Corruption and Financial Intermediation in a Panel of Regions: Cross-Border Effects of Corruption

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Abstract

The importance of financial market reforms in combating corruption has been highlighted in the theoretical literature but has not been systemically tested empirically. In this study we provide a first pass at testing this relationship using both linear and non-monotonic forms of the relationship between corruption and financial intermediation. Our study finds a negative and statistically significant impact of financial intermediation on corruption. Specifically, the results imply that a one standard deviation increase in financial intermediation is associated with a decrease in corruption of 0.20 points, or 16 percent of the standard deviation in the corruption index and this relationship is shown to be robust to a variety of specification changes, including: (i) different sets of control variables; (ii) different econometrics techniques; (iii) different sample sizes; (iv) alternative corruption indices; (v) removal of outliers; (vi) different sets of panels; and (vii) allowing for cross country interdependence, contagion effects, of corruption.

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Keywords: corruption; contagion effects; financial Intermediation; panel data

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1. Introduction

> Corruption is worse than prostitution. The latter might endanger
> the morals of an individual, the former invariably endangers the
> morale of the entire country- Karl Krauss

In recent years, the wide spread prevalence of corruption across nations, particularly in developing countries, has attracted the attention of economists and policy makers. Understanding the significant effects of corruption on a country's development process has motivated researchers to investigate why corruption exists and what determines its high degree of variation across countries. A number of empirical studies have recently identified a large set of causes of corruption such as economic, cultural, political and institutional aspects (see, for example, Treisman, 2000; Serra, 2006; Majeed and MacDonald, 2010). However, some of the channels of corruption still remain to be fully explored, such as the role of market imperfections for rent seeking and corrupt activities.

For example, a lack of competition, in product and financial markets, fosters corruption because rent seeking activities increase in the absence of competition and such rent seeking activities are closely associated with corruption levels. Theoretical studies predict an ambiguous effects of competition on corruption. On the one hand, lack of competition generates rents (supra normal profits) for entrepreneurs, thereby motivating bureaucrats to ask for bribery (Foellmi and Oechslin (2007). On the other hand, the presence of these rents increases the values of monitoring the bureaucracy in a society (Ades and Di Tella (1999).

This study focuses on the lack of competition in financial markets where lower levels of financial intermediation are taken to indicate underdeveloped financial systems. Foellmi and Oechslin (2007) argue that less developed financial systems strengthen economic elites and these economic elites can substantially oppose/hinder anti-corruption reforms if political power is concentrated in their hands. Boerner and Hainz (2009) predict an ambiguous relationship between financial sector reforms and corruption. Their results are conditional on the political weights of different groups and according to their model, financial sector reforms can lower corruption only if the political influence of relatives (other groups) dominates over the political influence of corrupt officials.

The motivation for testing the impact of financial intermediation on corruption is three fold. First, theoretical studies predict a relationship between financial reforms and corruption but to the best of our knowledge this relationship has not been tested. Second, theoretical studies predict ambiguous effects of financial reforms on corruption and this can only be clarified in an empirical setting. Third, theoretical studies indicate the importance of a threshold in shaping the link between corruption and financial reforms and again this can only be clarified in an empirical context.

The existing literature on the causes of corruption explicitly or implicitly assumes that corruption is determined by country specific factors; in other words, corruption is independent of corruption in neighboring countries. However, in practice, neighboring countries share common political cultures and adopt similar institutions. These common political cultures are very close to corruption (see, for example, Hillman and Swank, 2000). In this study, we explicitly control for cross-country interdependence of corruption using a spatially weighted matrix.

The motivation for spatial analysis of corruption is two fold. First, cultural reasons of corruption are closely related to cross country interdependence of corruption, as norms about corruption tolerance are more likely to spread to neighboring countries as compared to distant countries. Such interdependence of corruption implies that corruption levels may vary less within a region because of similar cultural reasons (for example, Paldam (2002) points out that corruption is mainly supported by cultural factors). Second, Becker et al. (2009) provide empirical evidence of cross country interdependence of corruption.

In sum, this study has a number of unique and novel elements compared to extant work in this area. First, we believe that this is the first study that tests empirically the relationship between the financial intermediation and corruption. Second, this is also the first study to test for the presence of a threshold in shaping the link between corruption and financial development. Third, our study introduces the concept of regional panels in addition to cross sectional or cross country panels. Fourth, we introduce the concept of alternative lag lengths to trace out the repercussion effects of policy reforms in neighboring countries. Fifth, we model the role of spatially weighted corruption that takes account of the common political, cultural and regional factors and, sixth, we use a variety

of econometric techniques to account for time dynamics and to control for the possible problem of endogeneity.

This paper, specifically, adds to this emerging literature on corruption by addressing the following questions: (1) Does high financial intermediation reduce corruption?; (2) Is the relationship between high financial intermediation and corruption perhaps non-monotonic?; (3) Does spatial corruption matter in shaping the link? (4) Do past levels of corruption in neighboring countries matter for current corruption in home countries? (5) Do regional panels make difference in shaping the link?

The remainder of the paper is structured as follows. Section 2 provides a review of the relevant literature and Section 3 provides a discussion of the data. In Section 4 we present our modeling framework and our estimation methods, while in Section 5 our empirical findings are presented. Section 6 is our concluding section.

2. Literature Review

In the first part of this section we briefly review the relevant theoretical literature on the relationship between financial reforms and corruption, while in the second part we review empirical studies on contagion and corruption and then summarize our discussion in a flow chart.

2.1 Review of Theoretical Studies on Financial Markets and Corruption

Mckinnon (1973) argues that the development of a capital market is "necessary and sufficient" to foster the "adoption of best-practice technologies and learning by doing." In other words, limited access to credit markets restricts entrepreneurial development, thereby leaving more space for rent seeking and corrupt activities. In this study we extend this view and argue that the absence of well functioning local financial markets can limit the availability of funds through formal recourses and incite an individual to seek other viable options for finance, from, say, the informal economy where the margin for bribes and rent seeking activities is likely to be significant.

Ades and Di Tella (1999), provide further insights into the corruption-rent seeking mechanism. They present evidence that the level of rents in general, and market structure in particular, determine the intensity of corruption in an economy. They argue that variation in rent size, as a result of changes in competition, causes ambiguous effects on

corruption: on the one hand, lower levels of competition provide opportunities to bureaucrats to extract more rents from the firms they control, while on the other hand, this situation also implies that it is more valuable for a society to avoid corruption and increase the accountability and monitoring of its bureaucracy. Thus, theoretically, the net impact of competition on corruption is ambiguous.

Recently, Foellmi and Oechslin (2007) focus on the lack of competition in financial markets in shaping the theoretical relationship between rent and corruption. They build a general equilibrium model with credit market imperfections and heterogeneous agents to explain the causes and consequences of non-collusive corruption[1]. The model features two types of individuals: potential entrepreneurs and the officials and where the potential entrepreneurs are heterogeneous in terms of ex ante wealth, while officials do not have any ex ante wealth endowment. This model predicts that credit market imperfections generate rents for the incumbent entrepreneur and the availability of these rents leaves the margin for an official with discretionary power to ask for a bribe because he knows that the alternative viable investment options to the incumbent yield much lower returns. If sanctions against bribes are also imperfect then the rents may be partially extracted by corrupt officials. However, in the case of a well developed financial system (i.e. countries with (nearly) perfect markets) returns inequalities across investment projects are eroded and there is a disincentive for the incumbent to consider a bribe and therefore, a corrupt official will not seek bribes in such a situation, even though the probability of being detected and punished is low. Foellmi and Oechslin predict that financially developed economies tend to be less corrupt because rents are lower in these economies.

Foellmi and Oechslin (2007) also derive the income distributional consequences from their model and predict that non-collusive corruption redistributes income from the entrepreneur (non officials) towards corrupt officials and also income is redistributed within the entrepreneurial group. The middle class losses (suffers) from more corruption while the wealthy entrepreneurs are less affected or they even win. Paying bribes adversely affects the size of collateral and thus borrowing decreases and the individuals who lack collateral and rely on borrowing to finance investment projects of minimal size

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[1] Non-collusive corruption means additional cost on private business activity.

suffer, specifically when credit restrictions are more severe. Some of the members of the middle class will not consider becoming an entrepreneur as a viable option and may quit the market causing a decline in aggregate demand for capital, thereby decreasing the cost of capital. Larger borrowers benefit more from the lower cost of capital, because this benefit (i.e. the general equilibrium effect) is strong enough to outweigh the costs of bribes. The largest borrowers are more affluent because their ex ante wealth plays the role of collateral. Another implication of the crowding out effect is that it may reduce competition on the product market as well, thereby amplifying the distribution consequences among the entrepreneurs (non-officials). The distributional consequences of the model suggest that less developed financial systems (credit market imperfections) strengthen economic elites, thereby anti-corruption reforms can be substantially opposed/hindered if political power is concentrated in the hands of economic elites.

Foellmi and Oechslin (2007) further argue that improving financial market conditions does not necessarily imply that the level of corruption will decline. If contract enforcement starts improving from a low level then initially corruption may rise and after reaching a certain threshold level of the contract enforcement it will fall. This happens because improving enforcement initially softens the borrowing constraints for entrepreneurs since higher capital demand does not affect the interest rate as the supply of capital is perfectly elastic. Other things equal, therefore, corrupt officials face bribe margins from an entrepreneur and therefore ask for higher bribes. Thereafter, improving contract enforcement no longer creates new entrepreneurs since the borrowing constraints have already been softened and the better enforcement increases the interest rate. These two effects work in opposite directions offsetting each other and the amount of bribes remains unchanged. Thereafter, further improvements in contract enforcement reduce optimal bribes because now entrepreneurship is not a viable option and becoming a lender is more attractive. In this situation, individuals have an incentive to take advantage of investing opportunities with higher returns outside their own firms.

Recently, Boerner and Hainz (2009) also provide a theoretical link between financial reforms and persistent corruption using a probabilistic voting model. The basic proposition of their model is that corrupt officials have to pay entry fees to get lucrative positions in the bureaucratic hierarchy. In the presence of imperfect credit market, the

corrupt officials arrange part of their finances from the informal market using personal connections, such as relatives. In doing so, they in fact give a stake in corruption to their relatives. This unproductive investment is viable for the relatives because economic opportunities are scarce and it implies that the stake-holders (the creditors) are likely to oppose anti-corruption reforms because they finance corrupt incumbent officials in view of a share in prospective rents.

If credit market imperfections are lower and the financial sector is liberalized then all citizens have access to loans. In the presence of wider opportunities for loans, corrupt officials can finance their entry fee through financial market instead of relatives and in the presence of a developed financial system, support for anti-corruption policies is the likely outcome.

The analysis of Boerner and Hainz shows that economic and financial reforms generate investment opportunities in productive sectors. These opportunities play an important role in shaping the political preferences of agents that, in turn, support the fight against corruption. While in the absence of these reforms, and thus the absence of productive investment opportunities, the rational agents tend to invest in unproductive corrupt activities by financing entry fees. Consequently, both corrupt officials and their financers do not support socially beneficial political initiatives to abolish unproductive activities. Thus, the political success of anti-corruption policies depends on economic and financial liberalization. The Boerner and Hainz study predicts unambiguous results in the case of reforms of the real sector because these reforms promote entrepreneurship in productive sectors. However, in the case of reforms of the financial sector the study provides ambiguous results since the results are conditional on the political weights of different groups. If the political influence of relatives dominates over the political influence of corrupt officials then financial sector reforms unambiguously help to fight against corruption.
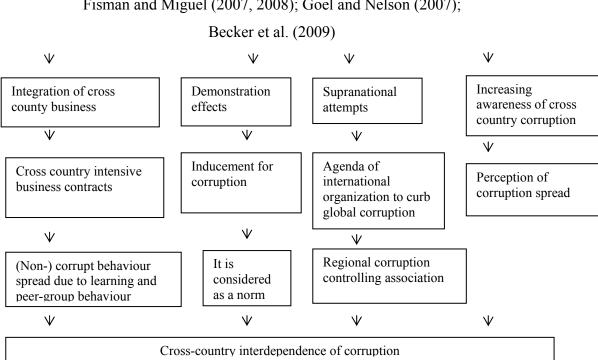
The ambiguous theoretical predictions of the link between financial sector reforms and corruption in the above studies, and the possible presence of a threshold level, can only be confirmed or rejected by an empirical test. That is what we attempt to do in this study.

2.3 Corruption and Contagion

The existing literature on the causes of corruption is mainly based on the assumption that corruption is a country specific phenomenon and the prevalence of corruption in a country is independent of the prevalence of corruption in adjacent countries. However, some recent studies have pointed out that institutions in neighboring countries are similar and the similarity of these institutions breeds a similar pattern of political culture and this political culture is closely associated with levels of corruption (Becker et al (2009); Hillman and Swank, 2000)

In order to support the argument of so-called contagion corruption, a number of justifications are noted here. First, interdependence of cross country business has increased in recent years and norms about corruption are more likely to shift from one country to another due to learning and peer-group behavior (see, for example, Fisman and Miguel, 2007, 2008). Second, corruption also spreads due to a demonstration effect; for example, existing levels of corruption in a country induce foreigners to get involved in corruption as well (see, for example, Goel and Nelson, 2007, for evidence of contagion corruption across US states). Third, recently curbing global corruption has been put on the agenda of international organizations such as the UNO, World Bank, IMF and WTO and they are now attempting to propagating corruption free societies. Fourth, corruption norms are spreading across borders because the awareness of individuals about corruption is increasing due to increased corruption surveys and its portrayal in the media. This can also propagate (non-) corrupt behavior across countries. A flow chart, given below, summarizes the above discussion.

2.3 Description of channels through which corruption becomes contagion

Contagion Effects of Corruption

Fisman and Miguel (2007, 2008); Goel and Nelson (2007);

Becker et al. (2009)

⇓	⇓	⇓	⇓
Integration of cross county business	Demonstration effects	Supranational attempts	Increasing awareness of cross country corruption
⇓	⇓	⇓	⇓
Cross country intensive business contracts	Inducement for corruption	Agenda of international organization to curb global corruption	Perception of corruption spread
⇓	⇓	⇓	
(Non-) corrupt behaviour spread due to learning and peer-group behaviour	It is considered as a norm	Regional corruption controlling association	
⇓	⇓	⇓	⇓

Cross-country interdependence of corruption

3. Data Description

The International Country Risk Guide (ICRG) corruption index and corruption perception index (CPI) by Transparency International are both used in corruption studies. We prefer to use the ICRG, since most previous studies use it and the index covers a large number of countries and a long period of time. The ICRG also has a high correlation with other indices that have been used in the literature, such as the Transparency International and Business International (see Treisman, 2000; Majeed and Macdonald (2010) for more details) indices[2]. We also use alternative corruption indices as a robustness check. The other variables used in this study are reported in Table 1. We average the data over a 5-year non-overlapping period, 1984-2007. In this way we have five observations, in most

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[2] Recently, Majeed and Macdonald (2010) show a correlation between these alternative corruption indices over the period 1996-2007. They show that the correlation between ICRG and TI corruption indices is 0.87, while the correlation between ICRG and World Bank (WB)'s corruption indices is 0.88. Finally, their study shows a very high correlation, 0.98, between TI and WB. These high correlations indicate that these alternative corruption indices are consistent, even though they are based on a subjective rating.

instances, for all of the countries in our sample. The 5 year average periods are: 1984-88, 1989-93, 1994-98, 1999-03, 2004-07.

We introduce the concept of regional panels in the following way. We calculate the average of a variable of interest for all countries in a specific region, such as East Asia and Pacific (EAP), for a specific year, such as the initial year of data, 1984. In this way we average all of the variables for all regions. In order to account for time dynamics within a region, we repeat our averaging exercise for each year until 2007. We have nine regions in total: East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia, Sub-Saharan Africa, Europe, Australia-Oceania, and North America. To the best of our knowledge this is the first study using panel data that introduces an entirely different method of data analysis. This innovative exercise of regional panels has several advantages. First, it serves as a robustness check. Second, it does not assume that cross country corruption (within a region) is independent. Third, it takes account of the time element in the data. Fourth, cultural, political and institutional similarities within a region are better captured by using regional panels.

4. Model

The theoretical formation of a model for this study relies on Becker (1968)'s seminal work where individuals make rational choices by giving weights to relative costs and benefits of an illegal (corrupt) activity. These costs and benefits depend on exogenous factors that, in turn, depend on the role of market structure and the socio-cultural environment. The socio-cultural environment is developed by historical, legal, political, regional and country-specific factors. This study takes into account all of these factors for an empirical analysis. The specified standard corruption equation is given as follows:

$$C_{it} = \alpha_{it} + \beta_1 PCY_{it} + \beta_2 FI_{it} + \beta_3 X_{it} + \mu_{it} + v_t + \varepsilon_{it},$$
(1)

where (i= 1... N; t=1...   T), C_{it} is a perceived corruption index, PCY_{it} is per capita income to measure the level of economic development, FI_{it} represents the degree of financial intermediation, X_{it} represents a set of control variables based on the existing corruption literature, u_i is a country specific unobservable effect, v_t is a time specific factor and ε_{it} is an i.i.d. disturbance term. The expected sign for the key parameter of interest, β_2, is negative.

In addition to the other terms contained in equation 1, equation 2 includes a non-linear term for financial intermediation (FI^2) to facilitate an assessment of the possible presence of a threshold level of financial intermediation. Now the expected sign for β_2 is positive while it is negative for β_3.

$$C_{it} = \alpha_{it} + \beta_1 PCY_{it} + \beta_2 FI_{it} + \beta_3 FI^2{}_{it} + \beta_4 X_{it} + \mu_{it} + \nu_t + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Equation 3 includes another key determinant of corruption, the military in politics (MP), that has recently been introduced by Majeed and MacDonald (2010). The authors suggest that the explanatory power of the military in politics is at least as important as the conventionally accepted causes of corruption, such as economic development. The expected sign of the parameter on MP, β_4, is negative.

$$C_{it} = \alpha_{it} + \beta_1 PCY_{it} + \beta_2 FI_{it} + \beta_3 FI^2{}_{it} + \beta_4 MP_{it} + \beta_5 X_{it} + \mu_{it} + \nu_t + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots (3)$$

In a very recent paper Becker et al. (2009) estimate cross country interdependence of corruption as a key variable of concern for 123 economies and provide significant evidence of contagious corruption. Our study evaluates financial liberalization and the contagion nature of corruption by using standard corruption equations and following an econometric model set out in Becker at el. (2009). While taking account of the contagion nature of corruption we differ from Becker at el. (2009) by considering alternative lag lengths of contagious corruption. We introduce 5, 10, 15 and 20 year lags in order to assess the lag nature of spatial corruption so that policy makers can effectively devise anti-corruption polices by taking account of beggar thy neighbor polices affecting the optimality of domestic policy initiatives. Becker et al. (2009) use conventional control variables of corruption while we use new measures of corruption, such as the military in politics. In addition, we also consider contagious corruption as a robustness check for our main variable of concern, financial intermediation.

Controlling for cross-country interdependence requires a suitable econometric model. One class of models that supports such interdependence is a spatial econometric model. The term has its origins in geographical statistics which in the past was the main application for such methods. However, in recent years, economists have discovered potential merits of such methods to analyze interdependence brought about by general equilibrium effects. Put differently, spatial econometrics involves the development of methods and statistical tools for the analysis of spatial interactions (spatial auto correlation), learning effects, externalities, spillovers and spatial structure (especially heterogeneity).

The key difference between spatial econometrics and traditional econometrics is that the former addresses a locational component. Two issues arise from such a component: the first is the existence of spatial dependence between observations and the second is the occurrence of spatial heterogeneity in the relationship. Traditional econometrics largely ignores such issues but they violate the traditional Gauss-Markov assumptions used in regression modeling. For example, one assumption in the Gauss-Markov framework is that the explanatory variables remain fixed in repeated sampling but spatial dependence violates this assumption, as does the assumption that a single line relationship exists across the sample data observations (Lesage, 1998).

In order to analyze the notion of interdependence across countries, spatial econometric models need an assumption regarding the nature of the interdependence. In applied research, researchers normally assume that interdependence is associated with space and geography and that interdependence is positively related to adjacency and negatively related to distance. Although there are many ways to model adjacency interdependence econometrically, here we consider two forms (following Becker et al., 2009), and these are spatial lags and spatially autoregressive residuals. The exclusion of significant spatial dependence in the residuals produces inefficient parameter estimates. Similarly the exclusion of related spatial lags yields inconsistent parameter estimates. In the context of our analysis, taking account of spatial lags implies that corruption in some country i depends on the corruption in j countries. Put differently, the level of corruption in country i is an adjacency (or inverse-distance-related) function of corruption in other countries. Similarly, another implication in our context is that the disturbance term of

country i depends on the disturbance terms of other economies. In other words, country i's disturbance term is an adjacency (or inverse-distance-related) function of other countries, disturbances. The model can be specified as follows:

$$c_i = \alpha + \lambda \sum_{j=1}^{N} w_{ij} c_j + X_i \beta + \mu_i; \mu = p \sum_{j=1}^{N} w_{ij} \mu_j ,\ldots\ldots (4)$$

where c_i stands for corruption in country i, and w_{ij} is an adjacency-related weight. The w_{ij} has two properties that are, $\sum_{j=1}^{N} w_{ij} = 1$ and $w_{ii} = 0$,[3] and x_i is a $1 \times K$ vector of covariates. The greek letters α, λ, and β refer to unknown parameters that require to be estimated. α is an intercept while β is a $K \times 1$ parameter vector for the covariates collected in x_i. Two parameter, λ and ρ, measure the intensity (strength) of interdependence, where λ denotes the spatial lag and ρ represents the spatial correlation in the residuals. In our analysis, we focus mainly on the spatial lag parameter λ since interdependence in terms of observable characteristics appears of more concern to economists and policy makers than interdependence in the disturbances. Finally, μ_i is the overall (spatially correlated) disturbance term and v_i is the remaining disturbance term which is independently (but not necessarily identically) distributed across all countries i.

5. Results and Interpretation

Table 1 provides our base line results for the effect of financial liberalization on corruption for a cross section of 120 economies. All columns of the table indicate that the impact of high financial intermediation (FI) on corruption is negative and significant. The estimated coefficient on financial Intermediation is remarkably robust and its size remains 0.001 in all the regressions. This finding implies that a one standard deviation increase in FI is associated with a decrease in corruption of 0.20 points, or 16 percent of a

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[3] For adjacency weights, we develop a country-by-country matrix using unitary values for countries share common land borders and zero otherwise. According to this rule islands do not have neighbors and also country-pairs with a common border that is not on land do not have a border, accordingly. The normalization divides all unitary entries by the sum of all neighbors for each country (Becker et al., 2009).

standard deviation in the corruption index. All other variables in the regressions turn out to be significant with the expected signs and the overall fit of the model is good.

The effect of economic development is consistently negative and significant in all regressions in this table, and in subsequent tables, which implies that countries at the bottom of the ladder of economic development tend to be more corrupt. This happens because poor countries generate minimal wealth effects for average citizens and lower incomes create structural incentives for corrupt behavior. Conversely, countries at the upper end of the ladder of economic development tend to be less corrupt because the discount rates of potential bribe takers and givers are lower in rich nations. Economic freedom and rule of law are negatively and significantly associated with corruption levels. A greater degree of economic freedom and a strong hold of law discourage corruption prone activities because economic freedom promotes productive business activities and similarly a strong rule of law discourages bureaucrats to ask for bribes. Furthermore, greater economic freedom implies a free flow of market forces and lesser government controls thereby less opportunities for rent seeking by government officials.

Table 2 replicates the results of Table 1 using alternative corruption indices and, again, the estimated coefficients for FI are significant in all columns and of the expected signs. This means the relationship between financial intermediation and corruption levels is negative, irrespective of which corruption index is being used for estimation. Columns 2-5 show parameter estimates using the Transparency International corruption index, while column 6-8 represents parameter estimates drawn using World Bank corruption index. Parameter estimates for other control variables are similar to the results of Table 1.

Table 3 replicates the benchmark findings using additional control variables and the benchmark findings turn out to be consistent to the addition of these control variables. The coefficient on FI remains robustly negative and significant at -0.001. Among the additional control variables - democracy, military in politics and military spending – all are significant with the correct signs. This analysis shows that democracy turns out to be most significant additional control variable, followed by military related variables. We believe that it is now widely accepted that corruption is rooted in various forms of political deficiencies. An established democracy promotes political competition, transparency and accountability (to the voter), thereby reducing corruption. To address

this we can either control for military expenditures or for the role of the military in politics and both turn out to be negative and significant, and this finding is consistent with Majeed and MacDonald, 2010. The involvement of military in politics engenders corruption because military is not elected by any one and accountability of the military elites is limited (see for further details Majeed and MacDonald, 2010).

Table 4 replicates the findings of Table 1 while controlling for regional dummies. The coefficient on FI, 0.001, remains robustly negative and the level of significance slightly improves. The last column of the table indicates that all of the regional dummies are positive and significant, implying that regional factors are important in explaining corruption.

Table 5 provides the results for the benchmark model using a panel of nine regions: East Asia & Pacific, Europe & Central Asia, Lat America & Caribbean, Middle East & North Africa, South Asia, Sub-Saharan Africa, Europe, Australia-Oceania, and North America. In absolute terms, the estimated coefficient on FI improves from 0.001 to 0.002 and the level of significance also improves as well. This finding implies that a one standard deviation increase in FI is associated with a decrease in corruption of 0.40 points.

Table 6 replicates the results of Table 5, using alternative econometric techniques and controlling for the issue of endogeneity. The estimated coefficients for FI are again significant in all columns and of the expected signs. In this study we develop regional panels that differ in two ways from cross country panels. First, each region comprises an annual observation to take account of time dynamics. Second, countries within a region share borders that capture the contagious nature of corruption (meaning that cross country corruption is not independent). Following the theory of contagion effects of corruption, the identification of a country is not of such importance as the identity of a region and the time element. It is noteworthy that the quality of the results improves in a regional panel in terms of the level of significance, the size of coefficients and direction of effects compared to all other ways of data analysis.

Table 7 contains estimates of the benchmark model using a panel of 146 economies. This shows that our benchmark findings are robust and the size of the estimated coefficient on FI is 0.0004 implying that a one standard deviation increase in FI

reduces corruption by 0.08 points. Findings for other control variables remain unaffected and the overall results seem to improve in a panel setting. The effect of government spending is significant with negative signs, implying that a larger government may spend more money to strengthen check and balances on corrupt activities.

Table 8 contains a sensitivity analysis for FI and corruption in a panel setting. Here we employ eleven additional control variables and find that FI is robustly significant in explaining corruption: the coefficient on FI fluctuates between 0.0004 and 0.0005 in all of the regressions. In the table the most significant additional control variables turn out to be inflation, openness, democracy and the military in politics. The effect of inflation is positive because inflation is an indicator of macroeconomic instability. Our results here are consistent with Paldam, 2002; Majeed and Macdonald, 2010.

Table 9 contains further results for the benchmark model using a panel of 146 countries with additional control variables. The results indicate that investment profile is the most significant factor in this sensitivity analysis. We also control for time dummies and our results remain robust. In sum, we infer two points from the results displayed in Tables 8 and 9: (1) our benchmark finding remains robust; (2) the parameter estimates drawn from additional control variables are similar to the prediction of the existing literature on the causes of corruption.

In Tables 10 and 11 we re-estimate our benchmark model using a random effects estimator. Our main variable of interest, FI, is still significant with a negative sign, although the size of coefficient drops slightly. Our main control variables - economic development, economic freedom, rule of law and government spending - are the same in terms of the level of significance and direction of effect. In our sensitivity analysis we include thirteen additional control variables, other than four time dummies and six regional dummies. Among the additional control variables military in politics is consistently positive and significant in increasing corruption. All other control variables are robust in terms of signs; however, some of them decrease or increase in terms of the level of significance. For example, inflation drops in significance, while investment profile increases in significance.

Table 12 contains estimates of the benchmark model using a systems GMM estimator. Using this technique our results improve in terms of the level of significance

and remain the same in terms of the direction of effect. The coefficient on FI is 0.0004 in all of the regression and this implies that a one standard deviation increase in FI reduces corruption by 0.08 points.

Table 13 reports results for a sub sample of developing counties and our benchmark findings turn out to be confirmed in this sample as well. The estimated coefficient on FI is consistently 0.001 in all columns of the table which implies that a one standard deviation increase in FI is associated with a decrease in corruption of 0.20 points, or 16 percent of a standard deviation in the corruption index.

We also test for the presence of a threshold in the relationship between FI and corruption for a cross section of 116 countries using alternative corruption indices. The parameter estimates for FI and FI^2 indicate the presence of a threshold. This implies that high financial intermediation is beneficial only up to a threshold level and after the threshold is reached corruption increases. This finding contradicts that of Foellmi and Oechslin (2007) who predict the opposite, that initially high financial liberalization increases corruption and after a certain threshold level is reached it decreases corruption. There argument is that at an initial phase of financial liberalization interest rate remains the same due to an elastic supply of capital and this leaves a margin for bribe paying. However, over time the interest rate rises and the margin for bribe paying vanishes.

However, the theoretical prediction of Boerner and Hainz (2009) is consistent with our empirical finding since they argue that a high level of financial liberalization make funds available in the formal sector and relatives do not have a stake in corruption thereby they support anti corruption policies. Boerner and Hainz are, however, not certain about the political weights of the different groups. For example, if the political weight of relatives is less than that of corrupt government officials corruption may increase in economies which have a high degree of financial reform.

Ours is the first study that attempts to provide an empirical understanding of threshold in view of conflicting predictions of threshold theoretical studies. A comprehensive understanding of the threshold effects of financial reforms on corruption requires further theoretical and empirical work. One possible reason for this non-monotonic relationship between FI and corruption could be that financial reforms with out regulation may become negative for the economy after a certain point.

Table 15 provides a set of results in which the most/least corrupt nations have been excluded. Specifically, in columns 3-4 we exclude the most clean countries, while in columns 5-6 we exclude the most corrupt nations. The results of Table 15 demonstrate that our benchmark findings remain consistent.

Finally, in Tables 16 and 17 we provide a set of results that take account of the contagion effects of corruption. The purpose of incorporating contagion effects is threefold. First, to test whether spatial affects matter. Second, to check whether our bench-mark findings are consistent and, third, to test the lag length of contagion effects. Our results show that contagion effects persist and affect corruption levels significantly and our benchmark findings prove to be consistent and robust. The estimated coefficient on FI is consistently 0.001 in all the regressions. The estimated coefficient on the spatial index is about 0.2, which implies that a policy that reduces corruption by one standard deviation in the home country will reduce corruption by 0.114 in the neighboring country.

In order to assess the lag nature of the spatial corruption phenomenon, we introduce 5, 10 year, 15 year and 20 year lags of spatially weighted corruption, respectively. Although each lag length is significant in explaining corruption but we infer that the most effective lag length is 5 to 10 years because models with other lag lengths do not perform well as the level of economic development becomes insignificant. First column of the table shows that estimated coefficient on contagion effects is 0.21 which implies that a policy in neighboring country that reduces corruption one standard deviation in past five to ten years will reduce corruption in the home country by 0.12 points.

6. Conclusion

In recent years, international organizations such as the World Bank, IMF and UNO have set the elimination of corruption as their prime goal. Additionally, regional organizations and domestic governments have advocated and devised anti corruption policies. According to the Global Corruption Barometer (2010) "corruption has increased over the last three years say six out of 10 people around the world, and one in four people report

paying bribes in the last year"[4]. The literature has identified a large number of factors that cause corruption, such as economic, political, cultural and institutional aspects. Although some of the determinants of corruption are inconclusive, a consensus is slowly emerging on the key causes of corruption. For instance Serra (2006) identifies economic development, democracy, and political stability as important causes of corruption. Our study differs from existing studies on the causes of corruption by empirically analyzing the importance of financial market imperfections for cross country variations of corruption levels.

The importance of financial market liberalization in combating corruption has been highlighted in the theoretical literature but no one has tested this relationship in an empirical settings. This study contributes to the existing literature on the causes of corruption by introducing the linear and non-monotonic relationship of corruption and financial liberalization. By drawing on a large cross sectional, country panels and regional panel data sets over a long period of time (1984-2007), our analysis finds substantial support for a negative relationship between financial intermediation and corruption. The results imply that a one standard deviation increase in financial liberalization is associated with a decrease in corruption of 0.20 points, or 16 percent of a standard deviation in the corruption index. Our findings are consistent with respect to a number of robustness checks, including incorporating contagion effects alternative corruption indices and regional dynamics.

Finally, the existing literature on corruption assumes that the prevalence of corruption is determined by country specific factors. Nonetheless, some studies point to corruption as being interdependent across bordering countries and it is a common characteristic of low income countries. For example, Rowley (2000) argues that a common political culture in Africa caused corruption to be the norm in these countries. We also contribute to this part of the literature by evaluating the different lag lengths of contagious corruption. Our results show that a policy in a neighboring country that reduces corruption by one standard deviation in the past five to ten years will reduce corruption in the home country by 0.12 points.

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[4] http://www.transparency.org/policy_research/surveys_indices/gcb/2010

Table 1: Corruption and Financial Intermediation (FI): Cross Section (CS) Estimation

Variables	Dependent Variable: Corruption					
FI	-0.004	-0.001	-0.001	-0.001	-0.001	-0.001
	(-4.38)*	(-1.75)***	(-1.66)***	(-1.78)***	(-1.72)***	(-1.68)***
PCY		-0.000	-0.000	-0.000	-0.000	-0.000
		(-8.18)*	(-6.18)*	(-5.25)*	(-2.62)*	(-2.73)*
Economic			-0.23	-0.22	-0.19	-0.19
Freedom			(-5.33)*	(-5.41)*	(-4.58)*	(-4.55)*
Govt.				-0.025	-0.011	-
Spending				(-2.18)**	(-0.95)	
Rule of Law					-0.32	-0.35
					(-4.32)*	(-4.90)*
R	0.14	0.45	0.55	0.57	0.63	0.63
Adj. R	0.13	0.44	0.54	0.55	0.62	0.62
F	19.16	47.96	46.79	36.71	37.73	48.18
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	120	120	120	120	120	120

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 2: Corruption and FI: CS Estimation: Alternative Corruption Indices

Variables	Dependent Variable: Corruption Index by Transparency International (TI)				Dependent Variable: Corruption Index by World Bank (WB)		
FI	-0.02	-0.004	-0.004	-0.002	-0.01	-0.002	-0.001
	(-9.47)*	(-2.49)*	(-2.45)*	(-1.62)***	(-9.53)*	(-2.69)*	(-1.72)*
PCY		-0.000	-0.000	-0.000		-0.000	-0.000
		(-10.55)*	(-9.86)*	(-8.22)*		(-9.70)*	(-7.15)*
Economic	-0.3	-0.27	-0.28			-0.18	-0.18
Freedom	(-4.88)*	(-2.38)*	(-4.87)*			(-6.64)*	(-7.18)*
Govt.		-.05	-.02				-.01
Spending		(-2.62)*	(-1.18)				(-1.09)
Rule of Law			-0.4				-0.21
			(-4.22)*				(-5.03)*
R	0.44	0.78	0.79	0.82	0.43	0.78	0.83
F	89.66	129.12	100.47	96.44	90.91	134.55	108.09
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	118	115	113	113	121	118	116

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 3: Corruption and FI: CS Estimation: Sensitivity Analysis

Variables	Dependent Variable: Corruption						
FI	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(1.72)***	(-1.57)***	(-1.73)***	(-1.73)***	(-1.77)***	(-1.87)***	(-1.60)***
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-2.62)*	(-3.09)*	(-2.66)*	(-2.72)*	(-3.36)*	(-3.21)*	(-4.62)*
Economic Freedom	-0.19	-0.18	-0.18	-0.18	-	-	-
	(-4.58)*	(-4.39)*	(-4.49)*	(-4.50)*			
Rule of Law	-0.32	-0.31	-0.36	-0.34	-0.29	-0.32	-0.37
	(-4.32)*	(-4.39)	(-4.95)*	(-4.90)*	(-4.22)*	(-3.56)*	(-5.20)*
Govt. Spending	-0.011						
	(-0.95)*						
Inflation		0.0004					
		(1.19)					
Trade Openness			0.001				
			(0.83)				
Urbanization				0.000			
				(0.42)			
Democracy					-0.28		
					(-5.61)*		
Military in Politics						0.117	
						(1.95)**	
Military Expenditures							0.05
							(2.03)**
R	0.14	0.65	0.63	0.63	0.66	0.58	0.62
Adj. R	0.13	0.63	0.61	0.61	0.65	0.57	0.61
F	19.16	40.67	38.58	38.58	56.27	40.21	43.96
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	120	120	120	120	120	120	120

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 4: Corruption and FI: CS Estimation: Regional effects

Variables	Dependent Variable: Corruption						
FI	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-2.99)*	(-2.21)*	(-1.96)**	(-2.46)*	(-2.41)*	(-2.32)*	(-2.16)*
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-2.13)*	(-1.47)	(-1.49)	(-1.73)***	(-1.73)***	(-1.61)***	(-1.5)
Economic Freedom	-0.18	-0.18	-0.21	-0.18	-0.18	-0.17	-0.18
	(-4.41)*	(-4.49)*	(-4.41)*	(-3.69)*	(-3.71)*	(-3.20)*	(-3.54)*
Rule of Law	-0.35	-0.42	-0.38	-0.40	-0.40	-0.37	-0.37
	(-4.56)*	(-5.84)*	(-4.60)*	(-4.69)*	(-4.57)*	(-4.31)*	(-4.32)*
East Asia & Pacific	0.024	0.01	0.12	0.20	0.21	0.35	0.69
	(0.13)	(0.55)	(0.63)	(1.07)	(1.10)	(1.30)	(2.41)*
Europe & Central Asia		0.62	0.65	0.70	0.72	0.86	1.17
		(3.21)*	(3.25)*	(3.51)*	(3.52)*	(2.97)*	(4.32)*
Lat America & Caribbean			0.24	0.23	0.25	0.41	0.78
			(1.25)	(1.23)	(1.30)	(1.49)	(2.56)*
Middle East & North Africa				0.28	0.28	0.44	0.76
				(1.52)	(1.55)	(1.62)***	(2.80)*
South Asia					0.13	0.32	0.68
					(0.40)	(0.80)	(1.64)***
Sub-Saharan Africa						0.22	0.56
						(0.80)	(2.02)*
Europe							0.51
							(1.94)**
R	0.63	0.66	0.67	0.67	0.67	0.67	0.68
F	34.52	34.28	30.61	27.68	24.69	22.45	19.83
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	118	118	118	118	118	118	118

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 5: Corruption and FI: Regional Panel Estimation

Variables	Dependent Variable: Corruption							
FI	-0.004	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(-9.92)*	(-3.71)*	(-7.15)*	(-7.16)*	(-7.00)*	(-6.77)*	(-6.70)*	(-7.31)*
PCY		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(-4.22)*	(-3.40)*	(-2.72)*	(-3.51)*	(-6.79)*	(-2.35)*	(-3.77)*
Govt. Spending		-.04	-.05	-.04	-.03	-.04	-.05	-.05
		(-3.13)*	(-4.97)*	(-3.57)*	(-3.5)*	(-3.97)*	(-5.59)*	(-5.28)*
Rule of Law		0.4	-0.44	-0.27	-0.63	-0.49	-0.35	-0.3
		(7.15)*	(-10.12)*	(-4.97)*	(-15.25)*	(-12.53)*	(-6.90)*	(-3.30)*
Trade Openness			0.01	0.01	0.01	0.01	0.01	0.02
			(12.29)*	(11.43)*	(10.01)*	(10.49)*	(8.89)*	(11.29)*
Military in Politics				0.26				
				(4.67)*				
Govt. Stability					0.17			
					(9.64)*			
Investment Profile						0.115		
						(7.72)*		
Democracy							0.17	
							(3.56)*	
Internal conflict								-0.08
								(1.7)***
R	0.32	0.75	0.86	0.87	0.90	0.89	0.86	0.86
F	98.40	159.96	249.58	232.28	314.99	276.19	221.70	210.43
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	216	215	215	215	215	215	215	215

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 6: Corruption and FI: Regional Panel: Alternative Econometrics Techniques

Variables	Dependent Variable: Corruption							
	2SLS				LIML		GMM	
FI	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(-6.93)*	(-7.00)*	(-6.42)*	(-6.31)*	(-6.42)*	(-6.31)*	(-10.63)*	(-11.74)*
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-3.55)**	(-2.90)*	(-2.50)*	(-6.72)*	(-2.50)*	(-6.71)*	(-2.22)**	(-6.81)*
Govt. Spending	-.05	-.03	-.06	-.03	-.06	-.03	-.06	-.03
	(-4.31)*	(-2.81)*	(-5.03)*	(-3.04)*	(-5.03)*	(-3.03)*	(-5.71)*	(-3.32)*
Rule of Law	-0.39	-0.20	-0.28	-0.46	-0.28	-0.46	-0.28	-0.46
	(-7.67)*	(-3.31)*	(-4.91)*	(-10.6)*	(-4.89)*	(-10.6)*	(-5.60)*	(-12.80)*
Open	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(12.00)*	(11.22)*	(8.32)*	(9.65)*	(8.32)*	(9.65)*	(7.72)*	(9.33)*
Military in Politics		0.29						
		(4.87)*						
Democracy			-0.19		-0.20		-0.20	
			(-3.82)*		(-3.83)*		(-3.41)*	
Investment Profile				0.15		0.15		0.15
				(7.37)*		(7.35)*		(6.32)*
R	0.84	0.86	0.86	0.88	0.86	0.89	0.86	0.89
Wald	1079.88	1238.24	1164.03	1534.0	1163.58	1533.53	2037.60	1915.26
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sargan	3.49	3.08	2.62	2.61	2.66	2.65		
	(.06)	(.08)	(0.11)	(0.11)	(0.10)	(0.10)		
Basmann	3.42	2.00	2.55	2.54	2.56	2.55		
	(.06)	(.08)	(0.11)	(0.11)	(0.11)	(0.11)		
Hansen							3.53	1.67
							(0.06)	(0.20)
Observations	197	197	197	197	197	197	197	197

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 7: Corruption and FI: Panel Estimation

Variables	Dependent Variable: Corruption				
FI	-0.001	-0.0004	-0.0004	-0.0005	-0.0004
	(-4.23)*	(-1.68)***	(-2.08)**	(-2.22)**	(-1.94)***
PCY		-0.000	-0.000	-0.000	-0.000
		(-14.77)*	(-10.64)*	(-9.19)*	(-4.69)*
Economic Freedom			-0.20	-0.19	-0.17
			(-7.79)*	(-7.53)*	(-6.72)*
Govt. Spending				-0.033	-0.02
				(-4.29)*	(-3.20)*
Rule of Law					-0.29
					(-7.69)*
R	0.03	0.32	0.38	0.40	0.46
Adj. R	0.01	0.31	0.37	0.39	0.45
F	17.90	121.25	107.79	84.02	86.71
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	545	534	529	515	515

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 8: Corruption and FI: Panel Estimation: Sensitivity Analysis (I)

Variables	Dependent Variable: Corruption							
FI	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004	-0.0003	-0.0005	-0.0005
	(-2.42)*	(-2.35)*	(-2.05)*	(-2.34)*	(-2.41)*	(-2.04)*	(-2.52)*	(-2.39)*
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.62)***	(-2.84)*	(-2.69)*	(-1.81)**	(-2.86)**	(-5.24)**	(-3.34)*	(-2.31)*
Economic Freedom	-0.19	-0.19	-0.12	-0.17	-0.19	-0.11	-0.18	-0.20
	(-8..02)*	(-8.28)*	(-2.93)*	(-6.49)*	(-8.19)*	(-3.89)*	(-7.73)*	(-8.14)*
Rule of Law	-0.34	-0.36	-0.33	-0.32	-0.37	-0.29	-0.36	-0.37
	(-9.13)*	(-10.03)*	(-8.71)*	(-8.09)*	(-9.70)*	(-7.51)*	(-9.63)*	(-9.89)*
Govt. Spending	-0.025							
	(-3.51)*							
Trade Openness		0.003						
		(3.68)*						
Democracy			-0.144					
			(-3.19)*					
Military in Politics				0.08				
				(2.41)*				
Education					0.004			
					(2.27)*			
Remittances						0.018		
						(2.14)**		
Inflation							0.002	
							(4.87)*	
Urbanization								0.000
								(1.16)
R	0.45	0.46	0.46	0.46	0.45	0.49	0.50	0.45
Adj. R	0.42	0.45	0.45	0.45	0.44	0.48	0.49	0.44
F	82.16	85.66	86.52	84.93	77.51	81.52	96.46	83.32
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	545	510	510	519	489	439	495	519

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 9: Corruption and FI: Panel Estimation: Sensitivity Analysis (II)

Variables	Dependent Variable: Corruption							
FI	-0.0004	-0.0004	-0.0004	-0.0004	-0.0005	-0.0005	-0.0005	-0.0004
	(-2.42)*	(-2.09)*	(-1.94)**	(-1.98)**	(-2.40)*	(-2.31)*	(-2.33)*	(-2.17)*
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.62)***	(-2.67)*	(-2.29)*	(-2.21)*	(-4.47)*	(-2.54)*	(-2.37)*	(-2.93)*
Economic Freedom	-0.19	-0.18	-0.22	-0.21	-0.24	-0.18	-0.20	-0.21
	(-8.02)*	(-7.70)*	(-8.88)*	(-8.45)*	(-10.35)*	(-7.04)*	(-8.17)*	(-10.26)*
Rule of Law	-0.34	-0.46	-0.47	-0.39	-0.43	-0.35	-0.37	-0.42
	(-9.13)*	(-11.78)*	(-9.89)*	(-9.94)*	(-11.84)*	(-9.26)*	(-9.12)*	(-12.34)*
Govt. Spending	-0.025							
	(-3.51)*							
Government Stability		0.13						
		(6.15)*						
Internal Conflict			0.085					
			(3.52)*					
External Conflict				0.045				
				(1.97)**				
Investment Profile					0.168			
					(7.66)*			
Religion in Politics						-0.065		
						(-1.98)**		
Ethno linguistic							0.002	
							(4.87)*	
yr1994								-0.07
								(-0.61)
yr1999								0.323
								(2.74)*
yr2004								0.84
								(7.46)*
yr2007								1.16
								(10.42)*
R	0.45	0.49	0.46	0.46	0.50	0.46	0.45	0.60
Adj. R	0.42	0.48	0.45	0.45	0.50	0.45	0.44	0.59
F	82.16	96.52	87.31	84.93	77.51	84.25	82.87	95.01
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	505	519	519	519	519	519	519	519

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 10: Corruption and FI: Panel Estimation: Random Effects (I)

Variables	Dependent Variable: Corruption							
FI	-0.0002	-0.0002	-0.0002	-0.0002	-0.0003	-0.0002	-0.0003	-0.0002
	(-1.89)**	(-1.91)**	(-1.71)***	(-1.62)***	(-3.24)*	(-1.70)***	(-2.40)*	(-2.03)**
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-3.15)*	(-3.92)*	(-4.21)*	(-3.58)*	(-5.06)*	(-4.62)**	(-3.99)*	(-4.02)*
Economic Freedom	-0.10	-0.10	-0.08	-0.07	-0.15	-0.06	-0.08	-0.10
	(-2.81)*	(-2.85)*	(-1.71)***	(-1.85)***	(-4.12)***	(-1.83)*	(-2.29)*	(-2.84)*
Rule of Law	-0.24	-0.26	-0.23	-0.19	-0.27	-0.26	-0.24	-0.24
	(-6.26)*	(-6.63)*	(-5.67)*	(-4.59)*	(-6.58)*	(-6.13)*	(-6.39)*	(-6.19)*
Govt. Spending	-0.033							
	(-3.88)*							
Trade Openness		0.005						
		(3.12)*						
Democracy			-0.05					
			(-1.03)					
Military in Politics				0.10				
				(2.93)*				
Education					0.01			
					(4.85)*			
Remittances						0.02		
						(2.22)**		
Inflation							0.0001	
							(1.26)	
Urbanization								0.000
								(2.66)*
RB	0.58	0.56	0.63	0.60	0.58	0.66	0.61	0.59
RO	0.45	0.45	0.46	0.45	0.43	0.51	0.48	0.45
Wald	148.99	140.81	147.68	143.65	147.72	166.15	132.94	127.07
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	515	520	529	529	499	439	503	529

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 11: Corruption and FI: Panel Estimation: Random Effects (II)

Variables	Dependent Variable: Corruption							
FI	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0003	-0.0002	-0.0002
	(-2.26)**	(-1.93)**	(-1.80)**	(-2.63)*	(-2.64)*	(-3.39)*	(-2.58)*	(-2.56)*
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-5.91)*	(-4.08)*	(-3.99)*	(-5.35)*	(-5.39)*	(-5.19)*	(-5.34)*	(-3.02)*
Economic Freedom	-0.17	-0.09	-0.10	-0.15	-0.15	-0.17	-0.16	-0.13
	(-5.55)*	(-2.52)*	(-3.03)*	(-5.29)*	(-5.49)*	(-5.96)*	(-5.70)*	(-4.06)*
Rule of Law	-0.31	-0.21	-0.24	-0.26	-0.28	-0.22	-0.29	-0.26
	(-8.67)*	(-5.16)*	(-5.62)*	(-5.85)*	(-7.75)*	(-5.83)*	(-8.18)*	(-6.70)*
Investment Profiles	0.17							
	(9.91*							
Religion in Politics		-0.09						
		(-2.48)*						
Ethno linguistic			0.01					
			(0.22)					
Internal Conflict				-.02				
				(-0.76)				
External Conflict					-.01			
					(-0.42)			
Government Stability						-0.14		
						(-5.03)*		
yr1994				-0.09	-0.08	-0.11	-0.09	-0.10
				(-0.76)	(-0.65)	(-1.07)	(-0.81)	(-0.92)
yr1999				0.15	0.15	0.33	0.13	.081
				(1.42)	(1.20)	(3.38)	(1.22)	(0.76)
yr2004				0.68	0.68	1.14	0.66	0.62
				(6.59)*	(6.81)*	(9.63)*	(6.48)*	(6.03)*
yr2007				1.02	1.01	1.38	0.99	0.94
				(9.61)*	(8.79)*	(12.55)*	(9.79)*	(9.07)*
East Asia & Pacific								0.77
								(2.59)*
Europe & Central Asia								0.95
								(3.32)*
Lat America & Caribbean								0.83
								(2.63)*
Middle East & North Africa								0.79
								(2.75)*
South Asia								0.96
								(2.56)*
Sub-Saharan Africa								0.68
								(2.28)**
Europe								0.05
								(0.19)
RB	0.61	0.60	0.61	0.68	0.68	0.68	0.68	0.71
RO	0.49	0.45	0.45	0.58	0.58	0.60	0.58	0.61
F	271.48	136.63	130.78	473.78	474.86	569.36	474.65	761.47
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	529	529	529	529	529	529	529	529

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 12: Corruption and FI: Panel Estimation (System GMM)

Variables	Dependent Variable: Corruption						
FI	-0.0004 (-4.78)*	-0.0004 (-5.37)*	-0.0004 (-5.37)*	-0.0004 (-4.96)*	-0.0004 (-5.27)*	-0.0004 (-5.52)*	-0.0004 (-5.36)*
PCY	-0.000 (-4.26)*	-0.000 (-4.07)*	-0.000 (-4.41)*	-0.000 (-4.22)*	-0.000 (-4.87)*	-0.000 (-4.28)*	-0.000 (-3.99)*
Economic Freedom	-0.15 (-5.41)*	-0.16 (-5.25)*	-0.16 (-5.43)*	-0.13 (-3.63)*	-0.14 (-4.72)*	-0.15 (-5.04)*	-0.17 (-5.45)*
Rule of Law	-0.34 (-6.83)*	-0.32 (-6.17)*	-0.31 (-6.44)*	-0.29 (-5.50)*	-0.29 (-4.85)*	-0.32 (-6.31)*	-0.29 (-5.81)*
Inflation	0.0001 (3.15)*	0.0001 (3.04)*	0.0001 (3.54)*	0.0001 (3.24)*	0.0001 (1.83)***	0.0001 (3.28)*	0.0001 (3.38)*
Trade Openness		0.001 (0.60)					
Government Spending			-0.012 (-1.12)				
Military in Politics				0.08 (2.08)**			
Internal Conflict					-.03 (-1.22)		
External Conflict						-.03 (-1.12)	
Government Stability							-.09 (-2.79)*
Yr1994	-0.11 (-1.75)***	-0.18 (-2.89)*	-0.16 (-2.42)*	-0.11 (-1.80)***	-0.12 (-1.82)***	-0.08 (-1.12)***	-0.13 (-1.85)***
Yr1999	0.15 (1.36)	0.07 (0.58)	0.09 (0.74)	0.13 (1.11)	0.18 (1.60)***	0.21 (1.61)***	0.29 (2.87)*
Yr2004	0.67 (5.14)*	0.62 (4.57)*	0.61 (4.54)*	0.67 (5.01)*	0.71 (5.21)*	0.70 (4.89)*	0.97 (6.74)*
Yr2007	1.03 (7.98)*	0.95 (6.95)*	0.97 (7.25)*	1.02 (8.11)*	1.07 (7.86)*	1.04 (7.29)*	1.26 (9.23)*
Over id	70.42 (0.07)	80.45 (0.07)	79.08 (0.08)	80.12 (0.07)	76.58 (0.12)	79.69 (0.08)	79.94 (0.11)
Hansen dif	18.52 (0.42)	20.27 (0.50)	18.05 (0.65)	23.27 (0.33)	23.47 (0.32)	24.46 (0.27)	20.40 (0.50)
No of groups	116	116	116	116	116	116	116
No of Instruments	64	74	74	74	74	74	74
Wald	403.02 (0.000)	381.87 (0.000)	458.78 (0.000)	415.32 (0.000)	408.26 (0.000)	402.76 (0.000)	404.95 (0.000)
AR1	0.36	0.31	0.24	0.46	0.31	0.38	0.83
AR2	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Observations	503	494	490	503	503	503	503

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 13: Corruption and FI: CS Estimation: Developing Countries

Variables	Dependent Variable: Corruption					
FI	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-2.31)*	(-2.67)*	(-2.88)*	(-2.99)*	(-2.90)*	(-3.06)*
PCY		-0.000	-0.000	-0.000	-0.000	-0.000
		(-3.05)*	(-1.65)***	(-0.86)	(-0.94)	(-0.65)
Economic Freedom			-0.13	-0.12	-0.12	-0.14
			(-2.47)*	(-2.53)*	(-2.67)*	(-3.02)*
Govt. Spending			-0.03	-0.01	-0.03	-.04
			(2.39)*	(-1.71)***	(-2.22)**	(-2.59)*
Rule of Law				-0.21	-0.17	-0.20
				(-2.47)*	(-2.00)**	(-2.44)*
Inflation					0.001	0.001
					(2.62)*	(3.18)*
Trade Openness						0.001
						(2.00)**
R	0.03	0.11	0.20	0.26	0.32	0.36
F	5.36	6.40	4.95	5.50	8.34	10.21
	(0.023)	(0.003)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	93	92	90	90	89	89

Table 14: Corruption and FI: CS Estimation: Non-linearity

Variables	Dependent Variable: Corruption Index by TI		Dependent Variable: Corruption Index by WB		Dependent Variable: Corruption Index by ICRG	
FI	-0.018	-0.014	-0.008	-0.006	-0.006	-0.004
	(-4.91)*	(-4.04)*	(-4.93)*	(-4.00)*	(-2.30)**	(-1.41)
PCY	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-10.77)*	(-9.04)*	(-9.64)*	(-7.84)*	(-5.20)*	(-3.63)*
Economic Freedom	-0.26	-0.26	-0.16	-0.17	-0.25	-0.26
	(-4.42)*	(-4.86)*	(-6.40)*	(-7.25)*	(-6.29)*	(-6.85)*
Govt. Spending	-.03	-.009	-.015	-.003	-.001	-.015
	(-1.60)***	(-0.52)	(-1.86)***	(-0.45)	(-0.07)	(-1.22)
Rule of Law		-0.34		-0.19		-0.24
		(-3.66)*		(-4.53)*		(-3.56)*
FI Square	0.000	0.000	0.000	0.000	0.000	0.000
	(4.22)*	(3.67)*	(4.16)*	(3.58)*	(2.20)**	(1.60)
R	0.82	0.84	0.82	0.85	0.61	0.66
F	96.47	91.96	100.37	101.87	35.30	34.66
	(0.000)	0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	113	113	116	116	116	116

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 15: Corruption and FI: Panel Estimation: Excluding Outliers

Variables	Full Sample	Corruption Index > 1		Corruption Index < 5	
FI	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004
	(-2.42)*	(-2.49)*	(-2.18)*	(-1.86)***	(-1.92)**
PCY	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.62)***	(-1.01)	(-3.00)*	(-6.04)**	(-5.61)**
Economic Freedom	-0.19	-0.11	-0.07	-0.14	-0.13
	(-8..02)*	(-4.92)*	(-2.43)*	(-5.95)*	(-5.20)*
Rule of Law	-0.34	-0.24	-0.21	-0.23	-0.22
	(-9.13)*	(-7.15)*	(-5.40)*	(-6.32)*	(-5.60)*
Govt. Spending	-0.025	-.013	-.02	-.02	-.02
	(-3.51)*	(-2.06)**	(-2.21)**	(-2.80)*	(-3.56)*
Trade Openness			0.001		0.004
			(1.05)		(4.39)*
Military in Politics			0.07		0.05
			(2.11)**		(1.6)***
Education			0.005		
			(2.70)**		
Remittances			0.01		
			(1.74)***		
R	0.45	0.25	0.29	0.45	0.47
Adj. R	0.42	0.24	0.27	0.44	0.46
F	82.16	30.76	16.60	77.84	60.43
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	545	467	368	487	484

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 16: Corruption and FI: A Spatial Analysis

Variables	Dependent Variable: Corruption					
SWC2	0.56	0.30	0.20	0.19	0.25	0.2
	(3.43)*	(1.91)**	(1.67)***	(1.60)***	(2.04)**	(1.70)***
FI		-.001	-.001	-.001	-.001	-.001
		(-2.20)**	(-2.94)*	(-2.96)*	(-2.06)**	(-2.87)*
PCY		-0.000	-0.000	-0.000	-0.000	-0.000
		(-5.35)*	(-2.13)**	(-2.06)**	(-1.20)	(-1.95)**
Economic Freedom			-0.18	-0.18	-0.11	-0.17
			(-4.35)*	(-4.38)*	(-2.76)*	(-4.28)*
Rule of law			-0.34	-0.32	-0.23	-0.37
			(-4.52)*	(-4.04)*	(-3.00)*	(-5.50)*
Government spending			-0.009			
			(-0.84)			
Bureaucracy quality					-0.37	
					(-3.77)*	
British Colony						-0.15
						(-1.19)
R	0.08	0.47	0.64	0.64	0.68	0.66
F	12.08	25.78	38.35	32.10	37.67	31.61
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	140	120	118	117	118	115

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Table 17: Corruption and Contagion: A spatial analysis with different lag lengths

Variables	SWC(99-03)	SWC(94-98)	SWC(89-93)	SWC(84-88)
SWC	0.21	0.19	0.19	0.19
	(2.31)*	(2.41)*	(2.43)*	(2.42)*
PCY	-0.000	-0.000	-0.000	-0.000
	(-2.33)*	(-1.26)	(-1.26)	(-0.25)
Democracy	-0.21	-0.25	-0.16	-0.27
	(-3.89)	(-4.77)*	(-2.43)*	(-5.26)*
Bureaucracy	-0.30	-0.24	-0.26	-0.21
Quality	(-3.18)*	(-2.72)*	(-5.0)*	(-2.35)*
Rule of Law	-0.24	-0.35	-0.36	-0.41
	(-3.69)*	(-5.36)*	(-5.41)*	(-6.15)*
R	0.76	0.80	0.80	0.81
Adj. R	0.75	0.79	0.79	0.80
F	79.40	94.56	95.78	96.91
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	134	125	123	117

*, **, and *** denote statistically significant at the 1 %, 5%, and 10% levels, respectively.

Appendix

Table 1: Description of Variables

Variables	Definitions	Sources
Per capita real GDP	GDP per capita (constant 2000 US$).	World Bank database World Bank (2008)
Credit as % of GDP	Credit as % of GDP represents claims on the non-financial private sector.	World Bank database, World Bank (2008)
M2 as % of GDP	It represents Broad money (money and quasi money).	World Bank database, World Bank (2008)
Financial Intermediation (FI)	The level of Financial Intermediation is determined by adding M2 as a % of GDP and credit to private sector as % of GDP.	World Bank database, World Bank (2008)
Trade Openness	It is the sum of exports and imports as a share of real GDP.	World Bank database, World Bank (2008)
Corruption	ICRG index 0-6 scale; where 6 indicate high degree of corruption and 0 indicate no corruption.	International Country Risk Guide, PRS group.
Corruption	Transparency International corruption index rescaled from 0 (absence of corruption) to 10 (highest corruption).	Transparency International.
Corruption	World Bank corruption index rescaled from -2.5 (absence of corruption) to 2.5 (highest corruption).	World Bank.
Democracy	ICRG index 0-6 scale; where 6 indicate high degree of democracy.	International Country Risk Guide, PRS group.
Military in Politics	ICRG index 0-6 scale; higher risk ratings (6) indicate a greater degree of military participation in politics and a higher level of political risk.	International Country Risk Guide, PRS group.
Religion in Politics	ICRG index 0-6 scale: higher ratings are given to countries where religious tensions are minimal.	International Country Risk Guide, PRS group.
Ethnic Tensions	ICRG index 0-6 scale; higher ratings are given to countries where tensions are minimal.	International Country Risk Guide, PRS group.
Rule of Law	ICRG index 0-6 scale; where 6 indicate high degree of law and order.	International Country Risk Guide, PRS group.
Bureaucracy Quality	ICRG index 0-4 scale; where 4 indicate high degree of law and order.	International Country Risk Guide, PRS group.
Government Stability	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	International Country Risk Guide, PRS group.
Socioeconomic Conditions	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	International Country Risk Guide, PRS group.
Investment Profiles	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	International Country Risk Guide, PRS group.
Internal Conflict	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	International Country Risk Guide, PRS group.
External Conflict	ICRG index 0-12 scale; where 0 indicates very high risk and 12 indicates very low risk.	International Country Risk Guide, PRS group.
Economic Freedom	Freedom House data. index rescaled 0 (low economic freedom)-7 (high economic freedom)	Fraser Institute.
Inflation	Inflation, consumer prices (annual %)	World Bank database, World Bank (2008)
Government Spending	General government final consumption expenditure (% of GDP)	World Bank database, World Bank (2008)
Remittances	Workers' remittances and compensation of employees, received (% of GDP)	World Bank database, World Bank (2008)
Military Spending	Military expenditure (% of GDP)	World Bank database, World Bank (2008)
Arm Trade	Arms exports plus arms imports (constant 1990 US$)	World Bank database, World Bank (2008)
Education	The secondary school enrollment as % of age group is at the beginning of the period.	World Bank database, World Bank (2008)
Urbanization	Urban Population	World Bank database, World Bank (2008)
British Colony	A dummy variable that is 1 for British Colony	http://flagspot.net/flags/gb-colon.html

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