POLITICAL AND ECONOMIC DETERMINANTS OF PRIVATE INVESTMENT

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Abstract: This paper presents empirical evidence that links private investment to rate of return differential, risk aversion, and several types of political and economic risk. Estimating private investment equation for a panel of 25 developing countries over 21 years yields the following results: (i) socio-political instability characterized by nonviolent protests promotes private investment while violent uprisings hinder private investment; (ii) regime change instability characterized by constitutional government change promotes private investment while unconstitutional government change hinders private investment; and (iii) policy uncertainty characterized by variability of contract enforcement rights promotes private investment while variability of government political capacity hinders private investment.

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1 INTRODUCTION

Conventional wisdom has it that the path to economic prosperity requires stable socio-political institutions, certainty in macroeconomic policies, and flexibility in the financial markets. If all these criteria are met, private investment will lead to economic growth. Nevertheless, many of the previous studies on private investment focus only on the economic determinants of private investment (Cuddington, 1987; Pfeffermann and Madarassy, 1991; and Servén and Solimano, 1993). This paper studies jointly the political and economic determinants of private investment in 25 developing countries over a period of 21 years.

Recent research has focused on the interrelationship between institutions and private investment using various control variables that include both economic and political factors (Greene and Villanueva, 1990; Pastor and Hilt, 1993; Pastor and Sung, 1995; Feng and Chen, 1997; and Feng, 2001). Political scientists and economists have recognized that not only economic failures in developing countries lead to a decline in economic growth but also political and institutional failures adversely affect economic performance. Hence, if

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economic growth is sustained through investment,1 we must jointly explain the economic-political dynamics that drive private investment in development countries.

This paper contributes to the private investment literature in two ways. First, the empirical specification derived from a portfolio choice model allows a clear decomposition of political risk that may affect private investment into three types—socio-political instability, regime change instability and policy uncertainty, while controlling for economic risk. Second, the empirical tests utilize pooled cross-section time-series analysis. Panel data allows us to examine the effects of different types of risk on private investment as these values change dynamically over time and across countries.

Estimating the equilibrium private investment equation, I show that all four types of risk have statistically significant impact on private investment. The major findings in this paper can be summarized in the following way: (i) socio-political instability characterized by nonviolent protests promotes private investment while violent uprisings hinder private investment; (ii) regime change instability characterized by constitutional government change promotes private investment while unconstitutional government change hinders private investment; and (iii) policy uncertainty characterized by the variability of contract enforcement promotes private investment while the variability of government political capacity hinders private investment. I also identify the political factors that foster private investment.2 These events might lead to political and economic reforms that reduce future uncertainty in the domestic market.3

The paper is organized as follows. Section 2 presents specification of the private investment model. Section 3 describes the political determinants of private investment and discusses a decomposition of political variables to be used in the empirical section. Section 4 provides a rigorous multi-step regression analysis and elaborates on the empirical findings. Section 5 concludes with discussion of policy implications.

2 SPECIFICATION OF THE PRIVATE INVESTMENT MODEL

The specification of the model is based on the portfolio choice model of asset allocation drawn from Le and Zak (in press).4 To be specific, the economy in the model consists of a large number of infinitely identical agents living in a developing country in which they consume from return on wealth allocated to one-period investments in the domestic country or to a foreign country.5 When a representative agent maximizes his/her expected utility, the following equilibrium equation is produced

\[
a_{t+1}^* = \frac{E(r_{t+1} - r_i)}{\partial VAR(r_{t+1})}
\]  

(1)

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1See Barro (1991, 1997) and also De Long and Summers (1993) for discussions on the benefits of investment in developing countries.

2Similar findings on capital reversals phenomenon can be found in Le and Zak (in press), who identify several conditions under which capital reversal occurs in developing countries. In this paper, I show that private investment increases when similar conditions applied.

3Rodrik (1996) and Fedderke and Klitgaard (1998) identify several political and economic conditions that make possible the adoption of reforms to sustain economic growth.

4The abridged portfolio choice model of private investment is presented in the Appendix.

5The portfolio substitution effect depends on the domestic private asset choices under uncertainty. See Collier (1999) for similar discussion on asset allocation under uncertainty.
where \(a_{t+1}'\) denotes domestic private investment, \(VAR(r_{t+1})\) is the variance of the return on domestic private investment, and \(\theta \equiv -E[U''(c_{t+1})]/E[U'(c_{t+1})]\) measures risk aversion which is assumed constant. The equilibrium equation (1) predicts that private investment is lower when the domestic expected return is low, domestic investment risk is high, and when risk aversion is high.

Taking logarithms of the equilibrium equation (1) at time \(t\) yields the following equation

\[
\ln(a_t') \cong \ln(E(r_t - r^f)) - \ln(VAR(r_t)) - \ln \theta
\]  

(2)

where \(a_t' = A_t/Y_t\) is the private investment as a percentage of GDP.

The variance of risk in the equilibrium equation (2) can be decomposed into political and economic determinants of private investment. I emphasize four types of variation in the returns: economic risk, \(\sigma_{e,t}^2\), socio-political instability, \(\sigma_{s,t}^2\), regime change instability, \(\sigma_{r,t}^2\), and policy uncertainty, \(\sigma_{p,t}^2\). Assuming that each type of risk is independently distributed, the risk of domestic private investment is\(^6\)

\[
VAR(r_t) = \sigma_{e,t}^2 + \sigma_{s,t}^2 + \sigma_{r,t}^2 + \sigma_{p,t}^2
\]  

(3)

Substituting the decomposition of the variance of returns in equation (3) into equation (2) and taking logarithms yields a specification model of private investment\(^7\)

\[
\ln \left( \frac{A_t}{Y_t} \right) \cong \ln(E(r_t - r^f)) - \ln(\sigma_{e,t}^2) + \ln(\sigma_{s,t}^2) + \ln(\sigma_{r,t}^2) + \ln(\sigma_{p,t}^2) - \ln \theta
\]  

(4)

Equation (4) demonstrates that when estimating equilibrium private investment as a percentage of GDP, one must control for the return differential, \(DRT\), measured by the difference between domestic interest rates and the US T-Bill rate. For simplicity, I hold the risk aversion variable, \(\theta\), constant. Economic risk, \(\sigma_{e,t}^2\), is caused by the volatility in the economy, including price uncertainty and market distortion. De Gregorio (1993) argues that the variance of inflation, \(\sigma_{INF}^2\), generates uncertainty about prices. The fluctuation in the real exchange rates is another indicator of economic risk. Adji et al. (1997) show that exchange rate depreciation increases the return on investment, while exchange rate overvaluation reduces the return on investment. I use the variance of the real exchange rate, \(\sigma_{EXR}^2\), as the source of market distortion.

Data for domestic interest rate, inflation rate and real exchange rate are from the World Bank’s World Development Indicators. Data for the US T-Bill rate is from the IMF’s International Financial Statistics.

The remaining risk factors to be determined in equation (3) are socio-political instability, \(\sigma_{s,t}^2\); regime change instability, \(\sigma_{r,t}^2\); and policy uncertainty, \(\sigma_{p,t}^2\). Next section provides a decomposition of the political risk factors.

### 3 POLITICAL DETERMINANTS OF PRIVATE INVESTMENT

This section describes a decomposition of the political variables. Data are taken from available indices on socio-political instability, regime change instability, and policy

\(^6\)This assumption will be relaxed in the empirical section to examine the political and economic risk jointly on private investment.

\(^7\)I approximate \(\ln(\sigma_{e,t}^2 + \sigma_{s,t}^2 + \sigma_{r,t}^2 + \sigma_{p,t}^2)\) by \(\ln(\sigma_{s,t}^2) + \ln(\sigma_{r,t}^2) + \ln(\sigma_{p,t}^2)\).
uncertainty. Table 1 contains descriptive statistics and Table 2 provides the correlations matrix of variables used in the analysis.

**Socio-Political Instability (SPI)** is defined as a series of widespread political violent and nonviolent protests and internal uprisings involving physical use of force and participation of the public. SPI reduces investment through two channels. First, SPI destroys physical capital and displaces human capital, thus reducing job opportunities and disrupting personal savings, hence, lowering investment. Second, SPI leads investors to shift their assets from fixed capital stocks to more liquid and speculative forms.

The SPI indices are taken from Ghate, Le, and Zak (2003). Violent and nonviolent actions are arguably a universal phenomenon, in a sense that they occur throughout history and across institutional structures. No form of government, neither repressive autocratic nor liberal democratic, appears to be immune to political instability. On the one hand, socio-political unrests caused by either violent or non-violent uprisings can lead to unconstitutional change in the executive power. On the other hand, the possibility of interactive effects between the government and individuals who engage in SPI activities may lead to further violence.

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**Table 1. Descriptive statistics**

<table>
<thead>
<tr>
<th>PRIVATE</th>
<th>SPIF1</th>
<th>SPIF2</th>
<th>MJCH</th>
<th>IRCH</th>
<th>RPC</th>
<th>$\sigma^2$RPC</th>
<th>CIM</th>
<th>$\sigma^2$CIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.623</td>
<td>1.939</td>
<td>1.453</td>
<td>0.147</td>
<td>0.029</td>
<td>0.893</td>
<td>0.005</td>
<td>0.558</td>
</tr>
<tr>
<td>Median</td>
<td>13.013</td>
<td>1.699</td>
<td>1.229</td>
<td>0.147</td>
<td>0.027</td>
<td>0.817</td>
<td>0.003</td>
<td>0.594</td>
</tr>
<tr>
<td>Maximum</td>
<td>25.973</td>
<td>5.173</td>
<td>2.841</td>
<td>0.285</td>
<td>0.056</td>
<td>1.510</td>
<td>0.037</td>
<td>0.802</td>
</tr>
<tr>
<td>Minimum</td>
<td>6.923</td>
<td>1.001</td>
<td>0.852</td>
<td>0.030</td>
<td>0.002</td>
<td>0.296</td>
<td>0.001</td>
<td>0.218</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>4.565</td>
<td>1.014</td>
<td>0.547</td>
<td>0.069</td>
<td>0.016</td>
<td>0.293</td>
<td>0.007</td>
<td>0.144</td>
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</table>

**Table 2. Correlations matrix**

<table>
<thead>
<tr>
<th>PRIVATE</th>
<th>SPIF1</th>
<th>SPIF2</th>
<th>IRCH</th>
<th>MJCH</th>
<th>RPC</th>
<th>$\sigma^2$RPC</th>
<th>CIM</th>
<th>$\sigma^2$CIM</th>
<th>DRT</th>
<th>$\sigma^2$INF</th>
<th>$\sigma^2$EXR</th>
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<tbody>
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<tr>
<td>SPIF1</td>
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<td>1.000</td>
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<td>SPIF2</td>
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<td>-0.197</td>
<td>0.192</td>
<td>1.000</td>
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<td>IRCH</td>
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<td>-0.413</td>
<td>-0.334</td>
<td>0.260</td>
<td>1.000</td>
<td></td>
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<tr>
<td>MJCH</td>
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<td>0.036</td>
<td>0.380</td>
<td>0.365</td>
<td>-0.206</td>
<td>1.000</td>
<td></td>
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<tr>
<td>RPC</td>
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<td>0.027</td>
<td>-0.192</td>
<td>-0.440</td>
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<td>-0.501</td>
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<td>-0.298</td>
<td>-0.251</td>
<td>-0.141</td>
<td>0.238</td>
<td>-0.180</td>
<td>0.469</td>
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<td>CIM</td>
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<tr>
<td>DRT</td>
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<tr>
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</table>

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8In recent studies, Barro (1991, 1997); Alesina and Perotti (1996); Alesina et al. (1996) have shown that SPI reduces investment.

9See Le and Zak (in press) for a discussion of SPI and capital flight phenomenon in developing countries.

10For a detailed discussion on the methodology underlying the SPI indices, see Ghate, Le and Zak (2003). Some related methods to construct the SPI Indices are outlined in Gupta (1990), and Alesina and Perotti (1996). All these SPI indices are positively statistically related, but not identical.
The SPI indices are derived by factor analysis. Two factors are produced to separate the types of SPI, denoted by SPIF1 and SPIF2. The first factor includes general strikes, riots, and antigovernment demonstrations, which represent collective protests. The second factor includes purges, guerrilla warfare, and assassinations, i.e., it captures internal crackdowns and violent uprisings. Figure 1(a) reveals that SPIF1 has a small positive impact on private investment, while Figure 1(b) shows that SPIF2 has a large negative impact on private investment. Table 2 shows the correlation between SPIF1 and private investment is relatively small, being 0.01, while the correlation between SPIF2 and private investment is −0.20. This is because countries experiencing collective protests typically undertake political and economic reforms. Internal crackdowns and violent uprisings, on the other hand, would have a negative impact on private investment because they typically spiral outside of government control.

Regime Change Instability is caused by constitutional or unconstitutional change in the executive power. In countries where regime change is frequent, investors tend to move

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11Factor analysis identifies underlying political variables that explain the pattern of correlations within a set of observed domestic conflict events in Banks (1996).

12Although political instability disrupts rent-seeking activities, Fedderke and Klitgaard (1998) argue that it may have a positive impact on economic growth. The Asian financial crisis in 1997, for example, led to widespread collective protests in Thailand and South Korea followed by a series of radical political and economic reforms.

13The violent uprisings experience in Indonesia during the Asian financial crisis made the adoption of economic reforms more difficult, despite the fact that radical political reform changed the political landscape of the country.
toward liquid and speculative assets because of future uncertainty. Feng (1997) characterizes two different types of government change—major government change and irregular government change.\(^{14}\) He argues that the probability of regime change is not directly observable. On the one hand, regime change is a discrete phenomenon. On the other hand, political stability and instability, as indicated by regime change, are not discrete states. As a result, he applies the limited dependent variable estimation method to estimate the probability of regime change as a continuous variable capturing the economic and political conditions leading to constitutional and unconstitutional change in the executive power.\(^{15}\)

Major regular government change, \(MJCH\), is defined as a constitutional power transfer of the executive office within the ruling party or the coalition of ruling parties. The major regular government change represents a policy adjustment and may pose uncertainty if such change leads to a distortion in the fundamental market structure. However, it may also lead to an adoption of market reform policies. Figure 1(c) reveals that \(MJCH\) has a positive impact on private investment. The correlation between \(MJCH\) and private investment is relatively small, being 0.04 as shown in Table 2. Irregular government change, \(IRCH\), occurs through unconstitutional means and may disrupt the political system. Irregular government change has a negative impact on private investment as revealed in Figure 1(d). Table 2 shows that the correlation between \(IRCH\) and private investment is \(-0.41\).

**Policy Uncertainty** reflects on the cynicism generated by a change in policy rather than in the political regime discussed above. The impact of different types of policy uncertainty on private investment has been studied by Rodrik (1991), Aizenman and Marion (1993), and Servén and Solimano (1993). In this paper, I focus on two different types of policy uncertainty—the variability of government political capacity and the variability of contract enforcement. The first policy uncertainty factor is measured by the political capacity of government to implement policy. Organski and Kugler (1980) and Kugler and Arbetman (1997) develop a measure called *Relative Political Capacity (RPC)*, which is based on the ratio of actual government revenue to predicted government revenue.\(^{16}\) A country with high \(RPC\) has a strong government that is capable to implement policy effectively. Conversely, a government with low \(RPC\) is unable to extract resources to implement its policy. The \(RPC\) concept is not politically institutionalized. Thus, it can be applied to different types of political regime (Willett, 1997). From a policy perspective, a decline in private investment occurs because the government fails to provide comprehensible policy guidance to the private sector. Feng and Chen (1997) argue that the variability of \(RPC\) generates uncertainty because the direction of policy implementation is not clear to investors.\(^{17}\) The variance of \(RPC\) is used as a proxy for policy uncertainty. Figure 2(a) shows that \(RPC\) slightly increases private investment. The correlation between \(RPC\) and

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\(^{14}\)I thank Yi Feng for making the data set available for this project. The first data set consists of three different types of government change—major regular government change, irregular government change, and minor regular government change (Feng, 1997). The extension of the data set in Feng *et al.* (2000) does not include minor government change. I apply the latter version of the data set in the empirical section of the paper.

\(^{15}\)See Feng (1997) for an extensive discussion on the methodology underlying the Regime Change indices. Related methods to construct the Regime Change indices can be found in Fedderke and Klitgaard (1998) and Campos and Nugent (2002).

\(^{16}\)I thank Jacek Kugler for making the data available for this project. See Kugler and Arbetman (1997) for a detailed discussion of the methodology underlying the RPC index. The extension of the data set is taken from Feng *et al.* (2000).

\(^{17}\)Feng and Chen (1997) state that uncertainty occurs if assets are allocated to a market under government influence in which the return is a random variable affected by a random impact of policy adjustment.
private investment is relatively small, being 0.03 as shown in Table 2. On the other hand, Figure 2(b) shows that the variance of \( \sigma^2_{RPC} \), denoted by \( \sigma^2_{RPC} \), decreases private investment. Table 2 shows that the correlation between \( \sigma^2_{RPC} \) and private investment is \(-0.30\). These indicators tell us that RPC is positively related to private investment, while \( \sigma^2_{RPC} \) is negatively related to private investment.

The second policy uncertainty factor is reflected in the variability of contract enforcement. Contract-intensive money, \( CIM \), a measure developed by Clague et al. (1999), is an indicator of property rights enforcement based on the type of financial assets being held.\(^{18}\) \( CIM \) is defined as the ratio of non-currency money to the total money supply, \((M2 - C)/M2\), where \( M2 \) is a broad definition of the money supply and \( C \) is currency held outside of the banks. When investors expect that the government will provide sufficient contract and property rights enforcement, private investment is high. On the other hand, the variability of \( CIM \) generates policy uncertainty because the flow of financial assets is not clear to investors. The variance of \( CIM \), denoted by \( \sigma^2_{CIM} \), is used as another measure of policy uncertainty. Figure 2(c) reveals that \( CIM \) is positively related to private investment. The correlation between \( CIM \) and private investment is 0.42 as shown in Table 2. To a lesser extend, Figure 2(d) shows that \( \sigma^2_{CIM} \) is also positively related to private investment. The correlation between \( \sigma^2_{CIM} \) and private investment is relatively small, being 0.03.

\(^{18}\)See Clague et al. (1999) for discussion on the methodology underlying the CIM index.
4 EMPIRICAL RESULTS

This section provides empirical results for the political and economic determinants of private investment using panel data from 25 developing countries between 1975 and 1995. Data for private investment as a percentage of GDP is taken from the International Finance Corporation (IFC). Figure 3 presents private investment relative to GDP for selected countries in the sample. Because the developing countries in this sample have diverse political landscapes and economic volatilities, the regression results may be driven by unmeasured country characteristics. That is, the direction of private investment may not be due to the risk factors but to other country characteristics. The empirical tests utilize a pooled cross-section time-series data which provide an opportunity to examine the effect of the political variables on private investment as these values change over time and across countries. The empirical results are derived from a rigorous multi-step test linking private investment to different measures of economic and political factors.

Figure 3. Private investment in selected countries

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19The choice of countries and years included in the sample is determined by the availability of panel data on private investment. The twenty-five countries are Argentina, Bangladesh, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, India, Kenya, Malawi, Malaysia, Mexico, Morocco, Pakistan, Paraguay, Philippines, South Africa, South Korea, Thailand, Tunisia, Turkey, and Uruguay.

20The private investment data set is available from http://www.ifc.org/economics/data/data set.htm (see also Everhart and Sumlinski, forthcoming). The IFC defines private investment as being equal to the difference between total and public investment. This estimate has certain problems such as the inclusion of public funding in private investment projects due to shortcomings in the data, as well as the different methods of categorizing financial investment in developing countries (see Pfeffermann and Madarassy, 1989, p. 2.).
In the first step, the basic economic-political model in Table 3 employs Feasible Generalized Least Squares (FGLS) procedure with a common intercept for all countries. Regression 1 estimates the economic model excluding the political determinants of private investment. The regression shows that private investment increases as the return differential rises and is statistically different from zero at the 1 per cent level. The relationship between the two economic risk variables and the private investment is negative as predicted. The variance of real exchange rate is negatively related to private investment at the 1 per cent significance level, while the coefficient on the variance of inflation is negative but statistically insignificant.

Regressions 2 through 7 include measures of socio-political instability, regime change instability, and policy uncertainty to examine the political determinants of private investment. In the first step, each political variable enters the basic economic model separately to evaluate its direct impact on private investment. Regressions 2 and 3 add to the economic model measures of socio-political instability, SPIF1 and SPIF2. SPI measured by collective protests has a positive impact on private investment and is statistically significant at the 5 per cent level. This indicates that collect protests signal market-oriented reforms will follow. For example, in 1989, President Carlos Saul Menem

Table 3. Political determinants of private investment basic economic-political model

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
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<td>2.510*</td>
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<td>2.463*</td>
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<tr>
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<tr>
<td>SPIF2</td>
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<td></td>
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<td>(0.009)</td>
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<tr>
<td>Regime change instability</td>
<td></td>
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<td></td>
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<tr>
<td>MJCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.065*</td>
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<tr>
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<td></td>
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<td>-0.115*</td>
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</tr>
<tr>
<td>RPC</td>
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<td></td>
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<td></td>
<td></td>
<td>0.091*</td>
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<tr>
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<td>-0.006*</td>
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<td>(0.017)</td>
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<tr>
<td>$\sigma^2$CIM</td>
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<td></td>
<td></td>
<td>0.010*</td>
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<td></td>
<td></td>
<td>(0.002)</td>
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<tr>
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<td>0.978</td>
<td>0.978</td>
<td>0.978</td>
<td>0.975</td>
<td>0.979</td>
<td>0.977</td>
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Notes: White heteroskedasticity-consistent standard errors are in parentheses. *Statistically significant at the 1 per cent level, **Statistically significant at the 5 per cent level. All variables are in logarithms.
of Argentina imposed an austerity programme that sparked nationwide protests followed by a period of rising private investment as revealed in Figure 3(a). SPI measured by violent uprisings has a negative impact on private investment and is statistically significant at the 1 per cent level. This indicates that in response to violent uprisings, private investors will engage in portfolio substitution, transferring their assets abroad. In the case of Mexico, sporadic uprisings by Zapatista rebels in Chiapas in the early 1980s led to a sharp decline in private investment. Figure 3(b) indicates that the economic crisis in the mid-1980s challenged the legitimacy of the ruling party Partido Revolucionario Institucional or PRI followed by a gradual increase in private investment.

Regressions 4 and 5 add regime change instability to the economic model. The estimation result in regression 4 shows that the probability of major government change, MJCH, has a positive and significant impact on private investment at the 5 per cent level. This indicates that major government change induces reforms and raises stability because it is a non-threatening-regime type of risk. One possible explanation for this result is that short-term uncertainty generated by major government change is dominated by the long-term benefits of policy readjustment toward market-oriented reforms. For example, the mid-1980s was a period of democratic transition in South Korea. After a successful democratic transition in 1987, South Korea experienced a significant increase in private investment peaking at 33 percent of GDP in 1991 as shown in Figure 3(c). Conversely, regression 5 reveals that the probability of irregular government change, IRCH, reduces private investment. This indicates that regime-threatening type of risk generates uncertainty with respect to the domestic investment return. The Philippines is an example of this type of regime-threatening risk. From the early to the mid-1980s, the Philippines led a wave of democratization in Asia. This commenced a social movement against the authoritarian regime of Ferdinand Marcos. In 1986, President Marcos faced with mounting protests and pressure from the U.S., agreed to a national election which was defeated by Corazon Aquino. However, following the election, the new government was faced with a regime-threatening by the Marcos supporters who refused to give up power. During the period of political turmoil and high probability of an irregular regime change, private investment in the Philippines was at its lowest peak averaging to 13 percent of GDP as shown in Figure 3(d).

Regressions 6 and 7 add policy uncertainty to the economic model. The estimation result in regression 6 shows that the relative political capacity, RPC, has a positive impact on private investment. Countries with high political capacity tend to allow policy to adjust quickly in response to economic and political environment. As a result, there is a considerable correlation between political capacity and the variability of this capacity (Feng, 2001). Nevertheless, the variance of RPE generates uncertainty to the market, hence, resulting in a decrease in private investment. Both measures are statistically significant at the 1 per cent level. Kenya, after 1980, is an example of policy adjustments causing sporadic changes in the investment climate as indicated in Figure 3(e). Kenya embarked on a massive tax reforms in the 1980s called the Tax Modernization Program. The reforms had a positive impact on the overall tax structure. However, these policy adjustments generate uncertainty to the private sector, which led to frequent changes in asset allocation.

Regression 7 examines the impact of contract-intensive money and the variability of this variable on private investment. Unlike the political capacity variable above, the correlation between contract-intensive money and its variability is relatively low. When investors expect the government to provide sufficient contract and property rights enforcement,
private investment is high. Conversely, the variance of CIM might generate policy uncertainty thus reducing the magnitude of private investment. The estimation results in regressions 6 and 7 clearly show that policy uncertainty reduces the magnitude of private investment as investors diversify their portfolio. Figure 3(f) shows that asset allocation in South Africa was driven by contract and property rights enforcement. For example, South Africa implemented the Patents Act and the Copyrights Act in 1978. In the following years, private investment surged peaking at 16 per cent of GDP in 1982. In 1993, South Africa implemented the Designs Act and the Trade Marks Act. After the implementation of these policies, private investment started to rise from its lowest level at 10 per cent of GDP. The policy uncertainty in South Africa had little impact on the private sector because the variability of contract-intensive money is relatively low.

The second step provides a full economic-political model by jointly estimating the political effects on private investment as politically unstable countries have high probability of regime change and are also likely to have unstable policies. Table 4 provides estimation results using the FGLS procedure with no effects, fixed effects and random effects to test for robustness of the model specification.21

There are two full economic-political models in Table 4. In the first model, collective protests, major government change, and the variance of CIM are used. Countries experience sporadic nonviolent collective protests tend to undertake reforms, including transition to democracy, which leads to increased stability. Major government change provides signal of policy readjustment towards market-oriented reforms, hence, inducing more private investment. The variability of contract-intensive money has a small but positive impact on private investment. The second model utilizes violent uprisings, irregular government change, and the variance of RPE, which are impediments to private investment because of the risk of physical and human capital destruction, and uncertainty.

Regression 8 shows that after controlling for the return differential and the economic risk, the coefficients on SPIF1, MJCH, and $\sigma^2$CIM are statistically significant at the 1 per cent level and carry the expected signs. The fixed effects model in regression 9 shows that SPIF1 has a positive effect, but is not statistically significant. MJCH and $\sigma^2$CIM continue to have the expected signs at the 1 and 5 per cent level of significance, respectively. The random effects model in regression 10 reveals that only MJCH remains significant at the 1 per cent level and carries the expected sign.

Regressions 11, 12, and 13 show that after controlling for the return differential and the economic risk, all three specifications have the expected signs. The IRCH variable is significant at the 1 per cent level in all three models. The SPIF2 variable is no longer significant at the standard critical values in the fixed and random effects models. The $\sigma^2$RPC variable is not statistically significant at the standard critical values in all three models. In short, the estimation results in Table 4 indicate that some political factors robustly reduce private investment while others induce it.

The regressions presented above call our attention to the composite indices of risk as more accurate assessments of the political and economic determinants of private investment. The political and economic effects on portfolio allocation of assets should be jointly examined, as they are clearly interrelated. I estimate equation (3) on the variance of returns,

\[ \text{private investment} = \text{function of political factors} \]

21I perform the Hausman test to examine if there is any statistically significant difference in the coefficients of the fixed effects versus random effects models. For all regression specifications, the Hausman test failed to reject the null hypothesis that there was no systematic difference between the coefficients of the two models. Both fixed effects and random effects models produce similar coefficients in most of the estimations.
VAR(r_{it}), at time t to produce two different types of risk indices. The non-regime-threatening risk that might lead to policy readjustment and market-oriented reforms, denoted by \textit{RISK1}, includes the variance of inflation, the variance of real exchange rate, collective protests, major government change, and the variance of contract-intensive money. The regime-threatening risk, denoted \textit{RISK2}, includes the variance of inflation, the variance of real exchange rate, violent uprisings, irregular government change, and the variance of relative political capacity. This type of risk is outside of the government control.

Applying these two new risk indices to the equilibrium private investment equation yields a robust result of the joint political and economic effects on private investment. All three specifications—no effects, fixed effects, and random effects indicate that both risk indices are statistically significant at the standard critical values as revealed in Table 5. Quantitatively, the non-regime-threatening risk promotes private investment, while the regime-threatening risk hinders private investment.

\begin{table}
\centering
\caption{Political determinants of private investment full economic-political model}
\begin{tabular}{lcccccc}
\hline
Explanatory Variable & (8) & (9) & (10) & (11) & (12) & (13) \\
 & No Effects & Fixed Effects & Random Effects & No Effects & Fixed Effects & Random Effects \\
\hline
\textit{INTERCEPT} & 2.743* & 2.840* & 2.188* & 2.037 & 2.002 & 2.037 \\
 & (0.034) & (0.113) & (0.037) & (0.074) & (0.097) & (0.104) \\
\textit{DRT} & 0.009** & 0.001 & 0.004 & 0.022* & -0.002 & 0.003 \\
 & (0.004) & (0.001) & (0.011) & (0.004) & (0.007) & (0.010) \\
\textbf{Economic risk} & & & & & & \\
\sigma^2\textit{EXR} & -0.003* & 0.001 & 0.001 & -0.003* & 0.001 & 0.001 \\
 & (0.0003) & (0.001) & (0.002) & (0.0003) & (0.001) & (0.002) \\
\sigma^2\textit{INF} & -0.004** & -0.009* & -0.014* & -0.003 & 0.009* & -0.011* \\
 & (0.002) & (0.002) & (0.004) & (0.002) & (0.002) & (0.004) \\
\textbf{Socio-political instability} & & & & & & \\
\textit{SPIF1} & 0.044* & 0.021 & 0.007 & -0.075* & -0.015 & -0.020 \\
 & (0.013) & (0.014) & (0.026) & (0.010) & (0.014) & (0.021) \\
\textit{SPIF2} & & & & & & \\
\textbf{Regime change instability} & & & & & & \\
\textit{MJCH} & 0.057* & 0.079* & 0.130* & -0.078* & -0.092* & -0.109* \\
 & (0.014) & (0.024) & (0.031) & (0.007) & (0.012) & (0.016) \\
\textit{IRCH} & & & & & & \\
\textbf{Policy uncertainty} & & & & & & \\
\sigma^2\textit{CIM} & 0.009* & 0.005** & 0.001 & -0.002 & -0.003 & -0.002 \\
 & (0.001) & (0.002) & (0.004) & (0.002) & (0.003) & (0.004) \\
\sigma^2\textit{RPC} & & & & & & \\
\textbf{Adjusted R^2} & 0.979 & 0.977 & 0.765 & 0.976 & 0.982 & 0.785 \\
Number of observations & 365 & 365 & 365 & 371 & 371 & 371 \\
\hline
\end{tabular}
\end{table}

Notes: Fixed and random effects are not reported. White heteroskedasticity-consistent standard errors are in parentheses. *Statistically significant at the 1 per cent level, **Statistically significant at the 5 per cent level. All variables are in logarithms.

Results are not reported to save space and are available from the author.
CONCLUSIONS AND POLICY IMPLICATIONS

The model specification in this paper leads to identification of three types of political risk—socio-political instability, regime change instability, and policy uncertainty. The empirical results lend support to the theoretical argument that the political determinants of private investment must be fully specified and controlled for.

While previous studies conclude that political risk has a negative impact on private investment, there has been no systematic effort to decompose the different types of political risk. Understanding the trends of private investment in developing countries requires not only consideration of the relationship between political risk and private investment, but also an understanding of the different types of political risk decomposed by their own characteristics. In order to provide a sound environment to attract domestic investors and to maintain a stable flow of private investment in the economy, governments in developing countries should differentiate the types of political risk in order to design and implement consistent policy to deal with issues at hand. The empirical tests in this paper show that it is possible to have political risk that promotes private investment. For instance, major constitutional government change stimulates the flow of private investment because gradual policy readjustment is more preferred to a radical policy readjustment, such as the unconstitutional government change. Furthermore, collective protests promote private investment because they signal the need for market-oriented reforms as opposed to violent uprisings, which are outside of government control. Finally, government can change its level of political capacity to achieve its policy goal, but frequent changes in the political capacity signal uncertainty to investors. Surprisingly, frequent changes in contract enforcement raise investment returns by reducing risks.

ACKNOWLEDGEMENTS

I thank Maja Micevska, an anonymous referee, two reviewers and seminar participants at the International Conference on Business and Economy in San Francisco, Whittier College, and University of Mainz for valuable comments on previous versions of this paper. The usual disclaimer applies.

Table 5. Political determinants of private investment political risk Indices

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>(14) No Effects</th>
<th>(15) Fixed Effects</th>
<th>(16) Random Effects</th>
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<tr>
<td>INTERCEPT</td>
<td>2.515* (0.010)</td>
<td>2.514* (0.079)</td>
<td></td>
</tr>
<tr>
<td>DRT</td>
<td>0.010* (0.004)</td>
<td>0.0003 (0.006)</td>
<td>0.006 (0.010)</td>
</tr>
<tr>
<td>Political-economic risk indices</td>
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</tr>
<tr>
<td>RISK1</td>
<td>0.069* (0.012)</td>
<td>0.027** (0.027)</td>
<td>0.047** (0.021)</td>
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<tr>
<td>RISK2</td>
<td>−0.061* (0.014)</td>
<td>−0.036* (0.015)</td>
<td>−0.063* (0.021)</td>
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<tr>
<td>Adjusted $R^2$</td>
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<td>0.980</td>
<td>0.756</td>
</tr>
<tr>
<td>Number of observations</td>
<td>408</td>
<td>408</td>
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</tr>
</tbody>
</table>

Notes: Fixed and random effects are not reported. White heteroskedasticity-consistent standard errors are in parentheses. *Statistically significant at the 1 per cent level, **Statistically significant at the 5 per cent level. All variables are in logarithms.
APPENDIX: A PORTFOLIO CHOICE MODEL OF ASSET ALLOCATION

The following portfolio choice model of asset allocation is drawn from Le and Zak (in press). Consider an economy with a large number of infinitely-lived identical agents living in a developing country. Agents consume from the return on wealth allocated to one-period investments in a domestic country or in a foreign country. For simplicity, investors allocate their assets into a single market in the domestic country—private investment. In addition, labor income is ignored. There is a single homogeneous good in the country, and population is constant and normalized to unity.

Let $a_t$ denote assets invested in the domestic market at time $t$, which earn the rate of return $r_t$. Returns in the domestic market are risky, $r_t \sim N(\mu, \sigma^2)$. Agents also invest $d_t^f$ in a foreign country, earning a risk-free time-invariant rate of return $r^f$.

A representative agent maximizes lifetime utility by solving

$$
\text{Max } E \sum_{t=0}^{\infty} \beta^t U(c_t)
$$

s.t.

$$
c_t = (1 + r_t)a_t + (1 + r^f)d_t^f - a_{t+1} - d_{t+1}^f
$$

where $U(c)$ is strictly increasing, continuous, and concave.

The necessary and sufficient conditions for an optimal solution to (A1) are

$$
U'(c_t) = E[U'(c_{t+1})r_{t+1}]
$$

(A3)

$$
U'(c_t) = E[U'(c_{t+1})r^f]
$$

(A4)

Combining (A3) and (A4) yields

$$
E[U'(c_{t+1})(r_{t+1} - r^f)] = 0
$$

(A5)

Applying the definition of covariance, (A5) is equivalent to

$$
E[U'(c_{t+1})]E[r_{t+1} - r^f] = -\text{COV}[U'(c_{t+1}), r_{t+1}]
$$

(A6)

where $\text{COV}(x,y)$ is the covariance between the random variables $x$ and $y$.

Assuming $U'(c_{t+1})$ and $r_{t+1}$ are jointly normally distributed, equation (A6) can be written as

$$
E[U'(c_{t+1})]E[r_{t+1} - r^f] = -a_{t+1}E[U''(c_{t+1})]\text{VAR}(r_{t+1})
$$

(A7)

Equation (A7) holds by Stein’s lemma: $\text{COV}(g(x), y) = E(g'(x))\text{COV}(x, y)$ is continuous and satisfies some regularity conditions. See Huang and Litzenberger (1988, p. 101). If $U'(c_{t+1})$ and $r_{t+1}$ are not jointly normally distributed, then (A7) approximates (A6) by the central limit theorem.
Rearranging equation (A7) yields

\[ a_{t+1}^* = \frac{E(r_{t+1} - r_f)}{\theta \text{VAR}(r_{t+1})}, \quad (A8) \]

where \( \text{VAR}(r_{t+1}) \) is the variance of the return on domestic private investment, and

\[ \theta = -\frac{E[U''(c_{t+1})]}{E[U'(c_{t+1})]} \]

measures risk aversion which is assumed constant. The equilibrium equation (A8) predicts that private investment is lower when the domestic expected return is low, domestic investment risk is high, and when risk aversion is high.

REFERENCES


Le Q, Zak P. in press. Political risk and capital flight. *Journal of International Money and Finance*.


World Development Indicators CD-ROM. 2000. World Bank: Washington, DC.