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Corruption, banking sector, and stock market development: A panel data analysis[1]

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Abstract

Studying the relation between corruption and financial factors and examining its consequences for financial system have attracted many researchers in recent years. This study examines the role of corruption and banking sector development on stock market development using a panel data of 42 emerging economies for the period 1996 to 2011. Our findings suggest that there exists a negative relation between level of corruption and financial system improvement. We observe a positive relation between banking sector development and stock market development in emerging market countries. This article also shows that macroeconomic factors such as income level, interest rate, private capital flows, stock market liquidity, investment and inflation are important determinants of stock market development in emerging market countries. In this study, effects of corruption level on stock market is examined and also it is examined that how banking sector reacting to the changes at corruption level. For this purpose corruption level and sector development indicator are integrated and added to the model. This helps us not only to examine corruption level or banking sector development on stock market, but also examine the effect of these two variables together. A strong negative relationship between interaction term and stock market development is found. This result shows that devastating effects of corruption in these countries is more important than the positive effects of the development of the banking sector. The finding also indicates even though the banking sector is developed, the level of corruption effect adversely stock market development. The results are generally in agreement with the theoretical and empirical literature.
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Keywords: Stock market, corruption, banking, panel data;

1. Introduction

As an integral part of financial development, stock markets have received over the last decade. There is a general consensus among scholars that stock market plays an important role in the development of an economy (Hearn and Piesse, 2010; Levine and Zervos, 1998). Since the seminal work of McKinnon (1973) research has emphasized the significant role of capital markets. For instance, it accelerates economic growth by enhancing mobilization of domestic and foreign resources and facilitating investment (Bencivenga et al., 1996) and reduces reliance on bank finance which is susceptible to interest rate fluctuations as well as providing a channel for foreign capital inflows (Yartey, 2008). The development of stock markets is crucial toward further development of the financial system. The stock market increases flexibility in the financial intermediation process, as it provides investors with a clear exit strategy (Cherif and Gazdar, 2010). Stock markets thanks to these functions serve as a bridge the gap between

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economic activity and financing. Thus, stock markets development plays a crucial role for the global economy and finance. This link between finance and the economy have been studied in the work done. In general, a well-functioning stock market is seen as the key elements of the financial sector and stock market development plays a critical role in achieving sustainable economic growth is claimed in the studies.

The consequences of corruption[†] (Mauro, 1995) have been a hot issue that has attracted many academics as well as many policymakers. The main focus has been placed upon corruption's impact on economic growth; numerous studies have investigated the channels through which various economic forces such as private investment, public expenditure, and other factors affect economic growth (Shleifer and Vishny, 1993; Mauro, 1995). However, the description of the relationship between corruption and stock market development has mainly relied on anecdotal evidence, and very little academic effort has been made so far. The aim of this study is to provide rigorous empirical evidence of the impact of corruption on stock market development. We also examine the impact of interaction effect between corruption and banking sector development on stock market development. If our arguments are supported by empirical results, this paper may contribute to existing literature in one important way. This study is the first to use the interaction effect between corruption and banking sector development on stock market development.

2. Literature Review

Although there are numerous studies examining relationship between stock market development and economic growth, studies on relationship between corruption stock market development have increased rapidly. Some of these studies reported a negative relation between corruption and country wealth factors like GDP indicating that the higher level of corruption, the higher the level of poverty (Svensson, 2005). A number of empirical studies examine the effects of corruption on financial markets. Asset prices are determined based on future cash flows; therefore, they are good measures for evaluating the cost of corruption from the investors' points of view (Ciocchini et al, 2003). Ahlin and Pang (2008) reported that low corruption and stock market development both facilitate the undertaking of productive projects and consequently lead to higher economic growth. These findings indicate that corruption control and stock market development are substitutes rather than complements. Recently, Yartey (2010) and Cherif and Gazadar (2010) found there is a negative relationship between corruption and stock market development. More recent work by Bolgorian (2011) suggests that there exists power-law dependence between corruption and stock market development.

3. Methodology and the Data

We use panel regressions to examine the effect of corruption and banking sector development on stock market development. The use of panel data analysis provide some advantages due to the use of time-series and cross sectional analysis, data quality, and increasing the amount of analyst, compared to the situation in the methods used to separate, allowing you greater flexibility (Baltagi, 2005). The models are as follows:

Model 1a:
$$MARKET_{it}=\alpha_t+\beta_1 COR_{it}+\beta_2 CAPITAL_{it}+\beta_3 BANK_{it}+\beta_4 INF_{it}+\beta_5 M2_{it}+\beta_6 GSYH_{it}+\beta_7 GSYT_{it}+\beta_8 FDI_{it}+_9 RF_{it}+u_{it}+\varepsilon_i \quad eq.(1)$$

Model 1b:
$$MARKET_{it}=\alpha_t+\beta_1 INT_{it}+\beta_2 CAPITAL_{it}+\beta_3 INF_{it}+\beta_4 M2_{it}+\beta_5 GSYH_{it}+\beta_6 GSYT_{it}+\beta_7 FDI_{it}+\beta_8 RF_{it}+u_{it}+\varepsilon_i \quad eq. (2)$$

Where subscripts i and t indicate country and time period, respectively. Where *MARKET* is stock market capitalization relative to the gross domestic product (GDP), *COR* is corruption index, *CAPITAL* is bank capital to assets ratio (%), *BANK* is domestic credit provided by banking sector (% of GDP), *INF* is inflation rate measured by

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[†] Among many definitions of corruption, this definition seems to focus on political corruption–corruption of a political system where public officials seek illegitimate personal gain through actions (Park, 2012).

rate of change in the consumer price index, *M2* is money and quasi money as a percentage of GDP, *GSYH* is growth rate defined as the rate of change in the gross domestic product, *GSYT* is gross savings as a percentage of GDP, *FDI* is foreign direct investment (net inflows) as a percentage of GDP, *RF* is real interest rate (%), *INT* is interaction effect term between corruption (*COR*) and banking sector development *(BANK)*. In this study 33 advanced economies examined by using panel data analysis method between 1996-2011 periods annually. All data was obtained from World development indicators (WDI), except for Corruption Perception Index. Corruption Perception Index (CPI) was get from Transparency International. The dependent variable of interest is stock market development.

Banking sector development: banking sector is important in the economic development and more so in the development of stock market because it affords investors with liquidity by advancing credit, and facilitating savings (Kemboi and Tarus, 2012: 60). Nacuer et al., (2007), Garcia and Liu (1999) and Yartey (2008) found support to a positive relationship between banking sector development and stock market development. This variable is added the model to understand the role of the development of the banking sector in the development of stock market. Private credit captures the amount of external resources channeled through the banking sector to private firms. With the development of the banking sector, based on the idea of investments will be channeled into productive areas, we expect credit to the private sector to be positively correlated with stock market capitalization.

Corruption: A concise and roughly precise definition of corruption is the misuse of public office in order to gain private benefit. Corruption around the world is believed to be endemic and pervasive and a significant contributor to low economic growth, to stifle investment, to inhibit the provision of public services and to increase inequality to such an extent that international organizations like World Bank have identified corruption as 'the single greatest obstacle to economic and social development' (Bolgorian, 2011). Although corruption is a variable that cannot be measured directly, in recent years, some organizations have provided corruption indices across a wide range of countries to qualitatively assess the level of corruption. One of the most renowned indices is the Corruption Perception Index (CPI) published by Transparency International. This index is an aggregate indicator that classifies countries based on the degree to which corruption is perceived to exist among politicians and public authorities. Similarly, fighting corruption is high on the policy agenda of many international organizations as well as governments in both developing and developed countries (Nguyen and Dijk, 2012). Following the Park (2012), we define a corruption index (CI) as shown below so that a high CI means a high level of corruption. Note that CPI scores range from 0 to 10 and a higher score represents a lower level of corruption:

Corruption index (COR) = 10 – CPI

Interaction term: In this study, effects of corruption level on stock market is examined and also it is examined that how banking sector reacting to the changes at corruption level. For this purpose Corruption level (COR) and sector development indicator (BANK) are integrated and added to the model. This helps us not only to examine corruption level or banking sector development on stock market, but also examine the effect of these two variables together. The corruption affecting a bank's performance could arise for several reasons: firms may bribe politicians (to secure loans by bypassing the loan review processes), banks may bribe politicians (to gain regulatory forbearance), and corruption that affect bank performance.). One possible result will be the misallocation of loanable funds from normal projects to bad projects, which typically ends up with an increase of non-performing loans. Increasing the amount of bad loans may lead to the reduction in the productivity of private investment (Park, 2012). Corruption may adversely effects banking sector development.

4. Empirical Results

Table 1 provides descriptive statistics of all variables. During the entire period 1996–2011, the mean, min and max value of *MARKET* is 84.4, 3.1 and 606, respectively. This situation shows that some countries have the highly developed stock markets, but the other countries have less developed stock market. As can be seen from Table 1;

COR is the mean value of 2.68 and the highest and lowest values are 6.9, 0, respectively. It is possible to say that the countries have average corruption index values.

Table 1-Descriptive statistics

Variables	Obs.	mean	Std. deviation	Min.	Max.
MARKET	560	84.381	77.455	3.134	606.001
COR	450	2.679	1.820	0	6.9
CAPITAL	450	6.469	2.206	2.7	14.4
BANK	540	130.697	59.964	31.880	340.926
INF	560	2.567	2.230	-4.479	16.897
M2	512	127.675	93.499	34.236	669.880
GSYH	560	2.965	3.118	-8.538	14.763
GSYT	542	23.819	8.509	0.013	53.355
FDI	542	5.323	13.411	-161.240	172.715
RF	450	3.822	3.032	0.01	16.25

Table 2 reports the empirical results from our estimations of stock market development, modeled by (eq. 1) and (eq. 2). All coefficients on variables have expected signs. The results of the entire model (Model 1a, b) are parallel to a large extent.

Table 2-Estimation Results

Variables	Model 1 a	Model 1b
CAPITAL	2.07** (0.039)	2.36** (0.018)
M2	4.55*** (0.000)	5.49*** (0.000)
INF	-0,07** (0.048)	-0.16** (0.070)
RF	-1.24** (0.016)	-1.25** (0.012)
GSYH	2.33** (0.020)	2.20** (0.028)
GSYT	2.52** (0.012)	3.13*** (0.002)
FDI	4.20*** (0.000)	4.19*** (0.000)
COR	-4.22*** (0.000)	
BANK	2.62*** (0.009)	

INT		-4.29***
		(0.000)
fixed	0.28	-1.77*
	(0.780)	(0.076)
R^2	0.35	0.31
Observations	450	450
Groups	33	33
Hausman test	12.91	3.33
Hausman probability	0.1667	0.9123
Wald test	111.17	112.51
F test probability	0.0000	0.0000
F value	8.05	12.37
Prob>F	0.0000	0.0000
Durbın-Watson	2.043	1.99
Baltagi-Wu Lbi	2.362	2.24

*, ** and *** indicate the coefficient significant at the 10, 5 and 1% levels, respectively.

The presence of autocorrelation in the model has been controlled by Durbin-Watson and Baltagi-Wu Lbi test statistics. Autocorrelation in the models were not found. Hausman test statistic was used for the selection of the appropriate model. Hausman test statistic value of each of the two models is greater than 0.05. Thus, was selected as a appropriate model for the random effects estimator.

5. Conclusion

The purpose of this paper is to focus on the role of corruption and banking sector development on stock market development. Results are presented following. The result shows that financial intermediary development in a country increase stock market development, implying that increase in the share of capital in the banking sector and the increase in monetary aggregate positive effect on the development of the stock market. The coefficient on inflation rate and real interest rate are negative meaning that decrease in the rate of inflation and interest rates effect the development of stock markets a the positive direction. Savings and income level enter with positive and significant signs in the stock market development regression implying that savings suggests that increase savings in these countries more capital transferred to in need of companies through the stock market. Foreign investment has positive signs in the regressions. The finding suggests that an increase in a foreign direct investment level influences stock market development a positively direction. It can be said that an increase in informational and operational efficiency in these countries and thus the establishment of confidence in the local markets. The coefficient on credit to private sector is positive meaning that an increase credit to the private sector has a positive impact on the development of stock markets.

The results for stock market development model show that corruption level is significantly and negatively associated with stock market development. The finding suggests that an increase in corruption level, known as one of the major obstacles to the development of countries, adverse effect on the development of the stock markets due to the spread of abuse in the markets. Thus, it can be said increase in the level of corruption in a country that not only an obstacle to the country's development, but also an obstacle to the development of stock markets.

In this study, effects of corruption level on stock market is examined and also it is examined that how banking sector reacting to the changes at corruption level. For this purpose corruption level and sector development indicator are integrated and added to the model. This helps us not only to examine corruption level or banking sector development on stock market, but also examine the effect of these two variables together. A strong negative

relationship between interaction term and stock market development is found. This result shows that devastating effects of corruption in these countries is more important than the positive effects of the development of the banking sector. The finding also indicates even though the banking sector is developed, the level of corruption effect adversely stock market development. This paper may contribute to existing literature in one important way. This study is the first to use the interaction effect between corruption and banking sector development on stock market development. The results are generally in agreement with the theoretical and empirical literature. From this point, the policy-makers instead of focus on the development of the banking sector, by making adjustments towards decrease of corruption level is recommended to improve institutional quality. Increased institutional quality brings about the development of the stock market.

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