HOW DOES GOVERNMENT POLICY AFFECT EQUITY RISK PREMIUM?

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Introduction
Government policies may be changed from time to time due to political or economic changes. High government decision uncertainty may affect economic aggregates. In fact, Ali (2001) suggests that the volatility of government economic decisions is negatively correlated with GDP growth rate. Moreover, Youngsuk and Julio (2013) examine the effects of government policy uncertainty on FDI flows. Their results show that electoral patterns in FDI flows are more prominent in countries with higher susceptibility for policy reversals, and when election results are more uncertain.

During the recent bank crisis, U.S. government has changed policy, which affected equity risk premium. Taylor (2010) and Hoshi (2011) argue that high government policy uncertainty related to the resolution of financial institutions bankruptcies has worsened the banking crisis of 2008.

Pástor and Veronesi (2012) suggest that uncertainty about government decisions translates into higher equity risk premium. More recently, Pástor and Veronesi (2013) show that equity investors require compensation as the changes of policy can affect firm's value, in theory. Furthermore, Lam and Zhang (2014) investigate the potential policy shock from government changes and the bureaucratic ability to reduce shocks. They argue that both factors affect equity risk premium in 49 countries over the period of 1995-2006, and bureaucratic risk carries an annual risk of 8 percent.

Finally, Donadelli and Persha (2014) examine the importance of governance policy uncertainty in explaining industry-by-industry equity risk-premium behavior in emerging markets. They find negative correlations between industrial stock market excess returns and global economic policy uncertainty.

In this study, we are interested in the effect of governance quality rather than uncertainty about it.

Literature review

Governance quality
Erbas and Minakhor (2007) use cross-sectional data from 53 emerging and mature markets in order to examine the sources of equity risk premium. They argue that a large of equity risk premium may reflect investor aversion resulting from the weaknesses of institutional governance.

In a similar spirit, Hooper et al. (2009) study the link between the quality of institutions and stock markets performance employing asset pricing models. They use a sample of 50 developed and emerging markets over the period 1996-2002. They find a significant positive association between the quality of institutions and stock market
performance. They suggest that countries with better quality of institutions have stock markets with higher equity returns and lower levels of risk.

In addition to governance quality, we consider a set of other determinants of equity risk premium as independent variables in the model, which are consumption preferences, inflation, economic risk, international financial integration and crisis.

Consumption preferences
Equity risk premium would be higher if investor preferences for current over future consumption increase. Equity risk premiums are lower in markets, where investors are net savers than markets, where investors are net consumers. Therefore, equity risk premiums should be higher if saving rates are lower (Damodaran, 2014). Rieger et al. (2012) examine equity risk premiums and time discount factors in 27 countries and find that higher equity risk premiums are observed when investors are more short-term.

Inflation
Modigliani and Cohn (1979) examine the decrease of equity prices in the 70s and conclude that it is a consequence of an increase in inflation rates.
Moreover, Brandt and Wang (2003) argue that equity risk premium increases (decreases), when inflation is higher (lower) than estimated. Therefore, it is not the level of inflation which determines equity risk premium but uncertainty about it. Campbell and Vouletenaho (2004) update Modigliani and Cohn results and find that dividend to price ratio changes are related to changes in the inflation rate over time.

Economic Risk
Lettau et al. (2008) link changes in equity risk premium in the U.S. to the changes in economic growth volatility. Moreover, the authors attribute low equity risk premium of the 90s to the low volatility of consumption, employment and economic growth.

International Financial Integration
Boussiga and Abaoub (2013) analyze the effect of international financial integration on equity risk premium using a panel dataset of 60 emerging and developing economies from 2000 to 2010. They find a negative relationship between international financial integration and equity risk premium. However, their results are not confirmed in crisis situation.

Model Formulation
We examine the effect of government policy quality on equity risk premium using a panel dataset of 122 developed and emerging countries over the period of 2000-2012. In view of the literature review above, we formulate the following model:

\[
ERP_{it} = \alpha_1 + \beta_1 \text{GovInd}_{i,t} + \beta_2 \text{Grossav}_{i,t} + \beta_3 \text{Infl}_{i,t} + \beta_4 \text{EconRisk}_{i,t} + \beta_5 \text{IFI}_{i,t} + \beta_6 \text{IFI}^*\text{Crisis}_{i,t} + \epsilon_{i,t}
\]

For panel data \(i = 1, \ldots, 122\) and \(t = 2000, \ldots, 2012\)

We use equity risk premium data available on Professor Damodaran’s website (http://pages.stern.nyu.edu/~adamodar/). All variables are described in Tables 1 and 2.
### Table 1. Description of Variables and Expected Effects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Expected effect</th>
<th>Explanation</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Risk Premium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td><a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a></td>
</tr>
<tr>
<td>Governance Indicators</td>
<td>Worldwide Governance Indicators</td>
<td>-</td>
<td>-</td>
<td>World Bank Database (Kaufmann et al., 2010)</td>
</tr>
<tr>
<td>Gross savings</td>
<td>Gross savings are calculated as gross national income less total consumption, plus net transfers. Percentage of gross savings is used in order to measure consumption preferences.</td>
<td>negative</td>
<td>Equity risk premiums are lower in markets where investors are net savers than in markets where investors are net consumers (Rieger et al., 2012; Damodaran, 2014)</td>
<td>World Bank Database</td>
</tr>
<tr>
<td>Inflation</td>
<td>Inflation rate</td>
<td>positive</td>
<td>When inflation is higher, equity risk premium increases</td>
<td>World Bank Database</td>
</tr>
<tr>
<td>Economic risk</td>
<td>GDP Volatility : standard deviation of quarterly GDP</td>
<td>positive</td>
<td>There is a positive relationship between economic risk and equity risk premium (Lettau et al., 2008; Boussiga and Abaoub, 2013).</td>
<td>International Financial Statistics</td>
</tr>
<tr>
<td>International Financial Integration</td>
<td>(FDI net inflows + FDI net outflows)/GDP (Arfaoui and Abaoub, 2010; Boussiga and Abaoub, 2013)</td>
<td>negative</td>
<td>When international financial integration increases, equity risk premium decreases (Boussiga and Abaoub, 2013).</td>
<td>World Bank database</td>
</tr>
<tr>
<td>Crisis</td>
<td>Dummy variable : it takes the value of 1 if there is financial or economic crisis and the value of 0 if not.</td>
<td>positive</td>
<td>In crisis, investors require higher equity risk premium. (Boussiga and Abaoub, 2013)</td>
<td>The data is from Reinhart and Rogoff’s website (<a href="http://www.reinhartandrogoff.com/data">http://www.reinhartandrogoff.com/data</a>)</td>
</tr>
</tbody>
</table>

### Table 2. Governance Indicators

<table>
<thead>
<tr>
<th>Governance Indicator</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice and Accountability</td>
<td>Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.</td>
</tr>
<tr>
<td>Political Stability and Absence of Violence/Terrorism</td>
<td>Reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as &quot;capture&quot; of the state by elites and private interests.</td>
</tr>
</tbody>
</table>

*Source: World Bank*
Data Descriptive Statistics and Methodology

Figure 1 shows the broad trend of equity risk premium over the period 2000-2012. There is a drop in equity risk premium in 2009, then a sudden increase over 2009-2011. Average of equity risk premium remains high and quite stable between 2011 and 2012.

Average equity risk premium reaches two peaks in 2002 and 2008. This evidence makes out the fact that developed and emerging financial markets are connected. Therefore, we think that it would be interesting to include the binary variable 'crisis' and consider the term of interaction 'IFI*Crisis' in order to decipher the effect of interaction between international financial integration and crisis on equity risk premium.

Figure 1. Broad Trend of Average Equity Risk Premium

Figures from 2 to 7 show the evolution of governance indicators in 6 countries from different regions and categories. We draw attention to the lack of data about governance indicators for 2001. We are interested in Tunisia and Egypt because of recent revolutions occurred in 2011.

Figure 2 illustrates the evolution of voice and accountability indicator which is positive for U.S., Korea and India but not for Venezuela, Egypt and Tunisia. We notice that voice and accountability indicator for Tunisia increased in 2011 just after revolution. Employment, freedom of expression and dignity were the claims of thousands of young Tunisian protesters.

After January 14th, freedom of expression and free media became a priority. Free and fair elections have been organized on October 23rd of the same year.

Political stability and absence of violence illustrated in figure 3 show a decrease of U.S. indicator after September 11th. Egyptian indicator is negative since 2000 and dropped to -1.5 from 2011 to 2012 after revolution. Tunisian indicator is negative in the post-revolutionary period because of serious social tensions and deterioration in security situation.
Figures 4-6 illustrate the evolution of government effectiveness, regulatory quality and rule of law. U.S. indicators are close to 2 on average, but Venezuelan indicators are negative and close to -1.5 on average from 2000 to 2012.

Finally, Figure 7 shows that control of corruption indicator for the U.S. is close to 2 in 2002 after Sarbannes-Oxley act.

Table 3 exhibits data summary statistics. Governance indicators estimates range from -2.5 for weak governance to 2.5 for strong governance. While examining min and max values, we noticed that there is an important variation of inflation and international financial integration across countries over time. The minimum value of inflation rate is -4.8632% (Qatar, 2009) and the maximum value is 324.9969% (Angola, 2000) and the mean value is 6.2654%.

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There is also a considerable variation in equity risk premium. The highest value is about 0.23 (Moldova, 2008), the minimum is 0.0451 (Bermuda, 2002) and the mean value is about 0.0819.

**Figure 4. Evolution of Government Effectiveness Indicator**

**Figure 5. Evolution of Regulatory Quality Indicator**

Table 4 shows the correlation matrix. It appears that there is a strong and negative correlation between governance indicators and equity risk premium (about -0.8). Moreover, international financial integration and inflation are negatively correlated (Vo and Daly, 2007, Boussiga and Abaoub, 2013). Finally, we notice that inflation is positively and highly correlated with equity risk premium.
Panel estimation results are exhibited in Table 5. First, we test for individual effects and use Hausman test in order to define the nature of individual effects. The results show that there are fixed effects. Then, we use the Breush-Pagan test for heteroskedasticity and Wald test for first-order autocorrelation. We find out both heteroskedasticity and first-order autocorrelation. We estimate the model using Generalized Least Squares method. The estimated coefficients for the 6 governance indicators are negative and significant at 1%. We conclude that a better governance quality translates into lower equity risk premium. Investors require high equity risk premium when governance quality is bad. The effect of governance quality on equity risk premium is about 0.01 on average considering the 6 governance indicators.
Concerning gross savings, we notice that significant coefficients at 5% and 10% are positive, but this variable has a small effect on equity risk premium (about 0.0001).

Estimated coefficients for economic risk are positive and significant at 5% and
10%. When economic growth is volatile, investors cannot predict it and require higher equity risk premium.

All estimated coefficients for inflation are positive and significant at 1%. Equity risk premium rises when inflation is higher.

We ask whether international financial integration has a negative effect on equity risk premium. The estimated coefficients for international financial integration are positive and significant at 10%. When the degree of international financial integration is higher, investors require lower equity risk premium.

Finally, we examine the effect of international financial integration on equity risk premium in crisis. We consider both financial and economic crisis. The estimated coefficients for IFI*Crisis are positive and significant at 10%. There is a positive relationship between interaction term 'IFI*Crisis' and equity risk premium. It means that, in crisis equity risk premium increases when international financial integration is higher.

**Conclusions**

The determinants of equity risk premium are identified from the literature including 6 worldwide governance indicators, consumption preferences, inflation, economic risk, international financial integration and crisis. The purpose of this paper is to shed the light on the importance of country-level governance quality in determining equity risk premium. In order to measure governance quality, we use 6 indicators derived by Kaufmann et al. (2010). Empirical results show that worse governance quality translates into higher equity risk premium. Governments make the rules of the game. In fact, environmental policy may affect firm's value and consequently investors' decision making.

Our empirical results indicate that investors require lower equity risk premium when the quality of governance is better. Equity risk premium is also affected by consumption preferences, economic risk, inflation and international financial integration. The results indicate a positive relationship between the percentage of gross savings and equity risk premium.

In addition, we find out a positive relationship between economic risk and equity risk premium. Our results corroborate the conclusions of Lettau et al. (2008).

Empirical evidence of this study shows that there is a positive association between inflation and equity risk premium. These results confirm the findings of Modigliani and Cohn (1979) and Campbell and Voulteenaho (2004). Finally, we find that equity risk premium is higher when the degree of international financial integration increases. However, in situation of crisis, higher degree of international financial integration translates into higher equity risk premium (Boussiga and Abaoub, 2013).

Finally, we conclude that investors require high equity risk premium when governance quality is weak. This paper has relevant implications for policy makers. Countries have to make efforts in order to attract investors. Democracy, freedom of expression, free media, security and absence of terrorism, government credibility, justice and control of corruption are essential for an economy in order to have access to foreign capital.
References


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**Abstract**

This study examines the effect of country-level governance quality on equity risk premium using a panel dataset of 122 developed, emerging and developing economies over the period 2000-2012. Governance quality is measured by worldwide governance indicators. We use other determinants of equity risk premium as independent variables in the model which are inflation, consumption preferences, economic risk, international financial integration and binary variable 'Crisis'. Our results show that better governance quality translates into lower equity risk premium. This paper has strong policy implications for policy makers. In fact, a good government policy is essential in order to attract foreign investors.

**Keywords**: equity risk premium, governance quality, generalized least squares