



UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA

University of Wollongong  
**Research Online**

---

Faculty of Business - Economics Working Papers

Faculty of Business

---

1999

# Valuation of Foreign Direct Investment in the Presence of Political Risk

B. C. Lee

*University of Wollongong*

J. G. Powell

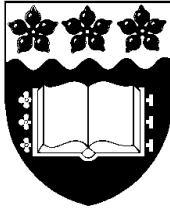
*University of Otago, New Zealand*

---

## Publication Details

Lee, BC and Powell, JG, Valuation of foreign direct investment in the presence of political risk, Working Paper 99-8, Department of Economics, University of Wollongong, 1999.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:  
[research-pubs@uow.edu.au](mailto:research-pubs@uow.edu.au)



**University of Wollongong**  
**Department of Economics**  
**Working Paper Series 1999**

**Valuation of Foreign Direct Investment in the Presence  
of Political Risk**

Boon-Chye Lee

and

John G. Powell

WP 99-8

## **Valuation of Foreign Direct Investment in the Presence of Political Risk**

Boon Chye Lee  
Department of Economics  
University of Wollongong  
Northfields Avenue, Wollongong  
NSW 2522, Australia  
Fax: +61 2 4221-3725  
Email: boon@uow.edu.au

and

John G. Powell  
Department of Finance and Quantitative Analysis  
University of Otago  
Dunedin, New Zealand  
Fax: 643-479-8193  
and  
Department of Commerce  
Australia National University  
Canberra ACT 0200  
Email: jpowell@commerce.otago.ac.nz

March 1999

# VALUATION OF FOREIGN DIRECT INVESTMENT IN THE PRESENCE OF POLITICAL RISK

*Investments in a country are subject to risks stemming from the same political events and government policies. Therefore it is possible to construct a portfolio which mimics the income profile of a particular FDI project using assets with readily observable prices. This paper provides a general risk replication model for valuing FDI projects in the presence of political risk.*

## INTRODUCTION

The valuation of foreign direct investment (FDI) is an exercise fraught with difficulty. Political risks such as potential expropriation or restrictions on currency convertibility complicate the analysis of FDI because they can create a wedge between the underlying returns to FDI and the level of FDI returns which can be repatriated. Recent events in Asia, including civil unrest in Indonesia and Malaysia's attempts to restrict foreign investment repatriation, emphasise the importance of potential FDI political risk.

Valuing FDI projects using a standard adjusted present value approach is especially difficult when the level of political risk is significant because appropriate risk-adjusted discount rates are notoriously difficult to estimate in an international setting (see, for example, Levy, 1990). An alternative approach is to draw upon the notion that FDI returns can be replicated using a portfolio of alternative investments that mimic the political risk and underlying profitability of an FDI project. Using this approach allows FDI projects to be valued because when two alternative investment portfolios have the same eventual payoffs they should have the same initial value. This paper therefore provides a general risk replication model for valuing FDI projects in the presence of political risk. We begin with the observation that investments in a particular country — including sovereign debt and FDI — fall within the jurisdiction of the same government, and therefore they are subject to risks stemming from the policies of the same government and political events in the same country. This means that it is possible to put together a portfolio of investments, including sovereign debt instruments, which mimics the income profile of a particular FDI project. Since the replicating portfolio is made up of assets with prices which are readily observable, the valuation of the FDI project is relatively straightforward.

We use an event tree representation to depict political risk in stylised form, thus clarifying the possible outcomes facing FDI projects in the presence of political risk. FDI projects are then valued using a payoff replication approach. The valuation procedure relies upon the observation that political risks which affect FDI projects also tend to hurt sovereign debt investors, so a portfolio of foreign government debt as well as other investment holdings can be used to replicate FDI project payoffs. This valuation approach provides a simple and intuitive indication of whether a particular FDI project will be value-enhancing for offshore investors.

The following section looks at how political risk can affect foreign investments. The model is then outlined and its solution presented. Implications of the model's solution are also briefly explored.

## FOREIGN INVESTMENTS AND POLITICAL RISK

Three main avenues of investment typically exist for foreign investors in a country: debt instruments issued by entities, including the host government, domiciled in the country; shares in listed companies located in the country;<sup>1</sup> and foreign direct investment (FDI). These investment avenues are all subject to varying degrees of risk, including political risk.

For the purposes of this paper, we define political risk generally as arising from any politically-motivated actions that have an impact on investment returns in a country. Political risk covers a wide range of possible actions, from acts of terrorism and kidnappings directed at the foreign personnel of companies to foreign exchange restrictions. Sovereign risk, which arises from the actions of the government, is part of political risk. We make no distinction between these risks in our paper.

Of the three main investment avenues, sovereign debt and FDI are perhaps more subject to political risk factors because, unlike indirect equity investments, they are more difficult for investors to disengage themselves from quickly when the investment climate becomes unfavourable. In addition, investors tend to be more closely involved with the management of the investments, either directly (in the case of FDI) as equity partner-owner-managers of the investment or indirectly (in the case of debt) by way of a relationship with the government of the day. This closeness makes it more difficult for them to withdraw from the investments.

For foreign investors, the absence of a legal or other mechanism which guarantees unhindered access to investment returns adds a "country risk" element to their investments (Eaton and Gersovitz, 1983). In the case of FDI, the severest form of political risk which investors are subject to is the threat of outright expropriation by the host government. Expropriation risk can be somewhat countered by the reverse threat of retaliatory economic sanctions, by the use of "knowledge-based, firm-specific assets" which are more difficult to seize, and by employing smaller plants which utilize more labour-intensive technologies so that capital investment costs can be recouped more quickly (Eaton and Gersovitz, 1983; Markusen, 1991). However, even if FDI can be afforded a degree of protection from outright expropriation, they are still vulnerable to more subtle or indirect forms of political risk. These include currency inconvertibility, war damage, civil strife damage, actions against company personnel (like kidnapping), and limits on remittances (repatriation risk). Similarly, foreign creditors are vulnerable to debt moratoria or outright repudiation although, as in the case of FDI, these risks are tempered by the availability of economic sanctions.

Although actual losses incurred by FDI and debt investments do not necessarily occur contemporaneously, during difficult economic circumstances these forms of investment are particularly vulnerable to the actions of national governments. Debt-service moratoria or restrictions on capital repatriation, for example, are commonly employed by countries in these situations in order to halt capital flight or further depletion of stocks of

international reserves. This fact alone will tend to put downward pressure on prospective values of debt and FDI projects even during good times and implies that debt and FDI values will tend to be correlated.<sup>2</sup>

The threat of political risk implies that an element of extra return is necessary before offshore investors find that FDI is value-enhancing. Exactly how much extra return is required by foreign direct investors when it is possible that foreign governments will impose political risk losses on investors is determined in this paper using a valuation approach which replicates FDI payoffs. It is possible, however, to empirically outline some very general profitability measures for different regions of the world. Africa appears to have had the highest average return on equity for FDI of around 25.5% per annum in 1993 (United Nations, 1995), possibly reflecting the extreme level of political risks sometimes encountered which discouraged multinationals from pursuing all but the most profitable investment projects. This compares to an average return on equity of 16.6% p.a. in other developing regions of the world and an 8.6% p.a. average return on equity in the developed world for FDI in 1993 (United Nations, 1995).

While differences in the relative depth and sophistication of capital markets no doubt account for some of the observed regional disparities in rates of return, differences in political risk levels are also important. Political losses faced by foreign direct investors during the period 1987 to 1992 have been estimated by Howell and Chaddick (1994). These range from a low of 0 (no recorded losses) in developing countries Kenya, Malaysia and Nigeria to a high of 9 (out of a possible 10) in Czechoslovakia as well as Yugoslavia, and a 7 for Vietnam and Saudi Arabia, where 10 represents maximum losses (please refer to Table 1). These losses are due to factors such as corruption, payment delays, personnel restrictions, expropriation, and inconvertibility, all of which contribute directly to political risk losses incurred by foreign direct investors. Howell and Chaddick (1994) also examined variables used by political risk forecasting agencies which are highly correlated with political risk loss realizations. The most important of these variables appear to be exchange controls, international borrowing liability, payment delays, labor costs, equity restrictions, bad neighbors, and authoritarianism. Countries with the worst 1986 scores for these variables included Sudan, Uganda, Iran, Ethiopia, and Iraq.

**<Table 1 about here>**

In order to distinguish between political risk losses facing foreign direct investors and foreign government debt investors, the Political Risk Services' forecasting variables (outlined in Howell and Chaddick, 1994) which pertain to government debt investors can be used. These include exchange controls, fiscal or monetary expansion, and international borrowing liability. Countries which score badly on these government finance variables but do relatively better on overall political risk, thus implying a low FDI risk to government debt risk ratio, include Venezuela and Indonesia. Mexico and Saudi Arabia were in the opposite situation of having a relatively high FDI risk to sovereign debt risk ratio.

## THE MODEL

In the stylised model there are two representative countries. The “home” country (designated by a subscript  $h$ , when required) is a developed economy that is home to a large multinational. The foreign country (designated with a subscript  $f$ , when necessary) provides FDI opportunities for the multinational but is subject to political risk. The foreign country also provides indirect equity investment opportunities.

Each dollar invested in a particular indirect equity investment opportunity in the foreign country at time  $t=0$  provides potential time period  $t=1$  total returns equal to  $u$  dollars if returns are favourable or  $d$  dollars if the investments go badly. The probability of the foreign indirect equity investment return being favourable is  $p$ , as illustrated in the following diagram:

<Diagram 1 about here>

It is assumed for simplicity that foreign indirect equity investments are not subject to political risk; this assumption can easily be relaxed.

In the stylised model it is assumed that FDI project profitability in the foreign country is proportionately related to the returns of a particular foreign indirect equity investment opportunity, with the proportionality factor being  $a$ .  $a > 1$  corresponds to the situation where FDI is more profitable than the indirect equity investment due to the multinational having a competitive advantage in the foreign country. Underlying FDI returns at time  $t=1$  to a dollar invested by the multinational in FDI projects in the foreign country are a high return of  $au$  with probability  $p$  or a low return of  $ad$  with probability  $1-p$  (see Diagram 2).<sup>3</sup>

<Diagram 2 about here>

A drawback to FDI is the possibility that some of the FDI returns might not be available to the multinational due to political risk losses. Political risk considerations include potential confiscation, repatriation restrictions, punitive taxation, foreign exchange controls, or other political interventions and misadventures. Losses due to political risks can occur when FDI returns are high as well as low. It is assumed in the stylised model that realized political risk losses at time  $t=1$  are  $R$  per dollar initially invested with probability  $q$  if FDI returns are favourable or  $L$  per dollar invested with probability  $m$  if returns are low (see Diagram 3).

<Diagram 3 about here>

Socio-political considerations suggest that government actions giving rise to political risk losses are more likely when FDI returns are unfavourable. In this situation some of the foreign country’s industries would be generating lower profits and therefore lower government revenues, thus creating an incentive for the government to try to cover any revenue shortfalls by (for example) imposing additional taxes or restrictions on the repatriation of profits. Difficult economic times might also provide a trigger for civil unrest which could affect the profits of the companies concerned. The overall

implication is that the probability and extent of political risk losses will generally be greater when FDI returns are low ( $m > q$  and  $L > R$ ).

Government actions which create political risk also tend to affect the foreign government's debt securities. Sovereign debt political risk losses incurred by foreign investors can include payment delays, foreign exchange convertibility restrictions, excessive withholding taxes, and partial or outright default. If political risk losses occur when FDI returns are high then they are assumed to impose a loss of a proportion  $T$  of the face value of one period foreign government debt ( $D_f$ ) whereas political risk losses in low FDI return situations imply losses of a proportion  $U$  of the debt face value (see Diagram 4). It is further assumed that the level of sovereign debt political risk losses is proportionate to the level of FDI political risk losses, so

$$(1) \quad \frac{T}{R} = \frac{U}{L} .$$

This assumption makes the stylised model's solution simpler to obtain but is not otherwise important. The cost at time  $t=0$  of one period foreign government debt with face value  $D_f$  is  $D_f / (1+r_f)$ , where  $r_f$  is the appropriate one period foreign government debt interest rate.

**<Diagram 4 about here>**

Risk-free debt of the multinational's home country is guaranteed to provide total returns equal to the risk-free debt's face value  $D_h$  due to the assumed absence of political risk in the multinational's home country. The cost at time  $t=0$  of domestic risk-free government debt is  $D_h / (1+r_h)$ . The local debt value is translated into the foreign country's currency via a forward exchange rate.

## THE MODEL'S SOLUTION AND IMPLICATIONS

The approach used to solve the model relies upon the concept of replicating (mimicking) the multinational's FDI returns by examining an investment portfolio which provides the same payoffs as the FDI project in each of the four alternative return scenarios at time  $t=1$ . Diagram 3 indicates that the alternative FDI payoffs at time  $t=1$  are  $au$  (Scenario 1),  $au-R$  (Scenario 2),  $ad$  (Scenario 3), or  $ad-L$  (Scenario 4). The cost of initially creating this replicating investment portfolio provides a time  $t=0$  indication of the value of the FDI project from the perspective of the multinational. The intuition for this result is that when two alternative investments (the replicating portfolio and the FDI project) have the same eventual payoffs then they should have the same initial values (see, e.g., Dixit and Pyndick, 1994).

An investment portfolio created at time  $t=0$  which will replicate FDI payoffs at time  $t=1$  consists of  $k$  dollars invested in the foreign indirect investment opportunity,  $D_h$  dollars of domestic risk-free debt maturing at time  $t=1$ , and  $D_f$  dollars of foreign government debt maturing at time  $t=1$ . This replicating portfolio has a payoff (see Diagrams 1 and 4) of  $ku+D_h+D_f$  in Scenario 1,  $ku+D_h+D_f(1-T)$  in Scenario 2,  $kd+D_h+D_f$  in Scenario 3, or  $kd+D_h+D_f(1-U)$  in Scenario 4. In order to mimic the time  $t=1$  payoffs to one dollar invested in the FDI project the investment and debt holding values  $k$ ,  $D_h$ , and  $D_f$  must be



adjusted so that the replicating portfolio payoffs are equated with the FDI project payoffs in every scenario. This requires

$$(2) \quad ku + D_h + D_f = \mathbf{a}u$$

in Scenario 1, where the lefthand side of the equation is the return to the replicating portfolio in this scenario whereas the righthand side is the repatriable FDI payoff in the same scenario. Similarly, in Scenario 2

$$(3) \quad ku + D_h + D_f(1 - T) = \mathbf{a}u - R$$

is required,

$$(4) \quad kd + D_h + D_f = \mathbf{a}d$$

is required in Scenario 3, and in Scenario 4 the requirement is

$$(5) \quad kd + D_h + D_f(1 - U) = \mathbf{a}d - L.$$

The solution of equations (2) through (5) implies

$$(6) \quad k = \mathbf{a},$$

$$(7) \quad D_f = \frac{R}{T},$$

and

$$(8) \quad D_h = -D_f.$$

The total cost of the replicating portfolio (equations (6) to (8)) at time  $t=0$  is

$$\mathbf{a} - \frac{R}{T} \left[ \frac{1}{1 + r_h} - \frac{1}{1 + r_f} \right],$$

where  $r_f$  and  $r_h$  are the appropriate one-period interest rates on foreign government debt and domestic borrowings maturing in one time period. The cost of the replicating portfolio provides a time  $t=0$  valuation  $V_0$  of a dollar invested by the multinational in the FDI project since investments which have the same eventual payoffs should have the same initial values:

$$(9) \quad V_0 = \mathbf{a} - \frac{R}{T} \left[ \frac{I}{1+r_h} - \frac{I}{1+r_f} \right].$$

The first term of FDI valuation equation (9) adjusts the value of FDI according to its profitability whereas the second term of the valuation equation takes account of the potential for FDI political risk losses. A multinational's competitive advantage raises the value of a dollar of FDI by a factor  $\mathbf{a}$ , as the first term of equation (9) indicates. The potential for political risk reduces the multinational's valuation of FDI below the level  $\mathbf{a}$ , however, as the second term of equation (9) reveals. A higher magnitude of potential FDI political risk losses ( $R$ ) lowers the valuation of FDI from the multinational's point of view, especially when political risk also increases the interest rate  $r_f$  which investors demand when investing in foreign government debt.<sup>4</sup> These latter two considerations, taken together, imply that FDI has a lower value when the foreign country is perceived to have a lot of potential political risk which is likely to be harmful to FDI projects. In this situation an element of extra return is necessary to compensate FDI investors for the additional political risks they have to bear relative to indirect equity investors (Eaton and Gersovitz, 1984).

The FDI valuation equation (9) indicates that, from the multinational parent's perspective, the value of FDI ( $V_0$ ) exceeds its cost if

$$(10) \quad \mathbf{a} - I > \frac{R}{T} \left[ \frac{I}{1+r_f} - \frac{I}{1+r_h} \right].$$

This condition provides the intuitive result that increasing the multinational's FDI projects is only value-enhancing if the additional profitability of the FDI project ( $\mathbf{a}-I$ ) exceeds a measure of the expected political risk losses of the project (the right hand side of condition (10)).

Implementation of valuation equation (9) requires estimates of investment profitability, government debt interest rates, and potential political risk losses. FDI profitability is project-specific and must therefore be estimated for each project, but the other input variables can be directly estimated. Estimates of the risk premium demanded by sovereign debt investors in the foreign country ( $r_f-r_h$ ) can be obtained from debt prices (see, for instance, the Monday edition of the International Herald Tribune). Political risk forecasts can also be used to infer an appropriate risk premium for foreign government debt. The potential for political risk losses facing foreign direct investors ( $R$ ) and foreign debt market investors ( $T$ ) can be estimated using past loss realizations as well as political risk forecasts (Howell and Chaddick, 1994).

The valuation approach described in this paper indicates that governmental negotiations with potential foreign direct investors could focus on potential FDI political risk losses (parameter  $R$ ) and the FDI profitability level  $\mathbf{a}$ . For example, in negotiating the initial FDI agreement with the government, the multinational (MNC) should take care that the agreement is not too skewed in favour of the MNC (unlike some cases in the past where the government was disadvantaged relative to the MNC because of a lack of technical expertise and negotiating skills). Otherwise, this can be a source of resentment and

increase the probability of political action in the future, and it can also increase the size of potential FDI political risk losses  $R$ . Conversely, the foreign host government would be ill-advised to press its advantage to the point where it will suffer in the long run by making FDI unattractive to multinationals.

The paper's analysis of FDI political risk also suggests that foreign direct investors should discuss all of these considerations with the foreign government, thus helping foreign direct investors to be more accurate about their evaluation of potential returns under different scenarios. Governments might actually want to initiate this discussion if it reduces foreign direct investors' qualms about potential political risk losses.

## CONCLUSION

This paper has presented a simple model for valuing FDI from the point of view of foreign multinationals facing potential political risks. The key assumption of the model is that political risk losses affect the government debt market as well as FDI, thus allowing repatriable FDI returns to be "replicated" using foreign and local debt holdings as well as foreign indirect equity investments. Once this assumption is made and FDI payoffs are mimicked, a valuation of FDI projects follows directly since it can be observed that two investments which have the same payoffs in all situations should have the same initial value. The model's solution supports the intuition that FDI has a lower value when the foreign country is perceived to have a lot of potential political risk which is likely to be very harmful to FDI projects, so an increase in FDI is only value-enhancing if the additional profitability of the FDI project exceeds a measure of the expected political risk losses of the project.

## ENDNOTES

1. This form of investment is often referred to as indirect equity investment or portfolio investment.
2. This will be the case even if actual losses suffered by FDI and debt investors do not occur together.
3. The model implies that underlying FDI project returns and the returns to the foreign indirect equity investment opportunity being examined move up or down proportionately, as would happen if the multinational's FDI project faces operational risk factors which are similar to the risk factors facing the indirect investment opportunity. The model can be altered or extended to relax this feature.
4. It would appear that the value of FDI is increasing in the potential political risk losses facing sovereign debt investors ( $T$ ), but this interpretation is incorrect because higher potential sovereign debt losses lead to an increase in the foreign interest rate  $r_f$  demanded by sovereign debt investors.

## REFERENCES

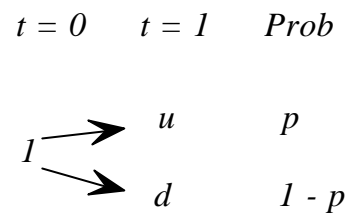
- Dixit, A., & Pindyck, R. 1994, *Investment Under Uncertainty*, New Jersey: Princeton University Press.
- Dunning, J. 1981, *International Production and the Multinational Enterprise*, Allen and Unwin.
- Eaton, J. & Gersovitz, M. 1983, "Country Risk: Economic Aspects", in R.J.Herring (ed.), *Managing International Risk*, Cambridge University Press.
- Eaton, J. & Gersovitz, M. 1984, "A Theory of Expropriation and Deviations from Perfect Capital Mobility", *Economic Journal*, 94 (March), 16-40.
- Howell, L.D., & Chaddick, B. 1994, "Models of Political Risk for Foreign Investment and Trade: An Assessment of Three Approaches", *Columbia Journal of World Business*, Fall, 70-91.
- Lee, B.C. and Powell, J.G. 1998, "Globalised Investing and the Political Risk Aspects of International Sovereign Debt and Foreign Direct Investments", in A. Levy-Livermore (ed.), *Handbook of the Globalisation of the World Economy*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 100-122.
- Levy, M.D. 1990, *International Finance*, McGraw Hill.
- Markusen, J.R. 1991, "The Theory of the Multinational Enterprise: A Common Analytical Framework", in E.D.Ramstetter (ed.), *Direct Foreign Investment in Asia's Developing Economies and Structural Change in the Asia-Pacific Region*, Westview Press.
- Singh, H. 1994, "Socio-Economic Determinants of Foreign Direct Investment In Developing Countries", San Diego State University Working Paper.
- United Nations 1995, *Foreign Direct Investment in Africa*, United Nations Conference on Trade and Development in Geneva.

**Table 1: FDI Political Risk Losses, 1987-92**  
**(Proportion of Total Investment Lost)**

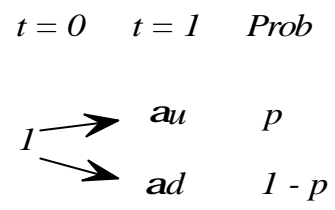
<b>Latin America</b>	<b>Index</b>	<b>Sub-Saharan Africa</b>	<b>Index</b>	<b>Other</b>	<b>Index</b>
Argentina	1	Ghana	2	Algeria	0
Brazil	2	Kenya	0	China	4
Chile	4	Nigeria	0	Czechoslovakia	9
Ecuador	2	South Africa	4	Egypt	3
El Salvador	3	Zaire	5	Greece	4
Guatemala	3	Zambia	4	Hong Kong	2
Mexico	3	Zimbabwe	3	Indonesia	3
Peru	4			Malaysia	0
Venezuela	4			Morocco	3
				Pakistan	1
				Philippines	2
				Poland	3
				Russia	2
				Saudi Arabia	7
				South Korea	2
				Taiwan	3
				Tunisia	1
				Turkey	2
				UAE	4
				Vietnam	7
				Yugoslavia	9

*Note: 0 = no political risk losses, 10 = maximum political risk losses*

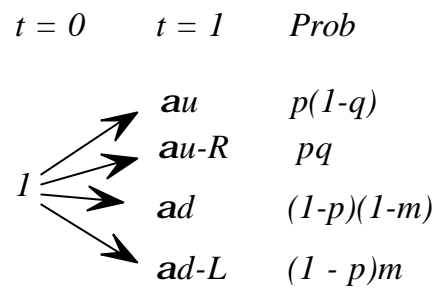
*Source: Lee and Powell (1998), adapted from Howell and Chaddick (1994)*



**Diagram 1: Foreign Indirect Equity Investment Returns**

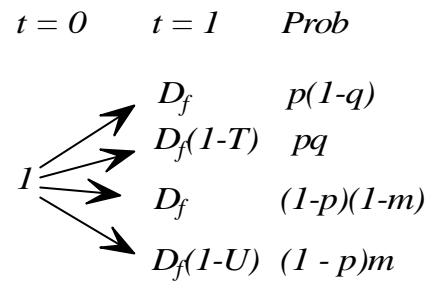


**Diagram 2: Underlying Foreign Direct Investment Returns**



**Diagram 3: Repatriable Foreign Direct Investment Returns**





**Diagram 4: Repatriable Foreign Government Debt Returns**