



Economic freedom, equity performance and market volatility

Economic
freedom

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189

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Abstract

Purpose – The purpose of this paper is to investigate the relationships between the *Index of Economic Freedom*, equity market performance and its volatility.

Design/methodology/approach – The paper examines whether the level of economic freedom is significant for a country's stock market performance and volatility.

Findings – Regression results show that adjusted stock returns bear little relationship with economic freedom. On the other hand, economic freedom is associated with lower stock market volatility.

Originality/value – The results imply that a country with greater economic freedom provides investors with better mean-variance investment efficiency.

Keywords Economics, Freedom, Stock returns, Stock markets

Paper type Research paper

1. Introduction

Economic freedom is the extent to which one can pursue economic activity with limited interference from government. It is widely believed that economic freedom engenders prosperity, and that there is some correlation between a country's economic freedom and capital market size/equity returns. For example, Li (2002) shows that greater economic freedom and stronger shareholder protections are positively related to the relative market capitalization. La Porta *et al.* (1997) also report that a country's legal environment positively affects its market capitalization. Stocker (2005) provides a review of the relationship between economic freedom and equity returns between 1970 and 2000[1]. In his paper, a strategy for global investors is proposed, which essentially ties the rate of increase in economic freedom directly with equity returns, and it is shown that an investment strategy based on the change in economic freedom yields attractive 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 a recent paper, Stocker (2006) highlights the relationship between economic freedom and investment returns. Based on the economic freedom of the world (EFW) survey, he stresses that an increase in economic freedom associated with improved socioeconomic conditions provides investors with above-average investment returns.



Ritter (2005) adds to our understanding that economic growth in fact is negatively correlated with equity returns. Additionally, other researches, such as La Porta *et al.* (1998), conclude that difference in legal protection of investors explains why firms are financed and owned so differently in some 49 countries.

Although the aforementioned studies explore the relationship between equity markets and legal environment or economic growth of a country, only Stocker (2005, 2006) report the impact of changes in economic freedom on equity returns. However, Stocker's results are based on a database that is available only every five years for a total of six cross-country data sets. More than half of his data sets contain countries that have only two consecutive five-year samples. Furthermore, it should be recognized that "countries that experience the most improvement in economic freedom" cannot be equated to "countries that have the highest level of economic freedom." In this study, we are more interested in the latter group of countries since the former group by definition involves less developed nations. Moreover, the impact of economic freedom on market volatility has never been explored.

Therefore, we are able to contribute to the literature in three aspects. First, our research is based on an alternative measurement of economic freedom, namely, the *Index of Economic Freedom*[2], which is available annually since 1995. Second, we study if countries with higher level of economic freedom witness better equity market performance. Third, in addition to the relationship between economic freedom and equity returns, we also examine the relationship between economic freedom and equity market volatility. Since volatility measures investment uncertainty, it is only meaningful that we investigate both stock market performance and inherent investment risks with respect to economic freedom.

In this paper, we empirically test two hypotheses on the relationships between the level of economic freedom, equity performance, and market volatility, using data on 55 countries for the past decade. As such, potential trends may be revealed and investment implications may be uncovered. It is demonstrated in our empirical results that less intervention in economic activities from the government contributes to lower volatility in stock markets, although a similar clear-cut impact on stock performance is lacking.

The rest of this paper is organized as follows. Section 2 describes data and presents summary statistics. Section 3 outlines our methodology and reports empirical findings. Section 4 summarizes the results and presents concluding remarks.

2. Data and summary statistics

The data for our study are extracted from the Heritage Foundation's web site[3] and DataStream. The *Index of Economic Freedom* published by the Heritage Foundation and the *Wall Street Journal* has been acclaimed as the most comprehensive and systematic empirical measurement of economic freedom in 157 countries throughout the world since 1995. Based upon a set of objective economic criteria, the index is more than a simple ranking, as it also identifies 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 labor freedom. These components are defined by the Heritage Foundation as:

- Business freedom is the ability to create, operate, and close an enterprise quickly and easily.

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- 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.

A grading scale of 0-100 is used to construct the economic freedom index, and a score of 100 represents the highest level of freedom. All factors are equally weighted in order to not bias the overall score toward any one factor or policy direction. A higher overall score or a higher score on a single factor indicates a lower level of government interference in the economy, and an economic environment or a set of policies that are most conducive to economic freedom.

Although the economic freedom data are available for 157 countries from 1995, after matching the index with other variables we use from DataStream, we are left with 55 countries which have most of the data available from 1995 to 2006 for our analysis. The total sample size varies from 578 to 604 country-year observations depending on variables. We look at these countries' annual stock index returns, standard deviations of the returns, annual GDP growth rates, overall scores of the *Index of Economic Freedom*, and various criteria of the index from 1996 to 2006. Data available for our empirical analysis starts in 1996, because we lose one year of data for computing GDP growth rates and stock returns. Owing to the fact that the labor freedom factor is a new addition since 2005, we drop it in the analysis breakdown of the index to preserve consistency.

Table I shows the summary statistics. During our sample period, as a proxy for market volatility, the average standard deviation of equity returns of all countries is around 38 percent, while the annual equity return averages 18.8 percent with a maximum of 514 percent and a minimum of – 81 percent. GDP growth rate averages

Variables	Mean	SD	Min.	Max.
Volatility	0.3806	0.2267	0.1109	1.5273
Return	0.1883	0.4508	-0.8141	5.1396
GDP%	3.6563	3.0255	-13.1000	11.7000
Index	64.8880	9.3669	42.2422	91.3673
Business	54.5003	17.6253	30.0000	100.00
Trade	69.9241	12.5037	4.4000	100.00
Fiscal	76.2173	9.7926	50.2904	95.8266
Government	61.6659	21.2185	3.8984	98.9024
Monetary	77.0785	12.5651	11.8768	95.5240
Investment	63.0132	14.8690	10.00	90.00
Financial	60.9602	18.3137	30.000	90.000
Property rights	65.9271	20.9548	30.000	99.000
Corruption	56.3427	25.2828	10.000	100.00

Notes: This table reports descriptive statistics of the variables used in the analysis: volatility, standard deviation of annual stock returns; return, stock index returns; GDP percent, GDP growth rate; index, economic freedom index; business, business freedom; trade, trade freedom; fiscal, fiscal freedom; government, freedom from government; monetary, monetary freedom; investment, the investment freedom; financial, financial freedom; property rights, property rights protections; and corruption, freedom from corruption

Table I.
Descriptive statistics

around 3.65 percent. The composite economic freedom index varies from 42 to 91, with a mean of 64.88. The averages of the individual components of the index all exceed 50, with a highest score 77 for monetary freedom and a lowest 54.5 for business freedom. Among all the criteria, the Corruption component exhibits the biggest variation of 25 percent from country to country.

3. Methodology and empirical findings

It should be noted that when government intervenes in the stock market, it virtually interferes with the pricing of capital. In light of the growing importance of the degree of economic freedom of a country in equity market performance, two hypotheses are set up as follows:

H1. The higher the economic freedom, the higher the equity performance.

H2. The higher the economic freedom, the lower the market volatility.

To test *H1*, we consider the following regression models:

$$R_{jt} = \alpha_1 + \beta_1 \text{Index}_{jt} + \varepsilon_{jt} \tag{1}$$

$$R_{jt} = \alpha_2 + \beta_2 \text{GDP}_{jt} + \gamma_2 \text{Index}_{jt} + \nu_{jt} \tag{2}$$

$$R_{ijt} = \alpha_{i3} + \beta_{i3} (\text{IndexComponent}_i)_{jt} + \mu_{ijt} \tag{3}$$

where R_{jt} is a proxy of stock market performance measured by the equity return for country j in year t scaled by the standard deviation of stock returns. We scale stock returns by the standard deviation of returns, because comparing cross-country mean

stock returns are not valid if variances of such returns differ. Index represents the economic freedom index; GDP denotes annual GDP growth rates; and IndexComponent_{*i*} are various components of the economic freedom index. Equation (1) tests the impact of economic freedom index on equity market performance; equation (2) tests the same impact while controlling for the GDP effect; and equation (3) tests the effect of each individual index component on equity returns.

In a similar fashion, we employ the following regression models to test *H2*:

$$\sigma_j = \alpha_1 + \beta_1 \text{Index}_j + \varepsilon_j \quad (4)$$

$$\sigma_j = \alpha_2 + \beta_2 \text{GDP}_j + \gamma_2 \text{Index}_j + \nu_j \quad (5)$$

$$\sigma_{ij} = \alpha_{i3} + \beta_{i3} (\text{IndexComponent}_i)_j + \mu_{ij} \quad (6)$$

where σ_j stands for the standard deviation of annual equity returns for country *j*. Since we use annual equity returns to construct the standard deviations, σ_j is a measurement of average equity market volatility over the sampling period. Therefore, all exogenous variables are measured by the average values over the sampling period.

We report the results of equations (1)-(3) in Table II. In Model 1 of Table II, economic freedom index carries a negative sign but is not statistically significant, suggesting that the degree of economic freedom does not necessarily have an expected positive impact on equity performance. GDP growth rate in Model 2 is positive and significant at the 1 percent level. This positive effect of GDP growth rate on equity performance is expected, however, it contradicts the finding in Ritter (2005). In Model 3, we retest the impact of economic freedom index on equity performance while controlling for the effect from the GDP growth rate and the result does not materially differ from those of the previous two models.

Models 4-12 intend to reveal the impacts of individual components of the economic freedom index on equity returns. Virtually all components show negligible effects on equity returns except for business and government freedom. The only component that is statistically significant and positively associated with equity performance is business freedom. It suggests that stock market performs better when government regulation is kept at the minimal level.

On the other hand, being marginally significant, government freedom carries a negative sign, which counters our prior expectation. It is possible that this variable picks up the effect of an unknown/unobserved variable, which is negatively related to equity performance. Indeed, when we put all economic freedom components in the same regression along with GDP growth rate, as shown in Model 13 in the last row of the table, business freedom remains positive and significant, but government freedom is no longer significant. To summarize, we find little evidence to support the hypothesis that economic freedom enhances equity market performance.

We next proceed to examine the relationship between economic freedom and equity market volatility. Since equity market volatility measures investment risk and is an important factor in equity and derivatives pricing, it is at least as important as equity returns for investors, if not more so. Table III reports our findings on the impact of economic freedom on equity volatility measured by the standard deviation of equity returns.

Table II.
Regression results for
adjusted stock returns
and economic freedom

	Intercept	Index	GDP	Business	Trade	Fiscal	Government	Monetary	Investment	Financial	Property rights	Corruption	Adj. R ²
M1	0.631 (2.15)**	-0.002 (-0.55)											-0.001
M2	0.150 (2.39)**		0.088 (6.61)*										0.07
M3	0.174 (0.60)	-0.0004 (-0.08)	0.088 (6.58)*										0.07
M4	0.116 (0.86)			0.006 (2.75)*									0.01
M5	0.611 (2.58)*			-0.002 (-0.61)									-0.001
M6	0.911 (2.79)*				-0.006 (-1.36)								0.001
M7	0.702 (5.54)*					-0.004 (-1.94)**							0.004
M8	0.607 (2.15)**						-0.002 (-0.49)						-0.001
M9	0.584 (3.12)*							-0.002 (-0.63)					-0.001
M10	0.534 (3.69)*								-0.001 (-0.46)				-0.001
M11	0.414 (2.97)*									0.001 (0.42)			-0.002
M12	0.415 (4.05)*										0.001 (0.59)		-0.001
M13	1.253 (2.23)**		0.089 (6.57)*	0.008 (2.96)*	-0.005 (-1.15)	-0.004 (-0.56)	-0.004 (-1.49)	-0.008 (-1.85)	-0.002 (-0.45)	-0.002 (-0.76)	0.003 (0.75)	-0.001 (-0.22)	0.09

Notes: Statistical significance at the *1 and **5 percent levels, respectively; *t*-statistics are reported in parentheses

Intercept	Index	GDP	Business	Trade	Fiscal	Government	Monetary	Investment	Financial	Property rights	Corruption	Adj. R^2
M1	0.947 (15.6)*	-0.009 (-9.47)*										0.13
M2	0.369 (25.8)*	0.003 (0.85)										-0.001
M3	0.943 (15.1)*	-0.009 (-9.43)*										0.133
M4	0.061 (18.8)*		-0.003 (-6.21)*									0.062
M5	0.442 (8.44)*			-0.001 (-1.24)								0.001
M6	0.169 (2.36)**				0.003 (2.93)*							0.013
M7	0.317 (11.3)*					0.001 (2.31)**						0.008
M8	1.241 (26.3)*						-0.011 (-18.47)*					0.373
M9	0.5768 (13.8)*							-0.003 (-4.75)*				0.040
M10	0.577 (18.5)*								-0.003 (-6.64)*			0.070
M11	0.553 (18.6)*									-0.003 (-6.16)*		0.060
M12	0.545 (25.5)*										-0.003 (-8.55)*	0.112
M13	1.195 (11.9)*	0.002 (0.7)	-0.0004 (-0.7)	0.001 (1.50)	0.001 (0.86)	-0.001 (-1.54)	-0.011 (-14.7)*	-0.001 (-2.03)**	-0.001 (-2.27)**	0.003 (4.15)*	-0.001 (-2.66)*	0.393

Notes: Statistical significance at the *1 and **5 percent levels, respectively; t -values are reported in parentheses

Table III.
Regression results for
stock market volatility
and economic freedom

This time Model 1 points out a negative and statistically significant relationship between economic freedom index and equity market volatility. Clearly, an economy with less government intervention promotes equity market stability. Economic freedom index explains 13 percent of the variations in the cross-country equity market volatility. The same result holds in Model 3, where the GDP growth rate is included to serve as a control variable. Models 4-12 report results based upon individual components of the economic freedom index. As revealed by these models, except for fiscal freedom and freedom from government, all the other variables unanimously are conducive to a more stable stock market and they all bear anticipated negative signs. The t -values in parentheses show that these coefficients are all statistically significant at the 1 percent level with trade freedom as the only exception. A closer look reveals that among all economic freedom components, monetary freedom has the best explanatory power of stock market volatility with an adjusted R^2 of 37 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 but carry the unexpected positive signs, we also regress stock market volatility against all economic freedom index component variables along with GDP growth rate to see if they might have potentially picked up the effects from other variables. The results are shown in Model 13 of Table III. Now fiscal freedom and government freedom are no longer statistically significant. Although most other variables remain negative and significant, property rights freedom now turns positive while still being significant. We attribute this to the potential multicollinearity problem in the model. For instance, the simple correlation between business freedom and property rights freedom is as high as 58 percent. Generally speaking, less government involvement in the economic activities tends to shield the stock market from going through more ups and downs. This finding is consistent with $H2$ that a higher degree of economic freedom, the less volatile the stock market. In short, there is strong evidence supporting it that economic freedom helps reduce equity market volatility. With market volatility measuring investment risk, we can say that economic freedom enhances mean-variance investment efficiency.

4. Conclusions

In this paper, we study whether the level of economic freedom matters for a country's stock market performance and volatility. Since the *Index of Economic Freedom* can be used to size up an economy as a potential market to invest in, we explore how equity performance along with market volatility are related with the Index as a whole as well as a breakdown of its individual components for 55 countries over 1996-2006.

Contrary to some anecdotal evidences, we find economic freedom exerts little impact on equity market returns. In addition to the aggregate index, individual components of the index also exhibit no measurable effects on equity performance. In a sharp contrast, evidence points out that an economy with lax government intervention promotes equity market stability. This conclusion is supported by the results based upon both the aggregate measurement of economic freedom as well as individual components of the index. As equity market stability reduces investment risk, our results imply that a

country with greater economic freedom provides investors with better mean-variance investment efficiency.

Notes

1. The economic freedom used by Stocker is measured by the Fraser Institute's EFW index.
2. Compiled by the Heritage Foundation and the *Wall Street Journal*, the annual *Index of Economic Freedom* provides a simple framework for understanding how open countries are to competition, the degree of state intervention in the economy, whether through overregulation, spending or taxation, and the strength and independence of a country's judiciary to enforce rules and protect private property.
3. The official website is at: www.heritage.org/index

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