



UNIVERSIDAD CARLOS III DE MADRID

working  
papers

Working Paper 04  
Business Economic Series 03  
January 2012

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## “Political Risk and Corporate Investment Decisions” \*

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### Abstract

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This paper analyzes the different definitions and expressions of political risk and proposes a broad and more inclusive definition regarding its origins and effects. Regarding the effects of political risk on corporate investment decisions, this paper shows the multitude of ways by which the different expressions of political risk may influence both positively and negatively the value of investment opportunities and the decisions of firms to invest. Finally, it proposes different lines of research addressing some of the weaknesses identified in the existing literature.

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**Keywords:** Political risk, corporate investment decisions, real options

**JEL Classification:** G12, G13, G32, G33

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\* This paper is the sole responsibility of its authors, and the views represented here do not necessarily reflect those of the Banco de España. Correia acknowledges research support from Ministerio de Ciencia e Innovación (Proyecto - MCI ECO2009-12551).

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# 1 Introduction

Political risk is an important feature of the business environment for many firms, especially with the globalization of operations, and the fact that contracts are almost impossible to enforce at an international level (e.g. see Cole and English, 1991; Thomas and Worrall, 1994; Tomz and Wright, 2010). Some reports show that it has been recrudescing in recent years (see for example Jensen, 2008; Guriev, Kolotilin and Sonin, 2009; Hajzler, 2010 and Baas, 2010), and nowadays it receives widespread interest in the business media, especially due to the conflicts in Middle East and North Africa, the recent wave of nationalizations in South America, and the possibility of default of some EU governments and even of the US government.

Although a vast literature has been written on political risk, there is no unique definition for it. Several authors recognize this lack of consensus (Kobrin, 1979; Simon, 1984; Jarvis and Griffiths, 2007 and Baas, 2010) leading to a multiplicity of particular definitions of political risk. This is partly due to an association of political risk with specific industries and countries (Jarvis and Griffiths, 2007). This paper analyzes the existing literature in order to find common elements and regularities and to derive a broad and inclusive definition of political risk. Some common elements are controversial and possibly help explain some of the disparities in the different definitions of political risk and of the expressions of political risk. Some elements may just be relevant to reduce the unit of analysis, like the stage of development or the degree of political freedom. One could argue these elements are more related with hypothesized causes of political risk than with the definition itself.

We find that political risk has different origins and expressions, and the way they affect the firms decisions are manifold and complex. Yet, there is a clear focus of the literature on Least Developed Countries (LDCs), commodities and political regimes. Other aspects, however, tend to be ignored; it is the case of the impact of political risk on the variables that affect the decision-making process of the firm in terms of investment. This is rather surprising if we consider how large the literature is on political risk and investment.

The remainder of this paper is as follows. Section two discusses the definition of political risk and proposes a broader and more accurate definition for this concept. Section three describes and classifies the main expressions of political risk, aiming at an effective operationalization of this concept. Section four analyzes the effects of the different expressions of political risk on corporate investment decisions. Finally, section five concludes and presents future lines of research.

## 2 Definition of Political Risk

This section addresses a series of questions regarding the origin, nature and impact of political risk on the business environment of firms.

Regarding the origins of Political Risk we find a multitude of culprits in the existing literature such as:

- Politics (Bremmer, 2005);
- Government (Tomz and Wright, 2007);
- Politically motivated changes or events (Clark, 1997, Feils and Sabac, 2000);
- Political motivated activists (Jensen, 2008, Baas, 2010);

Most of the authors consider the government (at a national, regional or local level) to be the main driver of political risk (see Gorjaev and Sonin, 2005; Busse, 2007; Tomz and Wright, 2010). A clear example is provided in Truitt (1970), for whom governments have a broad band of political and economic actions able to restrict the activity of investors. However, this can be quite reductionist when we consider that in many cases political risk originates from changes in legislation (Root, 1972; Clark, 1997; Feils and Sabac, 2000; Clark and Tunaru, 2003) and from the actions of non-governmental actors associated with the concept of societal risk (first defined by in Iankova and Katz, 2003), like political violence (Kobrin, 1979; Clark, 1997; Feng, 2001; Jensen, 2005; Jarvis and Griffiths, 2007; and Baas, 2010). As it becomes clear the origins are multiple and exist almost as many as manifestations of political risk.

Regarding the nature of political risk as event or continuous risk, it can be classified as both, since these characteristics are not mutually exclusive. In many cases, events are just a materialization of a process that has been brewing for a long time. It may be a one time isolated event (most common in expropriation cases as the Oil company Chiquita in Colombia discussed in La Rotta, 2011), or it can be the result of an evolving political process (the wave of nationalizations in Bolivia and Venezuela during the last decade).

Regarding the political and economic environment associated with political risk, we can find several regularities in the existing literature: specific political regimes, the stage of economic development, the basis of business operations, and a link to specific economic sectors. First, there is an association between political risk and non-democratic regimes, which are often considered to be riskier. However, in practice, this

is not a rule<sup>1</sup> and the incentives of political leaders are the key to this question. When provided with the right incentives, autocratic regimes might actually be perceived as less risky than some democratic regimes regarding the upholding of contracts with private investors and the enforcement of property rights (Clague, Keefer, Knack and Olson, 1996; Gehlbach and Keefer, 2011). In some cases, autocratic regimes are even able to provide more safety and a better supporting infrastructure that improves the business environment (Olson, 1993). Second, there is an overwhelming focus on Least Developed Countries (LDC) commonly presented as being riskier. While it is true that most of the evidence comes from this group of countries, it is also true that developed countries present political risk as evidenced in Duncan (2005) regarding expropriations on Australia and Canada. Given the higher bargaining power of developed countries, McMillan and Waxman (2007) shows that governments in developed countries are able to obtain higher government takes<sup>2</sup>. Simon (1984) summarizes the relationship between economic development and political risk quite adequately, when stating that it is not that political risk is not present in developed countries, the difference is the intensity of the expressions of political risk from one group of countries to the other. When comparing expressions of social discontent in a developed country and in an LDC, it is possible that both experience strikes and riots, but the scope and severity of these manifestations in LDCs are usually greater.

Regarding the impact on investment, most of the literature focuses only the negative effects of political risk, its downside danger. However, risk is not characterized only by losses; it represents a deviation from an expected return that can either be negative or positive. Therefore, there is also an upside potential to political risk as referenced in Buttler and Castelo (1998). Common and important examples of an upside potential to the actions of political agents are the incentives to attract Foreign Direct Investment (FDI) in a context of international competition (Jensen, 2005, 2008) such as tax holidays (Feils and Sabac, 2000) and subventions to investment.

Regarding the target or agents that are affected by political risk, the literature mainly focuses on international operations. Possibly this focus on international businesses relates to the fact that the most prominent expressions of political risk expropriation of subsidiaries and limits to the transfer funds, are related with this type of companies, and because the enforcement of contracts at the international level is ar-

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<sup>1</sup>Consider the cases of Singapore and the United Arab Emirates, which, according to the Polity IV database, are autocratic regimes with a low fragility index; that is, low political risk. These two countries have a lower index than a democracy like Brazil (e.g. see Marshall and Monty, 2011).

<sup>2</sup>McMillan and Waxman define government take as the share of economic rent from extraction in the oil industry that goes to the host government. This can be performed through corruption premiums, the tax system, royalties systems, product and profit sharing.

guably more difficult due to the lack of a institution capable of stopping governments from renegeing on contracts (Cole and English, 1991; Thomas and Worrall, 1994; Tomz and Wright, 2010). However, even firms without operations abroad are exposed to political risk (Bremmer, 2005), either directly due to domestic country risk or indirectly due to the influence of political risk events in any of the territories of operations of a firm and of its business partners (including clients and suppliers). Different expressions of political risk such as changes in taxes and political violence affect domestic and multinational firms indiscriminately.

Finally, consider the relationship between political risk and different economic sectors, particularly the natural resource sector. The link of this sector with political risk seems to originate from the resource curse (van der Linde, 1993; Humphreys, Sachs and Stiglitz, 2007). Preliminary findings on the relation between political risk and natural resources come from the studies on expropriation carried out by Kobrin (1980, 1984) and followed by Kennedy (1993), Minor (1994), and Hajzler (2010). These studies report that expropriations of natural resource exploitation firms do not always follows rational motifs or even political ideology, and although they are sometimes selective, many times they appear to be random . They also imply that resource-based FDI is more vulnerable to expropriations, especially in the mining and oil sectors. Jensen and Johnston (2011) explicitly link political risk and natural resources, and find that countries flushed with natural resources have more incentives to expropriate, especially due to the fact that they do not depend entirely on FDI resources.

Regarding the expressions of political risk, which we analyze in detail in the next section, they are manifold and range from mere political unrest to expropriation. All of them must have an impact on normal business activities, so that political developments do not imply risk by its mere existence. In this case, it is easy to identify the common factor in all these actions: they all directly or indirectly affect the value of economic assets.

After the analysis of the existing literature we propose the following definition for political risk: *"Political risk represents the risk associated with the effect that actions of agents pursuing political objectives may have on the value of the assets of agents pursuing economic objectives."*

We consider that this definition has several characteristics that make it broad and inclusive regarding the different particular definitions:

- It is neutral regarding positive or negative charges to Political Risk and regarding other elements such as the political system and the stage of economic development;
- It considers multiple and diverse originators of Political Risk, which have as

a common factor the pursuance of political objectives, and can be as diverse as national or local governments, political activists, military or even terrorist groups;

- It considers multiple and diverse targets of political risk, which have as a common factor the fact that the value of their assets is affected. It is irrelevant if it affects the asset value directly (e.g. expropriation or destruction of assets) or indirectly by affecting the earnings the asset generates (e.g. changes in tax rates).

The next section operationalizes the concept of political risk analyzing the different actions that politically driven agents take affecting the value of economic agents.

### **3 Operationalizing Political Risk**

In order to operationalize the different existing expressions of political risk, we have classified them according to the type of risk they pose. We follow the categorization system of Root (1972) and its three different categories of risk: Expropriation risk, Operational risk and Transfer risk. Additionally, we consider an additional category Violence risk, following the approaches of Jensen (2005) and Baas (2010)<sup>3</sup>.

#### **3.1 Expropriation Risk**

Following Truitt (1970), expropriation is defined as: an official taking by a sovereign state of the tangible property of alien corporate ownership with a view toward the continued exploitation of that property for the public utility of the expropriating state (p. 24). This definition implies several limiting characteristics of expropriation, as discussed in Kobrin (1980): (i) the expropriated property is located in the host country and its original owners reside outside the host countrys territory, (ii) it must not appear like a temporary action, (iii) expropriation must involve an indemnity payment from the government; otherwise, it is classified as a confiscation, and (iv) mild forms of intervention, such as an increase in taxes by the host government, are not considered expropriation, since expropriation is associated with deprivation of ownership only.

Compared to other manifestations of risk, such as political violence and transfer risks, the number of claims of expropriation to political risk insurance companies is low. However, expropriation remains the more important claim on insurance companies in terms of claimed value (Jensen, 2005). During the 1970s and 1980s, expropriation

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<sup>3</sup>Violence risk is nowadays overwhelmingly recognized as an important aspect of political risk and there is even insurance coverage offered to multinational corporation (MNCs) from risks associated with war.

was the most common form of political risk (Minor, 2003; Jarvis and Griffiths, 2007), and although less frequent after the 1980s, it showed an increase after the mid-1990s (Hajzler, 2010a)

Why do governments expropriate? There are several incentives, either political or economic in the sense of a rent seeking behavior, or both, that drive a government to expropriate.

In the case of politically driven expropriations, it may be due to political ideology changes that generate waves of forced divestment, a case defined as mass expropriation (e.g. Truitt, 1970; Kobrin, 1980); a typical example is the socialization of the Cuban economy in the 1960s. Other expropriations, related with specific sectors or firms, are called selective expropriations, and may be expressions of reactions against foreign domination (Kobrin, 1980; Kennedy, 1993).

The economically driven expropriations are selective by nature<sup>4</sup>. They may well come up as an opportunity to seize a high level of rents in a project, or as a desperate measure in the midst of an economic downturn. The first case is known as opportunistic expropriation (Cole and English, 1991), and is usually associated with natural resources production (see Duncan, 2005; Engel and Fischer, 2007; Guriev, Kolotilin and Sonin, 2009; Hajzler, 2010a; Stroebel and van Benthem, 2010). The government seeks to capture the difference between the rents of the business and the reputational costs it will incur, and the net benefits are more obvious for countries flushed with rents from natural resources and not dependent on FDI flows (Jensen and Johnston, 2011). In the second case, desperate expropriation (Cole and English, 1991), the net benefits are magnified by the fact that reputational costs greatly decrease during economic recessions, because the residents of the country place more importance on the welfare state (Jensen, 2005; Jensen, 2008 and Tomz and Wright, 2010). Table 1 summarizes the expropriation types and their drivers.

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<sup>4</sup>Although one might think mass expropriation could also be economically driven opportunistic or desperate, Hajzler (2010a) finds that no nationalization or socialization cases have been documented since the 1970s. Besides, until the 70's, the cases of mass expropriation were directly linked to instauration of new political regimes, following recently obtained independence, or both.

Types of expropriations and their drivers.

	Political	Economic
Mass Expropriation	Not observed yet	Ideologically motivated disregarding specific characteristics of industries or firms, e.g. nationalizations and socializations (Truitt, 1970; Kobrin, 1980; Raff, 1992; Kennedy, 1993)
Selective expropriation	Driven by specific political motives such as (i) reaction against foreign domination (Kobrin, 1980; Kennedy, 1993), (ii) newly independent states trying to shed the last vestige of colonialism (Truitt, 1970) or (iii) intervention in sectors that are considered key to national security: public utilities, military industry, etc (Kobrin, 1980; Kennedy, 1993).	Opportunistic: encouraged by high output levels or prices (Cole et al, 1991; Thomas et al, 1994) or high real prices (Duncan, 2005; Engel et al, 2007; Guriev et al. 2009; Stroebel et al, 2010; Hajzler, 2010b. Desperate: carried out during economic recessions (Cole et al, 1991).

### 3.2 Operational Political Risk

Following the definition of Root (1972), operational political risk is associated with policy uncertainty and actions that directly constraint the operations of firms. Although this definition is very broad, operational risk is commonly related with policies, regulation and governmental procedures that affect the results of the investment, but do not imply deprivation of ownership or loss of assets. Changes in legislation that may have an effect on the profits of the firm, and changes in taxes are usual examples of expressions of operational risk. Similarly to expropriation risk, we can classify operational political risk expressions through their drivers, which may again be political, economic or both. Table 2 summarizes the different expressions of operational risk and their drivers.



Expressions of operational political risk and their drivers.

	Political	Economic
Changes in taxes	Usually part of broad macroeconomic policies, although it may sometimes target specific industries and sectors (Jensen, 2003)	Opportunistic behavior aiming to seize rents from sectors with high output or price levels (Duncan, 2005; Engel et al., 2007; McMillan and Waxman, 2007; Stroebel et al., 2010)
Changes in royalties	-	Opportunistic behavior aiming to seize rents from sectors with high output or price levels (Engel et al., 2007; Stroebel et al., 2010)
Corruption premium	-	Most common in countries with poor governance in which unofficial payment may be required in order to be able to do business within the country (McMillan and Waxman, 2007)
Changes in legislation	Usually part of broad macroeconomic policies, may affect returns on investments (Jensen, 2003)	Most common when governments are both owners of firms and market regulators (Minor, 2003)
Political instability	Unstable governmental regimes may deteriorate broad economic situation and/or strong and active opposition may delay or hinder governmental policies and initiatives (Feng, 2001, Minor, 2003, Jensen, 2008)	Governments erratically change policies or policy directions in order to extract economic rents (Feng, 2001)
Subsidies and tax-incentives	As a mechanism to support emerging or important sectors	As compensation mechanisms addressing high levels of political risk (Engel et al., 2007; Hajzler, 2010b; Stroebel et al., 2010; Jensen et al., 2011)

There is sometimes an overlapping between some expressions of operational risk and expropriations. The concept creeping expropriation is considered to be a form of expropriation, and reflects governmental attempts to seize rents through taxes and royalties (e.g. Bohn and Deacon, 2000; Duncan, 2005). However, it is not easy to associate tax increases with expropriations, because tax increases are usually part of a broad contractionary fiscal policy with no particular industry or sector targets. Furthermore, taxes expropriate profits instead of productive assets, and in this sense, they do not fit into the definition of expropriation considered in this paper<sup>5</sup>.

### 3.3 Transfer Risk

Transfer risk is related with the uncertainty about flows of capital, payments, technology and people, among others (Root, 1972). More precisely, Baas (2010) defines it as the inability of a foreign enterprise to repatriate investment capital or loan principal, dividends or interests by legal means (p. 139). There are two main expressions of transfer risk. The first one, and perhaps the most popular, is sovereign default. It refers to the announcement by a government that it will not pay its debt, either fully or partially. The second one is capital controls, which encompasses a broad range of activities. Restrictions to the movements of capitals and currency devaluation schemes are common examples of this type of risk.

The effects of both types of transfer risk on operating businesses may be quite diverse.

Sovereign default may affect businesses indirectly, through deterioration of the economy by impairing economic activity. Arellano (2008) argues that sovereign defaults are often accompanied by deep economic recessions, and Tomz and Wright (2010), refer that its likely that international markets punish the defaulting economy with its known consequences.

Capital controls, have a direct effect on businesses and especially multinational firms, even when they are not aimed at these type of businesses (Clague, Philip Keefer, Knack, and Olson, 1996; Feng, 2001). They may impact the ability to transfer funds abroad, as well as the profit stream of the firm such as in the cases of devaluation schemes (Clague et al, 1996; Jensen, 2003) or currency inconvertibility (Clague et al, 1996; Baas, 2010). One further expression of capital controls relates to some special taxes such as import and export tariffs and constraints to payments to the parent company (Feils and Sabac, 2000; Brealey, Myers and Allen, 2010).

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<sup>5</sup>At this respect, Hajzler (2010A) provides a clarifying example: imposing a tax of 100% on profits may be more restrictive than an expropriation that pays at least an indemnity. However, this is not considered expropriation, since it does not involve transfer of ownership.

### 3.4 Political Violence Risk

It refers to the risk that politically motivated violent acts lead to the destruction of the operating assets of a project or render the project non-operational for a prolonged period (Baas, 2010:139). Among the expressions of this risk we can find war, insurrection, revolution, terrorism and sabotage. This category of political risk has been especially relevant during the last two decades, in which significant events such as September 11, March 11, the Londons attacks of July 7 of 2005, and the still ongoing political unrest in Middle East and Africa add to the picture<sup>6</sup>.

In few cases, violence risk is company or sector specific such as sabotages or terrorist acts. In most of the cases, political violence risk comes as an unwanted consequence of a broader conflict, like a civil war. The effect of this risk can be direct or indirect (Jensen, 2005). The direct effects of violence risk are the impairment of the firms assets including fixed and human capital. The indirect effects are possibly more common and affect the value of the operating firm as a consequence of collateral effects, such as an economic recession during periods of war. In any case, the operating costs are likely to increase: the company will most probably incur in additional expenses in order to protect against such conflicts, like additional surveillance, and insurance fees.

Expressions of political violence risk and their effects

	Expressions	Effects
Direct	Terrorist attacks, Sabotage, Insurrection and Wars.	Destruction of physical capital and/or loss of human capital and/or increases the cost of protection.
Indirect	Revolutions, Coup dtats, Insurrection and Wars.	Deterioration of the financial performance due to lower economic growth of the country and increases the cost of protection.

Having reviewed the main expressions of political risk, we will now analyze their effects on corporate investment, particularly through the decision making process of firms regarding investment.

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<sup>6</sup>International military intervention as a response to some of these developments also represents a derivative of political risk, with expressions such as increases in military spending and regime changes in rogue states (Jarvis and Griffiths, 2007).

## 4 Political risk and corporate financing decisions

This section analyses the direct effects of the different expressions of political risk on corporate investment decisions. Previous authors have already performed a theoretical analysis of these effects, although focusing almost exclusively on expropriations (see Cole and English, 1991; Raff, 1992; Thomas and Worrall, 1994; Clark, 2003; Engel and Fischer, 2007). As an exception, we find the analysis of Feils and Sabac (2000) that analyzes the effects of expropriations but also operational political risk expressed as increased operating costs. Different methodologies are followed such as NPV (e.g. Feils and Sabac, 2000) and Real Options (e.g. Clark, 1997 and Clark and Tunaru, 2003).

Considering the classical Net Present Value (NPV) model of investment decisions (Fisher, 1907; Williams, 1938; Dean, 1951) an increase in risk due to exposure to political risk directly translates into a higher discount rate and a lower value of the investment opportunity. Although intuitive, this simple effect is probably too simplistic to describe the effects of the multitude of expressions of Political Risk and it also ignores important aspects of investment timing.

In order to better understand the effect of the different manifestations of political risk on corporate financing decisions we use Real Options Analysis and built a version of a classical sequential investment timing model in the spirit of (McDonald and Siegel, 1986) assuming uncertain cash flows ( $x_t$ ) that evolve according to the following *gBm* process.

$$dx = x\mu dt + x\sigma dz \quad (1)$$

in which  $\mu$  is a drift term,  $\sigma$  measures the volatility of the cash-flow  $x$  and  $dz$  is the increment of a standard Wiener process.

The value of the operating firm ( $V(x)$ ) and of the investment project before the investment is realized ( $V_0(x)$ ) are both solutions to following general partial differential equation (PDE), derived using dynamic programming and assuming risk neutrality,

$$0.5\sigma_i^2 x^2 v_{xx} + \mu x v_x - rv + \pi_v = 0. \quad (2)$$

in which the subscripts indicate partial derivatives,  $v = V$  and  $\pi_v = (x - c)(1 - \tau)$  for the operating firm and  $v = V_0$  and  $\pi_v = 0$  for the investment project.

The general solution for this type of PDE (2) is of the following type,

$$v(x) = P + C_1 x^{\beta_1} + C_2 x^{\beta_2}, \quad (3)$$

in which  $P$  represents the present value of a perpetual stream of cash flows accruing to equityholders when the firm is operating and the probability of default is negligible

( $x \rightarrow \infty$ ), implying that the constant  $C_1$  is zero for the operating firm  $V$ . The constant  $C_2$  is associated with the possibility to abandon and is determined by a value matching abandonment condition we present next. For the investment project,  $P = 0$  (an investment project does not generate any cash flows), the constant  $C_2$  is zero and the constant  $C_1$ , associated with the investment possibility is determined by a value matching investment condition we present next. Finally,  $\beta_1$  and  $\beta_2$  are solutions to the following quadratic equation,

$$0.5\sigma^2\beta^2 + \left(\mu - \frac{\sigma^2}{2}\right)\beta - r = 0, \quad (4)$$

and therefore,

$$\beta_1 = 0.5 - \frac{\mu}{\sigma^2} + \sqrt{\left(\frac{\mu}{\sigma^2} - 0.5\right)^2 + \frac{2r}{\sigma^2}} > 1, \quad (5)$$

and,

$$\beta_2 = 0.5 - \frac{\mu}{\sigma^2} - \sqrt{\left(\frac{\mu}{\sigma^2} - 0.5\right)^2 + \frac{2r}{\sigma^2}} < 0. \quad (6)$$

Initially, a corporate decision maker times the decision to invest in a production unit with irreversible costs of investment ( $I$ ) and this decision is expressed in an investment trigger  $x_I$  representing the cash flow level at which it is optimal to realize the irreversible investment. Following the investment, an production facility is operated bearing fixed operating costs ( $c$ ) and subject to the payment of corporate taxes ( $\tau$ ) in a purely symmetrical tax system. Positive cash flows net of operating costs and corporate taxes are distributed as dividends, negative cash flows (whenever  $x < c$ ) trigger cash injections by equityholders to avoid default. However, there is a cash flow level defined as  $x_a$  for which it is not optimal for equityholders to keep on injecting cash in a loss making business and they simple abandon. The following value matching condition expresses the value at abandonment,

$$V(x_a) = 0, \quad (7)$$

by replacing (3) in equation (7) we able to determine the constant  $C_2$  and obtain  $V(x)$  for  $x > x_a$ ,

$$V(x) = \left(\frac{x}{r - \mu} - \frac{c}{r}\right)(1 - \tau) - \left(\frac{x_a}{r - \mu} - \frac{c}{r}\right)(1 - \tau) \left(\frac{x}{x_a}\right)^{\beta_2}. \quad (8)$$

Regarding the decision to invest, we have the following investment value matching condition,

$$V_0(x_I) = V(x_I) - I, \quad (9)$$

it represents an expression of the Net Present Value at the time of investment ( $x_I$ ) and allows us to determine the constant  $C_1$  and obtain  $V_0(x)$  by replacing (3) in equation (9), for  $x < x_I$  we get,

$$V_0(x) = \left[ \left( \frac{x_I}{r - \mu} - \frac{c}{r} \right) (1 - \tau) - \left( \frac{x_a}{r - \mu} - \frac{c}{r} \right) (1 - \tau) \left( \frac{x_I}{x_a} \right)^{\beta_2} - I \right] \left( \frac{x}{x_I} \right)^{\beta_1}. \quad (10)$$

Regarding the abandonment decision ( $x_a$ ) for the operating firm and the investment decision ( $x_I$ ) for the investment project we are able to determine both triggers by solving the following smooth pasting conditions,

$$\left. \frac{\partial V}{\partial x} \right|_{x=x_a} = 0, \quad (11)$$

$$\left. \frac{\partial V_0}{\partial x} \right|_{x=x_I} = \left. \frac{\partial V}{\partial x} \right|_{x=x_I}, \quad (12)$$

yielding an analytical solution for  $x_a$  and an implicit equation from where we numerically determine  $x_I$

$$x_a = \frac{\beta_2}{\beta_2 - 1} \frac{c(r - \mu)}{r}, \quad (13)$$

$$\frac{x_I(\beta_1 - 1)(1 - \tau)}{r - \mu} + \left( \frac{x_a}{r - \mu} - \frac{c}{r} \right) (1 - \tau) \left( \frac{x_I}{x_a} \right)^{\beta_2} (\beta_2 - \beta_1) - \left( I + \frac{c}{r}(1 - \tau) \right) \beta_1 = 0. \quad (14)$$

The following table summarizes how increases in the parameter values affect the decisions to invest and abandon and in the values of an operating firm and an investment project.

When a change in a parameter increases the value of the operating firm ( $V(x)$ ) it naturally also increases the value of the investment project ( $V_0(x)$ ) such as increases in  $x_0$ ,  $\mu$  and  $\sigma$  and decreases in  $c$ ,  $\tau$  and  $r$ . The logic is intuitively simple in these cases, the value of the project directly increases with increases in the operating asset and the operating asset increases when the cash flows to equityholders increase (increases in  $x$  and  $\mu$  and decreases in  $c$  and  $\tau$ ) and when the opportunity cost of capital decreases (a decrease in  $r$ ). Regarding volatility, an increase in volatility affects positively both the value of the operating firm, because it increases the value of the option to abandon and it affects positively the investment project, because its value derives entirely from the option to invest.

In terms of the decisions to abandon and to invest the logic works as follows. A reduction in the value of the operating business induces equityholders to close it down earlier, either because the operating costs are higher (higher  $c$ ), because the growth

Table 1: Static analysis summary for the investment timing model.

Parameter	$x_I$	$V_0(x)$	$x_a$	$V(x)$
$x$	-	↑	-	↑
$c$	↑	↓	↑	↓
$\tau$	↑	↓	-	↓
$\mu$	↓	↑	↓	↑
$\sigma$	↑	↑	↓	↑
$r$	↑	↓	↑	↓

Note: an '↑' symbol implies that an increase in the parameter value is associated with an increase in the corresponding variable, a '↓' symbol implies that an increase in the parameter value is associated with a decrease in the corresponding variable and finally a '-' symbol implies that an increase in the parameter value does not affect the corresponding variable.

rate is lower (lower  $\mu$ ) or because the opportunity cost of capital is higher (high  $r$ ). Regarding volatility, an increase in volatility increases the value of the option to abandon, making it more likely also that the cash flows might increase, as so equityholders wait for longer before exercising abandonment. The current level of cash flows ( $x$ ) naturally does not affect the decision to abandon ( $x_a$ ), as it does not affect the decision to invest ( $x_I$ ).

Regarding the corporate tax rate, changes in taxes do not affect the decision to abandon, since the tax system is assumed to be fully symmetrical implying that when cash flows are lower than the fixed operating costs, the firm is able to benefit from tax carry back and carry forward provisions. In terms of the investment decision, an increase in corporate taxes decreases the value of the operating firm inducing the decision makers to wait for longer and only invest at higher cash flow values.

Consider the effect of the different expressions of political risk on the decision to invest and in the value of an investment opportunity summarized in the following table.

Regarding the risk of expropriation, there is a wide range of outcomes for investors of a private firm, but in every case there is the risk of an attack on the proprietorship rights of investors. From receiving a fair indemnity that would have a neutral effect on investment to an extreme case of confiscation that would reduce to zero the value of the operating firm for private investors (Cole and English, 1991; Raff, 1992; Clark, 1997, 2003; Clark and Tunaru, 2003). In a 'normal' case, the indemnity will be lower than the fair value of the operating business. In this situation the investment project has a lower value and an investor will demand higher cash flows in order to realize the

Table 2: Impact of political risk on corporate investment decision

Expression	Effect on Parameter	Effect on $V_0$	Effect on $x_I$
Expropriation risk	$\downarrow V$	$\downarrow V_0$	$\uparrow x_I$
Operational risk			
Change in taxes	$\downarrow \uparrow \tau$	$\downarrow \uparrow V_0$	$\downarrow \uparrow x_I$
Change in royalties	$\uparrow c$	$\downarrow V_0$	$\uparrow x_I$
Corruption premiums	$\uparrow c \uparrow I$	$\downarrow V_0$	$\uparrow x_I$
Legislation changes	$\uparrow \sigma \downarrow x$	$\uparrow V_0 \downarrow V_0$	$\uparrow x_I$
Political instability	$\downarrow \mu$	$\downarrow V_0$	$\uparrow x_I$
Subsidies	$\downarrow I \downarrow c$	$\uparrow V_0$	$\downarrow x_I$
Transfer risk			
Sovereign default	$\downarrow \mu \downarrow I$	$\downarrow V_0 \uparrow V_0$	$\uparrow x_I \downarrow x_I$
Capital controls	$\downarrow V$	$\downarrow V_0$	$\uparrow x_I$
Violence risk			
Direct	$\downarrow V$	$\downarrow V_0$	$\uparrow x_I$
Indirect	$\uparrow c$	$\downarrow V_0$	$\uparrow x_I$

Note: an ' $\uparrow$ ' symbol implies that an increase in the parameter value is associated with an increase in the corresponding variable, a ' $\downarrow$ ' symbol implies that an increase in the parameter value is associated with a decrease in the corresponding variable and finally a '-' symbol implies that an increase in the parameter value does not affect the corresponding variable.

investment<sup>7</sup>.

In terms of operational risk there is a multitude of effects. Most of the effects are negative reducing the value of the investment opportunity and inducing a delay on the decision to invest. In this case we have increases in corporate taxes, increase in royalties (Minor, 2003; Jensen, 2003; McMillan and Waxman, 2007), corruption premiums such as bribes (McMillan and Waxman, 2007) and political instability reducing the growth rate of the economy. In those cases in which there are reductions in corporate taxes, either due to a general reduction in corporate taxes or because of specific tax shields, the effect is positive on the value of the investment opportunity and by accelerating investments. Regarding changes in legislation, an increase in volatility increases the value of the investment opportunity. However, increased risk delays investment and

<sup>7</sup>Previous research has analyzed the effects of expropriation on investment considering capital and labor intensive firms. Bohn and Deacon (2000) argue that if there is insecure ownership, capital intensive firms will have a slower exploitation rate than labor intensive ones, however, Boschini, Petterson and Roine (2007) defend that so long as property rights are well defined, both types of resources should present similar exploitation rates and be equally attractive to investors.



considering those cases in which changes in legislation occur in a context in which a government is an interested party as an economic agent, the effect is doubly negative decreasing the value of the investment opportunity and delaying investments. The effects of political instability are expected to impair economic growth, in this case they have a negative impact in the value of the investment opportunity and induce a delay on investments. Finally, subsidies have a positive impact on the value of the the investment opportunity and accelerate investments. It is a similar effect if it is a similar effect if the subsidy reduces the investment costs or reduces the operating costs of the firm.

Regarding transfer risk, the effects are mostly negative. We have a direct effect whenever a defaulting government is a business counterpart of firms, indirectly firms are also affected due to a decrease in economic growth. The intensity of these effects depends on the importance of the risky market on the overall business operations of the firm and in its net position as an importer or exporter regarding tariffs and changes in foreign exchange rates. Both the previously described effects decrease the value of the investment opportunity with a consequential effect on delayed investments. It is also possible that observe a marginal positive effect on the costs of investment whenever public spending leading up to default was mostly on building infrastructure (Feng, 2001), however, it is unlikely that this effect is stronger than the negative effects.

In terms of political violence risk the effects are strictly negative in terms of the value of the investment opportunity and investment timing. Political violence may directly impair the value of operating assets by damage or destruction of human and physical capital (Iankova and Katz, 2003; Jensen, 2005; Baas, 2010). Indirectly, it increases operating expenses, such as insurance against political risk events (Jensen, 2005; Baas, 2010), or the costs of extra private surveillance.

This analysis focused on the direct effects of one expression on the different parameters that affect the value of an investment opportunity and on the decision to invest. However it is important to refer that sometimes governments simultaneously enforce more than one measure, often with the objective of compensating a negative expression of political with a positive one. Several authors (see Engel and Fischer, 2007; Hajzler, 2010; Stroebel and van Benthem, 2010; Jensen and Johnston, 2011) attribute the offering of tax incentives and subsidies as a way to compensate firms for the existence of high expropriation risk. Engel and Fischer (2007) argue that, as a compensation mechanism for high expropriation risk, tax reductions may be a preferred alternative because of the smaller social costs associated with this alternative.

## 5 Conclusions

Most papers on political risk focus on how political risk is related with LDCs, political regimes foreign direct investment and commodities, however the expressions of political risk are so diverse that directly or indirectly most firms are exposed to this type of risk. As so in this paper we propose an inclusive definition of political risk and perform a qualitative analysis of the impact of the different expressions of political risk on the different parameters that affect the value of an investment opportunity and on the decision to invest.

There is still a wide field to cover in this areas and notably in terms of quantitative effects of the different expressions of political risk on welfare. Raff (1992) argues that raising taxes may be a preferred alternative to expropriation, because they generate a smaller welfare loss, however these are only two of the many expressions of Political risk we described. Furthermore, similar analyses should be performed for the compensation mechanisms in which there is an increased complexity of addressing more than one expression of political risk and a difference in the time of the governmental perceived benefits and the firms perceived costs. Hopefully, these are all aspects that may be addressed in future research.

## References

- [1] Alesina, A., Nouriel, R. and G. Cohen, 1997. Political cycles and the macroeconomy (MIT Press, Cambridge).
- [2] Arellano, C., 2008, Default risk and income fluctuations in emerging economies, *The American Economic Review* 98, 690-712.
- [3] Baas, D., 2010, Approaches and challenges to political risk assessment: The view from export development Canada, *Risk Management* 12, 29.
- [4] Bohn, H. and R. Deacon, 2000, Ownership risk, investment, and the use of natural resources, *The American Economic Review* 90, 526-549.
- [5] Boschini, A., Pettersson, J. and J. Roine, 2007, Resource curse or not: A question of appropriability, *The Scandinavian Journal of Economics* 109, 593-617.
- [6] Brealey, R., Myers, M. and F. Allen, 2010. Principles of corporate finance (McGraw-Hill/Irwin, Boston).
- [7] Bremmer, I., 2005, Managing risk in an unstable world, *Harvard Business Review* 83, 51-60. Bulow, Jeremy, and Kenneth Rogoff, 1989, Sovereign debt: Is it to forgive to forget?, *The American Economic Review* 79, 43-50.
- [8] Burgman, T., 1996, An empirical examination of multinational corporate capital structure, *Journal of International Business Studies* 27, 553-570.
- [9] Busse, M., Hefeker, C., 2007, Political risk, institutions and foreign direct investment, *European Journal of Political Economy* 23, 18.
- [10] Buttler, K., and D. Castelo, 1998, A note on political risk and the required return on foreign direct investment, *Journal of International Business Studies* 29, 9.
- [11] Clague, C., Keefer, P., Knack, S. and M. Olson, 1996, Property and contract rights in autocracies and democracies, *Journal of Economic Growth* 1, 243-276.
- [12] Clark, E., 1997, Valuing political risk, *Journal of International Money and Finance* 16, 477-490.
- [13] Clark, Ephraim, 2003, Pricing the cost of expropriation risk, *Review of International Economics* 11, 412-422.

- [14] Clark, E., and R. Tunaru, 2003, Quantification of political risk with multiple dependent sources, *Journal of Economics and Finance* 27, 125-135.
- [15] Cole, H., and W. English, 1991, Expropriation and direct investment, *Journal of International Economics* 30, 201-227.
- [16] Cuadra, G., and H. Saprizza, 2008, Sovereign default, interest rates and political uncertainty in emerging markets, *Journal of International Economics* 76, 78-88.
- [17] Dean, J., 1951. *Capital budgeting* (Columbia University Press, New York).
- [18] Dixit, A., and R. Pindyck, 1994. *Investment under uncertainty* (Princeton University Press, Princeton).
- [19] Drazen, A., 2001, The political business cycle after 25 years, in Ben Bernanke, and Kenneth Rogoff, eds.: *The political business cycle after 25 years* (MIT Press, Cambridge).
- [20] Duncan, R., 2005, Price or politics? An investigation of the causes of expropriation, *Australian Journal of Agricultural and Resource Economics* 50, 85-101.
- [21] Eaton, J., and M. Gersovitz, 1981, Debt with potential repudiation: Theoretical and empirical analysis, *The Review of Economic Studies* 48, 289-309.
- [22] Engel, E., and R. Fischer, 2007, Optimal resource extraction contracts under threat of expropriation, in William Hogan, and Federico Sturzenegger, eds.: *The natural resources trap: Private investment without public commitment* (MIT Press, Cambridge).
- [23] Feils, D., and F. Sabac, 2000, The impact of political risk on the foreign direct investment decision: A capital budgeting analysis, *The Engineering Economist* 45, 129-143.
- [24] Feng, Y., 2001, Political freedom, political instability, and policy uncertainty: A study of political institutions and private investment in developing countries, *International Studies Quarterly* 45, 24.
- [25] Fisher, I., 1907, *The rate of interest: Its nature, determination and relation to economic phenomena* (Macmillan, New York).
- [26] Gehlbach, S., and P. Keefer, 2011, Investment without democracy: Ruling-party institutionalization and credible commitment in autocracies, *Journal of Comparative Economics* 39, 123-139.

- [27] Goriaev, A., and K. Sonin, 2005, Is political risk company-specific? The market side of the Yukos affair, CEPR Discussion Paper (New Economic School London).
- [28] Guriaev, S., Kolotilin, A. and K. Sonin, 2009, Determinants of nationalization in the oil sector: A theory and evidence from panel data, *Journal of Law, Economics and Organization* 27, 301-323.
- [29] Hajzler, C., 2010a, Expropriation of foreign direct investments: Sectoral patterns from 1993 to 2006, *Economics Discussion Papers* (University of Otago, Dunedin).
- [30] Hajzler, C., 2010b, Resource-based FDI and expropriation in developing economies, *Economics Discussion Papers* (University of Otago, Dunedin).
- [31] Humphreys, M., Sachs, J. and J. Stiglitz, eds., 2007. *Escaping the resource curse* (Columbia University Press, New York)
- [32] Iankova, E., and J. Katz, 2003, Strategies for political risk mediation by international firms in transition economies: The case of bulgaria, *Journal of World Business* 38, 182-203.
- [33] Jarvis, D., and M. Griffiths, 2007, Learning to fly: The evolution of political risk analysis, *Global Society* 21, 19.
- [34] Jensen, N., 2003, Democratic governance and multinational corporations: Political regimes and inflows of foreign direct investment, *International Organization* 57, 587-616.
- [35] Jensen, N., 2005, Measuring risk: Political risk insurance premiums and domestic political institutions, *International Finance* (EconWPA).
- [36] Jensen, N., 2008, Political risk, democratic institutions, and foreign direct investment, *The Journal of Politics* 70, 1040-1052.
- [37] Jensen, N., and N. Johnston, 2011, Political risk, reputation, and the resource curse, *Comparative Political Studies* 44, 662-688.
- [38] Kennedy, C., 1993, Multinational corporations and expropriation risk, *Multinational Business Review* 1, 44-55.
- [39] Kobrin, S., 1979, Political risk: A review and reconsideration, *Journal of International Business Studies* 10, 67-80.

- [40] Kobrin, S., 1980, Foreign enterprise and forced divestment in LDCs, *International Organization* 34, 65-88.
- [41] Kobrin, S., 1984, Expropriation as an attempt to control foreign firms in LDCs: Trends from 1960 to 1979, *International Studies Quarterly* 28, 329-348.
- [42] La Rotta, S., 2011, No todo vale, *El Espectador* (Bogot).
- [43] Mander, B., 2011, Chavez expropriation threat of the day, *The Financial Times*.
- [44] Marshall, M., 2011, State fragility index, *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2010* (Political Instability Task Force).
- [45] McDonald, R., and D. Siegel, 1986, The value of waiting to invest, *Quarterly Journal of Economics* 101, 707-727.
- [46] McMillan, M., and A. Waxman, 2007, Profit sharing between governments and multinationals in natural resource extraction: Evidence from a firm-level panel.
- [47] Minor, John, 2003, Mapping the new political risk, *Risk Management* 50, 16-21.
- [48] Minor, M., 1994, The demise of expropriation as an instrument of LSC policy, 1980-1992, *Journal of International Business Studies* 25, 177-188.
- [49] Olson, M., 1993, Dictatorship, democracy and development, *The American Political Science Review* 87, 567-576.
- [50] Raff, H., 1992, A model of expropriation with asymmetric information, *Journal of International Economics* 33, 245-265.
- [51] Root, F., 1972, Analyzing political risks in international business., in A. Kapoor, and Phillip D. Grub, eds.: *The multinational enterprise in transition* (Darwin Press, Princeton).
- [52] Simon, J., 1984, A theoretical perspective on political risk, *Journal of International Business Studies* 15, 123-143.
- [53] Stroebel, J., and A. van Benthem, 2010, Resource extraction contracts under threat of expropriation: Theory and evidence, *USAEE Working Paper* (United States Association for Energy Economics, Cleveland).
- [54] Thomas, J., and T. Worrall, 1994, Foreign direct investment and the risk of expropriation, *Review of Economic Studies* 61, 81-108.

- [55] Tomz, M., and M. Wright, 2010, Sovereign theft: Theory and evidence about sovereign default and expropriation, in William Hogan, and Federico Sturzenegger, eds.: *The natural resources trap: Private investment without public commitment* (MIT Press, Cambridge).
- [56] Truitt, F., 1970, Expropriation of foreign investment: Summary of the post world war II experience of American and British investors in the less developed countries, *Journal of International Business Studies* 1, 21-34.
- [57] van der Linde, C., 1993. Sustaining development in mineral economies: The resource curse thesis, in Richard M. Auty eds.: *Resources Policy*, (Routledge, London and New York).
- [58] Williams, J., 1938. *The theory of investment value* (Harvard University Press, Cambridge).