The Impact of Perceived Corruption Levels in Public Sector on
Stock Market Development

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Most of the empirical studies that analyze the impact of corruption on the economy suggest that corruption is a serious obstacle against economic growth. However, it is ambiguous whether corruption has negative effect on the financial sector, especially stock market development. Thus, the first objective of this paper is to reexamine the relationship between corruption and stock market development. Furthermore, several previous literatures argue that democracy potentially mitigates the negative effect of corruption on economic growth. By this argument, the second goal of this paper is to investigate whether democracy has influence on mitigating the negative impact of corruption from stock market development. This study employs the Generalized Method of Moments (GMM) estimator for regression analysis of cross-counties panel data, covering 10 years period from 2011 to 2020. Corruption is found to have significant and positive effect on stock market development in terms of size. Additionally, it is found that the influence of democracy on corruption is significant and positive to stock market growth. When stock market liquidity is used as a proxy of stock market development, it is found that corruption has no significant effect on stock market development. Moreover, democracy is found to have no significant influence on the relationship between corruption and stock market development.

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TABLE OF CONTENTS

Page

Introduction

Theoretically, public corruption is the major cause of poor economic performance, the World Bank and IMF define corruption as "the abuse of public office for private gains". In previous studies, many researchers suggest that corruption lowers economic growth in several channels. Mauro (1995) finds that corruption reduces private investment, consequently lower the economic growth in term of GDP per capita. Mauro also suggests that, for curtain country, if it reduces bureaucratic inefficiency[1] (corruption level), its investment rate would improve. This may be resulted from increasing bureaucratic efficiency could improve investors' perception of political stability[2], which is considered as the key determinant of investment rate. Tanzi and Davoodi (1998) find the empirical evidence presents that corruption increases public investment while lower its productivity, thereby inhibit economic efficiency. In developing countries, corruption is the obstacle of doing business for SMEs because there is a rising cost, which causes no productivity but needed for firm survivals, for paying the officials as bribery. Furthermore, high level of corruption results in low level of direct taxes ratio to GDP (Tanzi and Davoodi, 2001). As the consequence, decline in tax revenue or increase in public expenditure, corruption may cause improper budgetary allocation. It may also lead to monetary problem if it resulted from inappropriate lending by public financial institutions at below-market interest rate (Mauro and Driscoll, 1997).

[1] In addition to corruption index, Mauro also considers the bureaucratic efficiency index to be the proxy of corruption measurement. He states that bureaucratic efficiency index is more precise measure of corruption than the corruption its own.

[2] The investors' perception of political stability is considered as the significant factors, which directly determine investment rate and economic performance. And there is the significant and positive correlation between bureaucratic efficiency and political stability, thereby it could be implied that bureaucratic efficiency could be used as the investment and growth determiners (Mauro, 1995).

As there are several studies suggest that the development of financial market is crucial part of economics growth. Most of these studies reveal that there is an endogeneity between economic and financial development, therefore, economic development in turn has impact on the structure and quality of financial market. That can be implied that if we understand the factors drive economic growth, we can understand the financial system evolution as well. From this view, there may be the link between corruption and financial market development, as corruption affects economic growth. In line with this implication, there is literature suggests that financial system is influenced by nonfinancial development, the institutional environments include country's legal system and political factors also affect evolution of financial system. In addition to these factors, fiscal and monetary policies do affect financial institution in term of taxation and services provisions as well (Levine, 1997).

In the recent years, there have been some studies try to determine the relationship between corruption and financial market development. Yartey (2008) investigates the impact of macroeconomic factors and institutional factors on the stock market development in 42 emerging countries. For the institutional quality, the explaining variables include political risk, bureaucratic quality, law and order, corruption, and democratic accountability, while the measurement of stock market development using market capitalization as a proportion of GDP. Yartey finds that almost institutional factors are the significant determinants of stock market development, except for corruption level, which is statistically insignificant.

For another study on relation between corruption and financial system, Park (2012) finds the empirical evidence indicates that corruption has strongly negative impact on

bank asset quality i.e., bank loan, resulting in the weakness of bank system. This study also suggests that corruption is potential factor causing the financial crisis. Thereby, corruption has impact on the soundness of financial system, consequently this event may somehow influence financial system development, that seems to be disagreed with Yartey's conclusion. These results are ambiguous that whether corruption do influence on financial market development or not?

Unlike Park who unintentionally includes diversity of sample countries in his research, Yartey concentrates on only emerging countries for his investigation. It seems to be that most of Yartey's sample countries may have the comparable intuitional quality i.e., democracy accountability[3], that might cause corruption has no impact on financial development. To re-examine Yartey's study, I study on the effect of corruption, connecting with democratic quality, on the financial system development. Rather than focusing of emerging economies, my study considers the diversity of sample counties that demonstrate variety of democracy level to see the influence of democracy degree on corruption level as well.

Based on previous studies, several scholars agree that there is strong relationship between democracy quality and corruption level, Sandholtz and Koetzle (2000) argue that countries with strong democracy norms tend to have low level of corruption, they also suggest that the higher number of years of democracy that country experiences, the lower corruption that country exposes. Bohara et al. (2004) find that democracy process is the potential influence in controlling corruption, that is in line with

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[3] The 42 sample countries in Yartey's research consist of 24 flawed democracy, 9 hybrid regime, 6 authoritarian and 2 full democracy countries. According to democracy index published by the Economist Intelligence Unit for the Year 2021

Pellegata (2013)'s argument that both current degree of democracy and period of democracy accumulation potentially impact on corruption control. Furthermore, Drury et al. (2006) propose that democratic mechanism would potentially discourage corruption from causing negative impact on the economy.

Accordingly, the objective of this study is to examine that does the democracy level affect the relationship between corruption and financial system development? As the existing study explores the impact of corruption on financial system development straightforwardly, the main contribution of this paper, improvingly, is to assess the interaction between democracy and corruption level whether it influences the evolution of financial development. This study will concentrate on stock market development as the main proxy of financial development. To my knowledge there is no literatures have investigated this before. Furthermore, as mentioned above, Yartey (2008)'s study concentrates mainly on the emerging countries that seem to present the comparable democracy characteristics, which might lead to similar corruption quality. Differently, as supported by empirical evidence that democracy characteristic has solid impact on corruption level, the countries sample I select for this study exhibits the variety of democracy degree as well as corruption level. More clearly, this paper includes full democratic independent states at least 20 percent of sample countries that does not present in Yartey (2008)'s work, see the **Appendix A.** Hence, the following research questions and hypothesis are proposed.

Research Question 1: Does corruption level have impact on stock market development?

Hypothesis 1: the country with lower degree of corruption level, will have higher stock market development.

As prior mentioned that corruption has significantly negative impact on the economic development, and there is the presence of causal relationship between the financial system development and economic growth, through this relationship, I expect that corruption could potentially affect stock market development in the same manner as corruption affects economy growth. Since corruption negatively influences on the financial system soundness, subsequently corruption might impact on stock market development in some way. Through these arguments, I, thereby, hypothesize that corruption will cause negative impact on stock market development. In other world, the country that has lower corruption level will have higher stock market development.

Research Question2: Does democracy level affect the relationship between corruption and stock market development?

Hypothesis 2: the higher degree of democracy index will mitigate negative effect of corruption on stock market development.

As mentioned above, democracy quality has significant influence on corruption level and corruption control. In other world, higher degree of democracy the country experiences, lower level of corruption the country encounters. Empirically, corruption has adverse effect on economic growth. Since there is endogeneity between financial

system evolution and economic development, thus, it is supposed that corruption will negatively impact on financial market development as well. Through this interconnection among democracy quality, corruption level, and financial market development, I hypothesize that that higher democracy degree will lead to lower corruption level, subsequently lower corruption level will promote more development of stock market as presented in Figure 1. In other world, I expect that higher degree of democracy will mitigate the negative effect of corruption on stock market development.
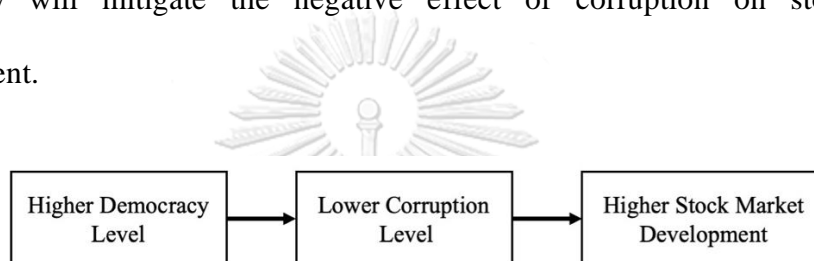

Figure 1. Assumption of Linkage between Democracy Quality, Corruption Level, and Stock Market Development

Literature review

1. Causes and Consequence of Corruption in Economic Perspective

The corruption in public sector generally exists if the restriction and government intervention can generate the private gains for officials seeking for rent. The classic examples of such restriction include trade restrictions, favoritist industrial policies, price control, multiexchange rate, and government-controlled provision of credit. Corruption especially occurs in the countries where the public servants earn very low income, they subsequently acquire bribes to cover their expenditure. This can be implied that there is lower corruption to take place if the civil savant paid better wages compared to private-sector worker who have comparable qualification. The corruption commonly coincides with other forms of institutional inefficiency namely

political instability, weak rule of law, and excessive red tape. Poor countries tend to experience higher degree of corruption than rich countries (Mauro, 1995; Mauro and Driscoll, 1997).

The consequence of corruption, suggested by many researchers, is to lower economic growth and efficiency because corruption discourage private investment – both from domestic and foreign businesspersons. In addition, corruption acts as the tax for entrepreneurs when they are requested for additional compensation from the officials. Tanzi and Davoodi (1998) conclude that corruption causes higher public investment while lowers investment productivity.

There is the evidence suggest that, in general, malfunctioned governments are associated with improper budgetary allocation. In this way, corrupt governments spend significantly low for developing education and healthcare system but pay considerably high for military and unnecessary public infrastructure. Thereby, corruption, having effect on making decision of public investment or distorting the process of decision making, act as key obstacle of creating good policy (Mauro and Driscoll, 1997).

Additionally, corruption leads to lower public revenue by lowing taxes collection because some of taxes paid may be diverted to the officials' personal profit, or individuals may make negotiation for their income taxes burden with tax officers. For the private sector, corruption may indirectly raise cost of enterprises and consequently result in decreasing rate of return from project investment. Especially, SMEs might incur unproductive payment that may include negotiation for benefit, taxes payment deal, or bribes arrangement (Tanzi and Davoodi, 2001).

2. Financial System and Economic Development

Financial system development is the significant factor driving economic growth and industrialization. Some researchers find the evidence suggests that the development degree of financial sectors is important indicators of economic growth and efficiency. Accordingly, the economies of countries with well-functioning bank sector and well-developed stock market expand faster than those with low-developed financial market (Levine, 1997).

Theoretically, the function of financial system, which comprises of financial market, financial institution, and financial instruments, is to mitigate the consequence of market frictions (information friction and transaction cost friction). Generally, there are five basic functions of financial system consist of 1) allocating financial resources 2) controlling and monitoring the corporate investment after providing fund 3) pooling and mobilizing saving 4) promoting the trading and risk management and diversification, and 5) simplifying exchange of good and service.

The institutional factors such as political institution and countries legal systems are considered the key determinants of both economic and financial evolution. There is the empirical study suggest that the effectiveness of legal and regulation systems potentially promote the security market development; the effective security market facilitates investors in portfolio diversification, leading higher capital flow to project investment that results in promoting economic growth. Furthermore, the differences in political system and legal tradition among countries also lead to the difference of financial system structure and evolution (Čihák et al., 2012; Levine, 1997).

In addition, many literatures indicate that there is the causal relationship between economic development and financial market evolution. In other word, financial system development, especially the financial structure, in turn depends on the level of economics growth. Economic activities, technology improvement and innovations encourage the enhancement in financial services provided by financial intermediaries. This relationship indicates endogeneity between financial and economic growth (Levine, 1997).

3. Corruption and Financial Economics

Corruption is considered as the obstacle of foreign direct investment (FDI); the empirical evidence suggests that FDI inflow to the host countries would be lower when the difference in corruption level between the home and the host countries is wider. In the corrupt economy, some companies which pay the officials bribery will acquire preferential access to gainful market, this might prohibit the fair competition to other market participants. Corruption can also cause difficulty in management, operational risk, and unproductive cost for the foreign corporates. To invest in the corrupt economy, it might be necessary for foreign entrepreneurs to fight with corruption themselves in order to protect their own interest or just to survive in the market. This action will cost investors supplementary resources that do not generate productivity. Furthermore, theory argues that corruption could be partially caused by unethical behavior. Thus, oversea investors try to avoid corruption because it is regarded as morally wrong action. Inconclusion, foreign investors consider corruption as the inappropriate action and it can cause operational inefficiency, therefore they avert consequence of corruption (Habib and Zurawicki, 2002).

Brada et al. (2019) argue that corruption significantly influences the multinational corporates decision about the FDI through two dimensions. First, working environment of corrupt economies (host countries) can incur additional cost of business operation for the foreign firms. Second, working in corrupt society can improve ability of overseas firm in dealing with corrupt market environment, then those firms might transfer investment fund to other countries with comparable corruption characteristic but seem to gain higher return of investment. Consequently, for the host countries, corruption negatively impact on FDI in dimensions of both magnitude and possibility of receiving. Brada et al. (2019), in addition, indicate that increases in difference corruption level between host and home countries considerably reduce the average FDI stock. The previous literatures agree that if the host countries expect to increase FDI inflow, it is necessary for them to decrease degree of corruption in the public sector. As corruption negatively influence the FDI inflows and capital inflows, corruption, as the risk factors, subsequently discourage financial liberalization. To promote financial liberalization, it is necessary for the government to improve control of corruption in the public sector (Prasad et al., 2005).

Corruption potentially determined bank loan quality, especially increase in level of corruption tend to heighten household loans. The empirical evidence suggests that degree of corruption has influence on the level of accumulation of nonperforming loans. Increasing of bad loan in portfolio is important factor in reducing bank asset quality. Consequently, the high level of cumulative bad loan possibly leads to financial crisis, particularly for the bank-based economies. This implies that corruption seems to have the significant influence on financial crisis, since several global financial disasters in the past are frequently caused by large volume of

aggregate bad loan in bank sector. It can be concluded that the weakness of bank sector might be resulted from, in the corrupt environment, regulation on bank loan seems to perform ineffectively. Thus, government should combat corruption to improve the banking solidity (Park, 2012).

4. Corruption and Democracy

In the term of economic-political structure, Sandholtz and Koetzle (2000) empirically argue that level of corruption is determined by the degree of the democracy, weaker normative and institutional democracy are potentially associated with higher degree of corruption. In intuitional view, elected public officials in democratic state, in essence, need to act as the representative of citizens to serve public interest because they are sensitive to public judgment. By this way, officials who engage corruption activities are more likely to be detected and punished by public in democracy countries than in the authoritarian territories. Moreover, in democratic culture, people consider the corruption is illegal action, this social value negatively affects corrupt practices. This implies that the more solidity of democratic institution and longer period of democracy the country experience, the higher potent of the country in fighting corruption. Interestingly, there is the evidence suggests that the democratic countries that are former communist states tend to have higher capability in minimizing the corruption compared to the rest of the world (Sandholtz and Koetzle, 2000). In term of corruption control, Bohara et al. (2004) indicates that the democracy countries where public citizens participate in the political system through the election process could increase the control of corruption especially when there is high competitiveness in election.

Drury et al. (2006) indicate that, in the solid democracy countries, electorate can punish the corrupt leaders through the next election, thus corruption will be refrained. Besides, they argue that the election process in democracy countries will prohibit corruption to influence the economic development. This argument is supported by Pellegata (2013) that the democratic institution can suppress corruption through election process, the reason behind is that citizens will elect political officials who are not associated with corruption practice. In addition, soundness of democracy allows the residents to monitor and punish the officials who participate in corruption. The hybrid regime with authoritarian element tend to present the highest degree of corruption because the instability of political institution potentially stimulates politician and civil servant to gain illegal personal financial profit.

5. Measurement of Financial System Development

There is the difficulty in practice to assess financial development since the measurement of financial system development can be demonstrated in different dimensions. Thereby, the World Bank has recommended the framework to measure financial market in all four aspects include financial depth, access, efficiency, and stability[4]. The detail of each dimension is presented as the following.

1) The size of financial market (financial depth)

To assess the size of financial market, several measurements can be used as indicators. There are several basic methods to approximate the size of debt market for both government and corporate bond, such as through measure private security debt to GDP, public security debt to GDP and international debt security to GDP.

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[4] See https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database

For the stock market, the most common option researcher use is stock market capitalization to GDP. Percent of stock value traded to GDP is properly used to measure both market size and movement as well (Čihák et al., 2012).

2) **The level of accessibility to financial instructions and market (financial access)**

To measure the access of financial market, generally is to measure the concentration of the market, high level of concentration may imply the difficulty for small or brand-new corporations to finance their projects via issuing securities to the public. There are various indicators can be used to assess market concentration, such as percent of market capitalization outside of top 10 largest companies, percent of value traded outside of top 10 companies, ratio of domestic to total debt securities, ratio of private to total debt securities, and ratio of new corporate bond issues to (Čihák et al., 2012).

3) **The efficiency of financial institutions and market in providing financial service**

The measure of market transaction is commonly used as the proxy for market efficiency. For stock market, turnover ratio to capitalization of stock market is the basic indicator of market efficiency, higher turnover ratio signals higher market efficiency. Similarly, turnover of bonds on securities exchanges (both for corporate and government bond) and quoted bid-ask spread for government bonds are generally used as the proxy for bond market efficiency. Transaction cost is an alternative for using as the proxy of market efficiency, the lower transaction cost indicates the more efficient market (Čihák et al., 2012).

4) The stability of financial institutions and markets

The financial stability, considered as the significant aspect indicating the financial sector health, is mostly be measured on systematic risk and stress tests. The stability of financial market is important part of the stability of macroeconomy, the unstable financial market potentially leads to economic instability. For financial market, the common indicator to measure stability is the market volatility, increasing volatility signals the uncertainty of the market. The volatility of stock price index or government bond index is commonly used as the proxy for market volatility. Skewness of stock return is another proper variable to evaluate market volatility, the more negative skewness signals the higher negative return that may lead to lower stability. Alternative option to measure the market volatility is price to earnings ratio (PE ratio) and duration (Čihák et al., 2012).

6. Stock market development and determinant

It is widely known that financial market development takes important role in promoting economic efficiency. Certainly, the stock market, as a major part of the financial system, considerably influence the development of the economy. The large stock markets which are considered as well-functioning market tend to have high liquidity, low volatility, and more internationally integrated. Previous literatures indicates that macroeconomic factors take the important role in developing the stock market. Obviously, GDP per capita growth rate do strongly impact on the stock market size, this indicates that high income level per person has the positive effect on the stock market capitalization. Other aggregate level variables such as savings and investments are commonly considered the important factors influence stock market size (Garcia and Liu, 1999). Differently, Yartey (2008) suggests that only investment

rate do significantly affect stock market size while saving rate do insignificantly impact on market capitalization. In the dimension of macroeconomic stability, both Garcia and Liu (1999) and Yartey (2008) agree that inflation level or inflation change, as the proxy of macroeconomic stability, insignificantly affects the growth of stock market sizes.

In addition, Garcia and Liu (1999)'s study also suggests that increase in percent of domestic credit to the private sector to GDP subsequently boots market capitalization. In this way, financial intermediary growth is the important determinant promoting stock market growth. This is in line with other literatures, which suggest that improvement of financial institutions, especially bank, significantly influence stock market growth. Thus, it can be concluded that stock market growth coincides with financial intermediary development and act as the complements for each other.

Data and Methodology

1. Data and Description

This study will use yearly data from 46 countries from 2011 to 2020 to conduct panel analysis, the selected sample countries will clearly demonstrate the diversity of democracy quality and corruption level, see **Appendix A**. All numbers of data are annually observations.

1) Dependent Variable

Ratio of market capitalization to GDP

Among several financial development indicators, this paper focuses on stock market development. As the market size is the common indicators used to

measure stock market development in most of previous literatures (Garcia and Liu, 1999), instinctively, I use the ratio of market capitalization of listed domestic companies to GDP released by the World Bank as the proxy of financial market development. This value is calculated from the multiplication of share price and number of share outstanding of listed domestic companies.

2) Explanatory Variables

Corruption Perceptions Index (CPI)

CPI is the measurement for the level of corruption for 180 countries and territories, indicating how its level of public corruption is perceived, the score published by the Transparency International (TI). In 2021, the score composition is calculated by using 13 different data sources, collecting from different 12 reputable institutions that capture the assessment of expert and businessmen perception, see detailed description of each data source in **Appendix B.** All data sources demonstrate clear data collection and measurement methods, and data sources are not country specific and are legally comparable among countries. The selected data, used for CPI calculation, exhibit the professional evaluation of corruption in public sector (i.e., bribery, public budgetary fund diversion and extraction, state capture, favoritism in public service) and corruption limitation process (i.e., red tape, law enforcement, bureaucratic system, information accessibility, conflict of interest prevention, legal protection for who associate with discover or inspection of corruption). After that, the data (quantitative value) from each source is standardized with baseline years (2012) of each country. Then, the standardized score is averaged to achieve score for each country.

Finally, the value is altered to integer number, the score is scaled from 0 to 100, the 0 score indicates very high corruption degree in public sector, while 100 means very low corruption level (very clean). Although the index has been published since 1995, the methodology used for calculating CPI, for the year before 2012, is different year by year[5]. Thereby, as calculation methodology updated, only CPI since 2012 onward can be compared with next year CPI directly. To acknowledge that because of limitation of data used for this study, this paper uses the 2011 CPI in regression analysis by only rescaling the value into the same base.

Democracy Index

This paper use the Democracy Index released by the Economist Intelligence Unit (EIU), the research and analysis division of the Economist Group, the private cooperate based in the United Kingdom. The index, which has been published since 2006, presents the democracy level of 165 countries worldwide[6]. The score is rated from 60 indicators that is grouped in fives aspects of democracy include electoral process and pluralism, functioning of government, political participation, political culture, and civil liberties. The overall score, scaled from 0 to 10, is simply calculated from equally weighted average of the five categories score. Accordingly, the individual countries are placed into four main regime groups in accordance with score each country receive as the following: full democracy: score greater than 8; flawed democracy: score greater than 6, and less than or equal to 8; hybrid regime: score greater than 4, and less than or equal to 6; and

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[5] The Transparency International (TI), https://www.transparency.org
[6] The Economist Intelligence, Democracy Index 2021 Report, The China challenge.

authoritarian regime: score less than or equal to 4. The evaluation is conducted by experts' analysis; the so-called reliability is introduced in the measurement process to prevent the contravenes among different expert assessment[7]. In addition to expert's evaluation, some part of two categories of measurement include political participation and political culture are assessed through public opinion survey as well.

By this reliability, it is ensured that the measurement procedure produces the consistent quantification every time regardless of different person perform the measurement. Furthermore, the rating procedure is designed by incorporating dichotomous and three points scoring system to prevent arbitrary, spurious, and non-comparable rating. Even though this rating system could not provide the precise reliability, this method makes the measurement closest to the reliability as most as possible.

3) Control Variable

Financial Institution Development

Financial institutions development, especially banking sectors, have the significant role in promoting stock market development, many researchers find the positive correlation between growth of financial institutions and of stock market. Thereby they suggest that financial intermediaries act as the complements of stock market. Domestic credit to private sector to be used as proxy of development of financial institution in this study. The domestic credit to private sector is defined as the financial asset (such as loan, nonequity securities, traded credit, etc.)

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[7] The briefly description of measurement methodology is drawn from, Democracy Index 2021 Report, by EIU

provided by financial institutions to private sectors. The financial corporations providing financial recourse may include deposit money banks, monetary authorities, or other financial institutions.

Income levels

According to Garcia and Liu (1999), high growth of income rate will increase stock market capitalization that means income level has positive effect to development of the stock market. I use the GDP per capita as the measurement of income level of person in individual country. Moreover, GDP per capita is regarded as the indicator of economic growth as well.

Economic stability

According to Garcia and Liu (1999) and Yartey (2008), the macroeconomic stability is considered as the important factors in driving stock market development. This is because higher economic stability is expected to enhance the attractiveness of the stock market for both firms and investors. Moreover, change in real interest rate could directly affect firm profitability and investment decision. In this study, the real interest rate is employed as a proxy for economic stability in order to assess its impact on stock market development.

Stok market liquidity

Garcia and Liu (1999) find that stock market liquidity has significantly positive effect on stock market size, high stock market liquidity causes increase in market capitalization. By higher liquidity, investors can immediately adjust their investment portfolio with less transaction cost, leading to low liquidity risk for investors. This study will use stock market turnover ratio as the proxy of market

liquidity. The turnover ratio is the proportion of total traded shares to the average market capitalization.

4) Alternative dependent variable

Ratio of total stock traded value to GDP

This study uses the value of shared trades as the alternative variable. As recommended by Čihák et al. (2012), total value stock traded is common indicator to be used as the measurement of stock market depth characteristic. I employ ratio of total stock traded value to GDP released by the World bank, which is derived from total number of shares traded times their respective matching prices. Moreover, several previous studies suggest that there is the high correlation between the growth of stock market capitalization and valued of stock traded.

Table 1. The Summary of data used in this study

Variable	Unit	Observation	Mean	S.D.	Min	Max
Market capitalization to GDP	%	444	61.721	53.263	3.059	345.353
Valued of stock traded to GDP	%	429	27.748	37.037	0.049	192.904
Private credit to GDP	%	436	84.159	49.963	10.247	242.100
Log of GDP per Capita	-	460	4.059	0.526	2.933	5.092
Turnover ratio	%	424	38.931	40.371	0.768	199.158
Real interest rate	%	451	3.695	6.331	-18.845	41.7139
Corruption level	-	460	5.001	1.981	0.500	7.800
Democracy level	-	460	6.075	2.221	1.710	9.930

2. Methodology

As the regression model of this study presents the dynamic panel data characteristic, this paper will use Generalized Method of Moment (GMM) estimators, which is developed by Arellano and Bond (1991), to evaluate the influence of interaction of democracy and corruption level on stock market development. This study is conducted based on standard economic growth model incorporating with Yartey (2008) model. The model employed by Yartey (2008), which is modified from the Calderon-Rossell model, is the standard economic growth model which contains financial, economic, and institutional factors that potentially affect the stock market development, presented as equation (1).

$$Y_{it} = \alpha_i + \delta Y_{it-1} + \beta M_{it} + \varpi P_{it} + \varepsilon_{it} \qquad (1)$$

Where Y is stock market capitalization relative to GDP, α represents unobserved country specific. M is macroeconomic variable (base line variable) which include income rate, savings and investment, stock market liquidity, and private credit. P is institutional qualities include political risk, bureaucratic efficiency, law and regulation, corruption, and democratic accountability. ε is the error term, and the subscripts i and t represent country and time, respectively.

To test Hypothesis 1: the country with lower degree of corruption level, will have higher stock market development; the stock market growth model of conventional cross-country regression for this study is presented as equation (2).

$$SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \lambda CR_{it-1} + \varepsilon_{it} \qquad (2)$$

Where *SDL* represents stock market capitalization relative to GDP, *CT* is the set of control variable (macroeconomic variable) which include stock market liquidity, income level, real interest rate, and bank sector development. *CR* act for corruption level calculated from 100-CPI. α is unobserved country specific effect, ε is the error term, and the subscripts *i* and *t* represent country and time, respectively. As the corruption and democracy levels vary overtime for each individual country, see **Appendix C and Appendix D**, therefore this model includes μ, time fixed effect, in the regression to capture for time-invariant unobserved individual characteristics that might be correlated with the observed independent variables. In the regression result, I expect that the corruption level will have negatively significant effect on stock market development, thereby the coefficient of *CR* (λ) is anticipated to be negative value.

To test Hypothesis 2: the higher degree of democracy index will mitigate negative effect of corruption on stock market development; the stock market development model is shown as equation (3).

$$SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \lambda CR_{it-1} + \rho CR_{it-1}xDEM_{it-1} + \varepsilon_{it} \qquad (3)$$

Where *DEM* is democratic level, and *CRxDEM* represents the interaction between corruption level and democracy level. As the corruption is expected to negatively affect financial development, if the Hypothesis 2 cannot be rejected, the coefficient of *CR* (λ) is expected to be negative value. I expect that the democracy quality will reduce the negative impact of corruption on stock market development, thereby, in the regression result, coefficient of interaction term (ρ) is supposed to be positive.

In accordance with Tetlock (2007), there is the evidence suggests that the information presented in news media can broadly predict stock market activities or movement. This finding aligns with the discussion made by Davidson et al. (1994) that stock markets response significantly to announcements of corporate illegal activities such as bribery, tax evasion, and violations of government contracts. When considering corruption as significant political risk and the quality of democracy as a measurement of political stability, the releases of both indexes could potentially affect the sensitive investors when making their investment decisions. Typically, the corruption level and democracy indexes for a certain year are published in the early months of the following year. For example, the corruption and democracy indexes for 2020 are usually released in January and February of 2021, respectively. By recognizing the influence of corruption and democracy index announcements on the stock market, this study therefore employs the corruption and democracy levels from the previous year as explanatory variable to analyze the impact of corruption on stock market development.

According to the regression model of this study, there are 1) existence of correlation between dependent and control variables and 2) the casual relationship among various control variables in the model that potentially cause joint endogeneity to exist. Subsequently, the ordinary least squares estimator is biased and inconsistence when there is the presence of joint endogeneity. When considering the independent variables in the right-hand side of the model, all regressors are potentially correlated with the error term in every varying-time period. This violates the assumption for consistency of the fixed effects estimator and generalized least squares estimator. Generalized Method of Moment (GMM) is considered as common method used to

estimate the dynamic model from panel data as well as unbalanced panel data. Specifically, when the regression model contains individual unobserved specific effect and lagged dependent variable. The assumption of GMM application is that there is no exist of strictly exogenous variable and serial correlation in the error term. The specific test for GMM is Sargan test of over-identifying restrictions to test for serial correlation. This study assumes that, in the first differences of error term, there is not the existence of second order correlation, since its existence will cause the GMM estimator is not consistent (Arellano and Bond, 1991; Wooldridge, 2001; Yartey, 2008).

Empirical Results and Discussions

This section presents the results of panel data regression analysis of the impact of corruption on stock market development. Table 2. presents the statistic correlation between all variable used in the regression models. From table 2., it is obvious that the pairwise correlations between log of GDP per capita and lagged corruption level are considerably high (-0.8518). At the same time, the correlation between private credit to GDP and lagged corruption level are noticeably high (-0.6315) as well. These significantly high correlations between explanatory variables of the regression model could lead to multicollinearity problem. To avoid multicollinearity problems, the two explanatory variables include log of GDP per capita and private credit to GDP are dropped form regression analysis in this study.

The Empirical Results and Discussion for Dependent Variable: Percentage of Stock Market Capitalization to GDP

As the results presented in Table 3., in Model 1, the explanatory variables include last year market capitalization, stock market turnover ratio, current real interest rates, and lagged corruption level. The results present that lagged corruption level and lagged dependent are significant and have positive effect on stock market development. The market turnover ratio is significant and have negative effect on stock market growth, while real interest rate is insignificant to stock market development. By follow Yartey (2008) analysis basis, this study employs two steps different GMM, while base hypothesis on one step different GMM. The Sargan test and autocorrelation test tend to support the regression analysis with the GMM procedure.

Table 2. statistic correlation between all variable used in the regression models.

Variable	Market cap./GDP	Valued traded/GDP	Log GDP per Capita	Private credit/GDP	Turnover ratio	Real interest rate	Lagged corruption	Lagged DemxCorrupt
Market cap/GDP	1.000							
Valued traded/GDP	0.619	1.000						
Log GDP per Capita	0.305	0.286	1.000					
Private credit/GDP	0.584	0.648	0.568	1.000				
Turnover ratio	0.135	0.695	0.285	0.348	1.000			
Real interest rate	-0.052	-0.071	-0.200	-0.151	-0.049	1.000		
Lagged corruption level	-0.351	-0.284	-0.852	-0.631	-0.225	0.227	1.000	
Lagged DemxCorruption	-0.134	-0.138	-0.612	-0.385	-0.109	0.277	0.611	1.000

It is suggested by previous studies that market liquidity generally has positive effect on stock market growth, thereby, I firstly expected that turnover ratio as the proxy for market liquidity would positively influence market growth in term of size. Apparently, in this study, the result indicates that market turnover ratio significantly and negatively affects stock market development, that seems to conflict with previous studies. To argue this results, Minier (2003) investigates the effect of stock market turnover (poxy for financial development) on economic growth, this investigation finds that market turnover positively affects economic growth for those economies with high developed financial market. In contrast, market turnover is negatively related with economic growth for low developed financial sector. Minier also suggests that there is some threshold of financial development level that could separate positive relationship between turnover ratio and economic growth from the negative relation. From my knowledge, most previous financial literatures studying on the relationship between market capitalization and market liquidity (turnover) concentrate on highly developed and efficient markets e.g., United States, in those counties, market size and liquidity are positively related. However, this positive relationship might not appear to hold for the sample which contains diversification of different level of market development and efficiency.

Particularly, corruption has positive effect on market capitalization growth, this results unexpectedly conflict with my assumption that corruption would impact negatively on stock market development. Instead of hastily concluding that corruption has positive influence on stock market development, for the comprehensive analysis on this complex relationship, it is imperative to explore other determinant of stock market growth. There might be other factor i.e., economic growth, which is excluded

from the regression analysis, potentially influences the development of stock market. Especially in the emerging economies, which might have some characteristics to attract the investors even though they may experience widespread of corruption. To understand this connection, I conduct additional regression analysis that includes log GDP per capita in the model but excludes corruption variable, see the result in **Appendix E**. The result of this additional study presents that GDP per capita is not statically significant to stock market development. In other world, economic growth seems to not connect with the market capitalization growth for the countries group of this study.

Notwithstanding the influence of economic growth on stock market development, the positive relationship between corruption and stock market can be supported by Rock and Bonnett (2004)'s discussions on the East Asian paradox. Their study reveals that corruption has significant positive impact on economic growth in the large East Asian newly industrialized economies. This positive effect could be attributed to the establishment of stable and mutually beneficial exchanges where the government provide promotional privileges to specific companies or business in exchange for bribes. For this study, it is important to acknowledge that some certain countries sample of this study might have economic environments with pervasive corruption, similar to the East Asian newly industrialized economies, particularly in Indonesia, Egypt and Brazil. Consequently, the dynamics of the market could be distorted. In such cases, specific listed companies or industries that can maintain close relationships with corrupt officials or networks might receive preferential treatment or gain benefit from limited competition. As a result, these distortions can potentially inflate the capitalization of the stock market in somehow.

Table 3. Panel-Data Regression Analysis Result

Dependent Variable: Percentage of Stock Market Capitalization to GDP

Variable	Model 1	Model 2
Lagged dependent (SDL$_{it-1}$)	0.685	0.689
	(4.16)***	(4.38)***
Turnover ratio (CT$_{it}$)	-0.5531	-0.496
	(-2.85)***	(-2.32)**
Real interest rate (CT$_{it}$)	0.092	0.096
	(0.03)	(0.30)
Lagged Corruption Level (CR$_{it-1}$)	9.048	-6.977
	(2.32)**	(-0.75)
Lagged CrlevelxDem		2.952
		(2.05)**
Year	0.829	0.999
	(2.38)**	(2.05)**
Arellano -Bond AR (1) Test	-2.01	-2.05
	[0.044]**	[0.040]**
Arellano -Bond AR (2) Test	-0.73	-0.59
	[0.463]	[0.555]
Sargan test of overidentifying restrictions	147.39	134.18
	[0.000]***	[0.000]***
Hansen test of overidentifying restrictions	33.79	34.45
	[0.574]	[0.494]

Model 1: SDL$_{it}$ = α$_i$ + μ$_t$ + βSDL$_{it-1}$ + γCT$_{it}$ + λCR$_{it-1}$ + ε$_{it}$

Model 2: SDL$_{it}$ = α$_i$ + μ$_t$ + βSDL$_{it-1}$ + γCT$_{it}$ + λCR$_{it-1}$ + ρCR$_{it-1}$ xDEM$_{it-1}$+ ε$_{it}$

Note: Notes: T-statistic are in parenthesizes and P values in squared bracket. *** , **, * indicates statistic significant at 1, 5, and 10 percent respectively. CrlevelxDem is the interaction of corruption level and democracy level. Arellano -Bond AR (1) and AR (2) Tests are tests for first autocorrelation and second autocorrelation respectively.

To validate the argument of the relationship between corruption and stock market development as discussed based on the Asian Paradox, this study incorporates sub-group analysis. Its primary aim is to assess the influence of corruption on stock market development within distinct sub-groups, the low corrupt and high corrupt

countries groups. According to countries group presented in **Appendix B**, the high corrupt countries group include 11 specific countries, when employing GMM for regression analysis for 10 years period panel data, the study sample seems to be small compared to the period of time. This small sample might lead to suboptimal results. Therefore, to avoid this potential problem, I separate the whole 46 countries samples in to two groups by cutting at the corruption level of 6.0 for the sub-group analysis. The high corrupt countries group includes 20 countries samples, while the low corrupt countries group includes 26 counties.

The sub-group analysis result, as shown in **Appendix F**, presents that for those low corrupt countries group, corruption has insignificant effect on stock market development, while corruption is significant and has positive effect on stock market development for high corrupt countries group. The result of sub-group analysis alight with argument for the whole sample. For some certain countries included in this study, there may exist economic environments where corruption is widespread as observed in East Asian newly industrialized economies. Particularly listed companies or industries that have close ties with corrupt officials or networks may receive favorable treatment or benefit from limited competition in exchange for bribe. Consequently, the market dynamics might be distorted, these distortions might have the potential to artificially inflate the capitalization of the stock market to some extent.

In model 2, the independent variables include last year market capitalization, market turnover ratio, current real interest rates, lagged corruption level, and lagged interaction between corruption and democracy level. The results shows that lagged dependent is significant and has positive effect on stock market development, while

the market turnover ratio is significant and have negative effect on stock market growth that is consistent with Model 1. Real interest rate and corruption level are insignificant to stock market development. By basing hypothesis on one step different GMM, the Sargan test and autocorrelation test tend to support the regression analysis with the GMM methodology.

In addition, Model 2 regression analysis is conducted to investigate whether democracy can reduce the negative effect of corruption on stock market development. The result shows that interaction between democracy and corruption level is significant and have positive effect on stock market development, this implies that democracy quality tend to have positive effect on the relationship between corruption and stock market development. In other world, the countries that face comparable corruption level, the ones which have higher democracy quality tend to have more developed stock markets. This argument aligns with Drury et al. (2006) that political factors, especially democracy, significantly influence the process of economic development. Consequently, enchanting democracy quality might not only promote rights of individuals, but also their prospects for achieving prosperity. However, since the coefficient of corruption is not statistically significant, there is no clear evidence to claim that democracy could directly mitigate the negative effect of corruption on stock market development.

The Empirical Results and Discussion for Alternative Dependent Variable: Percentage of Value of Stock Traded to GDP

Table 4. Panel-Data Regression Analysis Result
Alternative Dependent Variable: Percentage of Value of Stock Traded to GDP

Variable	Model 1	Model 2
Lagged dependent	0.270	0.284
	(2.43)**	(2.54)**
Turnover ratio	0.529	0.530
	(5.71)***	(5.86)***
Interest rate	-0.163	-0.160
	(-1.89)*	(-1.91)*
Lagged Corruption Level	-0.885	-2.025
	(-0.23)	(-0.44)
Lagged CrlevelxDem		0.1929
		(0.57)
Year	0.739	0.748
	(3.24)***	(3.35)***
Arellano -Bond AR (1) Test	-1.97	-1.97
	[0.049]**	[0.049]**
Arellano -Bond AR (2) Test	0.47	0.49
	[0.636]	[0.625]
Sargan test of overidentifying restrictions	100.00	100.48
	[0.000]***	[0.000]***
Hansen test of overidentifying restrictions	41.89	41.83
	[0.231]	[0.232]

Model 1: $SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \lambda CR_{it-1} + \varepsilon_{it}$

Model 2: $SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \lambda CR_{it-1} + \rho CR_{it-1} xDEM_{it-1} + \varepsilon_{it}$

Notes: T-statistic are in parenthesizes and P values in squared bracket. *** , **, * indicates statistic significant at 1, 5, and 10 percent respectively. CrlevelxDem is the interaction of corruption level and democracy level. Arellano -Bond AR (1) and AR (2) Tests are tests for first autocorrelation and second autocorrelation respectively.

As the results shown in Table 4., for model 1, when value of stock traded to GDP is used as the proxy for stock market development instead of stock market capitalization. The result presents that the last year value of stock traded, and market turnover have significant and positive effect on stock market development. While last year corruption level has no significant effect on stock market development even through the sample includes countries that demonstrate the diversification of corruption level. The real interest rate is significant and has negative effect on stock market development for this model. The negative relationship between real interest rate and stock market development might be related to the Opportunity Cost of Investment, when real interest rates are high, it increases the opportunity cost of investing in stocks. Investors may choose to allocate their funds to fixed-income instruments or other interest-bearing assets that offer a relatively safer and guaranteed return. This reduced demand for stocks can negatively impact stock market growth. The Sargan test and autocorrelation tend test to support the regression analysis with the GMM procedure.

In Model 2, the result presents that the lagged value of stock traded, and market turnover have significant and positive effect on stock market development. Last year corruption level and lagged interaction between corruption and democracy have no significant effect on stock market development. Being consistent with model 1, real interest rate is significant and has negative effect on stock market development for this model. The Sargan test of overidentifying and autocorrelation test tend to support the regression analysis with the GMM procedure.

Conclusion

Several previous studies suggest that corruption in public sector has negative effect on economic growth, but it is ambiguous that whether corruption negatively affect the financial sector. The goal of this study is to reexamine the impact of corruption on the financial market especially stock market. Furthermore, numerous studies propose that democracy can reduce the adverse effects of corruption on economic development. Thus, additional objective of this paper is to investigate whether democracy can mitigate the negative impact of corruption on financial sector.

The results of this paper are summarized as follows. Firstly, in the cross-country analysis covering the period of 10 years, by employing Generalized Method of Moment estimators, I find that corruption is significantly and positively related to stock market development in term of size. This result possibly suggests that the studied sample may contain considerable number of countries that have economic environment with pervasive corruption, particularly in Indonesia, Egypt and Brazil. Some certain listed companies or big businesses, conceivably, might have connection with corrupt officials or political elites, such corporates may offer bribes to their connection for gaining business privilege. Consequently, this advantage would benefit the companies in increasing growth, then distorts market capitalization in somehow. Secondly, I find that interaction between democracy and corruption level is significant and has positive effect on stock market development, this implies that democracy quality tends to have positive influence on the relationship between corruption and stock market development in term of size. In other world, when countries face the

same level of corruption, the one which have higher quality of democracy tends to have hinger of stock market development.

The result is different for alternative dependent variable, when using value of stock traded to GDP as a proxy for stock market development, I find that corruption is not significant on stock market evolution. The interaction between corruption and democracy is also has insignificantly effect on stock market development in term of market liquidity.

From the result of this study, it appears that when assessing stock market development based on its size, corruption tends to have positive effect on stock market development. However, it is important to acknowledge that corruption in public sector undoubtedly leads to severe negative consequences for the overall economies. The result may depend on the countries that are used in the analysis. Therefore, this relationship may not hold for the analysis when the sample courtiers used is different from this study.

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Appendix A: Countries Sample List

Table 1. Democracy Index and CPI Score in 2021 of Sample Countries

No.	Country	Democracy Index	CPI	Corruption Level (CR)	Corruption Category
1	New Zealand	9.37	88	1.2	Low Corrupt
2	Norway	9.75	85	1.5	Low Corrupt
3	Switzerland	8.9	84	1.6	Low Corrupt
4	Luxembourg	8.68	81	1.9	Low Corrupt
5	Germany	8.67	80	2.0	Low Corrupt
6	Hong Kong	5.6	76	2.4	Low Corrupt
7	Austria	8.07	74	2.6	Low Corrupt
8	Canada	8.87	74	2.6	Low Corrupt
9	Australia	8.9	73	2.7	Low Corrupt
10	Japan	8.15	73	2.7	Low Corrupt
11	UAE	2.9	67	3.3	Low Corrupt
12	Chile	7.29	67	3.3	Low Corrupt
13	Qatar	3.65	63	3.7	Medium Corrupt
14	South Korea	8.16	62	3.8	Medium Corrupt
15	Costa Rica	8.07	58	4.2	Medium Corrupt
16	Poland	6.8	56	4.4	Medium Corrupt
17	Mauritius	8.08	54	4.6	Medium Corrupt
18	Saudi Arabia	2.08	53	4.7	Medium Corrupt
19	Greece	7.56	49	5.1	Medium Corrupt
20	Jordan	3.49	49	5.1	Medium Corrupt
21	Malaysia	7.24	48	5.2	Medium Corrupt
22	China	2.21	45	5.5	Medium Corrupt
23	South Africa	7.05	44	5.6	Medium Corrupt
24	Tunisia	5.99	44	5.6	Medium Corrupt
25	Hungary	6.5	43	5.7	Medium Corrupt
26	Bahrain	2.52	42	5.8	Medium Corrupt
27	India	6.91	40	6.0	Medium Corrupt
28	Colombia	6.48	39	6.1	Medium Corrupt
29	Morocco	5.04	39	6.1	Medium Corrupt
30	Vietnam	2.94	39	6.1	Medium Corrupt
31	Brazil	6.86	38	6.2	Medium Corrupt
32	Indonesia	6.71	38	6.2	Medium Corrupt
33	Turkey	4.35	38	6.2	Medium Corrupt
34	Kazakhstan	3.08	37	6.3	Medium Corrupt
35	Peru	6.09	36	6.4	Medium Corrupt
36	Thailand	6.04	35	6.5	High Corrupt
27	Egypt	2.93	33	6.7	High Corrupt
38	Philippines	6.62	33	6.7	High Corrupt
39	Mexico	5.57	31	6.9	High Corrupt
40	Kenya	5.05	30	7.0	High Corrupt
41	Russia	3.24	29	7.1	High Corrupt
42	Pakistan	4.31	28	7.2	High Corrupt
43	Bangladesh	5.99	26	7.4	High Corrupt
44	Iran	1.95	25	7.5	High Corrupt
45	Lebanon	3.84	24	7.6	High Corrupt
46	Nigeria	4.11	24	7.6	High Corrupt

Democracy Index is yearly index released by Economist Intelligence Unit (EIU), the score is scaled from 0 to 10, 0 score indicates low democratic degree, and 100 score means high

democratic quality of individual country. The CPI stands for Corruption Perceptions Index, which is released annually by International Transparency, the score scaled from 0 to 100, 0 score means vary high corrupt and 100 score means very low corrupt.

For this study, Corruption Level as the term CR in regression model is calculated form $0.1 \times (100 - CPI)$, then higher Corruption Level value indicates high corruption, and low Corruption Level value means low corruption. Based on the corruption level of individual county, each country is classified into three main groups include low corrupt group (CR less than 3.5), medium corrupt group (CR is greater than or equal to 3.5, and less than 6.5), and high corrupt group (CR is greater than or equal to 6.5)

Table 2. Country Regime Type in 2021 of Sample Countries

Authoritarian	Hybrid Regime	Flawed Democracy	Full Democracy
1. Bahrain	1. Bangladesh	1. Brazil	1. Australia
2. China	2. Hong Kong	2. Chile	2. Austria
3. Egypt	3. Kenya	3. Colombia	3. Canada
4. Iran	4. Mexico	4. Greece	4. Costa Rica
5. Jordan	5. Morocco	5. Hungary	5. Germany
6. Kazakhstan	6. Nigeria	6. India	6. Japan
7. Lebanon	7. Turkey	7. Indonesia	7. Luxembourg
8. Qatar	8. Tunisia	8. Malaysia	8. Mauritius
9. Russia	9. Pakistan	9. Peru	9. New Zealand
10. Saudi Arabia		10. Philippines	10. Norway
11. Vietnam		11. Poland	11. South Korea
12. UAE		12. South Africa	12. Switzerland
		13. Thailand	

The Economic Intelligence Unit classify individual country into four main regime types based on Democracy Index (DI) of each country receive include full democracy, flawed democracy, hybrid regime, and authoritarian by using criteria presented in Table 3. Since the Democracy Index is yearly data, the country classification varies year by year depend on the democracy score each country receive.

Table 3 Regime Classification Criteria

Regime Category	Democratic Index	Description
Full democracy	greater than 8	a) Respect for basic political freedom
		b) Respect for citizens liberties
		c) Presence of culture promoting democracy flourishment
		d) Government responsibility is adequate
		e) Freedom and verities of media
		f) Election process is inspected and balanced

Regime Category	Democratic Index	Description
		g) Justice system is independent
Flawed democracy	less than or equal to 8 and greater than 6	a) Presence of free and fair elective process b) Respect for essential citizens liberties c) Freedom of media is violated d) Undeveloped political culture e) Demonstration of low political participation of citizens f) Presence of several characteristic of democratic weakness
Hybrid regime	less than or equal to 6 and greater than 4	a) The election process is intervened b) Justice system is intervened c) Presence of media harassment d) Power holding party generally pressure its opponents
Authoritarian regime	less than or equal to 4	a) Election process is absent, or if it occurs, it will be highly intervened, or is unjustifiable b) General presence of absolute dictatorships c) Basic civil liberties are violated d) Media is own or controlled by ruling group and association e) Justice system is typically controlled f) Negative opinion regard with government is suppressed and eliminated g) Presence of weakness in public society and no political participation of citizens

Appendix B: Data Sources used for CPI Calculation

The Transparent Internationals uses 13 different data sources form different 12 creditable institutes to calculate the Corruption Perceive Index (CPI). The details of each source, drawn from the Full Source Description for CPI 2021 report, which are briefly described as below.

Data Source No.1

Data (Index): Country Policy and Institutional Assessment

Data Provider: **African Development Bank**

Country coverage: 37 African countries are cover

Assessment Description:
- The assessment indicates efficiency and quality of country institution in using development assistances.
- The corruption related part, used by Transparent Internationals, includes transparency, accountability, and corruption in the public sector.
- The assessment is conducted by country economist group with intensive experience in policy study, the analysis is then complemented with quantitative and qualitative insight by the local connections. The peer discussion is set to oversight the assessment quality.

Data Source No.2

Data (Index): Sustainable Governance Indicators

Data Provider: **Bertelsmann Stiftung (Private Foundation)**

Country coverage: 41 EU and OECD countries

Assessment Description:
- The assessment of government and policymaking associated with need for reform, and ability to respond current circumstances both in political and social dimension.
- The corruption related part, used by Transparent Internationals, indicates how state and society prevent corruption practice conducted by the public officials or politicians.
- The assessment is conducted through experts' survey. The questionnaire provides clear explanation to guarantee that all expert's share a common understanding of question. Then, the assessment is proceeded thought six stage peer review to ensure the validity and reliability of analysis.

Data Source No.3

Data (Index)   Transformation Index
Data Provider   **Bertelsmann Stiftung (Private Foundation)**
Country coverage   137 countries and territories
Assessment   ▪ The assessment is evaluating 49 indicators demonstrates
Description   transformation process of development conditions,
                        political governance, and economic execution.
                      ▪ The corruption related part, used by Transparent
                        Internationals, exhibits prosecution and penalization of
                        public official who involves corruption practice, and the
                        successfulness of the state in controlling corruption.
                      ▪ The assessment is conducted by two experts for each
                        country, one evaluates the data and provide score, another
                        independently reviews and rate the country score as
                        second opinion. Then, the regional coordinators, project
                        team, the foundation broad discuss and verify the score to
                        ensure that country ratings are comparable among
                        countries and regions, then the score is instituted through
                        extra layer verification. The country rating is firstly
                        proceeded through an intra-regional review, and followed
                        by an inter-regional review, and finally ratings
                        aggregation.

Data Source No.4

Data (Index):   Country Risk Service
Data Provider: **The Economist Intelligence Unit, the Economist Group**
Country coverage: 131 countries/territories
Assessment   ▪ The assessment reveals analysis of country risk of
Description: financial exposure.
                      ▪ The corruption related part, used by transparent
                        Internationals, measures public fund allocation, public
                        finances inspection, independence of system of justices,
                        bribery, and gain favoritism.
                      ▪ The score rating is conducted by in-house EIU country
                        analysts, supported by in-country experts, and then the
                        score is reviewed through rigorous procedures.

Data Source No.5

Data (Index):   Freedom House Nations in Transit
Data Provider: **Freedom House**
Country coverage: 29 countries in Central Europe and Central Asia
Assessment   ▪ The assessment of quality of democratization process as
Description: well as human right.
                      ▪ The corruption related part, use by the Transparent
                        Internationals, indicates anti-corruption initiatives,

bureaucratic factors that might promoting and preventing corruption, corruption of government officials and civil servants, law and regulation enforcement process for corruption control, corruption disclosure and investigation.

- The survey is conducted by the Freedom House staff and consultants by using several data sources include multilateral lending institutions; non-governmental organizations; international organizations; local media; and select government data.

- The assessment is then recommended by related advisors or country experts. The evaluation is also commented by several regional expertise reviewers, on both the score and quality of the assessment.

Data Source No.6

Data (Index): Global Insights Business Conditions and Risk Indicators

Data Provider: **IHS Global Insight Global Risk Service**

Country coverage: 204 countries/territories worldwide

Assessment Description:
- The assessment indicates country risk environment for business operation.
- The corruption related part, used by Transparent Internationals, reveals the risk of corrupt practices (i.e., bribery) that business sector will encounters during operating the business in respective countries.
- The country professional (in-house staffs) provides score rating, then regional and global level experts of HIS conduct quality review and standardize the ratings, the rating is also complemented by country experts (freelancers).

Data Source No.7

Data (Index): IMD World Competitiveness Yearbook

Data Provider: **IMD World Competitiveness Center**

Country coverage: 62 countries/territories

Assessment Description:
- The assessment measures the country competitiveness in term of political and economic environment.
- The corruption related part, used by transparent Internationals, indicates the existence of corruption and bribery.
- The score rating is conducted through survey on the perception of senior business leader (both local and foreign), IMD collaborate with 56 partner institutes worldwide to guarantee the assessment validity.

Data Source No.8

Data (Index):	Political and Economic Risk Consultancy
Data Provider:	**Political and Economic Risk Consultancy**
Country coverage:	Corruption Perceive Index plus United State
Assessment Description:	

- The assessment indicates the country political and economic risk for business operation.
- The corruption related part, used by Transparent Internationals, reveals the general corruption problem in the country.
- The rating process conducted by the opinion survey of local and foreign businesspeople as well as academic experts. The response is of each question ranged from 0 (not a problem) to 10 (a serious problem).

Data Source No.9

Data (Index):	The PRS Group International Country Risk Guide
Data Provider:	**The PRS Group**
Country coverage:	141 countries
Assessment Description:	

- The assessment indicates the country political, economic, and financial risk for international corporates operation.
- The corruption related part, used by Transparent Internationals, reveals the corruption in political system that business sector potentially faces i.e., financial corruption (extra payment and bribery) in order to get advantages or survive in the market.
- The rating process conducted by in-house ICRG staff, by gathering the political data, then the data is quantified to risk points based on the consistent process.

Data Source No.10

Data (Index):	Country Policy and Institutional Assessment
Data Provider:	**World Bank**
Country coverage:	72 countries
Assessment Description:	

- The assessment measures the quality of economic management; structural policies; policies for social inclusion and equity; and public sector management and institutions.
- The corruption related part, used by Transparent Internationals, exhibits transparency, accountability, and corruption in the public sector.
- The evaluation is conducted by in-house Bank economists, sector specialists, and country experts. For consistency, the rating guidance provides concise procedure and criteria on evaluating actual country performance based on the country knowledge and publicly available data.

Data Source No.11

Data (Index):	World Economic Forum Executive Opinion Survey
Data Provider:	**World Economic Forum**
Country coverage:	110 countries
Assessment Description:	

- The assessment is the survey of business executive opinion on global competitiveness.
- The corruption related part, used by Transparent Internationals, indicates undocumented extra payments or bribes related to foreign trading, public utilities, taxation, public contract or license award, or the favoritism in legal enforcement.
- The assessment is conducted by World Economic Forum partners include well-respected economics departments of national universities, independent research institutes, or business organizations, which are considered to have deep understanding of national business environment. The detailed guideline is provided to ensure consistency.

Data Source No.12

Data (Index):	Rule of Law Index
Data Provider:	**World Justice Project**
Country coverage:	140 countries
Assessment Description:	

- The assessment indicates several dimensions of rule of law in practice, provide the advantages and disadvantage of country when compare with other that have the similar condition.
- The corruption related, used by Transparent Internationals, indicates the public official extract private profit in many dimensions such as regulation practice and enforcement, court judgment as well as private gain police and military.
- The rating is conducted though asking 53 questions to the experts. The measurement is intendedly applied for each country with have considerate difference in social, culture, economy, and political institution.

Data Source No.13

Data (Index):	Varieties of Democracy Project
Data Provider:	**University of Gothenburg, V-Dem Institute and University of Notre Dame**
Country coverage:	179 countries
Assessment Description:	

- The assessment measures the multidimension of democracy of the country.
- The corruption related part, used by transparent Internationals, reveals the executive corruption, legislative corruption, and judicial corruption in political systems

(through grand and bribery payment, influence on law issuance, implementation influence)

- The assessment is the collaboration among experts worldwide which is co-hosted by the Department of Political Science at the University of Gothenburg, Sweden, and the Kellogg Institute at the University of Notre Dame, USA. The evaluation is conducted mainly based on the factual data obtainable from official documents i.e., government records.
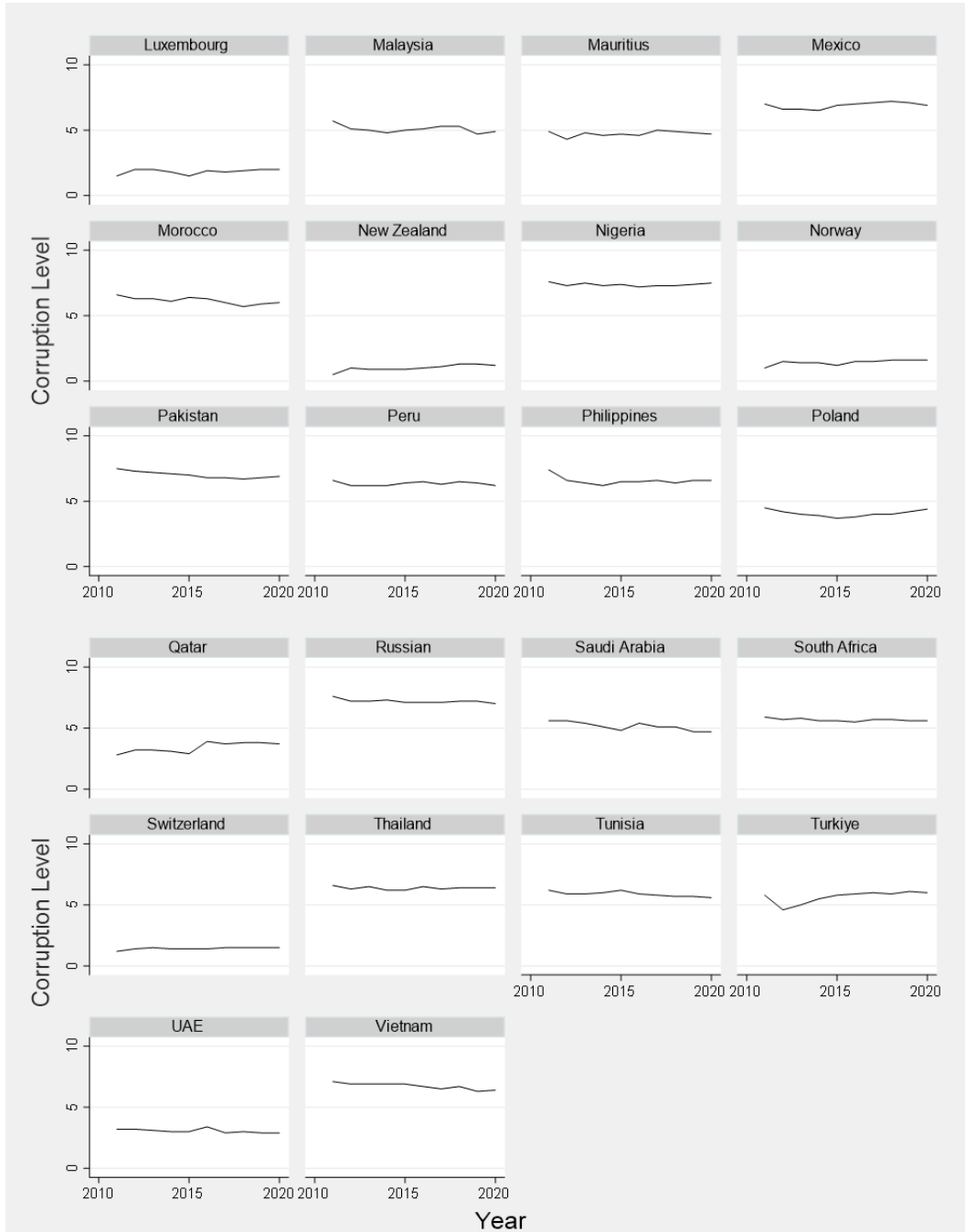
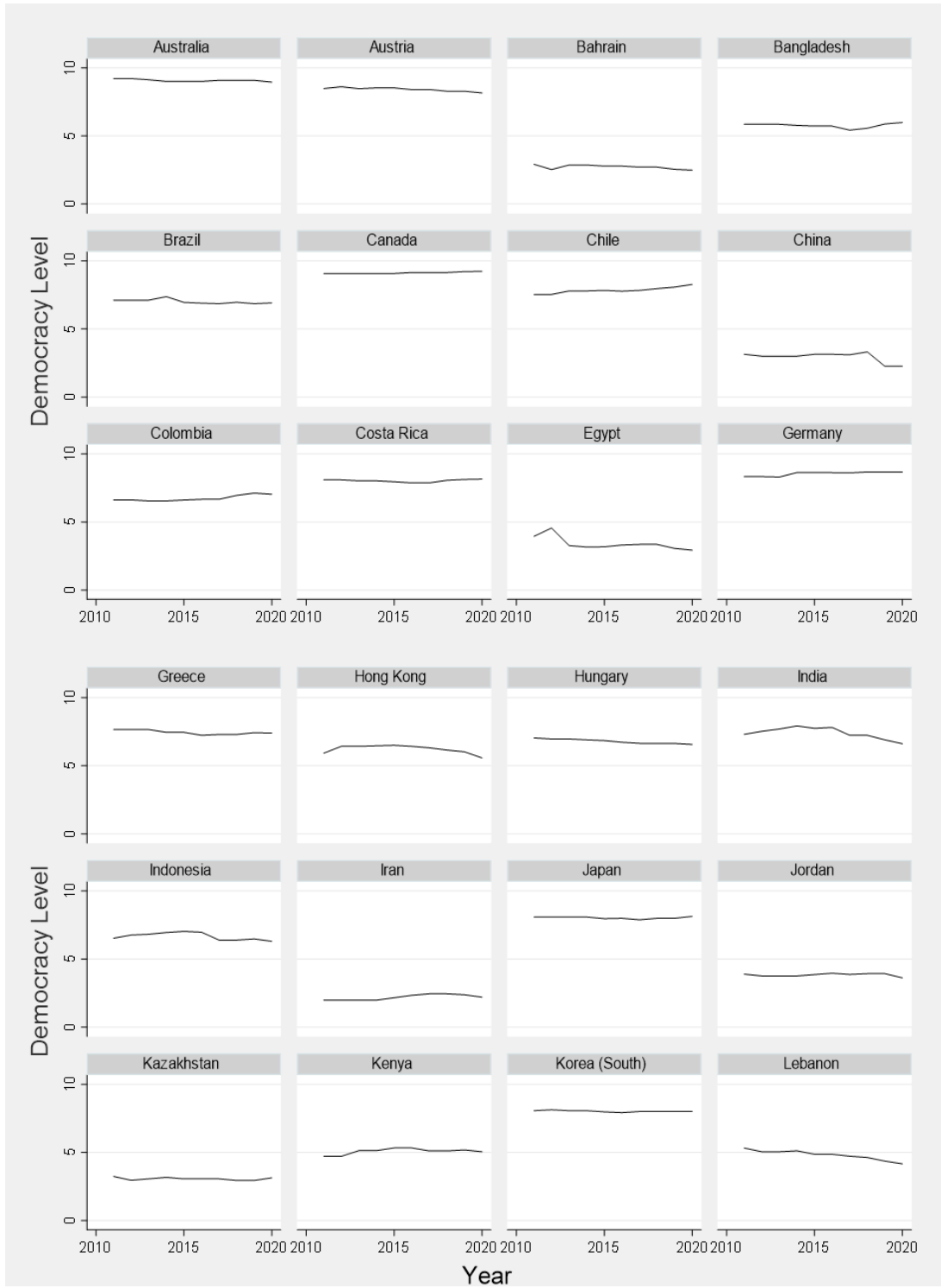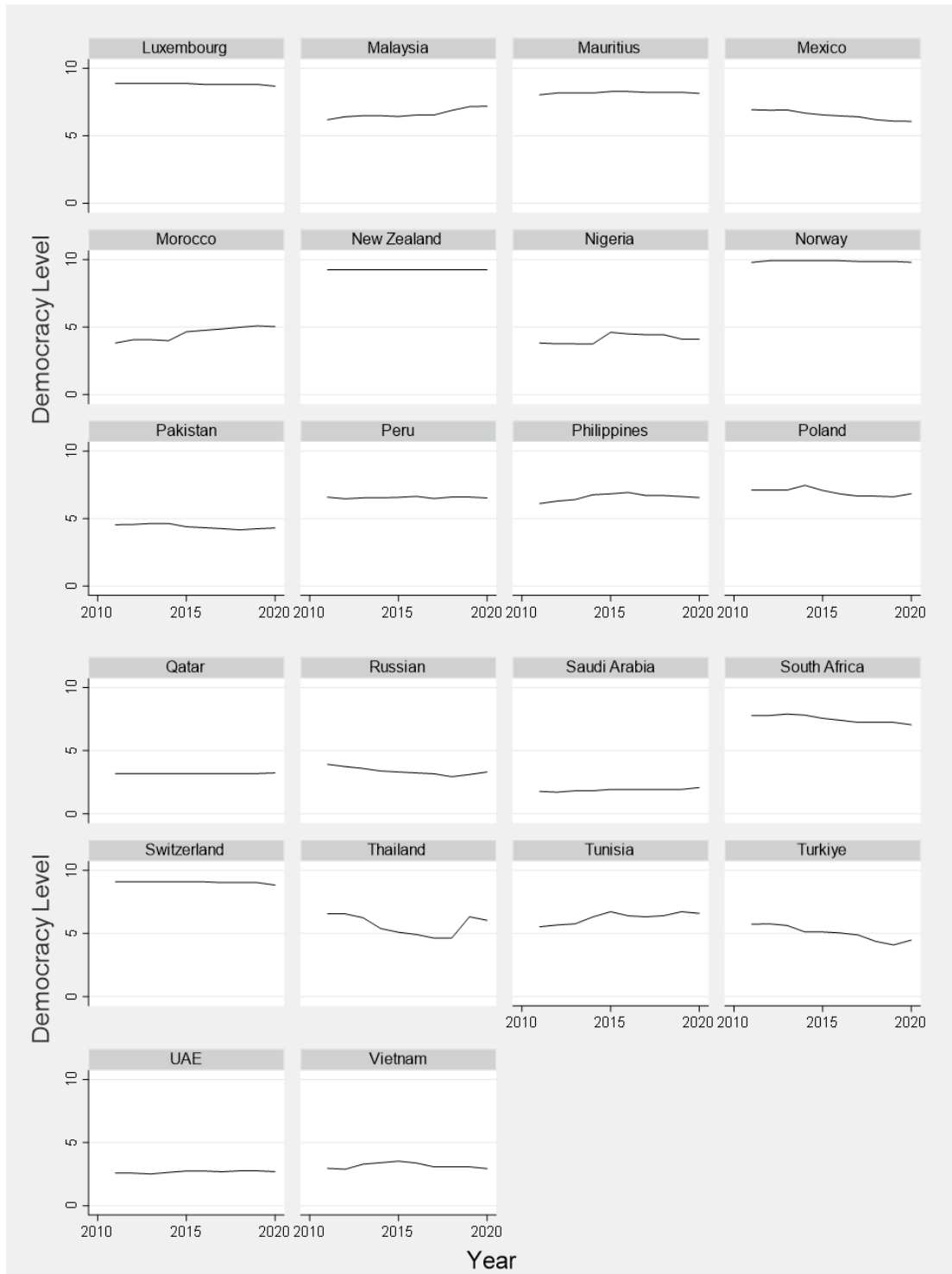# Appendix C: Corruption Level by Countries
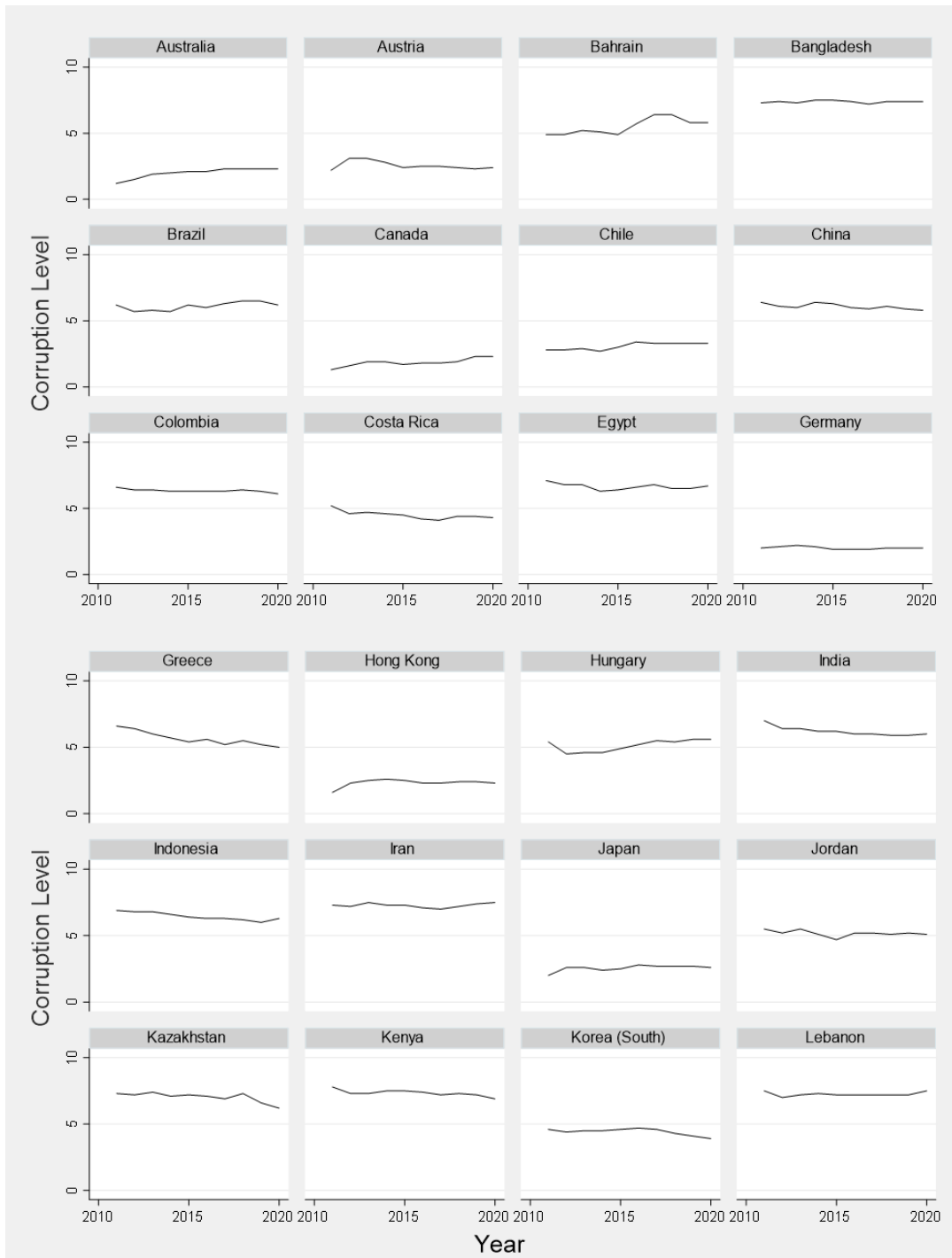
Corruption Level by Countries

Appendix D: Democracy Level by Countries

Democracy Level by Countries

Appendix E: Regression Analysis Result - Economic Factor

Table E-1. Panel-Data Regression Analysis Result – Subgroup Analysis
Dependent Variable: Percentage of Stock Market Capitalization to GDP

Variable	Model 1
Lagged dependent (SDL$_{it-1}$)	0.298
	(1.84)**
Log GDP per capita	-58.854
	(-1.64)
Turnover ratio (CT$_{it}$)	-0.029
	(0.11)
Real interest rate (CT$_{it}$)	0.030
	(0.06)
Year	1.432
	(2.40)**
Arellano -Bond AR (1) Test	-1.88
	[0.061]*
Arellano -Bond AR (2) Test	-0.49
	[0.622]
Sargan test of overidentifying restrictions	90.33
	[0.000]***
Hansen test of overidentifying restrictions	37.38
	[0.275]

Model 1: $SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \varepsilon_{it}$

Note: Notes: T-statistic are in parenthesizes and P values in squared bracket. *** , **, * indicates statistic significant at 1, 5, and 10 percent respectively. CrlevelxDem is the interaction of corruption level and democracy level. Arellano -Bond AR (1) and AR (2) Tests are tests for first autocorrelation and second autocorrelation respectively.

Appendix F: Sub-group Regression Analysis Result

Table F-1. Panel-Data Regression Analysis Result – Subgroup Analysis
Dependent Variable: Percentage of Stock Market Capitalization to GDP

Variable	Low Corrupt	High Corrupt
Lagged dependent (SDL_{it-1})	0.6915	0.3314
	(3.93)***	(1.98)*
Turnover ratio (CT_{it})	-0.6957	0.0782
	(-2.47)**	(0.68)
Real interest rate (CT_{it})	0.3058	-0.2258
	(1.20)	(-0.58)
Lagged Corruption Level (CR_{it-1})	-5.920	13.7408
	(-0.67)	(2.61)**
Year	1.1587	0.5514
	(1.87)*	(1.27)**
Arellano -Bond AR (1) Test	-1.81	-1.79
	[0.079]*	[0.074]*
Arellano -Bond AR (2) Test	-0.59	0.04
	[0.556]	[0.966]
Sargan test of overidentifying restrictions	93.96	54.19
	[0.000]***	[0.020]***
Hansen test of overidentifying restrictions	20.82	16.11
	[0.980]	[0.997]

Model 1: $SDL_{it} = \alpha_i + \mu_t + \beta SDL_{it-1} + \gamma CT_{it} + \lambda CR_{it-1} + \varepsilon_{it}$

Note: Notes: T-statistic are in parenthesizes and P values in squared bracket. *** , **, * indicates statistic significant at 1, 5, and 10 percent respectively. CrlevelxDem is the interaction of corruption level and democracy level. Arellano -Bond AR (1) and AR (2) Tests are tests for first autocorrelation and second autocorrelation respectively.

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