

Economic Freedom, Financial Crisis and Stock Volatilities in Emerging Markets

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Abstract

This paper explores how equity market volatilities are related with the Index of Economic Freedom for 22 emerging countries over 1995-2010 by considering the impacts of financial crisis. Consistent with theory, we find the overall economic freedom index and its components exert significant impacts on equity market volatilities. Specifically, the index components within the categories of regulatory efficiency (such as business freedom and monetary freedom) and limited government (fiscal freedom, and government spending) exhibit strong and significant explaining powers to the stock market volatilities. However, the other index components within the categories of rule of law and open markets are not significant. In addition, the stock market volatilities are significantly higher when the country confronts either one of the currency crisis, inflation crisis, stock market crash, debt crisis, or banking crisis. The results are consistent across different levels of inflation and wealth in emerging markets.

Keywords: Economic Freedom, Financial Crisis, Stock Volatility, Emerging Markets.

Introduction

Economic freedom is the driving force behind why some societies thrive while others do not. It is widely believed that economic freedom engenders economic prosperity, and a country's economic freedom is associated with the development of capital market and financial stability. For example, La Porta *et al.* (1997) claim that a country's legal environment is very important for investor

protection and it affects market capitalization. Li (2002) confirms that greater economic freedom is always related to stronger shareholder protections and the relative market capitalization. Stocker (2005) investigates the relationship between economic freedom and equity returns between 1970 and 2000, and finds that an investment strategy based on the changes in economic freedom yields significantly abnormal returns. In other words, for investors seeking superior investment returns, countries that are experiencing greater economic freedom improvement should be selected for their investment portfolios. In addition, Stocker (2005) points out that increases in economic freedom would provide investors with above-average investment returns. Lombardo and Pagano (2000) find that there is a positive correlation between return on equity and the quality of legal systems across different countries. Bekaert *et al.* (2001) further conclude that financial liberalization spurs economic growth.

This study attempts to fill the gap by analyzing the relationship between economic freedom, financial crisis and stock market volatilities in emerging markets. In these developing countries, stock return and uncertainties seem to be affected in the same way and by the same types of variables that are significant in developed countries. However, there are systematic differences in the way these ratios are affected by country factors, such as GDP per capita levels, inflation rates, and development of capital markets (Booth *et al.*, 2001). In addition, this group of economies is less developed and their financial markets are more likely affected by financial crisis, while the impact of economic freedom and financial crisis on emerging market stock volatility has rarely been explored in previous literature.

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This paper contributes to the literature in three ways. First, we use the Index of Economic Freedom to gauge economic freedom, which is available and provides us a broad range of up-to-date data resources. Second, we examine the relationship between economic freedom and equity market volatility using panel fixed effect model. We extend the previous research by focusing on stock volatility rather than stock return. Since stock volatility is associated with financial crisis, it is important that we investigate both stock market volatilities and inherent investment risks with respect to economic freedom. Third, by controlling for other economic factors, we empirically test two hypotheses on the relationships between the level of economic freedom, financial crisis, and market volatility, using data from 22 emerging countries over 1995-2010. The results have broad implications for economic activities from the government, stock market regulators and investors, especial during the time of financial crisis.

This paper explores how equity market volatilities are related with the Index of Economic Freedom as a whole as well as a breakdown of its individual components for 22 emerging countries over 1995-2010. Consistent with theory, we find the overall economic freedom index and its components exert significant impacts on equity market volatility. Specifically, the index components within the categories of regulatory efficiency (such as business freedom, labour freedom, and monetary freedom) and limited government (fiscal freedom, and government spending) exhibit strong and significant explaining powers to the stock market volatilities. However, the index components within the categories of rule of law (such as property rights and freedom from corruption) and open markets (such as trade freedom, investment freedom, and financial freedom) are not significant indicators of equity market volatility in emerging markets. In addition, the stock market volatilities are significantly higher when the country confronts either one of the currency crisis, inflation crisis, stock market crash, domestic sovereign debt crisis, external sovereign debt crisis, or banking crisis. The findings suggest a richer interpretation on investor-based hypothesis in emerging markets.

The rest of this paper is organized as follows. Section 2 describes data, section 3 outlines the methodology, and section 4 reports empirical findings. Section 5 concludes.

Data Description

The sample consists of monthly stock market indices from major emerging countries over the period of December 1994 to December 2010. These indices are obtained from Morgan Stanley Capital International (MSCI) and are expressed in the U.S. dollars to isolate currency risk. The countries in the sample include: Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey. Due to data availability, we do not include Egypt and Kuwait in the sample. However, as suggested by De Zwart *et al.* (2009) and Frankel and Poonawala (2010), we add Hong Kong and Singapore into the sample, since they are newly industrialized and play an important role in their regional economy. The stock volatilities for these countries are computed as their annual standard deviations by using their monthly stock index returns. Table 1 provides the summary of stock market index for selected emerging markets. It shows that the majority of the market indices start from January 1995, while some other countries have missing data for some years in early 1990s. After eliminating the missing values, the final sample ends up with a total number of 328 observations.

The data are collected from Datastream International and The Heritage Foundation available at <http://www.heritage.org/index/>. The proxy of economic freedom is a series of indices based upon ten specific components, namely, business freedom, trade freedom, fiscal freedom, freedom from government, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, and labour freedom. The Wall Street Journal and The Heritage Foundation have tracked the march of economic freedom around the world with the influential Index of Economic Freedom. Since 1995, the index has brought Adam Smith's theories about liberty, prosperity and economic freedom to life by creating 10 benchmarks that gauge the economic success of 185 countries around the world. A country's overall economic freedom score is a simple average of its scores on the 10 individual freedoms. The definitions for each component expressed as follows:

Table 1: Summary of stock market index for selected emerging markets

ID	Country	Code	Starting Date	Ending Date	Market Index
1	Brazil	BRA	Dec-01	Dec-10	IBOVESPA - PRICE INDEX
2	Chile	CHL	Jan-95	Dec-10	CHILE GENERAL (IGPA) - PRICE INDEX
3	China	CHN	Jan-95	Dec-10	SHANGHAI SE COMPOSITE - PRICE INDEX
4	Colombia	COL	Aug-01	Dec-10	COLOMBIA IGBC INDEX - PRICE INDEX
5	Czech Republic	CZE	Jan-95	Dec-10	PRAGUE SE PX - PRICE INDEX
6	Hong Kong	HKG	Jan-95	Dec-10	HANG SENG - PRICE INDEX
7	Hungary	HUN	Jan-95	Dec-10	BUDAPEST (BUX) - PRICE INDEX
8	India	IND	Jan-95	Dec-10	INDIA BSE (SENSEX) 30 SENSITIVE - PRICE INDEX
9	Indonesia	IDN	Jan-95	Dec-10	IDX COMPOSITE - PRICE INDEX
10	Malaysia	MYS	Jan-95	Dec-10	FTSE BURSA MALAYSIA KLCI - PRICE INDEX
11	Mexico	MEX	Jan-95	Dec-10	MEXICO IPC (BOLSA) - PRICE INDEX
12	Morocco	MAR	Feb-02	Dec-10	MOROCCO ALL SHARE (MASI) - PRICE INDEX
13	Peru	PER	Jan-95	Dec-10	LIMA SE GENERAL(IGBL) - PRICE INDEX
14	Philippines	PHL	Jan-95	Dec-10	PHILIPPINE SE I(PSEi) - PRICE INDEX
15	Poland	POL	Jan-95	Dec-10	WARSAW GENERAL INDEX 20 - PRICE INDEX
16	Russia	RUS	Sep-95	Dec-10	RUSSIA RTS INDEX - PRICE INDEX
17	Singapore	SGP	Sep-99	Dec-10	STRAITS TIMES INDEX L - PRICE INDEX
18	South Africa	ZAF	Jul-95	Dec-10	FTSE/JSE ALL SHARE - PRICE INDEX
19	South Korea	KOR	Jan-95	Dec-10	KOREA SE COMPOSITE (KOSPI) - PRICE INDEX
20	Taiwan	VNM	Jan-95	Dec-10	TAIWAN SE WEIGHTED - PRICE INDEX
21	Thailand	THA	Jan-95	Dec-10	BANGKOK S.E.T. - PRICE INDEX
22	Turkey	TUR	Jan-95	Dec-10	ISTANBUL SE NATIONAL 100 - PRICE INDEX

- Business freedom is the ability to create, operate, and close an enterprise quickly and easily.
- Trade freedom is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services.
- Monetary freedom combines a measure of price stability with an assessment of price controls.
- Freedom from government is defined to include all government expenditures – including consumption and transfers – and state-owned enterprises. Ideally, the state will provide only true public goods, with an absolute minimum of expenditure.
- Fiscal freedom is a measure of the burden of government from the revenue side. It includes both the tax burden in terms of the top tax rate on income (individual and corporate separately) and the overall amount of tax revenue as portion of gross domestic product (GDP).
- Property rights assess the ability of individuals to accumulate private property, secured by clear laws

that are fully enforced by the state.

- Investment freedom is an assessment of the free flow of capital, especially foreign capital.
- Financial freedom is a measure of banking security as well as independence from government control.
- Freedom from corruption is based on quantitative data that assess the perception of corruption in the business environment, including levels of governmental, legal, judicial, and administrative corruption.
- Labor freedom is a composite measure of the ability of workers and businesses to interact without restriction by the state.

The 10 economic freedoms are grouped into four broad categories or pillars of economic freedom as follows:

1. Rule of Law (property rights, freedom from corruption);
2. Limited Government (fiscal freedom, government spending);

3. Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and
4. Open Markets (trade freedom, investment freedom, and financial freedom).

The Index of Economic Freedom has a grading scale from 0 to 100, where 100 represents the maximum freedom. In another words, a higher score on a single factor indicates a lower level of government interference or a higher level of economic freedom. The economic freedom data are available for 185 countries from 1995 except for labour freedom index, which starts from 2005. Therefore, the labour freedom index is dropped from the sample statistics.

To control for other economic factors, we retrieved GDP per capita and inflation data for each country from The World Bank--World Development Indicator (WDI) database. The per capita GDP is especially useful when comparing one country to another because it shows the relative performance of the countries. A rise in per capita

GDP signals growth in the economy and tends to translate as an increase in productivity. Moreover, per capita GDP is often used as an indicator of standard of living, with higher per capita GDP being interpreted as having a higher standard of living. Specifically, each country's GDP per capita is calculated based on its Purchasing Power Parity (PPP) in a specific year in the current U.S. dollar value, while inflation rate for each country is defined as annual percent change in Gross Domestic Production (GDP) deflator. Unlike Consumer Price Index (CPI), the GDP deflator is not based on a fixed basket of goods and services. The basket is allowed to change with people's consumption and investment patterns. Specifically, for the GDP deflator, the basket in each year is the set of all goods that were produced domestically, weighted by the market value of the total consumption of each good. Therefore, the GDP deflator reflects up-to-date expenditure patterns, although in practice, the difference between CPI and GDP deflator is relatively small.

Table 2: Financial Crisis in Emerging Markets

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Brazil	3	1	1	1	1	1	2	4	0	0	0	0	0	2	0	0
Chile	1	1	1	1	0	0	0	0	0	0	0	0	0	2	0	0
China	2	1	1	1	1	0	1	1	0	1	1	0	0	1	0	0
Colombia	3	2	1	3	3	2	0	1	0	0	0	0	0	0	0	0
Czech Republic	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Hong Kong	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	3	2	1	0	1	1	1	0	0	0	0	0	1	2	1	1
India	2	2	1	2	0	1	1	0	0	0	0	0	0	2	0	0
Indonesia	1	0	3	6	5	3	2	3	1	0	0	0	0	1	1	0
Malaysia	1	0	3	2	1	1	1	0	0	0	0	0	0	1	0	0
Mexico	4	3	2	3	1	2	0	0	0	0	0	0	0	2	0	0
Morocco	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0
Peru	1	1	1	2	1	1	1	0	0	0	0	0	0	1	0	0
Philippines	1	0	3	2	1	3	2	1	0	0	0	0	0	1	0	0
Poland	3	1	2	1	1	1	1	1	0	0	0	0	0	1	0	0
Russia	5	3	1	7	4	2	1	0	0	0	0	0	0	3	1	0
Singapore	0	1	2	1	0	1	1	1	0	0	0	0	0	1	0	0
South Africa	1	2	1	2	0	1	1	0	0	0	0	0	0	1	0	0
South Korea	1	1	3	1	1	2	1	1	0	0	0	0	0	2	0	0
Taiwan	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	1	2	3	2	1	3	1	0	0	0	0	0	0	0	0	0
Turkey	3	2	2	3	2	4	5	2	1	0	0	0	0	2	0	0

The crisis index of each country is drawn from Reinhart (2010) and the author's hand collecting data from Lexus-Nexus Database. The crisis index is defined annually, which is the sum of seven dummy variables that take the value one if the country confronts a currency crisis, inflation crisis, stock market crash, domestic sovereign debt crisis, external sovereign debt crisis, or banking crisis, and zero otherwise. Table 2 summarizes the values of crisis index for each selected emerging market. As we can see that, financial crisis frequently occur in early 1990s in most of the emerging markets, and the 2008 financial crisis affects most of the emerging economies as well.

Methodology

We employ fixed effect panel regression model to isolate the within effect throughout the variables. The panel estimating model can be expressed as

$$y_{it} = \alpha_i + x_{it}\beta + \varepsilon_{it} \quad (i = 1, \dots, N; \quad t = 1, \dots, T) \quad (1)$$

where y_{it} is the dependent variable observed for individual i at time t , x_{it} is the time-variant $1 \times k$ regressor matrix, β is the estimated coefficient, α_i is the unobserved time-invariant individual effect, ε_{it} is the error term and it is independent and identical with normal distribution in the form of $\varepsilon_{i,t} \sim \text{i.i.d.} N(0, \sigma_\varepsilon^2)$ (Moulton, 1986).

This model specification is more appropriate because the random effect model uses generalized least squares (GLS) method, which assumes that α_i is a stochastic process and the regressor x_{it} is not correlated with the individual effects α_i , in other words, $E\{\alpha_i | x_{it}\} = 0$; however, fixed effect model allows for endogeneity of the regressors with the individual effects. It states that $\alpha_{it} = \alpha_i + v_{it}$, where α_i is time-invariant and denotes the unobservable individual specific effect, while v_{it} denotes the remainder disturbance and follows normal distribution such that $v_{it} \sim \text{i.i.d.} N(0, \sigma_v^2)$. In other word, if α_i and the regressor x_{it} are correlated, fixed effects model is preferred because it accounts for any individual-specific effect that is not included in the regression and controls for unobserved heterogeneity. When this heterogeneity is constant over time and correlated with independent variables, this constant α_i can be removed from the data by taking a first difference. In this case, α_i is assumed to be a fixed parameter to be estimated. More specifically, the fixed effect model can be further written as

$$y_{it} = \alpha_i + v_{it} + x_{it}\beta + \varepsilon_{it} \quad (2)$$

It is common to find explanatory variables of interest in panel data sets that are time invariant, (e.g. race, sex, regional location). In a fixed effects model these variables are "swept away" by the within estimator of the coefficients on the time varying covariates. Hausman, William, and Taylor (1981) analyze models in which some of the variables (both time varying and time invariant) are endogenous. Baltagi (1995) provides a comprehensive treatment of panel data models in the contexts of both single equation and systems methods. Any variables with a within standard deviation of zero will be dropped from the fixed effect model, because the coefficients on these variables may not be well identified as the others. The null hypothesis that x_{it} and α_i are uncorrelated can be tested by comparing the within and random estimators, which is suggested by Hausman (1978). If the *Chi-square* is greater than critical value, it rejects the null hypothesis that the random effect estimator is consistent, indicating that the fixed effect estimator is appropriate. Specifically, the fixed effect panel regression model can be expressed as follows.

$$VOL_{it} = \alpha_i + \beta_1 Freedom_{it} + \beta_2 Crisis_{it} + \beta_3 INF_{it} + \beta_4 GDPPC_{it} + \varepsilon_{it} \quad (3)$$

where VOL is stock index return volatilities, *Freedom* is the Index of Economic Freedom, *INF* is annual changes in GDP deflator, and *GDPPC* is *Per capita* GDP in current U.S. dollar value. ε_{it} is the error term. The dependent variable VOL is defined as the standard deviation of the monthly stock market index return for each country.

Empirical Results

Univariate Analysis

Table 3 reports the summary of descriptive statistics for selected variables. During our sample period, as a proxy for market volatility, the average standard deviation of equity returns of all countries is around 270.71 percent, while the median annual equity return volatility is 254.27 percent with a maximum of 8316 percent and a minimum of less than one percent. GDP per capita is U.S. \$11320.7 on average with a maximum of U.S. \$58061 and a minimum of U.S. \$1001.3. On average, the overall score of the Index of Economic Freedom is 64.16, and the means of other components of the Index of Economic

Table 3: Summary of Descriptive Statistics

	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>
Overall Freedom	328	64.157	63.200	10.157	45.100	90.500
Business Freedom	328	69.613	70.000	14.060	36.300	100.000
Trade Freedom	328	68.933	72.700	15.939	0.000	95.000
Fiscal Freedom	328	73.741	74.250	9.524	44.300	93.800
Government Spending	328	74.640	82.700	20.609	0.000	95.900
Monetary Freedom	328	74.260	77.200	13.585	0.000	94.200
Investment Freedom	328	58.918	60.000	16.782	20.000	90.000
Financial Freedom	328	55.335	50.000	17.041	30.000	90.000
Property Rights	328	58.537	50.000	20.322	20.000	90.000
Freedom from Corruption	328	44.229	40.000	18.804	10.000	94.000
Crisis	328	0.723	0.000	1.117	0.000	7.000
Volatility	328	270.713	254.27	931.246	0.005	8316.02
Inflation	328	8.944	5.723	15.690	-6.008	144.003
GDPPC	328	11320.66	8598.86	10282.43	1001.30	58061.51

Table 4: Correlation Matrix

	<i>Overall</i>	<i>Business</i>	<i>Trade</i>	<i>Fiscal</i>	<i>Govern</i>	<i>Monetary</i>	<i>Investment</i>	<i>Financial</i>	<i>Property</i>	<i>Corruption</i>	<i>Volatility</i>	<i>Inflation</i>
<i>ment</i>												
Overall	1.000											
Business	0.795	1.000										
Trade	0.628	0.426	1.000									
Fiscal	0.456	0.156	0.283	1.000								
Government	0.239	-0.006	-0.047	0.568	1.000							
Monetary	0.494	0.281	0.241	0.286	0.238	1.000						
Investment	0.683	0.615	0.323	0.058	-0.120	0.107	1.000					
Financial	0.631	0.540	0.476	0.027	-0.236	0.148	0.618	1.000				
Property	0.791	0.677	0.420	0.127	-0.044	0.209	0.620	0.495	1.000			
Corruption	0.858	0.743	0.482	0.278	0.032	0.435	0.571	0.448	0.732	1.000		
Volatility	-0.072	0.004	0.160	-0.085	-0.030	-0.248	-0.004	0.024	-0.057	-0.080	1.000	
Inflation	-0.253	-0.090	-0.075	-0.258	-0.135	-0.684	0.020	-0.052	-0.045	-0.261	0.246	1.000
GDPPC	0.700	0.601	0.530	0.381	-0.054	0.276	0.533	0.475	0.519	0.665	0.041	-0.195

Freedom are around 60-70. The composite economic freedom index varies from 45.1 to 90.5, with a median of 63.2 and a standard deviation of 10.16. The averages of the individual components of the index all exceed 50 except for freedom from corruption, with a highest score of 74.64 for government spending and a lowest score of 44.23 for freedom from corruption. Among all the criteria, the government spending exhibits the largest variation of 20.6 percent, and the fiscal freedom exhibits the lowest variation of 9.52 percent. The average crisis

happened per year is 0.72 with a maximum value of 7 and a minimum value of zero. In addition, the inflation rate varies significantly across different countries, the average changes in GDP deflator is 8.94 percent, with a maximum value of 144 percent and a minimum value of negative 6 percent.

Further analysis is shown in the correlation matrix in Table 4. It shows that the components of the Index of Economic Freedom are highly correlated to overall index. For example, business freedom, trade freedom,

investment freedom, financial freedom, property rights and freedom from corruption all have higher correlation above 0.5. Moreover, the components of the Index of Economic Freedom are correlated each other, indicating that potential multicollinearity may exist in model specification. In addition, inflation rate is negatively correlated to the Index of Economic Freedom and other factors, suggesting that a higher degree of economic freedom is more likely associated with a lower inflation rate. It is also true that a higher degree of economic freedom is more likely associated with a higher level of GDP per capita for the selected sample period in emerging economies.

Panel Data Regression

We first estimate the standard deviation of month stock index returns for each country as its annual volatility. We then proceed to examine the relationship between economic freedom, crisis, and equity market volatility by controlling for other economic factors, such as GDP deflator and per capita GDP. Table 5 reports the empirical results from panel data regression by using fixed effect model. Since equity market volatility measures investment risk and financial market stability, it is important for investors to analyze the determinants and other economic freedom in equity and derivatives pricing.

Table 5: Fixed Effect Panel Regression

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Panel A: Dependent variable--stock index return volatility					
Overall	23.990**				
	(2.26)				
Business		9.454**			
		(2.32)			
Fiscal			19.301***		
			(3.12)		
Government				12.807***	
				(2.95)	
Monetary					13.900***
					(3.64)
Crisis	65.221**	73.171**	82.267***	66.723**	96.553***
	(2.03)	(2.30)	(2.60)	(2.10)	(3.03)
INF	-13.439***	-14.329***	-11.571***	-12.917***	-9.954***
	(-5.24)	(-5.53)	(-4.41)	(-5.05)	(-3.67)
GDPPC	0.024***	0.029***	0.017**	0.024***	0.019**
	(3.10)	(3.73)	(2.00)	(3.09)	(2.43)
Constants	-1470.430**	-645.540**	-1296.744***	-889.600***	-960.391***
	(-2.18)	(-2.07)	(-2.95)	(-2.69)	(-3.29)
N	328	328	328	328	328
F	12.87	12.95	14.21	13.90	15.21
Within R ²	0.146	0.146	0.158	0.156	0.168
Between R ²	0.050	0.045	0.127	0.069	0.198
Overall R ²	0.009	0.005	0.015	0.009	0.032
Panel B: Dependent variable--stock index return volatility					
Trade	4.660				
	(1.35)				
Investment		-4.391			
		(-1.29)			

Financial			-1.644		
			(-0.50)		
Property				-1.428	
				(-0.36)	
Corruption					7.418*
					(1.90)
Crisis	85.781***	90.807***	76.037**	81.241**	72.835**
	(2.63)	(2.69)	(2.37)	(2.35)	(2.28)
INF	-13.625***	-13.116***	-13.316***	-13.454***	-13.167***
	(-5.28)	(-5.05)	(-5.09)	(-5.19)	(-5.11)
GDPPC	0.023***	0.025***	0.026***	0.026***	0.026***
	(2.73)	(3.17)	(3.33)	(3.21)	(3.37)
Constants	-247.071	298.012	129.896	124.197	-289.821
	(-1.05)	(1.32)	(0.62)	(0.48)	(-1.45)
N	328	328	328	328	328
F	11.92	11.88	11.47	11.44	12.44
Within R ²	0.136	0.136	0.132	0.132	0.136
Between R ²	0.059	0.116	0.089	0.088	0.059
Overall R ²	0.004	0.009	0.009	0.009	0.009

Table 5 reports our findings of the impact of economic freedom, crisis and other factors on equity volatility measured by the standard deviation of equity index returns. In Panel A, Model 1 through Model 5 all show that the economic freedom index have positive and statistically significant relationships with equity market volatility. Clearly, an economy with less government intervention promotes equity market stability and stock returns. Economic freedom index explains about 14.6-16.8 percent of the variations in the cross-country equity market volatility. The overall index of economic freedom is significant at the 5% level, and it shows that 1% increase in the overall index will lead to 23.99% increase in stock market volatility.

Models 2-10 report results based upon individual components of the economic freedom index. As revealed in Panel A by Models 2-5, business freedom, fiscal freedom, government spending, and monetary freedom are all conducive to a more stable stock market and they all bear anticipated positive signs. The t-values in parentheses show that these coefficients are all statistically significant at the 1% level with business freedom at the 5% level. A closer look reveals that among all economic freedom components, monetary freedom has the best explanatory power of stock market volatility with a within R² of 16.8 percent. Since monetary freedom measures the extent to

which a country is free from inflation and price control, it rightly conduces to a more stable market under lower influence from the government.

Since both fiscal freedom and government freedom are significant and both carry the expected positive signs, we conclude that the index components within the categories of regulatory efficiency (such as business freedom, labour freedom, and monetary freedom) and limited government (fiscal freedom, and government spending) have significant explaining powers to the stock market volatilities.

We also run panel regression on stock market volatility against all the other economic freedom index component variables along with crisis and controlling factors to see if they might have potential effects. The results are shown in Models 1-5 of Panel B. It shows that trade freedom, investment freedom, fiscal freedom, property rights are no longer statistically significant, although freedom from corruption is marginally significant at 10% level. Although trade freedom and freedom from corruption remain positive signs, investment freedom, financial freedom and property rights freedom now become negative while still being insignificant. Therefore, we conclude that the components of economic freedom index within the categories of rule of law (such as property rights and

freedom from corruption) and open markets (such as trade freedom, investment freedom, and financial freedom) are not significant, and they are not good indicators of equity market volatility in emerging markets.

In addition, we find that the occurrences of financial crisis are highly significant and positively associated with equity market volatility. One unit of increase in financial crisis tends to increase 65 to 96 units of stock volatility. Generally speaking, less government involvement in the economic activities tends to shield the stock market from going through more ups and downs. Moreover, the potential possibility of financial crisis will cause financial market to be more volatile. This finding is consistent with theory that the higher degree of economic freedom, the more volatile the stock market. In addition, there is strong evidence supporting it that economic crisis facilitates equity market volatility.

Conclusions

In this paper, we study whether financial crisis and the level of economic freedom matter for a country's stock market volatility. Since the Index of Economic Freedom can be used to measure the potential opportunity of investment, we explore how equity market volatility are related with the Index as a whole as well as a breakdown of its individual components for 22 emerging countries over 1995-2010. Consistent with theory, we find economic freedom exerts some impacts on equity market volatility. In addition to the overall index, some individual components of the index also exhibit no measurable effects on equity performance. In general, the index components within the categories of regulatory efficiency (such as business freedom, labour freedom, and monetary freedom) and limited government (fiscal freedom, and government spending) exhibit strong significant explaining powers to the stock market volatilities. However, the index components within the categories of rule of law (such as property rights and freedom from corruption) and open markets (such as trade freedom, investment freedom, and financial freedom) are not significant indicators of equity market volatility in emerging markets.

In addition, the stock market volatilities are significantly higher when the country confronts either one of the currency crisis, inflation crisis, stock market crash, domestic sovereign debt crisis, external sovereign debt crisis, or banking crisis. The findings suggest a richer

interpretation on investor-based hypothesis in emerging markets: less government-intervened financial markets lead to lower stock volatility, especially during the time of financial crisis. Although the rise in government intervention was always found to be very pronounced in emerging markets, higher real GDP per capita and lower inflation rate make stock market less fluctuate. Thus, a secure and a relatively fraud free environment with a high level of economic freedom increases the confidence of investors, and in turn increases the value of the listed firms. Our results imply that a country with greater economic freedom provides investors with higher investment efficiency and better financial market stability.

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