 =coef 1989-92 + dummy 2001-04	1991-97	1998-2004 =coef 1991-97 + dummy 1998-04
ICRG corruption index	-0.039 (0.20)	-0.053 (0.11)	-0.041 (0.18)	-0.131 *** (0.00)	-0.019 (0.59)	-0.098 *** (0.01)
Log(initial GDP per capita)	-0.032 (0.26)	-0.021 (0.39)	-0.064 *** (0.01)	-0.084 *** (0.00)	-0.044 ** (0.05)	-0.082 *** (0.00)
Trade openness	0.003 (0.14)	0.000 (0.84)	0.000 (0.72)	0.000 (0.99)	-0.001 (0.72)	0.000 (0.70)
Freedom House index	0.011 (0.66)	-0.006 (0.78)	0.031 (0.13)	0.017 (0.39)	-0.026 (0.38)	0.012 (0.50)
Log(Population)	-0.034 (0.35)	-0.047 ** (0.03)	-0.017 (0.35)	-0.020 (0.32)	-0.096 *** (0.00)	-0.020 (0.22)
Colony dummy	-0.042 (0.73)	0.076 (0.39)	0.112 (0.20)	0.086 (0.35)	0.081 (0.31)	0.066 (0.34)
Log(PRI/GDP)	-9.373 (0.13)	-3.897 *** (0.00)	-0.910 (0.29)	-1.507 (0.17)	1.546 (0.59)	-0.365 (0.70)
Observations:	216	216	216	216	122	122

In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported

Table 10: Pooled cross-section over three 5-year periods with period-dummy variables - Other estimation methods

Dependant variable: Log(PRI/GDP)	OLS			2SLS			SURE		
	1990-94	1995-99 =coef 1990-94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04	1990-94	1995-99 =coef 1990-94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04	1990-94	1995-99 =coef 1990- 94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04
ICRG corruption index	-0.005 (0.18)	-0.005 (0.21)	-0.005 (0.34)	-0.007 (0.16)	-0.005 (0.21)	-0.005 (0.35)	-0.007 * (0.07)	-0.006 (0.10)	-0.008 (0.10)
Log(initial GDP per capita)	0.000 (0.93)	0.002 (0.67)	0.004 (0.34)	0.000 (0.89)	0.002 (0.67)	0.004 (0.35)	0.000 (0.95)	0.001 (0.85)	0.002 (0.56)
Trade openness	0.000 (0.26)	0.000 *** (0.01)	0.000 ** (0.02)	0.000 (0.12)	0.000 ** (0.01)	0.000 ** (0.03)	0.000 (0.16)	0.000 *** (0.00)	0.000 ** (0.01)
Freedom House index	0.002 (0.56)	0.008 *** (0.00)	0.004 * (0.09)	0.002 (0.48)	0.008 *** (0.00)	0.004 * (0.10)	0.002 (0.51)	0.009 *** (0.00)	0.005 ** (0.05)
Foreign exchange rate volatility	0.008 (0.75)	0.024 (0.56)	0.009 (0.73)	0.018 (0.50)	0.024 (0.57)	0.009 (0.73)	0.007 (0.77)	0.020 (0.59)	0.007 (0.77)
Log(Inflation rate)	-0.001 (0.64)	-0.003 (0.14)	-0.003 (0.24)	-0.001 (0.69)	-0.003 (0.15)	-0.003 (0.25)	-0.001 (0.71)	-0.003 (0.12)	-0.003 (0.19)
GDP growth rate	0.001 (0.55)	-0.001 (0.76)	0.001 (0.67)	0.000 (0.86)	-0.001 (0.77)	0.001 (0.67)	0.001 (0.64)	-0.001 (0.68)	0.001 (0.65)
Export growth rate	0.001 (0.34)	0.001 (0.29)	0.001 (0.26)	0.001 (0.28)	0.001 (0.29)	0.001 (0.27)	0.001 (0.26)	0.001 (0.26)	0.001 (0.26)
Log(PUB/POP)	-0.035 ** (0.04)	-0.040 ** (0.02)	0.022 (0.26)	-0.067 ** (0.02)	-0.040 ** (0.03)	0.022 (0.27)	-0.045 *** (0.00)	-0.054 *** (0.00)	0.006 (0.73)
Dependant variable: Log(PUB/POP)	1990-94	1995-99 =coef 1990-94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04	1990-94	1995-99 =coef 1990-94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04	1990-94	1995-99 =coef 1990- 94 + dummy 1995-99	2000-04 =coef 1990- 94 + dummy 2000-04
ICRG corruption index	-0.051 * (0.09)	0.009 (0.78)	-0.088 ** (0.02)	-0.054 (0.15)	0.009 (0.78)	-0.088 ** (0.02)	-0.064 ** (0.02)	-0.015 (0.61)	-0.115 *** (0.00)
Log(initial GDP per capita)	-0.014 (0.59)	-0.048 ** (0.04)	-0.087 *** (0.00)	-0.013 (0.62)	-0.048 ** (0.04)	-0.087 *** (0.00)	-0.013 (0.59)	-0.047 ** (0.03)	-0.088 *** (0.00)
Trade openness	0.000 (0.71)	0.000 (0.87)	0.000 (0.59)	0.000 (0.88)	0.000 (0.87)	0.000 (0.59)	0.000 (0.84)	0.000 (0.57)	0.000 (0.74)
Freedom House index	-0.016 (0.46)	0.011 (0.59)	0.006 (0.76)	-0.014 (0.58)	0.011 (0.59)	0.006 (0.76)	-0.015 (0.46)	0.021 (0.27)	0.010 (0.57)
Log(Population)	-0.077 *** (0.00)	-0.040 ** (0.04)	-0.018 (0.36)	-0.072 ** (0.02)	-0.040 ** (0.04)	-0.018 (0.36)	-0.072 *** (0.00)	-0.038 ** (0.04)	-0.015 (0.39)
Colony dummy	0.025 (0.78)	0.120 (0.17)	0.100 (0.27)	0.016 (0.88)	0.120 (0.17)	0.100 (0.27)	0.042 (0.61)	0.117 (0.14)	0.100 (0.22)
Log(PRI/GDP)	-2.013 (0.20)	-0.946 (0.30)	1.011 (0.37)	-2.702 (0.49)	-0.946 (0.30)	1.011 (0.37)	-2.771 * (0.05)	-1.863 ** (0.02)	0.195 (0.85)
Observations:	162	162	162	162	162	162	162	162	162

In parentheses p-value of Wald test $H_0: \text{coef} = 0$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

For reasons of space, constant coefficients and the corruption equation are not reported