

Does Corruption Matter for Stock Markets? The Role of Heterogeneous Institutions.

Geeta Lakshmi, Shrabani Saha, and Keshab Bhattacharai¹

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Highlights of the paper -1

- Corruption is a set of immoral, illegal and criminal activities; spreads like a Corona-virus to all sections of national and global economies.
- Higher stock-returns (SR) are magnets for investment but it is unclear whether corruption lowers SR, thus, weakens stock markets.
- We explore whether institutions (Democratic accountability, Bureaucratic quality and Law and order) improve efficiency of stock markets by combating potential corruptions.
- Impacts of corruption on BRIC countries' SR are assessed with panel regressions and extreme bound analyses using monthly data during 1995-2014.
- While stronger institutions enhance stock returns, but corruption shows the opposite effect, sand on the wheel of the economic system
- The interaction of corruption with institutions illustrates some surprising positive effects, greasing the wheel of the rusty economy.
- In addition, co-movements with global and emerging markets show inverse and direct complimentary effects on SR, respectively, providing diversification opportunities.

Highlights of the paper-2

- Previous studies spotlight the macro impacts of corruption on economic growth; our study extends it to stock market returns.
- This helps to determine micro components of economic growth and to assess the role of institutions in it.
- We examine whether a higher level of corruption in a country lowers stock returns.
- Institutional heterogeneity matters; their qualities interact with corruption producing mixed effects
- High standards of Democracy and Bureaucracy can improve business practices and increase returns by reducing red tape.
- Law and order is distorted by corruption, and consequently lowers stock returns.
- Policies that combat corruption are flawed if they ignore individual attributes.

Research objectives and contributions of this paper

- Aims and objectives

- Does corruption influence stock returns (SR)?
- how do the qualities of institutions interact with corruption in determining returns on stocks?
- Qualities of institutions impact on ease of doing business and SR. Yartey (2008); Acemoglu and Verdier, 2000); Blau 2017
- Context: Emerging Markets deregulating their stock market and attracting FDI
- BRIC countries growing, but CORR is high and heterogeneous in democratic accountability (DA), law and order (LO), bureaucratic quality (BQ); (Granovetter, 1992; Rose-Ackerman, 2000)

- Contribution of the paper

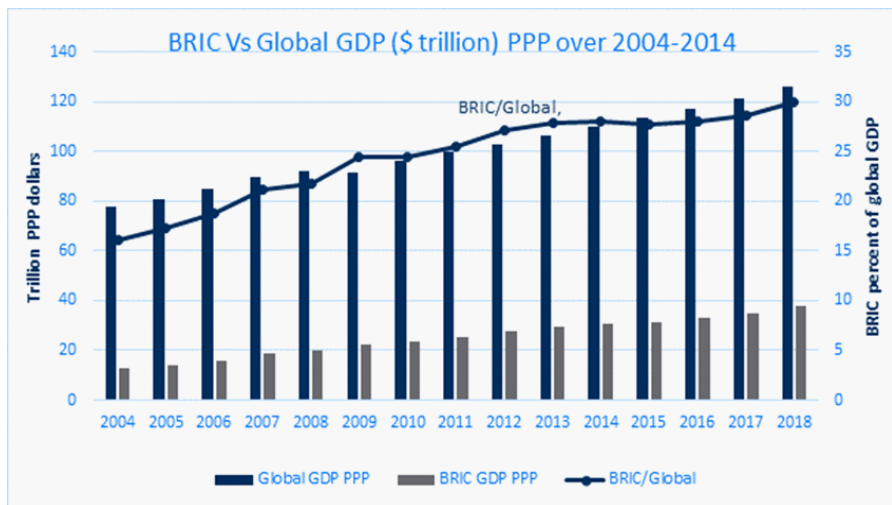
- First, we examine the independent impact of corruption and other country-level institutional variables on BRICs' stock returns, while controlling for global and emerging markets' returns.
- Second, we analyze heterogeneous institutions to identify which dimension of institutions supports the smooth functioning of stock markets

BRICS role in the global economy

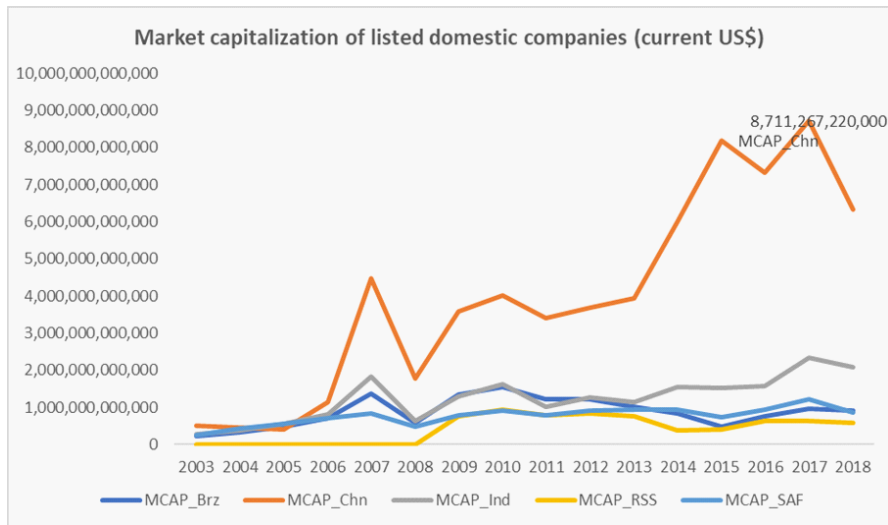
BRIC (Brazil, Russia, India and China)

- 40% of the world's population, $> 25\%$ of the world's land,
- around 23% of global GDP, and a growing share of foreign direct investment flows.
- Estimates by the International Monetary Fund (IMF) predict that BRIC nations will account for over 50% of global GDP by 2030.
- Measures and actions vary:
 - demonetization measures and GST implementation in India in 2017;
 - Anti-Graft Bill in China,
 - the Clean Company Act/ Operation Car Wash in Brazil in 2014 and
 - the National Anti-Corruption Strategy in Russia in 2010
- Since the practice and impact of corruption is secretive, non-systematic and illegal, expectations about investment flows can either positively or negatively impact SR.
- Heterogenous investors will perceive distorted signals because the effects of corruption are unpredictable.
- Unclear what effect would high corruption have on BRIC SR.

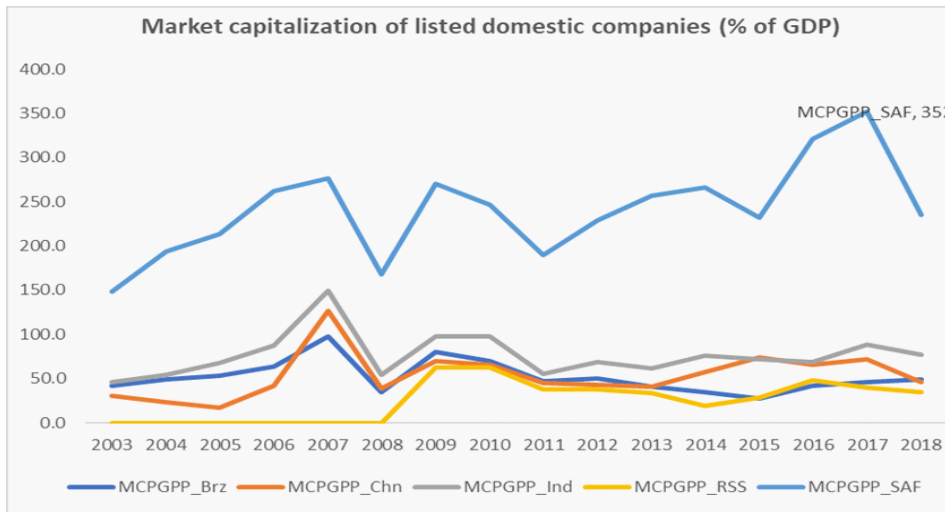
BRIC and global GDP (\$ trillion PPP): absolute and relative comparison



Market capitalization of listed domestic companies (current US\$)

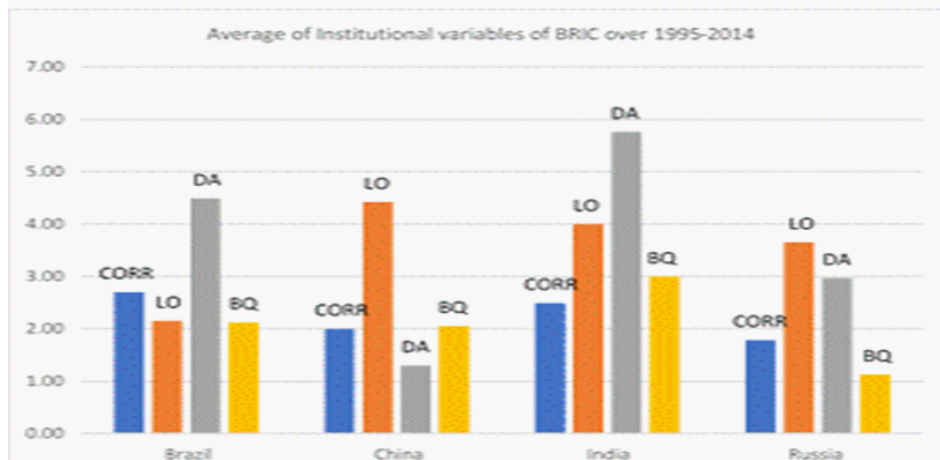


Market capitalisation of listed domestic companies in BRICS countries as percent of GDP (%)



Average of Institutional variables of BRIC over 1995-2014

Figure 3. Average of Indicators of Institutional Variables in BRICs



Source: Authors' calculation

Corruption can hinder Economic Activity (sand in the wheels)

Literature: Impacts of Corruption are Unclear

Corruption is all pervasive, hidden and normalized in some cultures –Bardhan (1997) ;Shleifer and Vishny (1993).

- Corruption can hinder Economic Activity (sand in the wheels)
 - Distorted perceived signals due to imperfect and hidden information and heterogeneity of interests. Negative relationship between the quality of governance and SR (Low et al. 2011, Hooper et al, 2009) due to added risk.
 - Secret tax on production inputs, increasing costs and uncertainty, reducing investment activity, profits and the impetus to reinvest (Fisman and Svensson 2007; Farooq et al., 2013; Vu et al. 2018).
 - Reduces foreign direct investment inflows (Jadhav and Katti, 2012) by dissuading potential foreign participation in joint ventures.
 - Corruption could also be a hurdle for meritorious participants in the investment sector (Acemoglu and Verdier, 1998), eroding reputation, culture, innovation and critical resources (Paunov, 2016; Vu et al., 2018).

Corruption can grease the wheels of growth and activities

- Corruption can grease the wheels of growth and activities
- Corruption oils the wheels of investment in the presence of high growth possibilities and imperfect institutions (Huntington, 1968)
- A lack of smoothly functioning institutions might encourage corruption growth (Méon and Weill, 2005; Méon and Sekkat, 2005; Rose-Ackerman and Truex, 2012) but can hasten mandatory business practices such as licensing processes (Leff, 1964; Lui, 1985)
- Legal compliance can act as costly and time-consuming barriers in starting investment ventures for legitimate but small entrepreneurs (De Soto, 1989).
- Political influence at selective times in boardrooms and crony capitalism may encourage market control for private investors (Bernardi et al. 2005)
- Access to political power boosts private sector investment growth even in less corrupt countries like Denmark (Amore and Bennedsen, 2013) but more so where corruption is high (Faccio, 2006).
- Helping hand and long-run stimulus for foreign direct investment (Egger and

Institutions: Corruption, Democratic Accountability and SR

- Impact of DA on stock markets is mixed and inconclusive (Tavares and Wacziarg, 2001).
- Positive effects -Yartey (2008) finds a significantly positive relationship between stock market development and democracy. In a study related to African countries, the beneficial effects of democracy on financial sector development by Asongu and Nwachukwu (2018). Similarly, Boadi and Amegbe (2017) note that higher democracy boosts equity performance in international markets.
- Biswas and Ofori (2015), too, report using 22 countries for 1985-2011, that mature democracies pave the way for liquidity in markets affecting returns as low bid-ask spreads decrease the cost of trading.
- Corruption in autocratic regimes initiates political linkages which have a positive impact on the value of Chinese firms (Wang et al. 2018) and bank loans (Feng and Yu, 2017).
- Non-linear relationship between corruption and other institutions –new

Institutions: Corruption, Bureaucratic Quality and SR

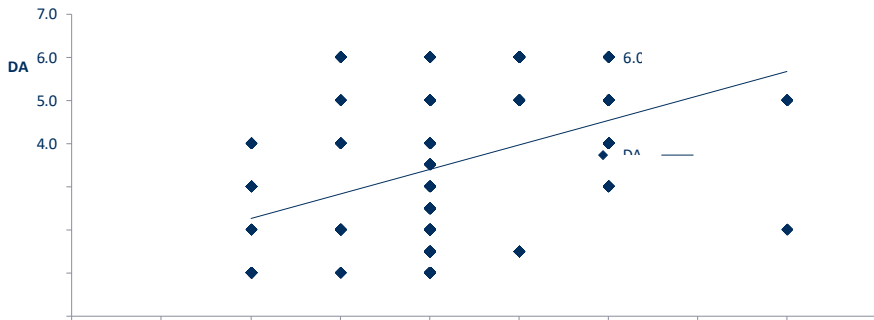
- A well-trained bureaucratic system is immune to the politics of government power i.e. BQ, aids market development (Yartey, 2008) and boosts investment (Méon and Sekkat, 2005 and Mendez and Sepulveda, 2006).
- Stability of policy is a well-known factor in encouraging a vibrant investment sector (Nee and Oppen, 2009).
- Huskey and Obolonsky (2003) report that institutional rivalries and lack of public debate deter professionalism among Russian bureaucrats.
- Lambsdorff (2003) finds that by itself, BQ is an important variable which imitates the impact of low corruption on productivity (GDP to capital stock)—a one-point increase in good bureaucracy boosts productivity by 5%.
- Corruption and BQ can impede performance (Seim et al., 2009).
- In a rapidly volatile environment and changing needs, agency problems can arise due to information asymmetry precipitating market failure.
- The role of public sector bureaucrats in already corrupt societies can increase the impact of corruption (Bardhan and Mookherjee, 2006; Boycko et al. 1995).

Institutions: Corruption, Law and Order and SR

- Fosters corporate sector to secure external funding and innovation (La Porta et al., 1997; Demirguc-Kunt and Maksimovic, 1998).
- Improvements in legal and political institutions lead to greater liquidity in financial markets (Eleswarapu and Venkataraman, 2006).
- Affects the costs of financing and lowers financial risk by reducing transaction and agency costs (Hooper et al., 2000; Öztekin, 2015; Gungoraydinoglu et al., 2017).
- Strong political, legal, open and regulatory institutions can positively affect SR and development (Yartey, 2008). Returns are larger in countries in the presence of security-conscious institutions i.e. disclosure rules, legal institutions, and strong legal enforcement (Hail and Leuz, 2006)
- Possible counterproductive effects of regulation on the small, informal sector. (IBRD) Deregulation encourages swift entry into capacity building industries.
- Méon and Sekkat (2005) the interaction—good governance (rule of law) decreases the cost of corruption/curtailing corruption in countries with weak rule of law would have beneficial effects.

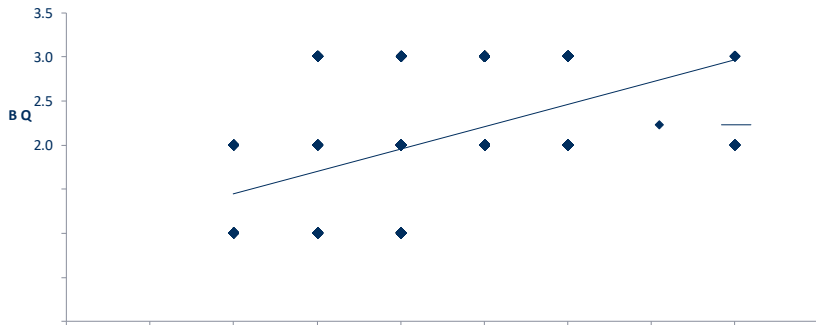
Interactions of Corruption and Democratic Accountability

Corruption and Democratic Accountability
in BRIC Countries, 1995-2014



Interactions of Corruption and Bureaucratic Quality

Corruption and Bureaucratic Quality
in BRIC Countries, 1995-2014



Interactions of Corruption and Law and Order



Panel Data Model

$$SR_{i,t} = \alpha_i + \beta^F X_{i,t}^F + \beta^D X_{i,t}^D + \lambda_t + e_{i,t} \quad (1)$$

where $e_{i,t} \sim IID(0, \sigma_e^2)$; $X_{i,t}^F$ free variable $X_{i,t}^D$ doubtful variables

More specifically

$$SR_{i,t} = \alpha_i + \beta_1 CORR_{i,t} + \beta_2 DA_{i,t} + \beta_3 LO_{i,t} + \beta_4 BQ_{i,t} \quad (2)$$

$$+ \beta_5 CORR_{i,t} (DA_{i,t} | LO_{i,t} | BQ_{i,t} |) \quad (3)$$

$$+ \beta_6 EX_{i,t} + \beta_7 Risk_{i,t} + \lambda_t + e_{i,t} \quad (4)$$

where for each country i and time t , CORR is corruption, DA is democratic accountability, LO is law and order, BQ is bureaucratic quality, EX is exchange rate, and risk is co-movements with global or emerging market index j for stock market of country i .

$$\frac{\partial SR_{i,t}}{\partial CORR_{i,t}} = \beta_1 + \beta_5 (DA_{i,t} | LO_{i,t} | BQ_{i,t} |)$$

Extreme Bound Analysis

- Under the traditional econometric approach an investigator relies on correct sign of coefficients, significance of t-values, and high R-square in order to determine the accuracy of the model specification with no role for prior beliefs as an initial point for such specification.
- EBA explicitly incorporates prior information and has systematic approach to test fragility of coefficients being reported (Leamer (1983) and Leamer and Leonard (1983) and Granger and Uhlig (1990)
- Let $y = X\beta + \varepsilon$ and focus coefficient $\beta_0 = \psi' \beta$ with linear constraints $C\beta = c$ and $M(C\beta - c) = 0$
- $A = CDC'$ with $A^{-\frac{1}{2}} = A^{-1}$ for given M define $W = A^{\frac{1}{2}} M'$.
- Define two important vectors $u = A^{-\frac{1}{2}} CD\psi$ and $v = A^{-\frac{1}{2}} (Cb - c)$ and with Euclidian norm $\|u\| = (u'u)^{\frac{1}{2}}$ for $\theta \in [0, \frac{\pi}{2}]$ and $\cos 2\theta = \cos(u, v) \equiv \frac{u'u}{\|u\|\|v\|}$. $\cos 2\theta = \cos(u, v) = 0$ if $u = 0$ or $v = 0$.
- The GLSE of $\hat{\beta}$ of β_0 under restriction $M(C\beta - c) = 0$ is

Tables of Empirical Results

Table 1. Effects of corruption and other institutional variables on stocks returns for BRIC countries: panel fixed effect models: dependent variable is return on stocks

Table 2. Dynamic Arrelano-Bond panel data model estimation of corruption and risks on stock returns

Table 3. Arellano–Bover/Blundell–Bond linear dynamic panel data estimation of corruption and risk on returns of stocks in BRIC countries

Table 4. Arellano–Bover/Blundell–Bond linear dynamic panel data estimation of corruption and risk on returns of stocks in BRIC countries

Table 5. Impact on the returns on stock in BRIC countries: 1995 to 2014 by Extreme Bounds Analysis

Table 6. Sensitivity of doubtful variables on stock returns in EBA analysis

Table A1. Variables and sources of the panel and EBA models

Table A2. Summary statistics of the variables used in estimation

Table A3. Structure of partial correlations among model variables

Table A4 Return on equity in BRIC countries, 1995 to 2014 by Extreme Bounds Analysis

Interaction effect: Corruption, DA and SR

- Following equation (2a), the impact of corruption on SR should be measured as $-0.0113 + 0.00221 \cdot DA$.
- In effect, the interaction effect at mean value of DA is $-0.0113 + 0.00221 \cdot 3.64 = 0.0193$. The negative impact of corruption becomes smaller as democracy improves in the country within the sample period.
- Because democratic accountability ranges from 1 to 6, the effect of corruption becomes negative to positive (i.e. over 60%) within a sample.
- However, the positive and significant interaction effect above the mean value of DA (i.e. 3.64) does suggest that corruption has a growth-inducing effect on the stock market as the country becomes more democratic (model 2) by transferring bad corruption to a good one (i.e., greasing the wheel effect of corruption).

Interaction effect: Corruption, BQ, LO and SR

- The interaction effect of CORR and BA is positive and significant (model 4) suggesting that sound bureaucracy can be beneficial for investment and in turn increases SR by lowering the risk and uncertainty.
- In contrast, the interaction effect of CORR and LO is negative as shown by its coefficient of -0.0023 (model 3, Table 1) and significant at the 10% level revealing that a high level of corruption can distort a burdensome law and order of a country and in essence increases the cost of business by weakening the property rights and lowers SR.
- Institutional factors are even more prominent in these dynamic panel scenarios.
- Law and order and bureaucratic quality are very significant as in the fixed-effect model. The competitiveness and complementary nature of relations between indices of advanced and emerging stock indices are true also in the dynamic models.

Dynamic Analysis on Corruption and Stock Returns

- The results are very similar to the panel fixed effect results showing that an increase in corruption reduces SR significantly, but the magnitude of the coefficient is low. Also, the individual impacts of DA, BQ and LO are positive and significant, and mostly BQ and LO enhance stock markets.
- Like panel fixed effects' results, changes in emerging market and global stock indices, i.e. co-movements impact SR positively and negatively, respectively. It is noteworthy that the coefficient of lag SR is negative and significant suggesting that the mean reversion of persistence of stock return is consistent with the literature (Lehkonen and Heimonen, 2015).
- Bureaucratic quality retains the same sign and remains significant. While there seems persistency in the SR as shown by the significant coefficient on lagged of SR term; there is no evidence of significant effect of per capita income or its growth rates in SR in BRIC countries implying stock markets full of brokers and speculators, who focus more on future expectations, to be somewhat separated from rest of the economy.
- Surprisingly, the interaction of corruption with democratic accountability has become insignificant in the dynamic model. One explanation may be due to

Extreme Bound Analysis

- EBA analyses the coefficients in free variables vary when one doubtful variable is present (absent) rather than another doubtful variable. The basic model only contains free variables.
- Augmentation of this occurs with the presence of other doubtful (that may or may not affect the free or focus) variables. As there are many ways of augmenting a stock return model; there are so many specifications of the main model.
- Thus, the lower and upper bounds of β^F coefficients are constructed by the maximum and minimum values of the coefficients with the central values given by the linear combinations of these two bounds.
- The results of EBA analysis in Table 5, based on 1000 samples constructed around the observed data on model variables, confirm our earlier findings from the panel data.
- Corruption has a negative impact on return on equities. More specifically, these returns are sensitive in the presence or absence of doubtful variables in the regression by several variables as listed in the first column.
- Interestingly, co-movements factors have significant effects as in the panel

Summary of Findings

- Corruption has a negative and significant effect
- Strong institutions such as good standards of law and order and bureaucratic quality contribute positively to SR.
- Complementary and competitive nature of risks from emerging and global markets on SR of BRIC economies.
- Interaction of corruption with institutions complex providing mixed empirical evidence for “greasing the wheel” or the “sand in the wheel” hypotheses.
- Interaction of law and order with corruption shows negative effect on stock returns; it can be due to distortions in the rule of law at the ground implementation level including police, judiciary or government officials in the presence of corruption. Such malpractice raises the cost of production and brings inefficiency, causing lower returns.
- In contrast, the interaction of corruption with bureaucratic quality, however, generates positive returns as this may reduce the red tape and increases bureaucratic efficiency.
- We did not find GDP per capita (YP) either in level or growth rate (LYP, YP, GYP) to have any significant impact on SR in BRIC countries

Thank you !