

**POLITICAL RISK AND MNC's LOCATION DECISION – A
DYNAMIC PERSPECTIVE**

by

Mohana Rajamanickam

A dissertation submitted to the

The Department of International Business

In partial fulfillment of the requirements for the degree of

Doctor of Business Administration

August 11, 2006

Southern New Hampshire University

School of Business



© Mohana Rajamanickam, 2006.

**POLITICAL RISK AND MNC's LOCATION DECISION – A
DYNAMIC PERSPECTIVE**

by

Mohana Rajamanickam

A dissertation submitted to the

The Department of International Business

In partial fulfillment of the requirements for the degree of

Doctor of Business Administration

August 11, 2006

Committee Approval:

Dr. Massood Samii	Date
Committee Chair, Professor of International Business and Strategy	

Dr. Bülent Aybar	Date
Professor of International Finance	

Dr. Tej S. Dhakar	Date
Professor of Quantitative Analysis and Operations Management	

Dr. Philip Fellman	Date
Professor of International Strategy	

POLITICAL RISK AND MNC's LOCATION DECISION – A DYNAMIC PERSPECTIVE

ABSTRACT

This thesis builds a dynamic modeling tool for analyzing the impact of political risk on the production location decisions of multinational corporations (MNCs). The choice of location by MNCs involves various decisional factors and the time- dependent interactions among them. A sophisticated location analysis has to incorporate these complexities in a holistic perspective. The combined impact of learning and political risk on the location decision was studied in this thesis through computation simulation. The key findings are as follows. a) The cost of operating in a host country increases with increasing political risk. Hence, a country with high political risk receives increasing investment at a later point in time than a country with lower political risk. From a country's national perspective, FDI policy makers need to focus on reducing the transaction cost due to political risk in order to receive earlier investments .b) An increased rate of learning by MNCs helps to reduce their transaction costs and this helps them expand internationally at an earlier stage compared to a slower learning MNC. A fast learning MNC in a risky environment can outpace a slow learner in terms of lower operating costs and profitability. It thus follows that MNCs need to consider the risk of the host country in combination with their learning capacity when evaluating international production locations. c) If the alternative location choice is a cheaper destination but has high political risk, smaller MNCs cannot gain a cost advantage by investing in such a host country because they lack economies of scale necessary to utilize this potential advantage. It only makes economic sense for large MNCs to move their production locations to riskier countries for cost advantages. Finally, the dynamic methodology employed in this thesis is a novel analytical contribution to the discipline of international business. By altering the variables in the simulation model, various scenario analyses specific to a firm and country can be performed which can be of value for FDI decision makers in a variety of settings including corporate strategy, marketing, finance and economic and social policy.

Mohana Rajamanickam
July 2006

TABLE OF CONTENTS

CHAPTER 1	2
Introduction.....	2
Motivations & Contributions	6
Conceptual Framework.....	8
CHAPTER 2	12
Literature Review.....	12
Political Risk and impact for MNCs	13
Political Risk Measurement	15
Risk and Impact of Learning.....	24
Political Risk and Choice of International Production Location	30
System Thinking and MNCs.....	34
CHAPTER 3	38
Explanation of Models.....	38
Learning Curve Model.....	39
Valuing the investment opportunity – A revised model	39
Choice of International Production Location.....	45
Political Risk	50
CHAPTER 4	61
Scenarios and Simulation Results	61
Learning Simulation.....	61
International Production Location Simulations	66
Political Risk Simulations.....	78
Integration of the three components	88
CHAPTER 5	101
Conclusion	102
Appendix.....	105
a. Learning Curve - Model Parameters.....	106
b. Choice of Production Location – Model Parameters.....	108
c. Impact of Political Risk on MNC – Model Parameters	110
d. Political Risk Ranking	113
References.....	114

LIST OF FIGURES

Figure 1: Costs, Political Risk, Learning, and Strategic Decision Making	9
Figure 2: Building Blocks of the Thesis	12
Figure 3: Traditional Method of Project Evaluation.....	27
Figure 4: Traditional treatment of learning curve.....	29
Figure 5: Overview of International Production Locations Model.....	32
Figure 6: Comparative cost of manufacturing cost in US Dollar, 1975-2000	33
Figure 7: Overview of model components.....	39
Figure 8: Causal Loops in the Learning Model	43
Figure 9: Impact of Learning curve	44
Figure 10: Choice of International Production Locations.....	49
Figure 11: Overview of Feedback Mechanisms	55
Figure 12: Impact of Political Risk on Transaction Cost.....	58
Figure 13: Impact of Learning curve	62
Figure 14: Learning curve effects- Simulation Output.....	63
Figure 15: Choice of International Production Locations.....	67
Figure 16: Quantities of production (base case)	68
Figure 17: Costs of production (base case).....	69
Figure 18: Domestic and International production quantities (case 2)	70
Figure 19: Costs of production (case 2).....	71
Figure 20: Production quantities.....	72
Figure 21: Cost Structure	74
Figure 22: Production Quantities.....	76
Figure 23: Cost of production	77
Figure 24: Minimum cost of production.....	78
Figure 25: Impact of Political Risk on MNC.....	79
Figure 26: Comparative Cost of Political Risk.....	80
Figure 27: Varying Probability	82
Figure 28: Cost of operating in Israel with varying probability of risk.....	83
Figure 29: Impact of Probability on level of investment in host country	84
Figure 30: Impact of learning on the cost of political risk of operating in Romania.....	86
Figure 31: Impact of learning on the level of investment in Pakistan	86
Figure 32: Integrated Model	90
Figure 33: Combined impact of learning and political risk on cost.....	94
Figure 34: Combined impact on the level of investment in the host country	95
Figure 35: Combined impact on the level of investment in the host country	98
Figure 36: Size of the MNC over time.....	96
Figure 37: Combined impact on the level of investment.....	99

Figure 38: Time varying rate of learning.....	99
Figure 39: Impact of variable learning on cost of political risk.....	100
Figure 40: Impact of variable learning on the level of investment.....	100
Figure 41: Political Risk Rating.....	113

CHAPTER 1

Politics are almost as exciting as war and quite as dangerous. In war, you can only be killed once, but in politics many times.

- Winston Churchill

INTRODUCTION

Globalization has created many opportunities; however, it is not without significant threats. The political crises in Southeast Asia, Russia, Latin America, and Turkey highlight the impact and importance of understanding political risk. During the last forty years, the impact of political risk on the world's economy has been dramatic. In the early decades of the 20th century, political risk took the shape of expropriation of foreign assets. However, the trend after World War II was towards the post-colonial declaration of independence followed by civil war or a take-over by a left-wing government, leading ultimately to the nationalization of foreign investors' properties under the twin excuses of national sovereignty and ending exploitation by foreigners. Research shows that between 15 to 20 percent of all US foreign direct investment was lost to expropriation during the 1970s (Wilkin and Minor, 2001).

The importance of understanding political risk has long been recognized by both investors and the top management of multinational firms. For example, a 2003 World Bank Survey reported political risk as the primary concern among investors. A similar survey of CEOs reported that the top concern among respondents was the fear of a major

disruption in the process of globalization. Almost all the respondents saw political risk as a major threat to their corporation's growth, assets, and operations (Wilkin, 2003).

Political risk encompasses a broad array of risks and depending on the source of origin, the risks can be classified as follows:

(a) Risks arising from government regulation and the legal Systems: Globalization has put increasing pressure on national legal systems. However, developing nations have largely inherited dysfunctional legal systems that exhibit corruption, anti-foreign sentiment, and political bias. (b) Risks from macroeconomic sources: Political activities motivated by financial crises have become more frequent as a result of bringing stocks, bonds, and other instruments that are well known in the developed world to emerging economies that lack the necessary institutions for successfully managing these instruments. (c) Risks arising from the political influence of local firms: Multinational companies compete alongside domestic companies from developing countries who use unfair political influence to their advantage against foreign investors. (d) Risks arising from regional sources: Despite the end of Cold War, political violence among the local groups and regional and ethnic conflicts continues to pose a serious threat for international investors. Issues in the Middle – East, the Philippines and Chechnya are examples of these kinds of disturbances. (e) Political risk arising from social concerns: With increased globalization, developing nations are beginning to show increasing concerns towards human rights, labor standards, and the environment. A detrimental effect of this positive turn in events is that local special interest groups have developed an anti-foreign investor attitude. For example, take the problem of Shell with local groups in Nigeria. (g) Risks arising from the threat of terrorist attacks: The world is facing a serious

threat from terrorists. The use of suicide bombers and other violent tactics poses a serious threat to life and property and is often focused specifically on multinational corporations and their employees. (h) Risks arising from volatile democratic processes: A serious outcome of democratization is that democratic governments tend to change more often. As a result contracts that were signed by the old government are at risk of withdrawal or repudiation by a new party. This makes it very difficult for international investors who may find it nearly impossible to rely upon the local government's contracts. (i) Risks arising from the decentralization of power: Centralized economies are moving towards more democratic processes and as a result local governments are gaining more power. Multinationals now have a threat not only from the national government but also from local governments which may override contracts made with the national government.

It is also interesting to note that increase in political risk has not slowed down the growth of globalization. The level of foreign direct investment in the past decade has increased substantially¹. Multinationals are constantly on the lookout for new countries in which to operate in order to achieve market expansion, or obtain improved production locations, which has resulted in an increase in the flow of FDI worldwide. For instance, inflows of FDI to developing countries alone grew by 40% to \$233 billion in the year 2003 to 2004 (UNCTAD, 2005). The global merchandise trade grew by 21% from year 2003 to 2004 and portfolio investments have seen a similar growth (World Trade Organization, 2005). Therefore, given the current trend of increasing globalization and political risk, there is a need to understand how political risk affects a multinational firm

¹ With the integration of international capital markets, global FDI flows grew strongly in the 1990s at rates well above those of global economic growth or global trade. Recorded global inflows grew by an average of 13 percent a year during 1990-1997. Driven by cross-border mergers and acquisitions (M&A), these inflows increased by an average of nearly 50 percent a year during 1998–2000, reaching a record US\$1.5 trillion in 2000. (Statistics Department, International Monetary Fund, 2003)

operating in a host country. With the increase in size of FDI projects, a more holistic approach to decision making is needed. Previous authors have attempted to address the problem of political risk and their works are described in the literature review section. This thesis takes a different approach than that found in the literature analyzing political risk. For a start, an MNC does not act as a standalone unit and political risk does not impact the firm in isolation. There are other important dynamics that have to be considered. For instance, as an MNC invests more in a foreign country, the risk increases because the potential loss is greater. This process entails a positive reinforcing behavior. The greater the resource commitment, the greater is the risk. At the same time, with increased resource commitments, an MNC begins to learn about the operating environment and becomes more adept at handling local political risk. In order to understand the impact of political risk in the presence of other interacting forces a dynamic framework is put forth in this thesis.

Chapter two describes the research motivation behind the thesis and explains its contributions to the field. Chapter three describes the conceptual model for the dynamic framework for analyzing the impact of political risk on an MNC. Chapter four explores the relevant literature. Chapter five builds a systems dynamics simulation model using *Vensim*® for the components explained in the conceptual framework. Chapter six discusses the output of the simulation model and presents various scenario analyses. Chapter seven presents the overall interactions between the components of the model built in Chapter five and Chapter eight presents the conclusion.

THESIS CONTRIBUTION

Political risk is an important force that affects multinational companies and is one of the top concerns for both top managers and investors. A better understanding of political risk can help managers and investors formulate strategies to better handle risk. In order to understand how political risk affects a firm, the problem needs to be narrowed down to more manageable terms. Complexity can then be added to the model in stages. For example, a firm can choose to go multinational for reasons varying from sales expansion to risk reduction and each of these cases can be a point of departure for study. In addition, MNCs face varying degrees of political risk from the time of initial entry into the host country until they exit from the country, and these risks come from multiple sources.

The goal of this thesis is to study the impact of political risk on the MNC. As mentioned earlier, an MNC may seek entry into foreign location for many reasons from resource seeking to market expansion. However, this thesis focuses on the MNC which seeks expansion into a foreign country in search of a lower cost production location. The motivation for the thesis comes from my earlier work in the area, which explored the dynamics behind locational decision making in the multinational firm. This decision is not a “one time” event and many interacting forces can alter the location choice. For example, scarcity of resources in the host country may make the country less attractive over time. That is, when an MNC moves its location to a cheaper country, cost differences will make economic sense initially. However, over time, as the MNC uses up the resources in that country, resource scarcity can set in and this leads to increases in cost, thereby increasing the total cost of international production. As a result, continuing

production in the host country may no longer be attractive and the MNC will need to shift location either to its home base or to a third destination, if available. How soon this resource scarcity sets in depends on various other factors such as the rate of cost escalation for domestic and international resources, as well as changes in pricing structure and market demand. In order to explore the sensitivity of these variables, a simulation model was built and different scenarios were analyzed (Samii, and Rajamanickam, 2005). The scope of the study however was limited to production and transaction costs.

In another previous research effort, we focused on the learning of multinationals in a host country and explored the impact of this learning on political risk (Samii, Rajamanickam, and Thirunavukkarasu, 2005). Here, we argued that when an MNC enters a new host country, or is considering entering a host country, it initially faces a very large risk. As a result of this anticipated risk, MNCs tend to add an arbitrary risk premium to the discount rate of projected cash flows in the project's valuation and often may reject an otherwise attractive project. What MNCs don't take into account is the impact of learning. As time progresses, the unfamiliarity with the host country diminishes and therefore, it is not appropriate to add a very large risk premium which is kept constant throughout the project. This approach formed the core of the research and we demonstrated that by incorporating learning effects, MNCs would be able to accept a project that they would otherwise have rejected as unattractive.

This thesis aims to build upon and integrate previous research results in order to explore the impact of political risk and learning on an MNC's location decision making. While there has been an increasing interest in the intersection of risk and international

business, empirical evidence is ambiguous about the impact of political risk on MNCs. Prior studies that have attempted to explore this relationship have investigated the impact of risk either at a country level using an index, or have focused on a particular isolated risk event. However, a firm does not operate in isolation and the decisions made by a firm depend on a number of different types of factors and the interactions among them. Further, political risk events happen at a single point in time, while the behavior of the MNC's decision makers varies over time. Therefore, in order to study the impact of political risks on a multinational firm, one must focus on the time path of the impact.

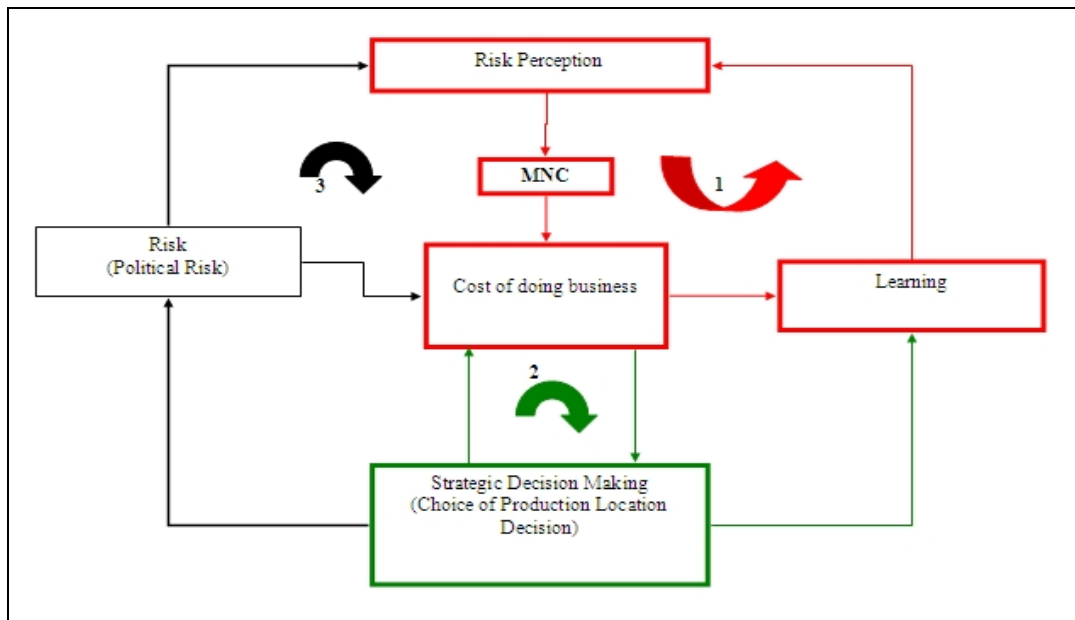
The contributions of this thesis are threefold. For managers, the model developed in the thesis gives a practical tool for developing a holistic understanding of the underlying causal and latent factors that influence an MNC's production location decision. This model can thus help them to devise better strategies for handling political risk. For investors, knowledge about how political risk influences firm value in the presence of other factors, can help them make better investment decisions. Finally, this thesis brings a methodological innovation to the study of political risk which may be of interest for academicians and practitioners.

CONCEPTUAL FRAMEWORK

Many factors influence the location decision of an MNC. These include cost differentials, quality, the capacity of the MNC to adapt to the new environment, the risk level of the host country and so on. Even from a simple cost perspective, the decision to go abroad can vary over time. This thesis explores the dynamics behind the location decision taking into consideration the impact of learning and political risk. This section provides the conceptual framework for the thesis. While it does not represent the

complete, complex dynamic interaction of all the factors that go into location decision, this framework serves as the foundation for that research. The dynamic process behind an MNC's location decision making process is shown in Figure 1 and can be broken down into three components: a) The impact of learning on the level of risk b) The dynamics behind location choice c) The impact of political risk.

Figure 1: Costs, Political Risk, Learning, and Strategic Decision Making



The case of an MNC engaged in the manufacturing of products is now considered. Here, the multinational company is looking for foreign locations to expand its production base. According to transaction cost theory, it is assumed that the MNC would prefer the location that offers the cheapest total production cost (including transaction cost). The first component of the model explores the impact of learning on the risk of the MNC. When the MNC evaluates a cost-effective foreign investment opportunity, it initially faces a huge risk because of unfamiliarity with operations. The operating climate, the rules of doing business, the relationship with the stakeholders etc, are all new and pose serious risk to the MNC. However, as the MNC spends more time in the host country, it

begins to learn about these operations and becomes more familiar with the local environment. This leads to a reduction in the level of risk.

The second component of the model explores the time path of the location decision of the MNC. As the MNC continues to operate in the new location, the initial cost difference that made the new location attractive slowly begins to diminish. This situation could arise from other competitors entering the country, or simply as a result of a scarcity of resources which causes the cost of production to rise. In either case, over time the cost difference of the new location declines. This is termed as the risk of 'scarcity of resources'. After a certain point it is possible that the cost structure of the new production location declines to the point where it becomes equal to that of the equilibrium stage and there is no longer a cost benefit to the MNC. At this point the host country ceases to be an attractive location and the MNC looks for an alternative location or chooses not to expand further.

Many factors can affect risk and therefore the cost of operations in the host country. One of them is the political risk that the firm faces. The third component of the model explores the impact of political risk. When the firm faces the political risk in the host country, the total cost of operating in the country increases. As a result, the new country may tend to become unattractive at an earlier stage itself.

The interaction of the scarcity of resources, risk, and learning on the strategic choice of location decision making of an MNC is diagrammatically represented in Figure 1 and explained below. Three different interactions can be observed in Figure 1 as shown by the three arrows. The first is the impact of learning on risk (loop1). When a multinational company is faced with the decision to enter into a foreign location for the first time it

initially faces a huge risk. One component of this risk can be attributed to the unfamiliarity of the operating environment which tends to make the MNC perceive the opportunity as a risky one. This risk can increase the cost of operating in the foreign environment. However, as the MNC begins to operate in this new environment, it begins to learn about the surroundings and as a result, the risk perception begins to change. Learning causes a decline in the level of risk.

The second loop reflects the strategic decision making process of the MNC. In this scenario, an MNC seeks to locate its production facilities among a choice of countries. Transaction cost theory argues that the MNC will choose a location that minimizes the overall cost of production for the product. However, this decision is not a one-time phenomenon, but changes over time as resource scarcity sets in, as new markets for production location emerge, and as production locations change over time. This dynamic interaction is shown in loop 2.

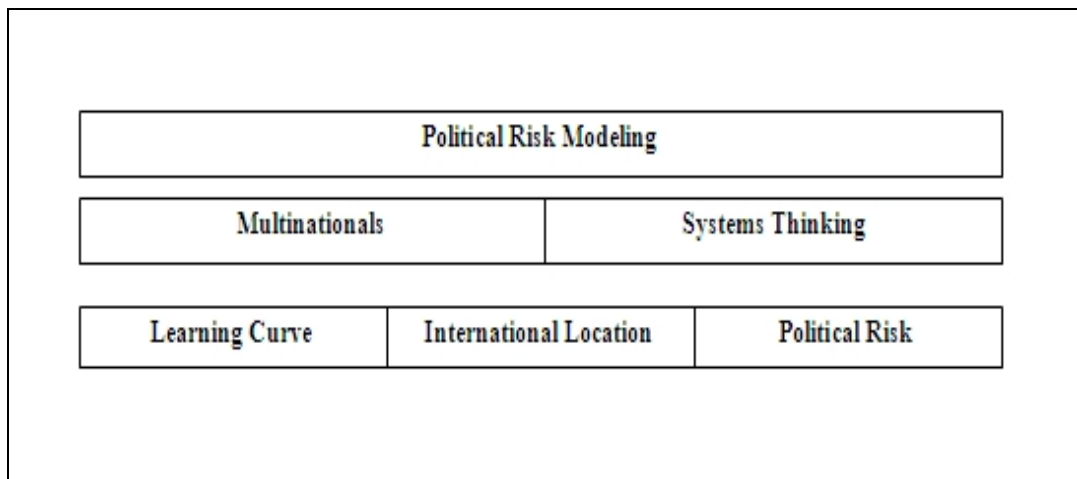
The third interaction shows the impact of political risk on the operations of the MNC's strategic decision process and forms the core of this thesis. While the impact of learning reduces the level of risk faced by the MNCs, political risk acts in the opposite direction, increasing risk by increasing the cost of doing business. The three loops described above act together and determine the production location choice of the MNC over time. Each of these loops forms a separate simulation model. The remainder of the thesis explains each of these models separately and analyzes the model through simulation. Finally, the interaction between all three models is presented. Using the integrated model, various firm-specific scenarios and proposed investments can be run in order to view the ex-ante impact of policy decisions by the MNC's managers.

CHAPTER 2

LITERATURE REVIEW

The underlying theoretical foundation of the thesis comes from other branches of study in addition to those concerned with Political Risk, and can be represented as a three-tiered structure. At the base level the thesis builds upon the existing literature on political risk and its impact on MNCs. This includes the way political risk has previously been studied, the decision process of an MNC with respect to the choice of international production location and the impact of the learning curve on the MNC. At the second level of analysis, the thesis provides a literature review of why a general systems view is most applicable to modeling the production location decision of the MNC. Finally the literature review examines political risk and the integration of political risk with the other components of the model (Figure 2).

Figure 2: Building Blocks of the Thesis



POLITICAL RISK AND IMPACT FOR MNCS

Politically risky environments are usually characterized by instabilities in the form of coups d'état, asset expropriations, radical and unpredictable changes in government policies, the unforeseen imposition of capital and ownership controls, sudden debt crises, and so forth. Pre-entry and post entry decisions for MNC's rely to a large extent on the stability of the host economy because politically induced events such as those mentioned above can profoundly affect a firm, whether multinational or domestic. For example, a political crises in the form of a coup, may result in a radical socialist government coming to power which imposes a policy of expropriation of all foreign-owned firms as happened in Ethiopia (Kobrin, 1984)). Alternatively, a coup might result in a conservative government coming to power which returns expropriated property as in Chile after Allende. In some cases, coup d'état may simply replace the governing authority without affecting MNCs, however, such political events still tend to introduce a general instability in foreign business environments.

While there is a widespread concern among international managers with respect to incorporating political instability issues in the FDI decision-making process, historical evidence shows that little is understood about how to actually incorporate the effects of such an impact in the firm's planning. The international business literature presents contradictory evidence regarding the effect of political instability and political risk on foreign direct investment (FDI). In an early review of studies on political risk Kobrin (Kobrin, 1979), concludes that the empirical evidence is inconsistent and mixed regarding the effect of political instability on FDI stocks and flows. Subsequent studies continue to produce mixed findings. Early research in this area studied the impact of

political risk via cross-sectional study, although the phenomenon of political risk is actually time dependant. Also, the response of MNCs to political risk will vary based on the nature of the industry in which the firm operates, the level of learning about foreign environment that the firm acquires, the size of the firm as well as other characteristics which are firm-specific. Therefore generalizations can only give a very broad general understanding about political risk and political instability and do not allow one to extrapolate specific consequences for a specific firm or a specific foreign investment decision.

When a multinational firm operating in a host country is faced with a politically risky event, the operations of the firm may be affected and this impact will be different for different firms depending upon various firm, industry, and country specific factors. Perhaps most importantly, the firm-level impact can result in huge losses. This is especially true for developed country multinationals operating in developing nations, where the volatility of democratic governments is a serious hurdle for FDI such as the case of Enron in India.

Enron, a US based company, signed a Memorandum of Understanding (MOU) with the State Government of Maharashtra in June 1992 to build a 2,015 Megawatt power plant at a cost of USD 2.84 Billion on a build-own-and-operate (BOO) basis. A 20-year Power Purchase Agreement with the State Electricity Board was put in place as of December 1993 and specified a tariff rate of 7.5 U.S. cents per Kilo Watt Hour (KWH). In February 1995, The Dhabol Power Corporation (DPC) was formed and construction was begun with an 80% equity held by Enron, and with GE Captial and Bechtel Inc., each holding 10% of the equity. The project faced a serious situation in March 1995

when a new government came to power in the Maharashtra State elections. After review of the contract, the new government cancelled the project on the grounds of excessive costs and potential corruption. DPC had to stop construction and start arbitration proceedings. After intense discussions and diplomatic pressure from the U.S. Government, the Maharashtra state government agreed to renegotiate the project in November 1995. Finally, after more than a year's delay, the government approved a renegotiated contract and DPC restarted construction in December 1996. Enron lost US\$175 million as a result of the 16 month delay in the project.

In such cases, what MNCs need is a mechanism to assist the decision making process in incorporating a holistic approach. What is needed is a practical tool to allow a priori analysis of investments in order to avoid losses and to formulate better strategies for dealing with high political risks.

POLITICAL RISK MEASUREMENT

Many different definitions of Political Risk have been put forth in the international business literature. Empirical research on political risk associated with international business has focused primarily on expropriation. Weston and Sorge (1972) define political risks as those that “arise from the actions of national governments which interfere with or prevent business transactions, or change the terms of agreements, or cause the confiscation of wholly or partially owned business property.” The term “political risk” occurs frequently in the international business literature and is usually used to refer to the unwanted outcomes of a political activity or to government interference with business operations. Similarly, other research (Aliber, 1975; Baglini,

1976; Carlson, 1969) refers to political risk as some form of governmental interference with business operations.

Using the notion of certainty of unstable events, Kobrin (1979) argues that political instability poses a risk to an MNC only when the outcome of the instability is uncertain. When there is certainty in the nature of the events, multinationals do not face any risk. For example, if it is certain that a new government will come to power in the next election and that it will force multinationals to divest a portion of their equity, this event should not be considered a political risk because it has no component of uncertainty. Even though, the value of the future returns of the firm will be negatively affected, the variation in the returns will not be unexpected. However, once uncertainty is introduced, political events can affect both the expected value of returns and contribute to their variation. In this kind of situation, political events then become a source of business risk. For example, suppose the Venezuelan government were to expropriate land from a British-owned farm, sparking fears of a large-scale land grab under the leftist government (Vidal, 2005) or the Russian government's seizure of Yukos (Ostrovsky, 2005) were all events whose outcome was unpredictable. These kinds of political events provoke instability and contain a high level of uncertainty.

Another approach in the literature defines political risk in terms of events. That is, political risk is explained as acts or constraints imposed upon a firm. While there are differences among individual authors, they (Robert T and Smith, 1972, Nehrt, 1970, Rodriguez, Rita M, and Carter, 1976, Shapiro, 1978, Zink, 1973) all identify political risk with either environmental factors such as instability and direct violence or with constraints on operations such as expropriation, discriminatory taxation, public sector

competition and the like. Other authors, (Michael Z. and H. Remmers, 1970, Daniels, Radebaugh, Sullivan, 2003, Dymsha, 1972) hint at a definition of political risk simply by acknowledging that the political environment is a source of business risk for the firm. Robock (1971) distinguishes between “macro risk” where political events result in controls on all foreign enterprises (for example, Cuba in 1959-1960) and “micro risk” which affects only selected fields of business activity or foreign enterprises with certain specific characteristics.

Root (1972) categorizes political uncertainties in terms of the manner in which they affect the firm: (1) transfer-uncertainty about flows of capital, payments, technology, people, etc.; (2) operational – uncertainties about policies that directly constrain local operations; and (3) ownership/control – uncertainties about policies relating to ownership or managerial control. He further suggests that transfer and operational uncertainties arise primarily from political/economic events and ownership/control uncertainties arise primarily from political/social events.

The international business literature presents many approaches which study the impact of political risks on an aggregate level, such as the Foreign Direct Investment of a country, however, the results are inconclusive (Kobrin, 1979). Schneider (Schneider and Frey, 1985/2) found that political instability had a negative effect on FDI flows. While, Nigh (Nigh, 1985) found in an analysis of 24 countries over 21 years that both inter-nation and intra-nation conflict and cooperation affect manufacturing FDI flows by US firms. Fatehi-Sedeh (Fatehi-Sedeh and Kamal & Hossein M. Safizadeh, 1989) on the other hand, failed to find statistical association between political stability and FDI. Other cross-sectional studies also disagree. Loree and Guisinger (1995) found that political

stability significantly promoted FDI inflows in 1982, but not in 1977. Olibe et al (Olibe, Kingsley O & Crumbley, C Larry, 1997) did not find consistent evidence that the political risk index influenced US FDI flows to 10 out of 13 OPEC countries. Using data for all reported manufacturing plant openings from 1984 to 1987, Woodward (Woodward and Rolfe, 1993) found that political stability increased the probability of a country being selected as an investment location.

Some studies have attempted to classify the nature of political risk according to new lines of fundamental reasoning. For example, in studying the impact of political instability on MNCs, Brewer et al (1983) make a distinction between policy instability and political instability. They argue that since an MNC is concerned with political risks that affect its normal operations and future profits, it is the policies of the host government that are of concern. However, not all government instability result in policy changes and therefore, not all political instability affect MNC's. The study conducted a cross-national analysis of 115 countries and found a positive but weak relationship between policy instability and political instability. Specifically, only factional changes (changes in the composition of the groups holding governmental power in countries having competitive party systems) had a moderately strong relationship with policy instability. Further, governmental instability was more strongly associated with policy instability for industrial countries than for developing countries.

A somewhat narrower focus was adopted in a number of studies which focused on the relationship between FDI and political instability in a sample restricted to the manufacturing sector (Green, Robert T and Cunningham, William H, 1975, Stephen J Kobrin, 1976, Thunell, 1977). A common finding among these studies was that a direct

or simple relationship does not exist between the FDI and measures of political instability (Bennett and Robert T. Green., 1972, Green, Robert T and Cunningham, William H, 1975, Green, Robert T and Smith, Charles H, 1972). For example, Green (1972) concluded that political instability did not affect FDI. His study regresses the stocks of US firms' FDI in manufacturing and trade on an index of political instability while controlling for gross national product per capita across 46 countries. An insignificant and weak relationship was demonstrated between manufacturing FDI and economic, social, and political factors. Green et al (Green, Robert T and Smith, Charles H, 1972) found a different result, establishing a weak but statistically significant relationship between the profitability of US FDI and political instability. Root (Root and Ahmed, 1979) used discriminant analysis and further confirmed the weak relationship between the two variables. A complex and indirect relationship between FDI and instability was argued for in two additional studies. In a longitudinal study by Thunnell (Thunell, 1977), an asymmetrical relationship between major "trend" changes in the flow of FDI and a number of indicators of elite and mass stability was found. Here, it was argued that a high level of mass violence precedes negative trend changes, whereas it takes both a low level of violence and a government transfer to generate a positive change. In a study of 48 countries, Kobrin (1978) found a significant negative relationship between FDI and one dimension of intrastate conflict; focused anti-regime violence. The relationship was found to be stronger in the presence of an economically rooted conflict and a strong administrative capacity of the host country to respond to the conflict. The study concluded that political conflict had the highest probability of affecting foreign investors

when it occurred under conditions which were likely to motivate relevant changes in government policy.

More recently, but still at an aggregate level, Li Quan conducted a pooled time series analysis of 52 developing countries (Li and Resnick, 2003) and did not find a statistically significant relationship between political instability and FDI inflows. Sethi (Sethi *et al.*, 2003) found that political instability, measured by a composite variable on a 100-point scale, did not influence US FDI flows to 28 countries between 1981 and 2000. Globerman (Globerman and Shapiro, 2003) conducted a two-stage analysis of US FDI flows to 143 countries from 1994 to 1997, in which the first stage investigated the causal factors of the probability that a country would be an FDI recipient while the second stage examined the determinants of the amount of FDI received. Globerman and Shapiro found that an index of political instability and violence, including armed conflict, social unrest, terrorist threats, etc, did not influence the probability of a country receiving any FDI inflow, but did reduce the amount of FDI inflow a country received. Again, the econometric evidence is mixed and inconsistent across studies. The inconsistency between empirical evidence among econometric studies of FDI flows and survey evidence has been widely noted in a number of studies of the determinants of foreign direct investment (UNCTAD., 1992)

While the literature has produced mixed evidence, the perspective of managers seems to present a different picture. They have stated that any foreign direct investment decision making process involves a careful examination of not only the factors relating to the external environment but also factors that are specific to a firm. Surveys of MNC's managers indicate that a political condition of the external environment is one among

their top concerns and plays a key role in assessing an FDI opportunity (Erol, 1985, Kobrin, 1979). Evidence from studies of responses of executives to interviews and questionnaires (Aharoni, 1966, Bass *et al.*, 1977) illustrate that political risk and political instability are among the most important considerations reviewed when investors make location decisions. Porcano (Porcano, 1993) found in a survey of Canadian, British, and Japanese firms across 36 industries, that political climate in the host country was consistently ranked above 3 on a 5-point importance scale.

Earlier research on political risk have focused on finding the determinants of risk and variables that compose specific risks. Some studies have also found the degree of association of the political risk events with foreign direct investment. A common finding among the studies is that political risk is a significant factor in determining the performance on MNCs. However, studies which analyze and recommend specific strategies for MNCs during risky events are scant. Interviews and survey studies of executives of multinational corporations have found that political events are one of the most important factors in the foreign investment decision process (Aharoni, 1966, Bass *et al.*, 1977, Schollhammer, 1974.). More specifically, executives acknowledge that the stability of the host government and the attitude of the host government toward foreign investment are the most important considerations in the foreign direct investment process. Given the size of resource commitment of MNCs, one would expect that firms would somehow incorporate adequate measures to analyze political risk before entry into a country and also devise a strategy for dealing with unexpected crisis situations. However, there is little evidence in literature showing the incorporation of political assessments in the FDI decision making process of MNCs'. Kobrin (1979) argues that

most managers have a poor understanding of the concept of political risk. He states that the way political risk is assessed and evaluated and the manner in which political risk is integrated into their decision making are “general, unsophisticated, subjective, and superficial”. The assessment of political risk and investment decisions, seems to depend upon “prevailing attitudes, first impressions, and generalizations on single events occurring in the host country” (Formica, 1996). Further, Keegan (1974) and Root (1968) note that an international managers’ reliance on systematic environment scanning methods in the FDI process is minimal.

Kobrin (1979) also notes that some of the drawbacks of these studies are that, they all focus on political instability, which is neither a necessary nor a sufficient condition for changes in policy relevant to foreign investment. Secondly, the studies all focus on the aggregate level of investment for analysis when the risk posed by the markets is primarily dependant on the industry, the firm, and even project specific factors. This is a profound variable mis-match. Finally, all of these studies embody major data and methodological constraints resulting from the use of composite indices of instability and the use of cross sectional techniques in their investigations. In political risk studies, a generic approach will lead to inaccurate results. As Erol (1985) points out, traditionally, research in the area of political risk and its relationship to foreign direct investment, involves analyzing data from a broad range of countries and differing industries. This kind of grouping of data will fail to capture the country specific, industry specific, firm specific, and even project specific characteristics that are important in understanding the impact of political risk. For example, some industries may be more vulnerable than others to specific risks. Some companies may be better at handling risk

than others. Fatehi et al (Fatehi-Sedeh and Kamal & Hossein M. Safizadeh, 1989) show evidence for the fact that when faced with a similar political turbulence, multinational corporations from different industries perceive risk in varying degrees although they are all operating in the same country. However, the usefulness of such conclusions is a function of the specificity to which they can be applied.

Authors conducting firm level research often suggest some kind of adjustment to the yearly cash flows of the project, in order to deal with political risk. Robock (1971) for example, shows that political risk can be incorporated by making adjustments to the expected cash flows of a firm or by adjusting the discount rate employed to value a project at the anticipated times of political risk. In general, the adjustment is made in proportion to the magnitude of the risk employed to value a project. Stobaugh (1969) suggests advancements in the estimation of cash flows by using a “range of estimates” and “risk analyses” that provide probability distributions and expected values for risky cash flows. Similarly a market determined approximation of a certainty equivalent has been suggested by Stonehill and Nathanson (1968). Here, they suggest the inclusion of the cost of a program of uncertainty absorption to each period’s incremental cash flows, in order to account for the purchase of additional information, insurance, hedging and so forth. Given the probability of expropriation at a point in future, Shaprio (1978) employs a capital asset pricing model (CAPM) to explore non-systematic risks and then develops a CAPM-based technique to adjust the requisite cash flows. While these studies have improved the understanding of political risk by employing a firm level approach, they have largely focused on the incorporation of risk in isolation, and so have failed to capture other important factors that may affect the FDI decision making process.

RISK AND THE IMPACT OF LEARNING

In studying the impact of risk on an 'MNC, it is essential to take into account the impact of learning by the MNC. Research demonstrates that FDI risk does not stay constant over time and that the response of the MNC to risk depends to large extent on its past behavior and on learning from experience (Kobrin, 1979). For example, if an MNC successfully lived through a financial crisis, then it will generally be better equipped to handle a future potential risky event of that type than a firm that is new to the environment and does not have much experience.

When an MNC is faced with a decision to enter a foreign environment, it initially faces a high risk due to unfamiliarity with the operating conditions and therefore must employ a higher risk premium in evaluating the investment. This risk arises due to the firm's unfamiliarity with operating conditions and is termed as "competitive risk" unique to the operating firm and the foreign environment. However, in practice, one can observe that as MNC's spend more time in the foreign operating environments they commit resources incrementally, indicating a greater degree of conformity with both the environment and the investment. For example, the case of Timken Corporation, (which was founded in 1899 in St. Louis, Missouri) is an example of the ways in which learning reduced the risk of entry into Europe (In this case, entry into Mackenzie and McKern, 2003). Timken Corporation, a leading manufacturer of highly engineered bearings and alloy steels recognized the significance of economic liberalization in Central Europe as an opportunity to expand their production capacity. Timken began seeking potential acquisitions in the region. The company started discussions with the Polish government in 1994 for the acquisition of FLT Prema Milmet S.A., a bearings manufacturer based in

Poland. The acquisition was finalized in 1996 and Timken became the first foreign investor to own 100% of a previously state owned asset. Although Poland was at the time a small and an unsophisticated market, the Polish investment project served Timken as a valuable learning platform. Timken was subsequently able to successfully formulate a new strategy and develop an improved model for expansion into Europe. This example illustrates how over time, MNCs become increasingly familiar with doing business in their new surroundings and how their perception of risk can then decline.

Risk can be defined as a situation in which the outcome is uncertain, and for which a number of different possibilities exist, each with its own probability distribution. Economists usually define risk as a measure of the dispersion of a probability distribution, with the greater the dispersion the higher the level of risk (Aharoni, 1966). In this context, risk for an MNC in the case of FDI arises when a multinational company is faced with an investment decision overseas for which a number of possible outcomes exist each with its own probability distribution. Epically, this risk is embedded in the discount rate used for the FDI decision evaluation. For the purposes of analysis, FDI investment risk can be broken down into the following three components. The *first* component is company risk, which is the risk faced by the company in its home market. The *second* component is country specific risk, is define as the risk which is faced by all of the companies that enter the particular country in question. This is also the unexpected institutional risk and refers to the risk of being taken over by the government of a country (expropriation), the risk of social acceptability and sovereign risk (which is the risk of intervention of governments in contractual agreements) (Miller and Lessard 2000). This variable encompasses the political risk, the incorporation of which is one of the main

subjects of this thesis. The *third* component is competitive risk and refers to the unfamiliarity of the parent company with the new operating environment.² Competitive risk is particularly important for a firm that enters a country for the first time and it is unique to that firm. That is,

$$\text{Total Risk} = f(r_{\text{company}}, r_{\text{country}}, r_{\text{competitive}})$$

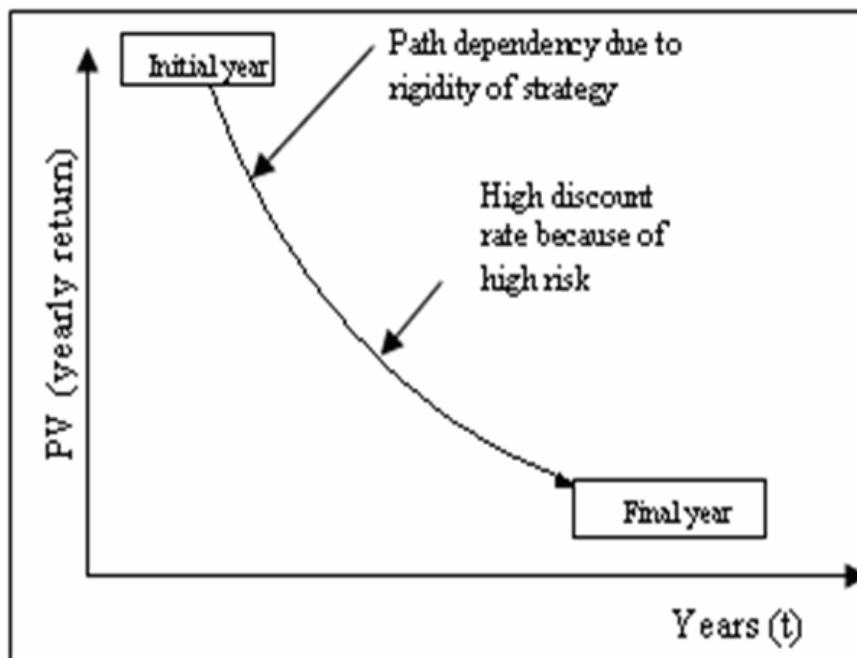
In order to reflect the risk of unfamiliarity of operations in the foreign environment, firms add a suitable risk premium based on their perception of the uncertainty of operating in the foreign environment. This risk premium arises because of a lack of knowledge about the operating environment and is specific not only to the firm involved but also to the operating environment. For example, in some countries, Such as India, local business groups are very powerful and penetrating the market requires insightful knowledge about the way local businesses deal with each other and with the bureaucratic system. Lack of knowledge in this area poses a risk that is unique to the firm and the target country under consideration. However, the choice of risk premiums in most of those cases is arbitrary because they do not take into account either the exact nature of the risks involved or the ability of the firm to manage those risks (Lessard, 1996). As a result, companies often undermine their own projected cash flows and excessively discount the NPV of the project, thereby inaccurately and excessively compensating for risks and uncertainty which may lead them in approximately rejecting an otherwise attractive project.

Figure 3 illustrates the traditional method of evaluating an overseas investment project. The abscissa represents the duration of the project in years and the ordinate

² This risk is similar to the private risk introduced by Miller and Lessard (2000) in analyzing Large Engineering Projects.

represents the present value of the project's cash flows at different times (t). In the traditional method, a single discount rate is used to discount future cash flows irrespective of the fact that companies learn about the environments in the initial years of operation that allows for a reduced discount rate in subsequent years. The use of a single discount rate during the initial investment period can be attributed to the high risks faced by companies during this period. However, the continued use of a steady discount rate cannot be justified on the same grounds and it can be argued that this is a negative result of path dependency or rigidity of firm strategy. As a result of this methodology, the present value of cash flows is decreasing over time and under these conditions, the NPV of the project may appear to be negative (thereby making it unattractive) when in fact the learning adjusted actual NPV is positive.

Figure 3: Traditional Method of Project Evaluation



Miller and Lessard (2000) have focused extensively on unfamiliarity risk, which they term private risk in the context of large infrastructure projects. However, in the

context of FDI, since MNCs spend more time in the foreign environment during the initial stage of investment, there is a strong possibility for the decline of unfamiliarity over time as a result of the learning process (Pedersen and Petersen, 2004).

The competitive risk and hence the ex-post risk premium should decline over time as a result of learning about the business and the competitive environment of the country³. This impact, which is typically the learning curve effect has been well studied in the context of systems dynamic models.

The concept of the learning curve was first introduced in the defense industry during the 1920s, where it was used to explain the phenomenon of declining labor costs (Ghemawat, 2002). Extensive work has been done on the impact of learning and the shapes of learning curves in organizational and production settings (Ghemawat, 1985). In addition, there is a great deal of empirical evidence suggesting that enterprises learn how to improve labor productivity while producing more output (Renshaw, 1979). According to the Boston Consulting Group, the cost of value added declines 20-30 percent each time accumulated experience is doubled (Henderson, 1974). Extending this argument to of multinationals, it can be argued that improvement in performance can be equated to a reduction in competitive risk as reflected by the discount rate (r) and an increase in practice can be equated to the number of years the multinational spends in a particular country (t) then, the incremental improvement (decrease) in the discount rate is a function of the relative increase in the time spent in learning about the particular foreign country.

³ This is the learning (Experience) curve effect as it applies to FDI and is a measure of the potential understanding of the foreign competitive environment. We do not distinguish between the Learning curve and the Experience curve in the context of this paper. However, the Boston Consulting Group proposed the term Experience curve in 1966 for the overall cost behavior and distinguished this from the Learning Curve concept. The Learning curve, on the other hand, applied to only labor cost that declined as experience accumulated (Bruce D. Henderson, 1974).

The traditional treatment of learning curve analysis argues that a given percentage change in the cumulative volume of output will provide a constant percentage rate decrease in the cost of the last unit produced. Figure 4 shows the effect of cumulative volume (on the X axis) on unit cost (on the Y-axis) for a component. The curve follows Equation (1) (Allen 1994, Keat and Young 1992).

$$C_q = aq^b \quad (1)$$

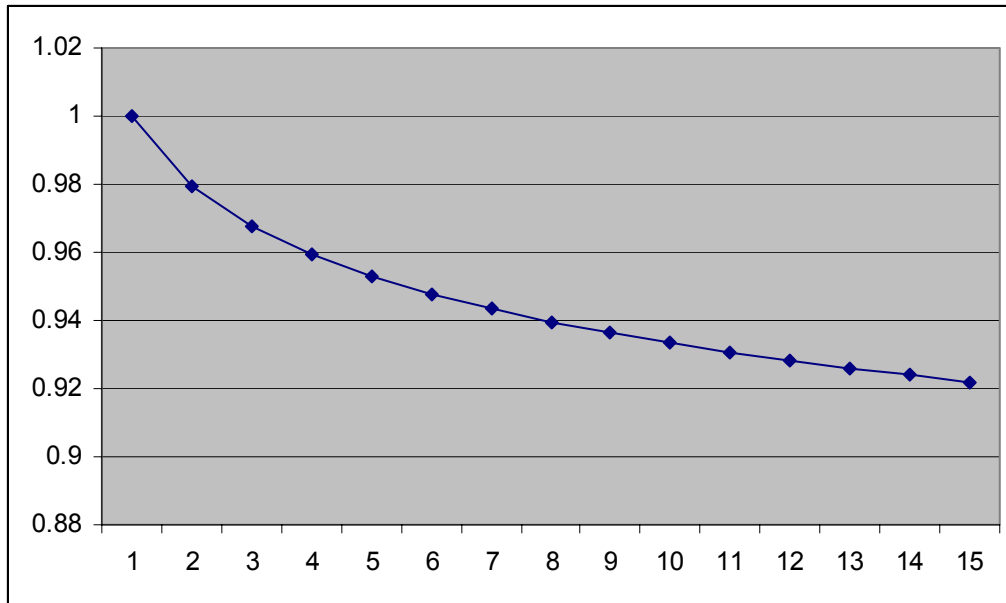
Where,

C = Expected cost of the q th unit

a = the cost of the first unit

b = a negative constant

Figure 4: Traditional treatment of learning curve



Equation (1) can also be plotted on a logarithmic scale by using the following equation (2), which is arrived at by taking the logarithm of equation (1):

$$\text{Log } C_q = \log a + b(\log q) \quad (2)$$

As the cumulative volume of output increases, the cost of each succeeding unit falls because of higher input productivity. Most learning curves are drawn on the assumption

of a constant percentage rate of decrease in unit cost as cumulative volume increases (Allen, 1994).

In studying the impact of political risk on MNC, the value of learning needs to be properly incorporated. While there are many different kinds of learning and each is affected by different factors, this distinction is not relevant to the area of inquiry covered in this thesis. Rather the impact of early learning and late learning is explored in the MNC's investment context. In Chapter 6 of the thesis, the impact of learning on risk reduction is explored through computational simulation.

POLITICAL RISK AND CHOICE OF INTERNATIONAL PRODUCTION LOCATION

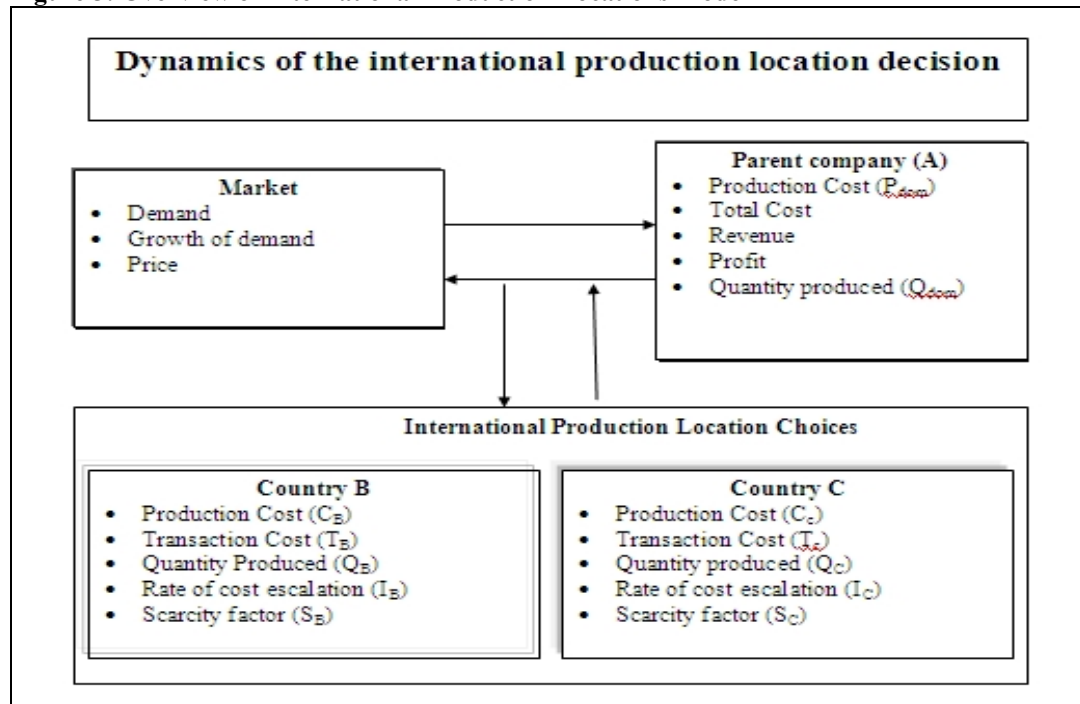
A multinational enterprise (MNE) organizes the production of goods and services in more than one country, and usually, this involves the transfer of assets or intermediate products without any change in ownership. In the literature on FDI and MNC, several strands of theoretical explanations have been developed to explain why firms engage in international production. Some scholars (e.g., Hymer, 1976) view FDI as the result of structural market imperfections and the firm's desire to pursue monopoly status using its firm specific assets. Other scholars (e.g., Buckley, and Casson, 1976, Rugman, 1981) look at FDI as a way to resolve opportunistic behaviors in market transactions, that is, as exerting direct hierarchical control over foreign production, instead of servicing the market by other means such as trade. Still others (Vernon, 1971.) consider FDI as the firm's response to the technological maturity of its products and growing demand in foreign markets.

The eclectic paradigm presented by Dunning (1988, 1993) ties these explanations into a single OLI framework. Dunning argues that national firms become transnational to exploit three types of advantage: (1) a firm's advantage due to ownership (O) over tangible and intangible assets, (2) the firm's internalization (I) advantages from its hierarchical control of cross-border production, and (3) the location-specific (L) advantages perceived by firms with respect to the characteristics of host countries in terms of their economic environments or government policies. In other words, a firm carries out FDI when the location and its ownership advantages make production abroad profitable and the direct hierarchical control of production is preferred over alternative modes of satisfying demand (e.g., licensing or trade).

Obviously, the decision to locate a production facility in a particular location by a multinational company is impacted by many factors. As mentioned earlier, one of the reasons a firm chooses an international production location is the cost advantage provided by the international location. However, there are also disadvantages to this decision in terms of added risk to the firm and potential problems of scarcity of resources in the new environment. The risk component can also be reduced as the multinational company spends more time and resources in learning about the new country. A foreign location may seem attractive to an MNC based on a low total cost of production. However, over time as the demand for labor in that location increases, the cost differentials may vanish, thereby leading to cost equalization. In the long-run the location may not be viewed as being as attractive as it was initially. At this point a third country may emerge as an attractive new location and production would shift there. A systems dynamic approach was employed to illustrate the dynamic nature of the choice of production location.

An overview of the model developed in this thesis is presented in Figure 5. A multinational firm that is located in the home country (Country A) is considered. Initially it is involved in manufacturing its products domestically. The company decides its level of production based on market demand plus the growth of incremental demand in the market. The product is ultimately sold in the market at a suitable price. In this model it is assumed that the final market for the product is the domestic market.

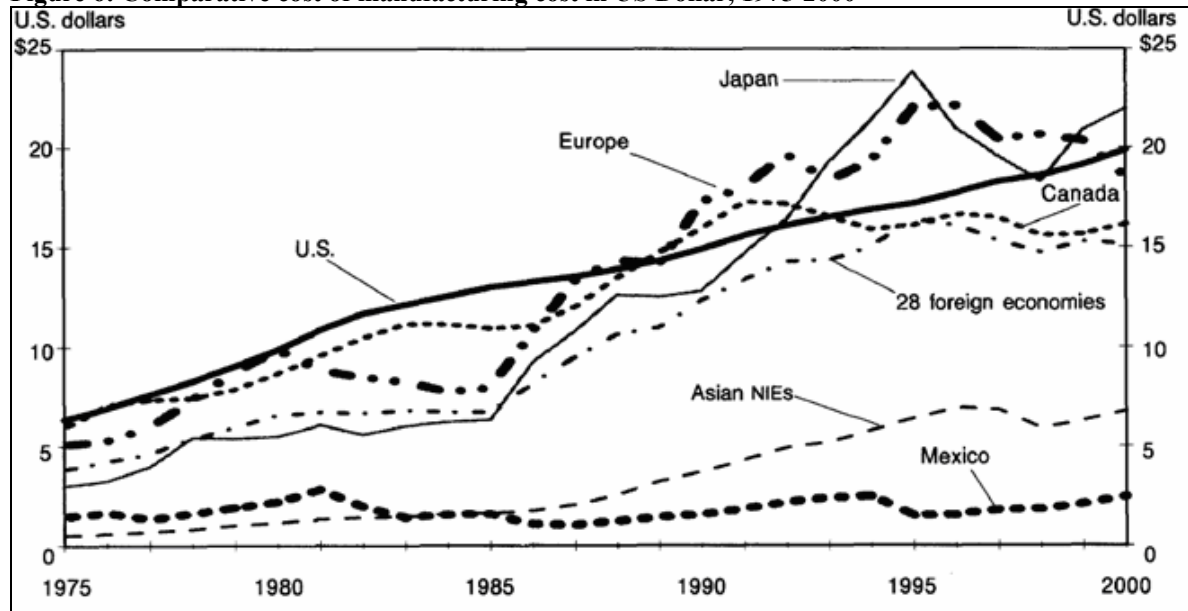
Figure 5: Overview of International Production Locations Model



The parent company seeks to establish new production locations upon exhausting the capacity of local production. The firm makes the decision to expand internationally based on the cost of production and transaction costs. Country B and Country C are the two options available for this company. The firm chooses the country that has a minimum cost of expansion (the total of production cost and transaction cost). The parent company can either shift its entire production to this new country or can shift only the incremental demand to the new location. In either case, there are distinct feedback-mechanisms that would change the production location choices over time.

For example, as production expands to country B, the demand for resources in country B goes up. As a result, prices begin to escalate and depending upon the scarcity of the resources available the cost advantages begin to disappear. This trend is observed in Figure 6, which graphs hourly worker compensation costs in US dollars for production workers in the manufacturing sector.

Figure 6: Comparative cost of manufacturing cost in US Dollar, 1975-2000



Source: (Sparks *et al.*, 2002)

Observing the costs for the Asian Newly Industrialized Economies (NIE) and Mexican economies, it can be seen that the wage rate of the Asian NIEs labor was cheaper until 1985 after which the demand for Asian labor forced price equalization. As a result, the wage rate of the Asian NIEs became relatively unattractive after 1985, while Mexican labor became cheaper. A similar trend can be observed between the US and Canada. In the system dynamics model presented in this thesis when country B has exhausted its resources, then at a certain point, a third country, Country C begins to look more attractive and production shifts to country C.

SYSTEMS THINKING AND MNCS

Many overlapping perspectives exist in the literature which attempt to explain the choice of production locations by multinational companies. Arguments from the fields of international trade (Calvet, 1981), offshore production, product life cycle (Vernon 1966, Stopford and Wells 1972) foreign direct investment (Dunning 1988, Hymer 1960 and Rugman 1986), and market failure (Casson 1982, Dunning 1988; Dunning and Rugman 1985, Hymer 1960; Kogut 1983, 1985; Prahalad and Doz 1987; Teece 1987) can be knit together in order to explain this phenomenon. However, to date there has been no single overarching and dynamic framework which explains the process of firm location selection and the dynamics behind the choice of location.

Transaction cost theory argues that when the cost of transaction in the external market (i.e. external transaction) is less than the cost of transaction within the firm (i.e. internal transaction) then firms will choose to move their activities to the market (Williamson 1979, 1985). A large pool of activities go into the sale of a finished product, ranging from basic research and development to product design, and from the preparation and installation of machinery and to the production of components, assembly, packaging, marketing, transportation, and after-sales support. For all of these activities, a firm must choose where to locate its activities. From a traditional transaction cost perspective, this decision boils down to the trade off between the cost of running a larger and less-specialized organization (in the case of internalization) versus the costs that arise from the search frictions and imperfect contracting which characterize market transactions. In the other words, internalization leads to an increase in the size of the firm, and it is well known from principal agent theory, that as the size of the firm increases, the associated

agency costs also increase (Williamson, 1985). Further, a vertically integrated firm may face higher costs in the production of components and services because such a firm has many divisions to manage and the organization may not benefit from the learning curve effects which comes from specialization in a single activity. On the other hand, search costs arise when a firm must search for suitable partners and then provide these partners with the necessary incentives to produce inputs to the contracting firm's specifications. Search costs embody their own problem as they are often large in magnitude and contain a significant level of uncertainty due to imperfect contracting. The decision as to whether or not a firm will seek international expansion depends on the over all tradeoffs between the costs and the benefits of the two alternatives. If the agency costs outweigh the transaction costs, then it will be beneficial for the company to engage in overseas production.

A general systems approach to understanding the multinational firm was first put forward by Casson in 1990. A more formal model was subsequently put forth by Buckley and Hashai (2004) In this model, the world was portrayed as a grid of locations from which the firm will chose the location for its various activities based on a complex set of decisional criteria. The Bueckley and Hashai model provides a basis for testing hypotheses on the number of firms that will exist in a global system. However, the Buckley-Hashai model is still static in nature and does not focus on the kind of interactions proposed in the model developed of this thesis.

One interesting dimension of systems dynamics focuses on mental models of the world. Here, general systems theories typically posit that the decisions made by managers are based on not the "real" world but rather are based on decision makers' mental models

of the world. It is argued that studying mental models may have some advantages over studying empirical phenomenon. For example, in this context it is possible to take into account a richer set of information than just numerical data c) A model in this context may be more flexible than a simple empirical representation and may be more adaptable to new situations allows decisions to be modified as new information becomes available. Some of the drawbacks of using mental models as an explanatory variable are that they are not easily understood by others and interpretations of models will differ across people. Also, the assumptions on which such models are based are usually difficult or impossible to examine directly, so ambiguities in the model may go undetected and remain unresolved. Systems dynamics has long been used to study the dynamics of systems such as the one described in this research. It was first started by Forrester, and has subsequently been used by others to study the dynamics of more complex systems (Forrester's market Growth Model (1968), the People Express Management Flight Simulator (Sterman 1988), learning curves and word of mouth in market saturation (Paich and Sterman 1993) and so on. Computer models have the ability to reflect the dynamics behind actual systems. While mental models cannot state the explicit assumptions behind a model and the various interactions among the variables, system dynamics simulation models can show the explicit assumptions and how they affect the working of a system. Not only explicit assumptions, but ambiguous and hidden assumptions can also be revealed and examined in the simulations. As the complexity of the problem increases, computer models become more reliable in predicting the future dynamics of the system. One can easily analyze how the assumptions in the model will

affect among themselves and also the future behavior of the overall system (Forrester (1971)).

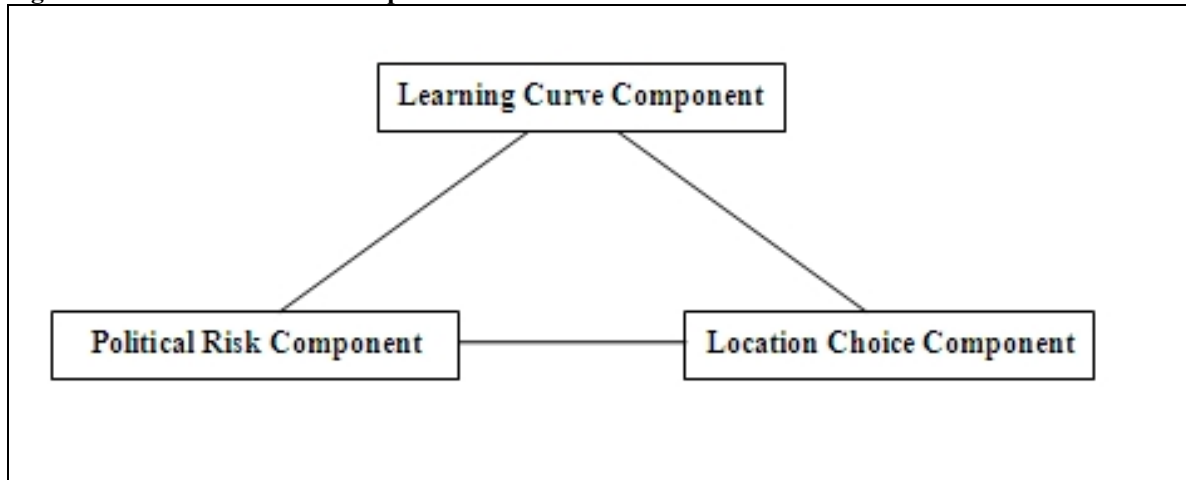
CHAPTER 3

EXPLANATION OF MODELS

This chapter gives an explanation of the different components of the simulation model.

Figure 7 shows the overall design of the three components of the model as described in the conceptual overview. In explaining the firm's location decision, a systems dynamic model was built using *Vensim*®. The advantage of building a systems dynamic model is that it can be simulated for different scenarios by altering the model's assumptions, and also each of the components can be analyzed both individually and in combination. These components will be explained in detail starting with the mathematical construction of the model followed by an explanation of the mathematical equations used in this systems dynamic model. The following figure gives an overview of the three components that will be described: a) The Learning curve b) Location Choice and c) Political risk.

Figure 7: Overview of model components



LEARNING CURVE MODEL

VALUING THE INVESTMENT OPPORTUNITY – A REVISED MODEL

The Net Present Value (NPV) technique for project valuation involves the estimation of future cash flows and then discounting them to present value. If $E(FCF_t)$ is the expected cash flow at time t , and I_0 is the initial investment, then the NPV over n time periods is computed by summing the discounted expected future cash flows at a steady discount rate (r_1) as follows,

$$NPV^{Traditional} = -I_0 + \sum_{t=1}^n E(FCF_t)/(1+r_1)^t \quad (3)$$

As has previously been discussed, because firm learning is not taken into consideration, this traditional method of evaluating a project underestimates future cash flows and therefore underestimates the net present value of the project. To illustrate this concept, consider the evaluation of the same project incorporating the assumption that multinationals learn and become familiar with the foreign operating environment. In this case, the discount rate gradually reduces ex-ante because of the reduction in competitive

risk. Following this logic, the discount rate at each time period is decreased by a fraction α , which we shall term as the learning curve factor. This rate of learning (α) depends on a number of firm specific factors such as the training given to the employees, the nature of the firm, its past experiences with FDI and other similar factors. Our concern here is how to incorporate this learning effect into the discount rate and as a result into the project evaluation. If r_t represents the discount rate at the time t and the discount rate at the time $t-1$ is, $r_{(t-1)}$ then, as previously explained r_t is composed of company risk, country risk, and competitive risk. Country specific political risk is dealt with in a separate chapter (Political Risk). Owing to learning, the $r_{\text{competitive}}$ and therefore the total risk r_t is assumed to decline over time that is $r_t = r_{t-1}(1 - \alpha)$, where α is a constant. However, this decline in the discount rate does not continue forever but rather reaches an equilibrium value over time, when $r_{\text{competitive}}$ becomes zero. After this point there is no further reduction. The discount rate remains constant and is composed of only company and country risk (r_{company} , r_{country}) similar to its competitors. If this constant equilibrium is represented by r_{eq} , then

$$r_t = \text{Max}([r_{t-1}(1 - \alpha)], r_{\text{eq}})$$

$$r_{\text{eq}} = f(r_{\text{company}}, r_{\text{country}})$$

Taking the effect of learning into account, if (NPV^{modified}) represents the learning incorporated NPV of the investment, then,

$$NPV^{\text{modified}} = -I_0 + \frac{FCF_1}{(1 + r_1)} + \frac{FCF_2}{(1 + r_1)(1 + r_2)} + \frac{FCF_3}{(1 + r_1)(1 + r_2)(1 + r_3)} \dots \frac{FCF_n}{(1 + r_1)(1 + r_2)(1 + r_3) \dots (1 + r_n)}$$

$$= -I_0 + \sum_{t=1}^n \frac{FCF_t}{\prod_{T=1}^t (1+r_T)} , \text{ Where, } r_T = \text{Max}([r_{T-1}(1-\alpha)], r_{eq}] \quad (4)$$

An ex-ante value of the discount rate in the equation (4) is considerably higher than the ex-post value due to learning curve impact and the ability to address competitive risk.

Computing the difference between the present values of the future cash flows between the two methods, it can be seen from equations (5) and (6) that, the present value of the individual cash flows are understated in the traditional method. At any time t, the present value of the future cash flows as given by the traditional and the proposed new method is as follows,

$$PV(FCF_t)^{\text{modified}} = \frac{FCF_t}{\prod_{T=1}^t (1+r_T)} \quad (5)$$

$$PV(FCF_t)^{\text{traditional}} = \frac{FCF_t}{(1+r_1)^t} \quad (6)$$

The magnitude by which the cash flows are underestimated in the traditional method when the effect of learning is not incorporated is obtained by the difference between equations (5) and (6).

$$= \frac{FCF_t}{(1+r_1)} \left[\frac{1}{\prod_{T=2}^t (1+r_T)} - \frac{1}{(1+r_1)^{t-1}} \right]$$

$$PV(FCF_t)^{\text{modified}} - PV(FCF_t)^{\text{traditional}} = \frac{FCF_t}{\prod_{T=1}^t (1+r_T)} - \frac{FCF_t}{(1+r_1)^t}$$

$$\Rightarrow PV[FCF_t]^{modified} = \frac{FCF_t}{(1+r_1)} \left[\frac{1}{\prod_{T=2}^t (1+r_T)} - \frac{1}{(1+r_1)^{t-1}} \right] + PV[FCF_t]^{traditional} \quad (7)$$

Hence, the Future Cash Flows at each time period are underestimated in the traditional method by a factor of,

$$\frac{FCF_t}{(1+r_1)} \left[\frac{1}{\prod_{T=2}^t (1+r_T)} - \frac{1}{(1+r_1)^{t-1}} \right]$$

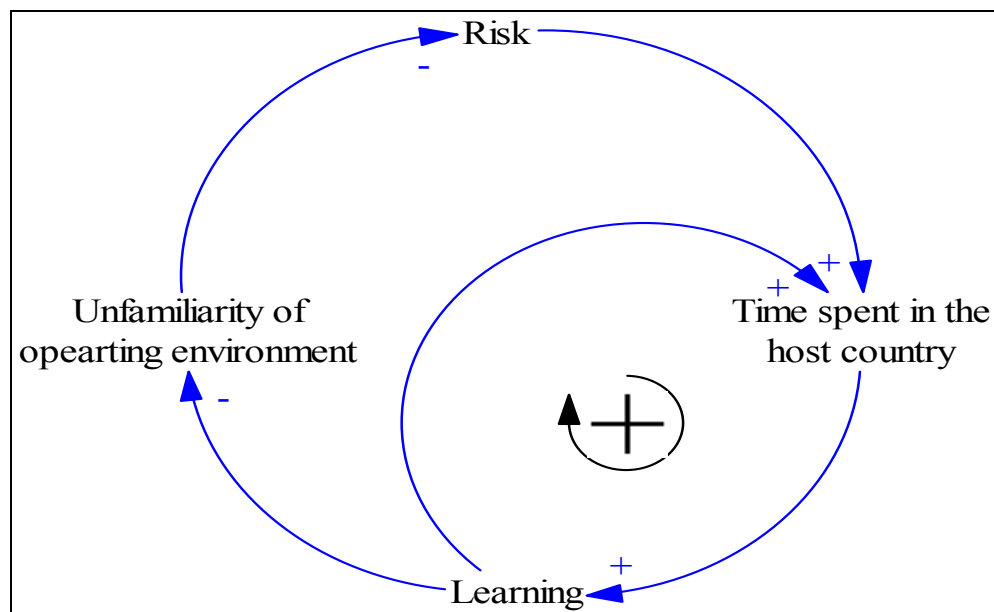
where, $r_T = \text{Max}([r_{T-1}(1-\alpha)], r_{eq}]$

The above equation shows the difference between the ex-ante (estimated) cash flows and the ex-post (actual) cash flows attributed to the learning curve effect. This difference is the value of learning and it accumulates over time and causes the underestimation of project value in traditional NPV analysis. The greater the value of this factor, the higher is the value of the learning. It can be seen that the value of learning directly depends on the value of α (the learning curve factor) and time. A higher value of α implies that the rate of learning for companies is large and this would causes the value of the investment opportunity to increase substantially. The above derivation assumes that learning begins at the time of entry. As a result of this assumption, a reduction in the discount rate is seen from year 2 onwards. However, this kind of effect might not always be present. Depending on numerous external factors, some companies learn slowly and this has to be factored in to the equations valuing any specific location decision. Nevertheless, the learning adjusted value will always be higher than traditional net present value. It can also be argued the sooner a company begins to learn, the greater will

be the value of the investment. These scenarios can be simulated and the results are shown in the next chapter.

In order to build a systems dynamic model, the various elements of the firm location decision have been broken down into causal loops as shown Figure 8. Two forces interact when an MNC is faced with a risky event. The first is the disruption in the firm's operations, which could have a negative (positive) impact on the firm value thereby further increasing (decreasing) risk. Under initial entry, the time spent in the host country is substantially less and therefore learning is also less. This means that the unfamiliarity of operating in the host country is greater and therefore the firm faces more risk.

Figure 8: Causal Loops in the Learning Model



The other opposing force is the effect of learning of an MNC. When an MNC operates in an uncertain environment, it initially faces a very large risk because of unfamiliarity with the environment. However as time spent in the host country increases, the learning factor accumulates. This leads to a reduction in unfamiliarity with the

analysis. Revenues include the sales revenue computed as the product of sales price and sales volume. Costs include depreciation, tax expenses, and other operating expenses. The cash flows are discounted using a discount factor $(1 + \text{discount rate})$ and the discount rate at each time period is set to decline at a constant rate of “Alpha”, which is set at the beginning of every simulation run depending on the rate of learning accumulated by the MNC. The ‘Final Equilibrium Discount Rate’ is the final equilibrium value of the discount rate at which point the competitive risk becomes zero and the total risk faced by the firm is equivalent to that of its competitors. The discount factor at every time period depends on the discount factor in the previous time period and this dependency is incorporated in the model. The discount rate used in the computation of the discount factor also has a time dependency (it declines by a fraction every time period) as shown in the model. The model was subsequently simulated and four different scenarios were considered, each of which will be explained in the following chapter.

CHOICE OF INTERNATIONAL PRODUCTION LOCATION

The second component of the conceptual framework (Chapter 3) is the location choice of multinationals and is the focus of this section. An MNC operating in the manufacturing sector is considered under a stable pricing strategy and a perfectly competitive market structure. To increase profit the firm focuses on cost reduction through international operations. In the simplest form, a single multinational firm having its production located domestically as the initial condition is considered. The firm produces a quantity equal to the market demand (Total Production = Market Demand). The total cost of production is the sum of total domestic production cost and the total cost of international production. The cost of international production is zero because all the

inputs are produced domestically. This total cost of international production is represented as follows:

$$C_{\text{tot}} = (Q_d * U_d) + (Q_i * U_i) = (Q_d * U_d) + (0 * U_i) \quad (8)$$

C_{tot} – Total Cost
 Q_d - Quantity produced domestically
 U_d - Domestic unit cost of production
 Q_i – Quantity produced internationally
 U_i – International unit cost of production

Unit domestic cost and unit international cost are the cost of producing one unit of the input domestically and internationally respectively. The unit international cost is composed of two components. One is the transaction cost (C_t) and the other is the product cost (P_i). If I_i is the rate of cost escalation in the country then the international product cost at time $t+1$ can be represented in terms of the cost at time t and the rate of cost increase as follows.

$$U_i = C_t + P_i \quad (9)$$

$$P_{i,t+1} = P_{i,t}(1 + I_i) \quad (10)$$

$P_{i,t+1}$ = International product cost at time $t+1$
 $P_{i,t}$ = International product cost at time t
 C_t = Unit transaction cost
 I_i = Rate of international cost escalation

Along the same lines, the unit domestic cost is defined as follows and grows over time with the rate of growth of domestic cost escalation.

$$P_{d,t+1} = P_{d,t}(1 + I_d) \quad (11)$$

$P_{d,t+1}$ = Domestic product cost at time $t+1$
 $P_{d,t}$ = Domestic product cost at time t
 I_d = Rate of domestic cost escalation

The quantities of domestic and international production depend on the cost of domestic and international production. According to transaction cost theory, if the cost of domestic production were lower than the cost of international production (inclusive of the transaction costs) then the firm would choose to produce domestically. If the domestic costs become higher, then for the sake of simplicity it is assumed that the firm closes its domestic operations and chooses to produce internationally. This is the base case scenario where it is assumed that the firm would shut down its domestic operations and move its entire production to the international location. A systems dynamic model is constructed based upon the above assumptions. The final price of the product and the market demand are set to grow at a steady rate of 5%. The total revenue is calculated, from which the profit (Revenue minus the Cost) is also computed.

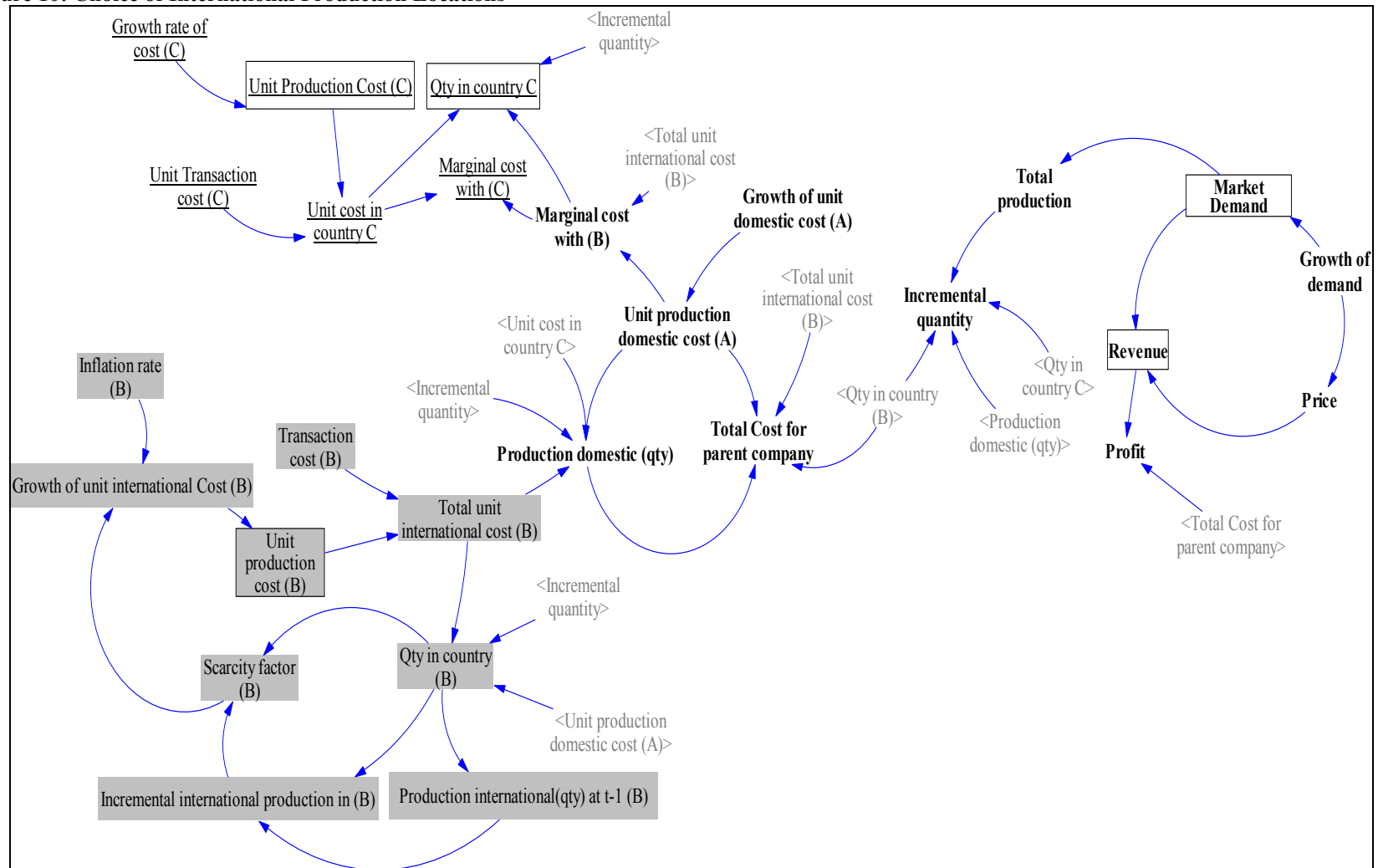
Figure 10 shows the systems dynamic model. ‘Production domestic (qty)’ represents the quantity of goods produced locally. An MNC operating in the home country and seeking alternative production locations is considered. Country B and Country C are the two choices available. The variables belonging to the home country A are shown in bold faced type, those for country B are shaded, and the variables of country C are underlined. The quantity of production depends on the ‘market demand’, which grows at the rate of ‘growth of demand’. ‘Unit production domestic cost’ is the unit cost of manufacturing domestically which grows at the rate of ‘growth of unit domestic cost’. This growth in the domestic cost can be attributed to inflation, competition, and other market forces. ‘Incremental Quantity’ is the excess demand that is not served by domestic production. The firm seeks alternative production location for producing this incremental quantity. ‘Profit’ is computed as the difference between ‘Revenue’ and ‘total cost for the parent

company'. 'Unit production cost (B)' represents the unit cost of production in country B.

'Transaction Cost (B)' represents the unit transaction cost of operating in country B.

'Total unit international cost (B)' is the sum of the production cost and the transaction cost of operating in country B.

Figure 10: Choice of International Production Locations



Production is moved to country B if the total cost of production in country B (including the transaction cost) is less than the total cost of domestic production. ‘Qty in country B’ represents the quantity of goods produced internationally. ‘Incremental international production in B’ represents the incremental demand that can be absorbed by the production facilities in country B without exceeding the cost of domestic production. ‘Scarcity factor (B)’ represents the rate at which the scarcity of resources set in. As more and more production shifts to the international location, those resources may not adequately support demand, depending on the nature of the country. As a result of resource scarcity, costs increase. Similarly variables for country C are also defined (the top structure of the model). If the total production cost in country B exceeds the domestic production cost, then the model looks for an alternative cheaper location. When country C appears attractive, the model allocates production to country C. Various scenarios based on the model are considered in the next chapter.

POLITICAL RISK

This section describes the model for the third component outlined in the conceptual overview, namely political risk. The impact of political risk on an MNC is analyzed in a dynamic framework, taking into consideration the impact of learning. The following section explains the impact of political risk on the MNC operating in an international location.

Consider the case of a multinational firm operating in the manufacturing sector in home country A. It is initially involved in manufacturing products locally. The company decides its level of production based on demand and the growth of demand in the market. The product is finally sold in the domestic market at a suitable price. The parent company

seeks to establish new production locations upon exhausting the capacity of local production. It makes the decision to expand internationally based on the cost of production and on transaction cost. The total unit cost of international production is therefore the sum of the international manufacturing cost and the transaction cost.

$$\Omega_t = \Gamma_t + T_t \quad (12)$$

Where,

Ω = Total Unit International Cost

Γ = International Manufacturing Cost per Unit

T = Transaction cost per Unit

Based on transaction cost theory, the firm decides to look for international production if the cost of domestic production exceeds the total unit international cost. If the international location is cheaper, then production shifts to the international location. Various other factors come into play in the decision for the choice of international location however; the influence of political risk is the focus of this thesis.

If the international location poses a politically risky environment, then the cost of doing business increases, and the location may appear to be unattractive. The costs of doing business may add up for example, because of corruption, the difficulty of getting the work done through multiple levels of bureaucracy, the threat of expropriation, potential loss due to political activities, a shift in industrial and sectoral policies and so on. Therefore, political instability can be treated as a cost of doing business and is modeled as a part of transaction cost as follows.

$$T_t = \Phi_t + \varepsilon_t \quad (13)$$

Where,

T = Transaction cost

Φ = Cost of Political Risk to the firm

ε = Other Transaction costs.

This method of treating political risk as a transaction cost ties in closely with the general accounting and financial norm of treating risk as a cost and adding a premium for compensation. A typical example of this approach would be offshore projects, which are generally viewed as more risky and which are seen as contributing less to shareholder value, than an otherwise comparable domestic investment. To reflect the risky nature of this investment, firms usually add a suitable risk premium to the discount rate which they apply in evaluating the project. Since the focus of this thesis is on political risk, other transactions costs treated as are exogenous to the model.

Risk, in general, is defined as a situation in which the outcome is uncertain, and for which a number of possibilities exist, each with its own probability. Economists typically define it as a measure of the dispersion of a probability distribution, with a greater dispersion indicating a higher risk. Risk for an MNC in the case of FDI arises when a multinational company is faced with an investment decision overseas for which a number of possible outcomes exist each with its own probability. FDI decisions include costs due to political events and various elements of the overseas environment such as corruption, excessive bureaucracy etc. Ultimately, the cost of political risk depends on the probability of the occurrence of the risk and the severity of the loss.

$$\Phi_t = \text{Prob (Occurrence of the event)}_t * \Psi \quad (14)$$

Where,

Ψ_t = Severity of loss at time t

If an event is likely to result in a huge loss and therefore has a high severity but a low probability of occurrence then the cost for the international firm is also less. For

example: assume it is absolutely certain that a new hostile government will come to power in one month and that it will force a firm to divest its assets. In this case the cost of political risk is very high.

The severity of the risk also depends on multiple factors. As a base case, it can be argued that severity depends on the dollar value (in the case of US MNCs) of the assets at risk combined with the impact of the risky event on the asset. Consider the case of an MNC that is in the initial stages of entry into an international location. Clearly the initial investment is at a relative minimum and the monetary value of the assets is also low. However, since this is a first time entry, the MNC faces a large risk as it is not familiar with the operating environment and it can be presumed that the MNC has not yet established friendly alliances. Therefore, it is logical to assume that any risk which may strike the MNC in this stage will have a heavy impact, and result in a monetary loss that is greater than the value of the assets at risk (reputation, intangible assets, loss of morale etc). In contrast an MNC that has well established operations in a foreign environment and which has learned about the operating environment as well as having formed friendly business alliances and strong relationships with local government is comparatively well protected against political shocks. So, even though the monetary value of the assets at risk may be quite high, the impact of a political shock to the firm is likely to be rather low. Hence in this model, severity is defined as:

$$\Psi_t = \beta_t * \alpha_t \quad (15)$$

Ψ_t = Severity of loss at time t

β_t = Loss Impact Multiple at time t

α_t = Size of the asset at risk at time t (Which includes the incremental quantity and the reinvestment of retained earnings in the foreign plant)

The size of the asset at risk depends on the initial investment and the incremental quantity produced in the new location:

$$\alpha_t = I_0 + \sum_{t=0}^{t=n} \Delta Q_t \quad (16)$$

Where,

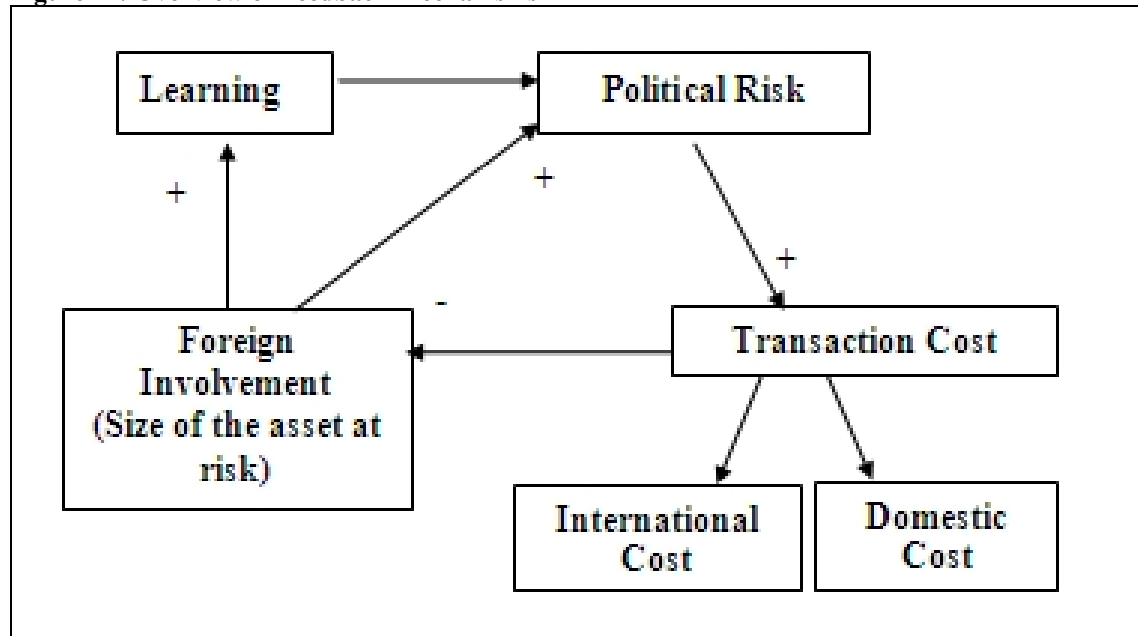
ΔQ_t = Dollar value of incremental quantity that is produced in the international location (depending on the cost differentials, incremental quantity is either produced domestically or shifted to the international location) and the reinvestment of retained earnings in the new location.

I_0 = Initial investment in the host country

It is also important to understand that the impact of Political Risk on transaction cost is not a one time event. Rather, it is a dynamic process which occurs over time. As a result, there are some important feedback mechanisms that have to be taken into account in studying the impact of political risk.

Figure 11 shows the feedback mechanisms for an MNC having foreign operations. The MNC's initial move to the foreign location can be explained by transaction cost theory. After a few years of operation, the MNC continues to operate in the foreign location because of cost advantages. When a political shock hits the MNC, the cost of doing business to the firm also increases. This increase in the cost may not be high enough to warrant an immediate roll-out, but may significantly affect both levels of production and future levels of investment.

Figure 11: Overview of Feedback Mechanisms



Over time, if the cost of doing business continues to increase, the MNC will have to reduce its foreign commitments. A counter-veiling force is the fact that during the time the MNC operates in the foreign country, it begins to learn about the operating environment. This learning helps in reducing the impact of a loss. For example, a firm that accumulates a 30% learning effect would reduce its impact of loss due to political risk by 30%.

$$\theta_t = \beta_t * (1 - \bar{\lambda}) \quad (17)$$

θ = Loss Impact Multiple After Learning

β = Loss Impact Multiple

λ = Rate of Learning

Dynamic Interactions in the Model

Based on the above explanations, a systems dynamic model was built to explore the different scenarios in the impact of political risk on the transaction cost of the firm.

Figure 12 shows a dynamic model that captures the impact of political risk on the transaction cost of a Multinational Firm engaged in international production.

The model considers the scenario of a hypothetical MNC in the manufacturing sector. The MNC behaves in a manner justified by transaction cost theory. That is, it looks for the cheapest location in which to manufacture and the decision to locate production in foreign manufacturing centers is entirely cost driven. The total unit cost of international production, as explained earlier, is the sum of the unit international manufacturing cost and the transaction cost. Political risk is also a part of the transaction cost, so when the firm faces a politically risky situation the transaction cost also increases. The variable ‘excess demand’ in the model represents the excess demand that cannot be satisfied by local production. The MNC serves local demand, which grows at a rate determined by the variable ‘Growth of demand’. The final products are sold in the local market at a price that also grows at the same rate as the growth of demand. The domestic manufacturing cost and the international manufacturing costs also grow at the rate set by ‘growth of unit domestic cost’ and ‘growth of international manufacturing cost’. If the ‘total unit international cost’ is lower than the ‘total unit domestic cost’, then the excess demand is moved to an international location for production.

If the ‘total unit international cost’ is greater than the ‘total unit domestic cost’, then the ‘excess demand’ is produced in the domestic location. The ‘total cost for the parent company’ is the sum of the domestic and international costs of production. The revenue and costs are computed from the same data as that from which the ‘profit’ to the firm is calculated.

The 'size of the asset at risk' is denoted by the dollar value of the assets that are at risk if a political threat strikes. This value in turn depends on the amount of reinvestment which occurs due to increased international production. If the initial investment is large, then the monetary value of the asset at risk also increases. Over time as more and more production moves to the international location, the investment in the international location also increases. 'Severity' denotes the dollar value of the tangible assets and intangible assets at risk. 'Loss impact multiple' captures the value of the intangible assets as a multiple of the tangible assets. 'Rate of Learning' captures in percentage terms the amount of learning that the MNC has accumulated over time and this learning helps to reduce the 'Initial Loss Impact'. The final loss impact represents the impact of the loss to the firm after factoring in the counterbalancing impact of learning.

‘Loss Impact’ and the ‘size of asset at risk’ together determine the severity of a political risk. Finally, the ‘cost of political risk to the firm’ is computed by taking into account the probability of the occurrence of the political risk event.

Political Risk Ranking

Different countries have varying levels of political risk depending on the nature of the government, the legal environment governing the operations of private businesses, the local fiscal and economic policies, the level of corruption and bureaucratic red tape, labor and human rights laws, as well as a number of informal social variables. The level of each of these variables will vary for each country and accordingly different countries can be classified as possessing different degrees of political risk. Many professional agencies exist, who rank the world’s countries on a spectrum ranging from high risk to low political risk depending on various underlying factors. These different professional agencies have been well studied in the literature (Haendel *et al.*, 1975, Howell and Chaddick, 1994, The Economist, 1986). In this context, their rankings are a useful way to understand the level of risk faced by MNC’s in each country. One important ranking is provided by the Economist Intelligence Unit (EIU). The Economist’s index is called the political stability risk ranking and is based on aggregate scores related to Social unrest, Orderly transfers, Opposition stance, Excessive executive authority, and International tensions. The scores are weighted to generate rankings between 0 and 100 with smaller numbers indicating lower risk and higher numbers indicating greater risk as shown in Figure 41, (for a complete listing of the countries with their respective ranks refer to Table 4.)

Four sample countries with an increasing order of risk were chosen for the purpose of this simulation: Switzerland (Rank: 0), Romania (Rank: 35), Israel (Rank: 50), and Pakistan (Rank: 85). If an MNC is operating in all of these countries, then the comparative level of risk faced by the MNC in each country would be proportional to the country's incremental risk ranking. For example, if an MNC is operating in the four countries mentioned above then, at the time of initial entry or no learning, the MNC would face 85% more risk from Pakistan than what they faced in Switzerland. For example, Techint (<http://www.techintgroup.com/>, 2005), a multinational group based in Argentina and operating in the steel, oil & gas, and services industry has operations in Japan (Rank: 5), Italy (Rank: 20), Brazil (Rank: 25), Romania (Rank: 35), and Argentina (Rank: 45). Under the above said assumption, Techint faces increasing levels of risk in proportion to the political risk rankings of the countries in which it has operations. Based on this assumption the political risk ranking is taken as a proxy for the probability of a risk event occurring in the country. The results of the simulations are discussed in the following chapter. Three different scenarios have been considered: a) The impact of probability on the cost of political risk b) The impact of political risk on the level of investment in each country and c) the impact of learning on risk probability and investment level.

CHAPTER 4

SCENARIOS AND SIMULATION RESULTS

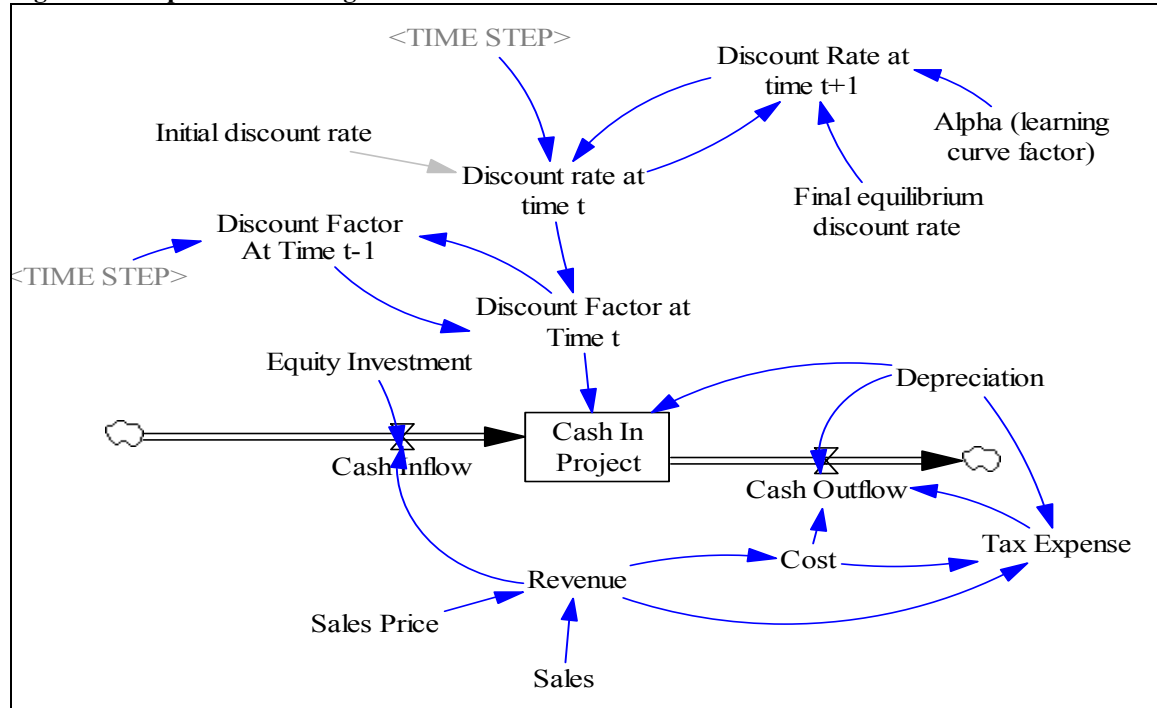
This chapter explains the various scenarios studied and the results of simulating the model components put forth in chapter three.

LEARNING SIMULATION

This section describes the output of the simulation model for the first component that is, the learning curve impact of multinationals. Figure 13 presents the simulation model described in the previous chapter for reference. In order to illustrate the learning curve effect, a numerical example of project valuation was chosen. (Please refer to the Appendices for a complete list of the model constants and time varying parameters). The present value of future cash flows is represented by the variable “PV of Cash In Project” and this is the variable of interest for the model. During the course of the simulation this variable provides the discounted value of all future cash flows in the project. It represents the present value of the cash inflows less cash outflows (revenue less expenses) in the same manner that the cash flows would be computed in an ordinary NPV analysis. The cash flows are discounted using a discount factor $(1 + \text{discount rate})$ and the discount rate at each time period is set to decline at a constant rate of “ α ”, which is set at the beginning of every simulation run. As defined earlier, ‘Final Equilibrium Discount Rate’ is the final equilibrium value of the discount rate at which point the competitive risk

becomes zero and the total risk faced by the firm is equivalent to that of its competitors. The discount factor at every time period depends on the discount factor in the previous time period as previously explained and this dependency is incorporated in the model.

Figure 13: Impact of Learning curve



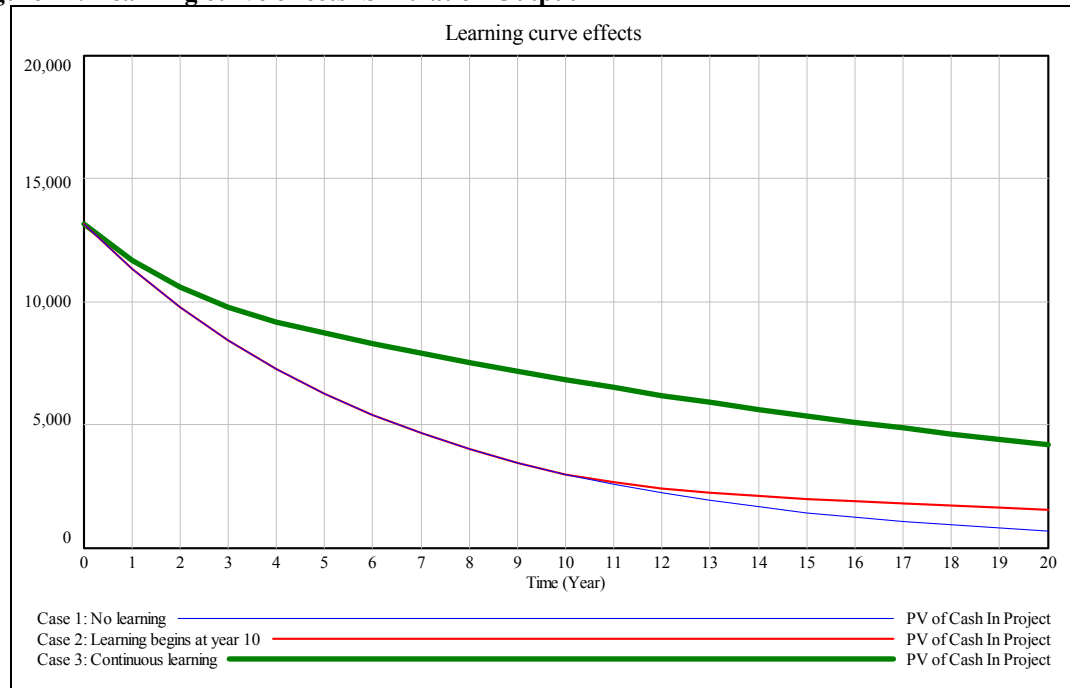
The discount rate used in the computation of the discount factor also has a time dependency (it declines by a fraction each time period) as shown in the model. The complete equations for the model are given in Appendix 1.

Three different scenarios were considered. The *first case* is the base case scenario and it reflects the use of a constant discount rate over the entire 20 year time-period.⁴ Under this scenario, the learning, if any, of the company in the time spent in the foreign environment is not incorporated in the discount rate and the project may seem

⁴ The variable “ α ” is set equal to 0.

unattractive compared to the other cases discussed shortly. The output of the simulation is plotted in the graph in Figure 14, where the ‘PV of Cash In Project’ is plotted over time.

Figure 14: Learning curve effects- Simulation Output



In the *second case* a two stage learning process is considered where, it is assumed that the learning occurs sequentially. In the first stage, the company has remained in the host country for ‘x’ years, justifying the usage of a higher discount rate to reflect unfamiliarity with the new, risky environment. During this time it learns about the operating environment and as a result of this learning in stage 1, there is a reduction in unfamiliarity as it enters stage 2. In stage 2 the competitive risk is reduced, and it remains at this new equilibrium level for the duration of the project. The result of the simulation is presented in the same graph, which shows that the present value of cash flows is identical to the previous case until the end of year 9. From the beginning of year 10, onward, the net present value of the cash flows increases. As a result, the project has improved in the second case.

The *third scenario* considers the case of continuous learning by the firm since the time of initial entry into the foreign environment. This implies a continuous decline in competitive risk and hence in the discount rate. However, in practice this decline cannot continue forever and eventually the discount rate reaches an equilibrium level, after which time the effect of learning on the performance of the firm with respect to political risk is minimal. The output of the simulation is again presented in Figure 14. Clearly, it can be observed that the net present value of cash flows has improved from year 1 onwards, and is higher in value than in either of the previous two scenarios.

In summary, the simulation shows that the two-stage learning process yields higher cash flows (and therefore a higher NPV compared to the base case scenario which uses a constant discount rate (the traditionally practiced FDI valuations). A continuous learning curve produces higher net present value for cash flows than either the two-stage method or the constant discount rate method. Further, the sooner multinationals learn about their environment, the higher the value of the NPV will be, thereby making the project more attractive. It should also be acknowledged that learning is a complex phenomenon and encompasses a variety of organizational and firm level factors. With competitive risk declining on the one hand and systematic risk increasing on the other hand, it would be interesting to explore the impact of such feedbacks on the value of the firm.

The foregoing analysis demonstrates that a stage wise strategy can be useful in elevating an FDI opportunity in a high risk environment. The two-stage approach was designed in order to model the situation whereby a firm could evaluate the initial few years' cash flow at a higher risk premium and then use a reduced discount rate for

subsequent years based on the learning capabilities of the firm. However, such a strategy also depends largely on the nature of the project, including whether it can be delayed or reversed. Previous research on FDI of under condition uncertainty has argued that, “the presence of uncertainty increases the value of the option to ‘wait and see’”. Given high uncertainty, the irreversibility of investment will make it more likely that FDI will be delayed. However, if the investment is easy to reverse, than FDI is more likely to be undertaken (Rivoli and Salorio, 1996). In the case of high uncertainty and an irreversible project, a two-step investment strategy might be particularly useful. In this case, the firm initially employs a high discount rate because of the unfamiliarity of the surroundings. An initial investment can be made while the firm learns about the foreign environment and this would give the firm a chance to subsequently reduce the discount rate, leading to a higher estimate of the net present value of future cash flows. What may have initially appeared as an unattractive investment in the presence of uncertainty may in fact become considerably attractive after the learning curve effect. Following this argument, a real options strategy for FDI might prove to be the ideal mechanism whereby an initial investment could be made as a first step in evaluating the environment (Copeland and Antikarov, 2001; Copeland and Tufano, 2004). After learning about the project by spending time in the new foreign environment, a suitable adjustment can be made to the discount rate which will allow the project to be valued at a more promising level and then the firm can proceed with subsequent rounds of investments as appropriate. In the case of reversible projects, if after the first stage of investment, the environment is still hostile, then the investment can be withdrawn and losses can be minimized.

When considering the timing of an FDI investment, the simulation shows that the sooner the firm enters the market and learns about the environment, the higher the value of the project will be in comparison to learning slowly later on in the project. Again, this result also depends on the capability of the organization to adapt to its surrounding quickly. When the risk of the target country is not perceived to be much higher than the risks of the home country then the initial risk premium employed by firms should not be very high. This feature of low country or political risk implies that the discount rate reduction in the learning curve in these cases is not substantial. In the case of firms contemplating an investment in a high-risk host country, the initial risk premium and the reduction in the competitive risk is substantial and a stage-wise strategy is likely prove useful.

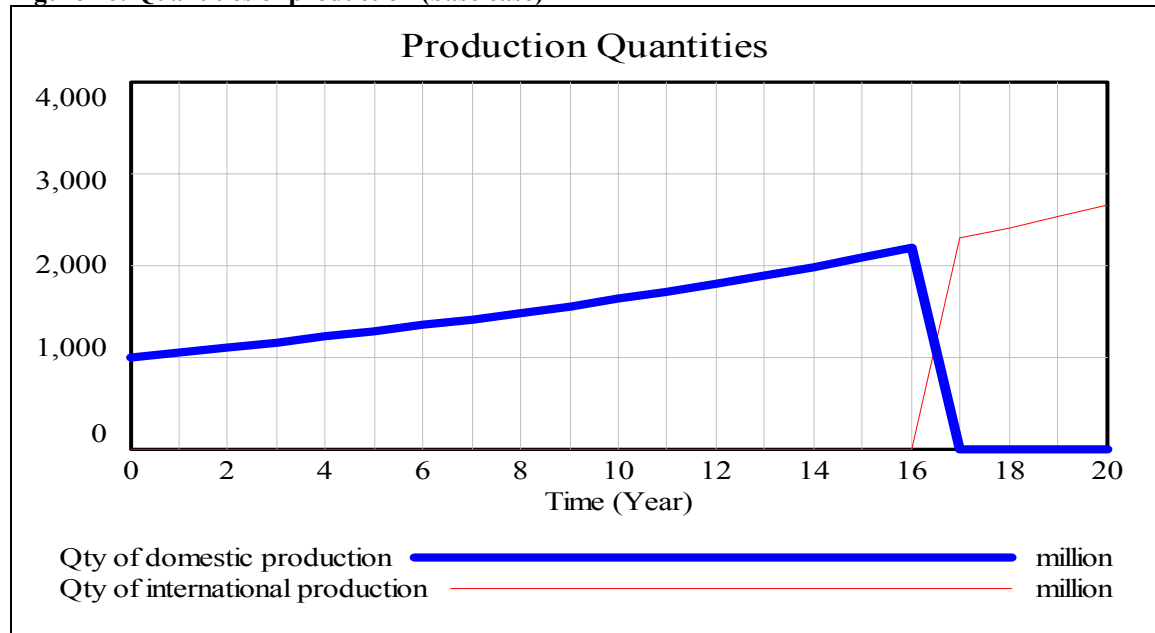
INTERNATIONAL PRODUCTION LOCATION SIMULATIONS

This section describes the output of the simulation model of the second component, that is, the choice of production location for multinationals. Figure 15 presents the simulation model described in the previous chapter.

Three scenarios were considered. In the first case, a multinational firm decided to expand into a foreign location (country B), based on transaction costs and the rate of change of the domestic and international cost escalation rates. The MNC shut down the operations of their domestic plant and shifted production to the international location upon finding a cost advantage in the new location. The second case built upon the first case and simulated the scenario where the firm, instead of shutting down its domestic operations entirely, continued to operate the domestic plant at full capacity, but moved their incremental capacity to the international location. In this case, the foreign country is

production decision would be sensitive to the rate of domestic and international cost escalation rates, transaction costs, and the initial production cost in both domestic and the international locations.

Figure 16: Quantities of production (base case)

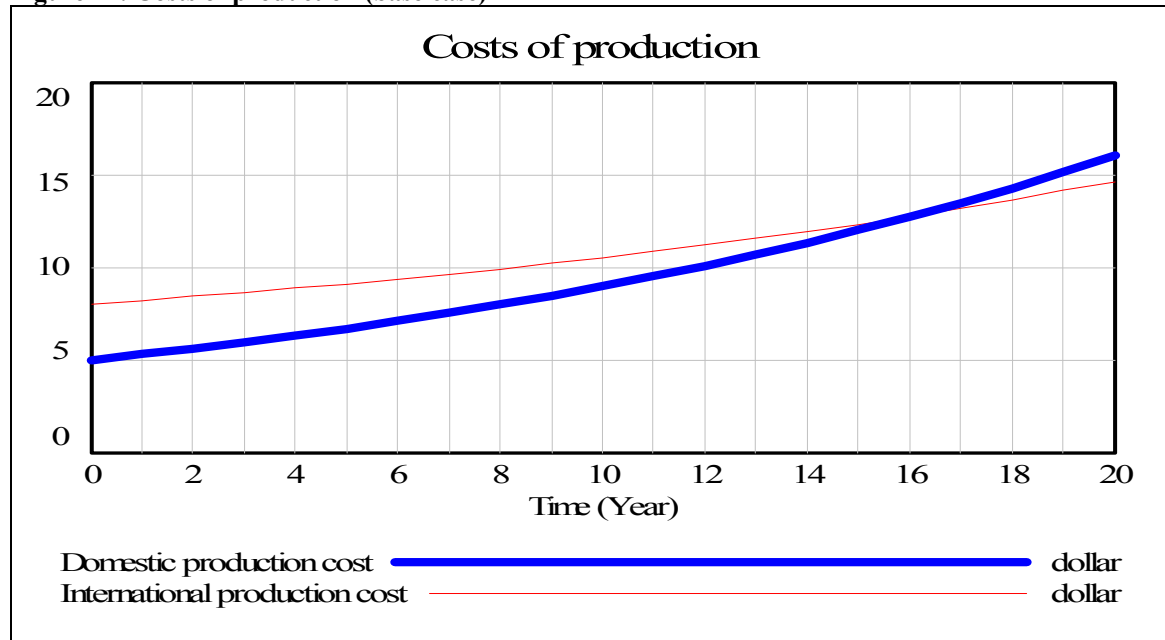


The model simulated 20 years of production and the quantities of production in both the domestic and international locations have been plotted on the same graph as shown in Figure 16. It can be seen that until year 16, domestic production is increasing and after year 16 there is a sharp fall in the level of domestic production until it reaches the value 0. At this time international production picks up (from year 16 onwards) and continues to increase until year 20. The production cost structure is the underlying mechanism which explains this observed production pattern.

Figure 17 plots the cost of domestic and international production versus time. It can be seen that until year 16, domestic production cost is increasing but remains well below the cost of international production. Further, the rate of increase for international cost is less than the rate of increase for domestic cost. Hence, it takes some time for the

two costs to equilibrate. When equilibrium is reached in year 16, domestic cost rises above the international cost. Therefore production shifts to the international location after year 16.

Figure 17: Costs of production (base case)



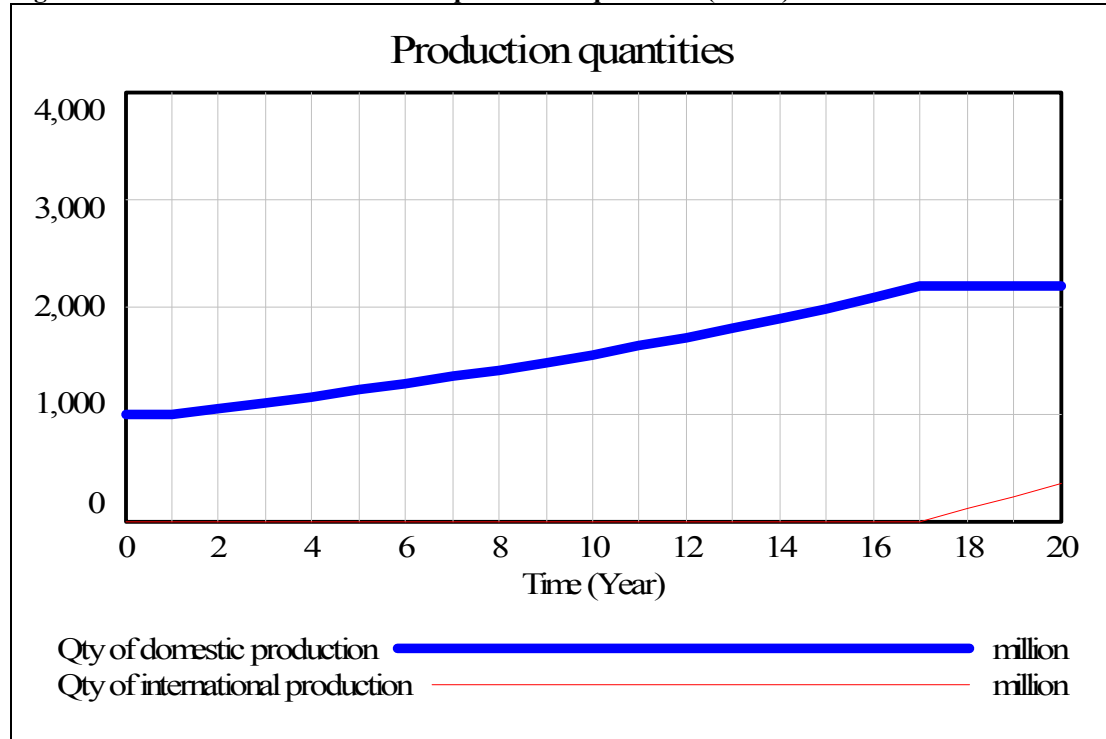
The profit of the MNC reflects the same situation. It increases at a steady rate until year 16 and increases at a faster rate thereafter. Consequently there is an improvement in the firm's profitability once the MNC shifts its operations overseas.

Case 2: Simultaneous domestic and international production operations

The base case scenario assumed that the local plant would be shut down and that production would be moved to an international location. However, in reality companies tend to operate simultaneously in both domestic and the international locations. In the second case it was assumed that country B is an attractive location and there are no resource scarcities in this country. This could be exemplified by a production move to China. As one economist in BCG pointed out, "...a latest report by the Boston

Consulting Group (BCG) made it clear that the cost advantage in some low-cost countries including China will remain or even expand. Their advantage will not disappear despite raised labor costs due to needs in these countries and their modernization process.”(People's Daily Online, September 07, 2004)

Figure 18: Domestic and International production quantities (case 2)



In case 2 it was hypothesized that instead of shutting down the old plant, the firm now shifts the excess demand to the international location. In order to model this process, a variable called “Incremental Quantity” was introduced, and it refers to the excess demand over and above what is already being serviced by the multinational firm.

$$\text{Incremental Quantity} = \text{Production} - (\text{production domestic (qty)} + \text{production international (qty)})$$

Figure 19: Costs of production (case 2)

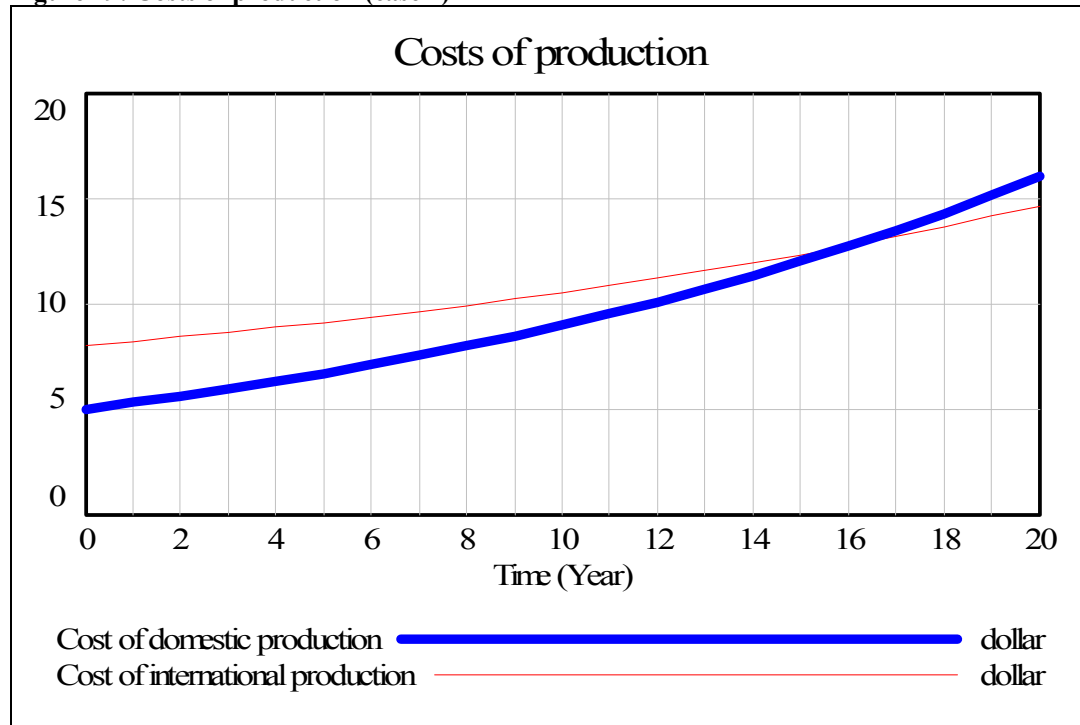


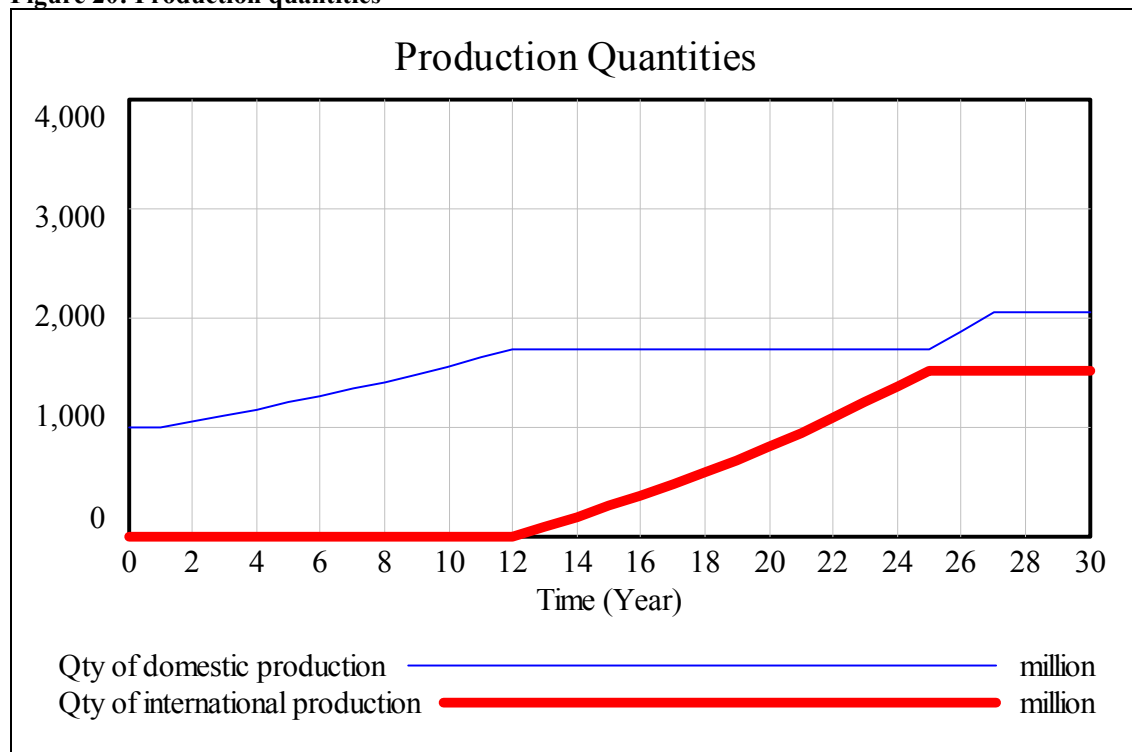
Figure 18 shows the graph of domestic and international production quantities for the MNC over the simulation period. Domestic production increases rapidly from time 0 and eventually levels off at time 17. Correspondingly the international production quantity which remained at 0 until time 17 then increases from year 17 onwards. Figure 19 shows the cost of domestic and international production operations. Domestic production cost is increasing; however, it remains well below international production costs. Under these circumstances, the MNC will choose to produce everything domestically. However after year 17, domestic production cost exceeds the international cost and from this point onwards, international production begins. Unlike the first case the domestic production at this stage does not become zero and instead simply flattens out. That is, the MNC on realizing a cost advantage internationally decides to expand its operations while simultaneously operating domestically at full capacity. The profitability of the MNC was

also observed over the course of the simulation. The strategy employed in case 2 largely outperformed that of the base case.

Case 3: Introduction of the Scarcity factor

The next scenario, case 3 extends case 2 and takes into account the fact that a country may not always have an abundance of resources. A recent Business Week reported that US Multinationals who once found Western Europe a promising location have begun to scale down their operations in recent years (Business Week 2005). In this scenario, cost advantages begin to disappear with the continual usage of resources. As a result costs begin to equalize with those of the home country and production eventually shifts back to the home country.

Figure 20: Production quantities



India, for example, initially was a competitive location in terms of cost of labor for the IT services industry. However, over a period of time, rising wages in India opened

the door for other developing countries to become more cost competitive in this field. A classic example here is the case of Siemens AG, and their experience with the Net Manager project. Siemens initially considered Bangalore, India as the location for starting their project, primarily because of cost advantages. However, after factoring in other costs such as information transfer, management costs, and job training, they found that several Eastern European countries appeared to be more cost effective than Bangalore (Thomke and Nimgade, 2001). This type of case is next modeled in the simulation, and it is assumed that under these circumstances the international country has limited resources. As a result, over time, the cost advantage of the international location begins to shrink and eventually it becomes unattractive in comparison to domestic price levels, at which point production is expected to shift back to the domestic location.

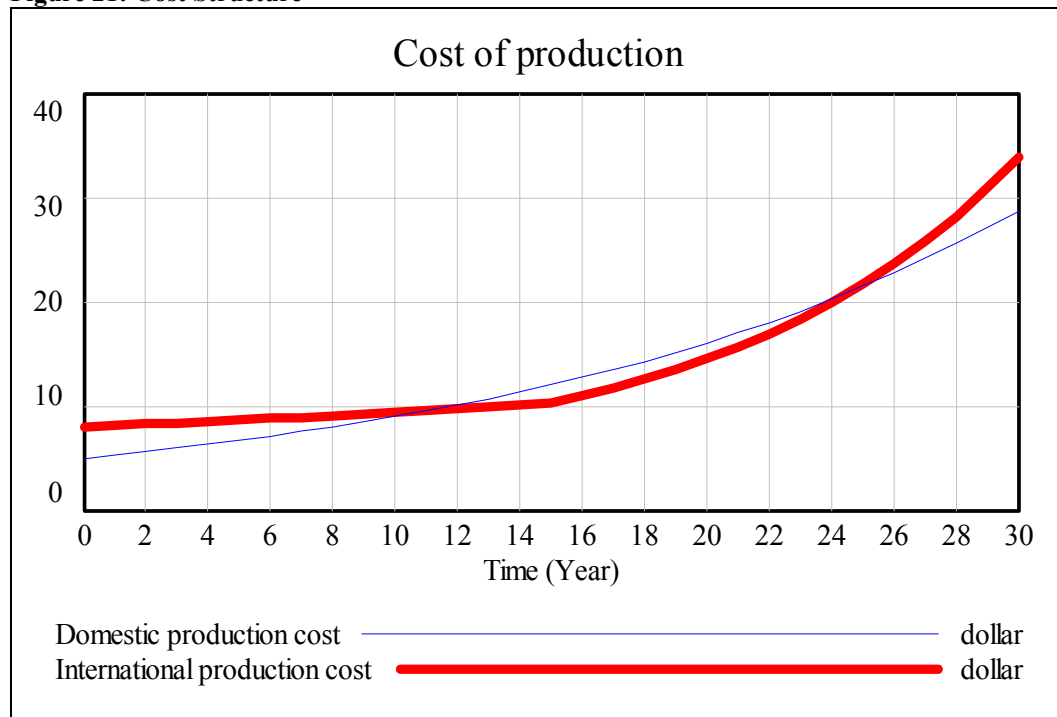
Figure 20 graphs the quantities of domestic and international production over 30 years of simulating this scenario. Domestic production increases slowly up to year 12. After year 12, it remains flat and international production which was at 0 begins to increase. However, while production is increasing internationally, the international resources are being gradually used up and costs begin to escalate. As a result, from year 25 onwards domestic production again picks up while international production remains flat.

Figure 21 shows the cost curve. As expected, domestic cost is below international cost until year 12. From year 12 to year 25 international cost is lower. As resources are used up international costs escalate and they overshoot domestic costs after year 25. As before the profitability of the MNC is also calculated. The profitability of case 3 is largely similar to that of case 2.

Case 4: Introduction of Third Country

In this case, the above model has been expanded to incorporate a third country, called country C that provides a greater cost advantage over country B after a certain time. For example, US multinationals initially expanded into Western Europe. However, in recent years, owing in part to a lack of resources, these companies have shifted parts of their operations to Eastern and Central Europe. Another example is the Japan. In several Japanese firms, particularly those engaged in the production of consumer electronics shifted production in the 1990's in order to take advantage of low costs in the Philippines. However, after a relatively short period of time and owing in part to the shortage of resources, these firms then shifted production to China which seemed to be a better market in comparison with Philippines.

Figure 21: Cost Structure



According to Yoshima Hayashi, Member of the House of Councilors in Japan, most Japanese companies are shifting their production location from the Philippines to China as they are more concerned about labor costs, or other factor costs than the power cost⁵.

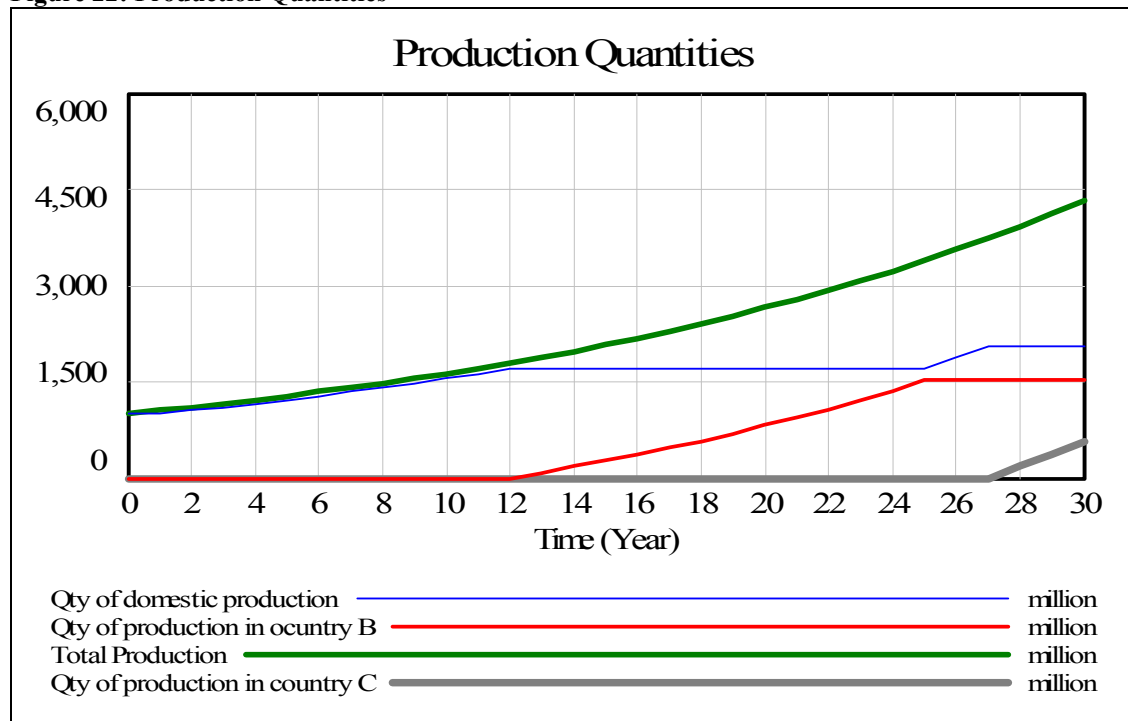
In this model for case 4, the marginal cost of production which is the incremental cost of the next unit of production, is computed. This marginal cost of production is then compared between the domestic, and the other international locations. The company chooses to locate its production to the country where the marginal cost of production is lowest. Country C is similar to country B in that there are scarce resources. So, the cost advantages in country C will also be exhausted after some period of time. In the simulation it is expected that production will start domestically and then move to country B. At a certain time, the production costs in country B escalates and country B is eventually no longer attractive. At that point, the company looks for a cheaper alternative, and as country C now appears attractive, the production location is shifted there. This model is simulated for 30 years.

Figure 22 shows the quantities of production over 30 years in the domestic and international (Country B & Country C) locations. As explained earlier, domestic production continues to rise until year 11. After that it begins to flatten out because the cost of domestic production is not attractive in comparison to country B. At this point, the firm moves their marginal production to country B and so the quantity in country B

⁵ *"In Japan, which has a higher power cost than the Philippines, most companies in our country are relocating to China because of the high labor cost in Japan. I believe high labor cost is also the reason why some Japanese companies in the Philippines relocated (their manufacturing plants) to China," he told a press conference for the 5th Asian Statesmen's Forum at the Plantation Bay Resort and Spa Tuesday (Techno-economic et al.).*

begins to increase from year 12 to year 25 before flattening out. After year 25, country B also begins to exhaust its resources and their cost advantage begins to disappear in comparison to country C. After year 25, country C's production picks up and continues to increase until the end of the simulation.

Figure 22: Production Quantities



In figure 23 the cost curves are examined in order to explain these shifts in production. Initially country B & Country C are expensive locations in which to produce. Hence, production stays domestic until year 11. From year 11 onwards Country B's cost of production appears to be cheaper than that of country C. Country B also has a cost advantage with respect to domestic production until year 25. Between year 11 and year 25, production in country B begins and then reaches its maximum. Beyond this point, country B is at a cost disadvantage. From year 25 onwards the cost in country C is lesser than the cost in either country A or country B until the end of the simulation. Thus, production shifts to country C. Figure 24 traces the minimum cost at all times. The

envelope curve is shown here by the thicker line. Production starts domestically, moves to country B after year 11 and then to country C after time 25.

Figure 23: Cost of production

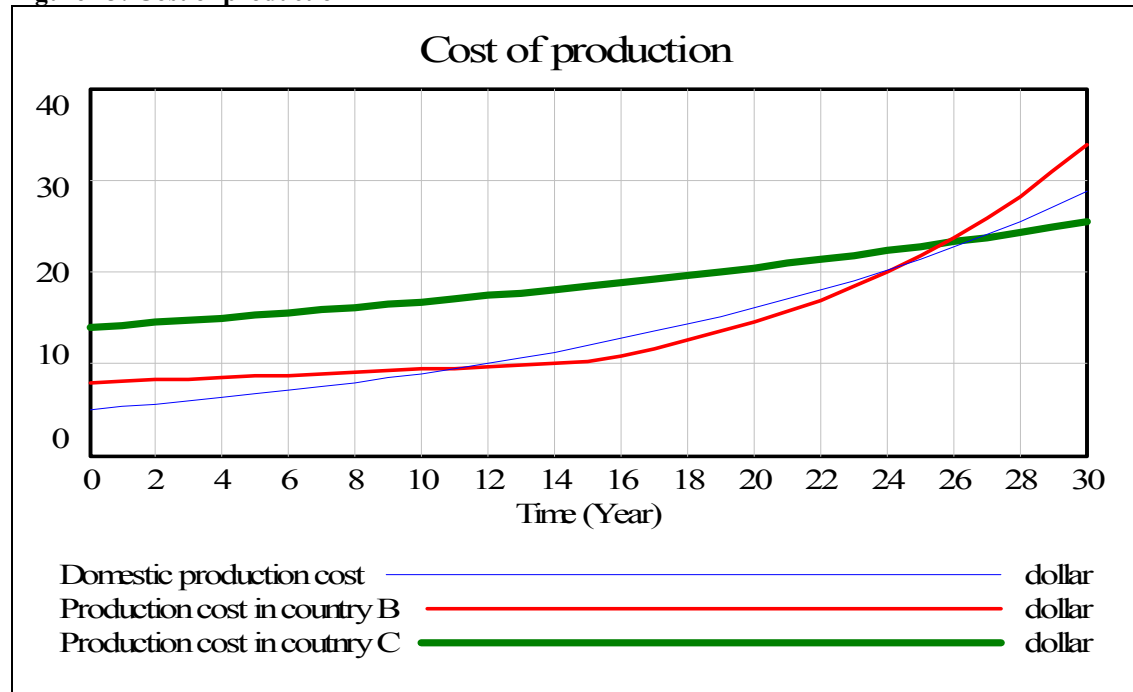
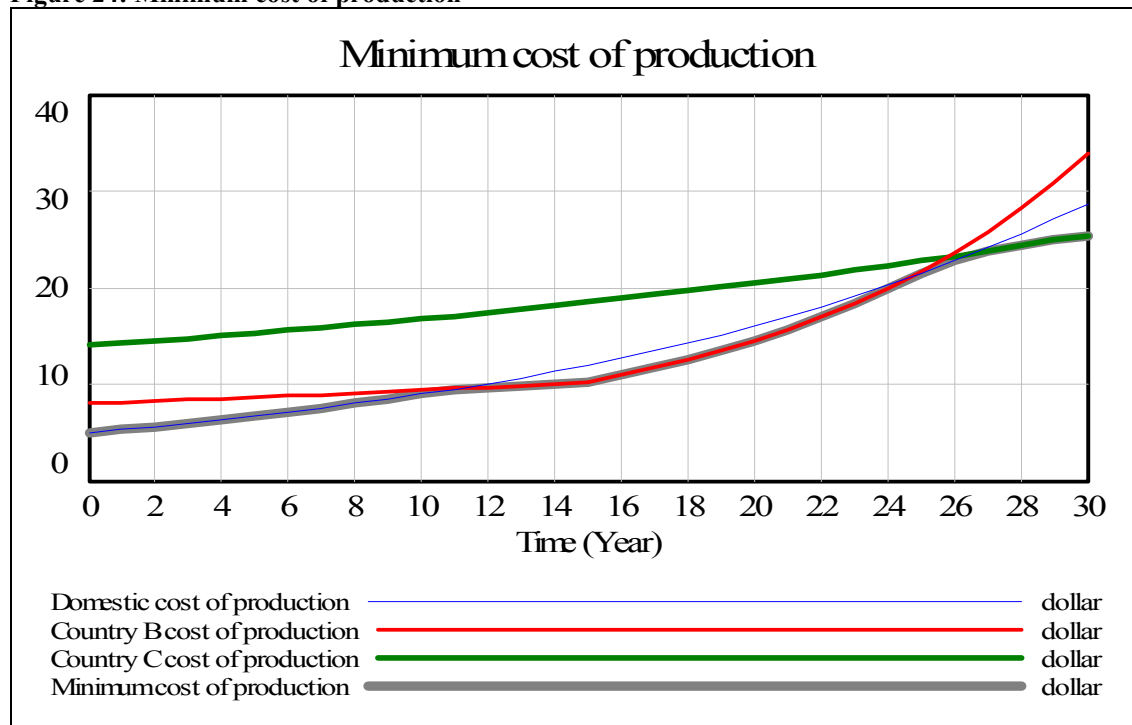


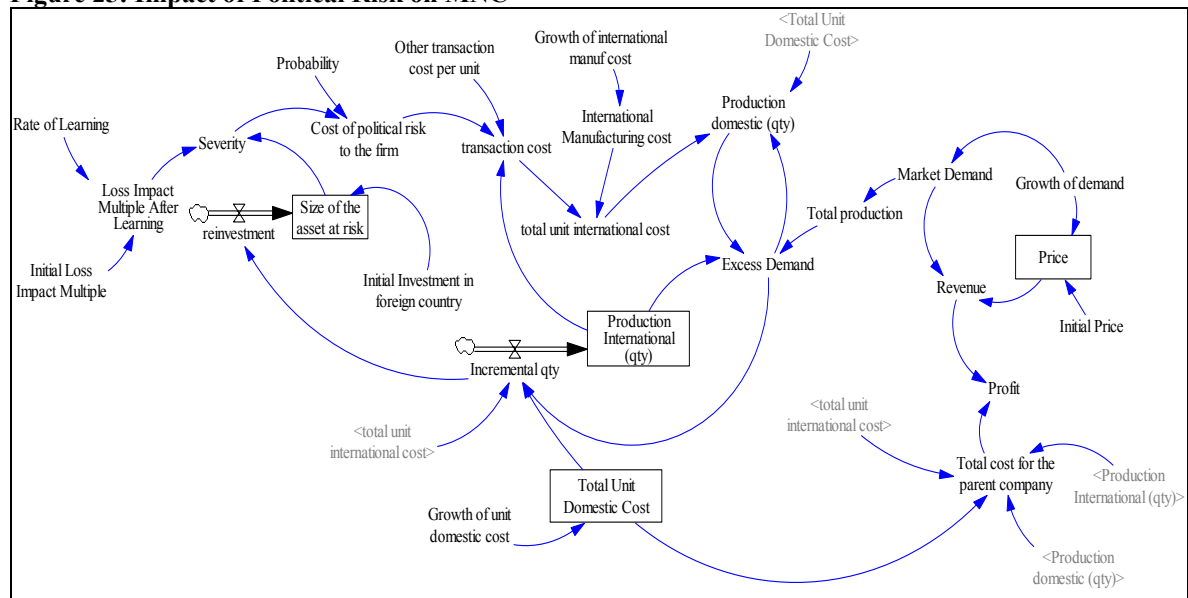
Figure 24: Minimum cost of production



POLITICAL RISK SIMULATIONS

The last section of this chapter describes the simulation output of the third component of the model, which is the impact of political risk on the MNC. Figure 25 shows the systems dynamics model for this component.

Figure 25: Impact of Political Risk on MNC



Four countries were chosen for this simulation. The countries are, in increasing order of political risk, Switzerland, Romania, Israel, and Pakistan. Three sets of simulations were run using the model described above. The first set of simulations tests the sensitivity of the cost of political risk to changes in the probability of political risk. The second set of simulations explores the impact of political risk on the level of investment received by the country. The third set of simulations focuses on the impact of learning on the level of risk for the MNC. Each simulation was run for a period of 100 months.

i) The sensitivity of the cost of political risk to probability

As explained earlier an MNC operating in the domestic environment is considering expanding its production location to an alternative location with the aim of minimizing its production cost. Country B is an alternative for the MNC which has a lower production cost than country A but a higher level of political risk. Different simulation runs are analyzed for various levels of political risk in country B. That is, difference scenarios are considered depending on whether country B is Switzerland (Risk

prob: 0), Romania (Risk prob: 35), Israel (Risk prob: 50), or Pakistan (Risk prob: 85). In each case, the impact of probability on the cost of political risk is observed over time. Figure 26 shows the results of these simulations. The cost of political risk for operating in Switzerland is zero because the probability of political instability is zero⁶. Therefore, Switzerland is seen as a stable country by an MNC and the cost of political risk as plotted over time stays steady at level 0.

Figure 26: Comparative Cost of Political Risk

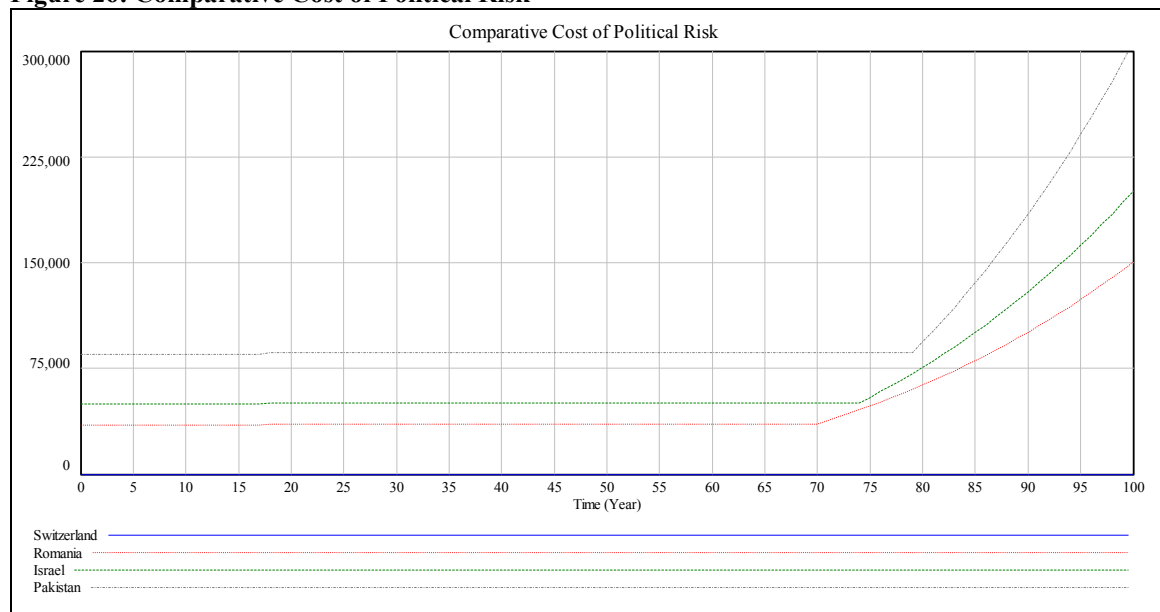


Figure 26 also shows the cost of political risk for an MNC operating in Romania (35% political risk probability), which has a higher level of political risk than Switzerland. The comparative cost of operating in Romania is substantially higher than operating in Switzerland. It can be seen that the maximum cost of political risk for operating in Romania is around 150,000 monetary units during the 100 months of the simulation.

⁶ The last Swiss expropriation of foreign assets took place in the 14th Century.

The cost of political risk for an MNC operating in Israel is also shown in the same graph. Israel has a higher political risk probability (50%) than either of the two foreign countries. The maximum cost of political risk for operating in Israel during the 100 months of the simulation is considerably higher (around 200,000) than that of Romania.

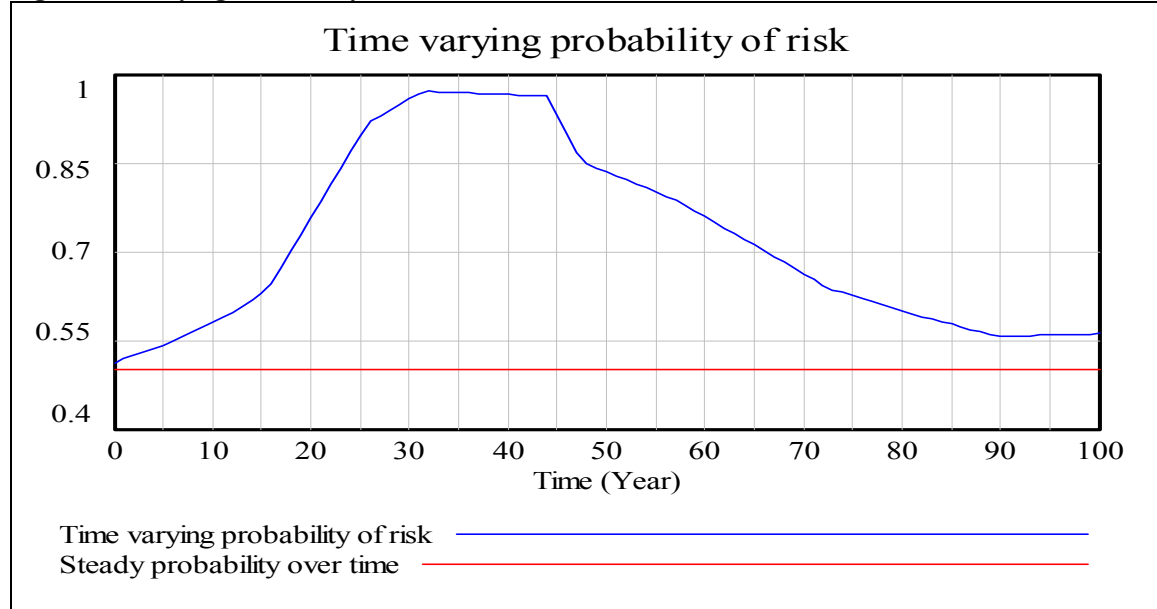
The cost of political risk for operating in Pakistan (risk probability of 85%), the country with the highest political risk in the sample is also plotted. Clearly the cost of operating in Pakistan is the highest with a value of 300,000 monetary units. This is substantially more than that all of the above cases combined.

From the above simulations it can be inferred that the model performs as expected. That is, the cost of political risk for operating in a country increases with the probability of political risk in that country. The maximum cost due to political risk incurred in a country will be proportional to the political risk probability in that country. MNCs desiring to keep their political risk costs at a minimum tend to choose those countries where the probability of occurrence of an adverse political event is low.

The model is useful for examining a number of alternative scenarios for an MNC manager. To illustrate the robustness of the model, a simple variation has been introduced. For instance, in all of the above simulations, the probability of political risk is assumed to be constant over time. This assumption can be modified to reflect a time varying risk which better reflects real life conditions. The impact of a time varying risk on the cost of operating can easily be observed in the simulation. Let us consider that country B is Israel and that an MNC's senior management believes that political risk in Israel is not a steady value but shifts away from a steady value over time. Specifically, political risk initially increases for 35 months due to heightened political activity, and

then begins to decline after 40 months. Figure 27 shows a graph of this varying probability over time.

Figure 27: Varying Probability



The simulation of time-varying political risk in Israel has costs which vary over time as expected, which is shown in Figure 28. The base case of a steady probability of political risk is also illustrated in the graph for comparison. Compared to the base case, the varying probability creates a greater variation in the cost structure and can have direct implications for the firm's profitability. This kind of model provides a priori knowledge about the varying cost structure for the MNC in the host country. It is a value addition insofar as it helps to avoid surprises and would place management in a better position to deal with political risk. In the example under discussion, Table 1 shows the descriptive statistics for the cost of political risk with time varying probability. On average, the cost of political risk has increased by 41.9% from the base case. The maximum deviation is of 94.2% from the base case and occurred at time 32. The minimum deviation from the base case is 2.2% and occurred at time 1. The standard deviation is 33%.

Figure 28: Cost of operating in Israel with varying probability of risk

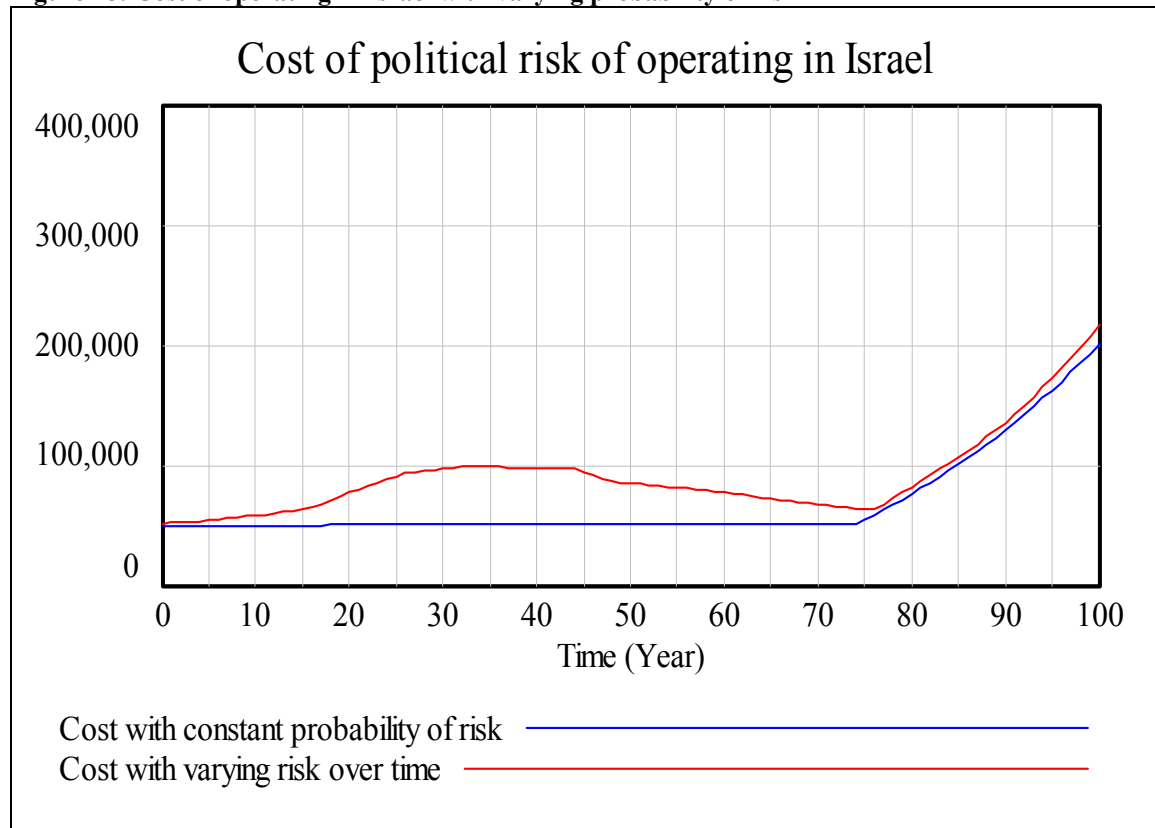


Table 1: Descriptive Statistics of cost of operating in Israel (Time-varying probability)

<i>Cost of political risk in Israel with varying probability</i>	
Mean	41.9%
Median	36.3%
Standard Deviation	33.0%
Sample Variance	10.9%
Minimum	2.2%
Maximum	94.2%

Sensitivity of level of investment in the country to political risk

The second set of simulations was performed to analyze the sensitivity of the level of investment in a host country to the level of political risk in the country. That is, if a country is seen as more risky then what is the level of investment that is received by the country as compared to a country that is seen as a more stable one. A priori, it is expected

that the level of investment would increase with decreasing political risk and also the investment would increase at a much earlier time period in the stable country.

Figure 29: Impact of Probability on level of investment in host country

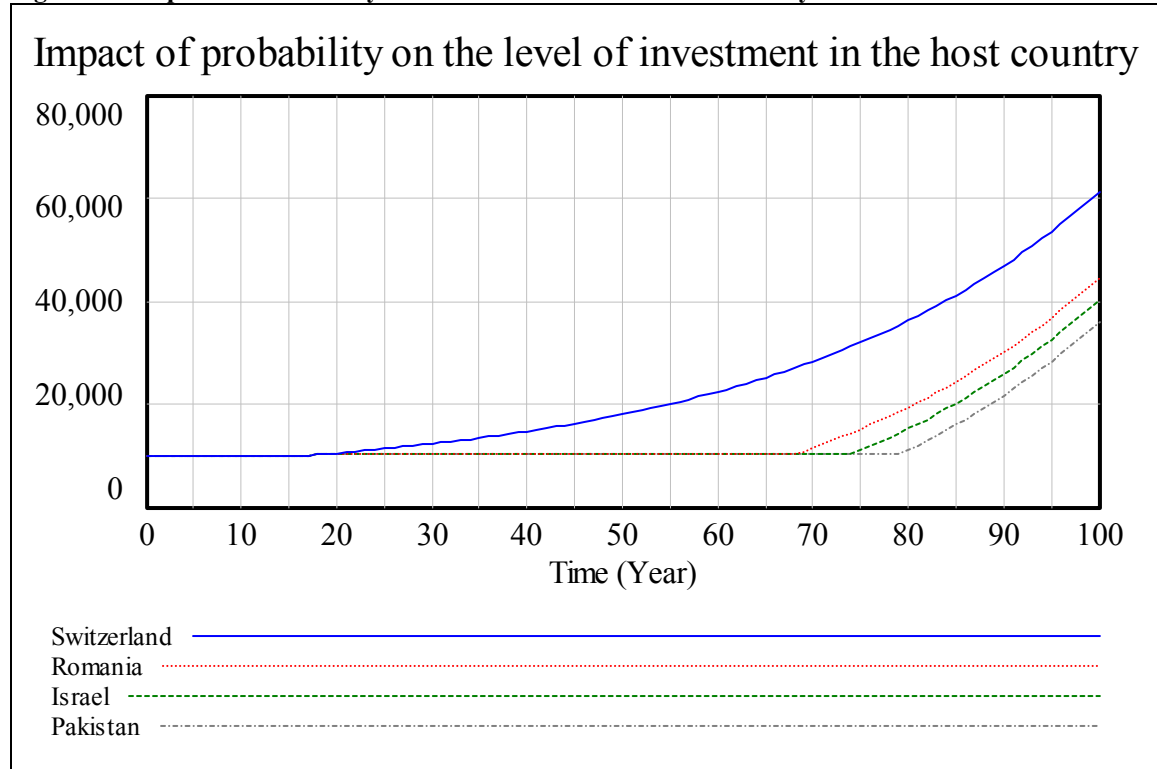


Figure 29 shows the growth of the asset at risk for an investment in the host country over a simulation period of 100 months. Since the political risk of Switzerland is very low, the MNCs have an uninterrupted investment pattern starting at time 20. The maximum level of investment in Switzerland is around 60,000 monetary units. Compared to the investment level of Switzerland, the maximum level of investment received by Romania (risk prob: 35) is considerably less. Romania's maximum level of investment is around 44,000 monetary units and the investment begins to pick up only at time 70. Israel is much more risky than Romania, and again receives further less investment (40,000 monetary units). The investment in Israel begins to accelerate only in year 75, which is much later than either of the above two cases. Figure 29 also plots the level of investment

in Pakistan. Compared to the investment level of Switzerland, the maximum level of investment in Pakistan is very low at 36,000 monetary units. Further Pakistan's investment begins to increase only at time 77, which is much later than all of the previous cases.

From the above simulations, it can be concluded MNCs tend to increase the level of investment in a foreign country at a much earlier time period in a less risky country and that MNCs are willing to wait and invest later when dealing with a volatile environment.

ii) Impact of Learning

The above simulations have shown the impact of political risk on the level of investment and the impact of risk probability on the cost of political risk to a firm. An opposing force exists that can help to minimize or lessen the impact of political risk. This effect is the impact of learning by MNCs that helps to reduce the impact of risk probability and also increases the level of investment. The following set of simulations shows these impacts.

Figure 30 shows the impact of learning on the cost of political risk for an MNC operating in Romania. Two cases of learning are plotted in figure 30. The dotted line shows the cost of political risk with a 20% learning rate and the continuous line represents the cost of political risk with an 80% learning rate. Clearly, with increased learning, the cost of political risk of operating in Romania declines with an increased rate of learning.

Figure 30: Impact of learning on the cost of political risk of operating in Romania

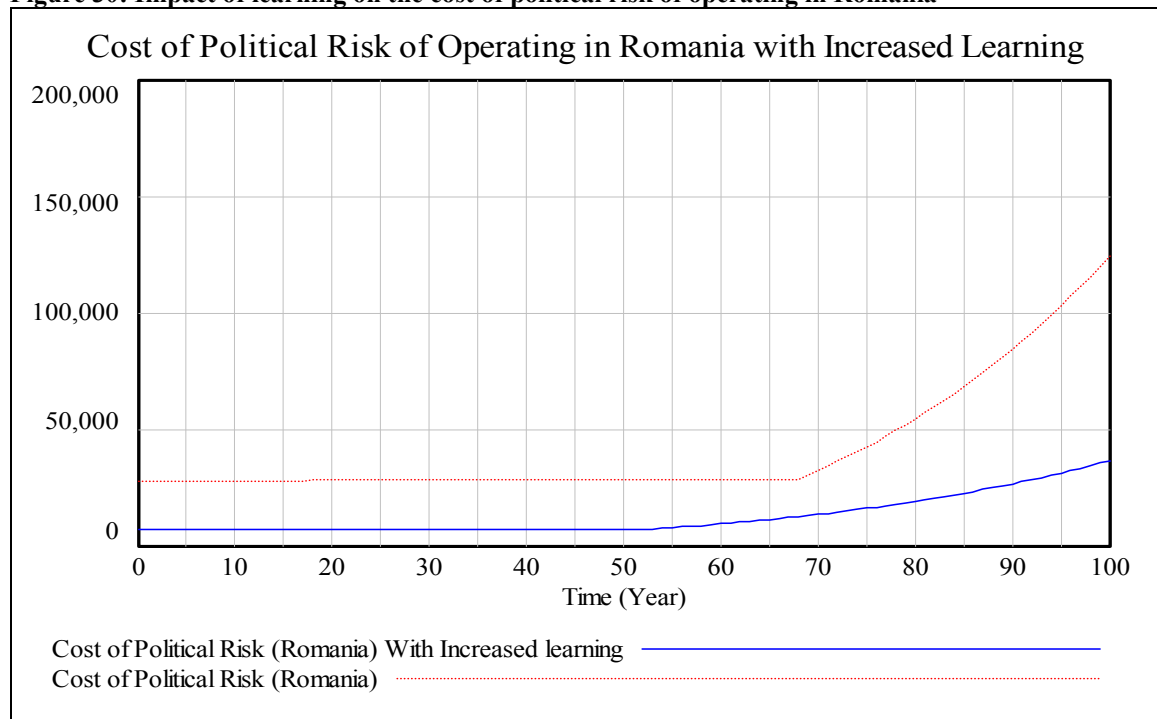


Figure 31: Impact of learning on the level of investment in Pakistan

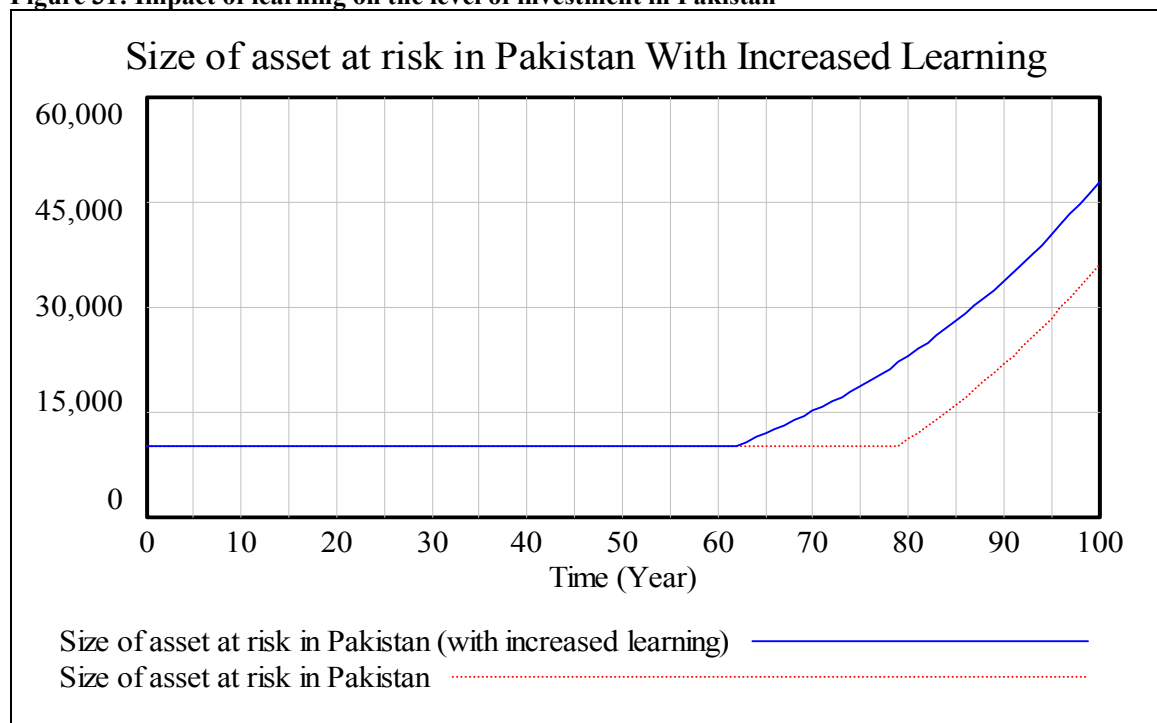


Figure 31 shows the impact of learning on the level of investment in the most risky country in the sample, Pakistan. As before, two learning rates are plotted on the

same graph. The dotted line shows the impact at a learning rate of 20% and the continuous line shows the level of investment over time at a learning rate of 80%. The higher rate of learning provides an increased level of investment at a much earlier time period than the 20% learning rate.

The impact of political risk can be treated as a cost of doing business globally and this cost adds to the overall transaction cost. The loss for the firm due to political risk depends on the probability of occurrence of the event and the severity of the event. Severity again depends upon the size of the asset at risk and the loss impact multiple. When MNCs make an investment it is not only the immediate investment that is at risk but there are also other factors, such as reputation, goodwill, morale, and other intangibles assets. The actual monetary loss rising from political risk can be much more than the physical investment. This effect is captured in the loss impact multiple. The other balancing force that helps to neutralize the impact of political risk is the impact of learning. As firms spend more time and allocate more resources to form friendly business alliances with local groups and governments, they become more adept at doing business in the local environment and can gain a competitive advantage. This helps them to better handle political risk. Given a rate of learning and a loss impact multiple, it has been found in simulation that a) the cost of political risk to a firm increases with the increasing probability of risk and b) countries with a high probability of risk do not retain a high level of investment from MNCs. Countries with a low probability of political risk retain a high level of investment and also receive this investment in a much earlier time period. Further, the rate of learning by MNCs presents an added dimension in the sense that the impact of political risk on costs can be reduced and also the level of investment can be

increased with increased learning. With appropriate leaning behaviors, MNCs can choose to move their production to risky locations and aim to increase their rate of learning to decrease their operating costs.

INTEGRATION OF THE THREE COMPONENTS

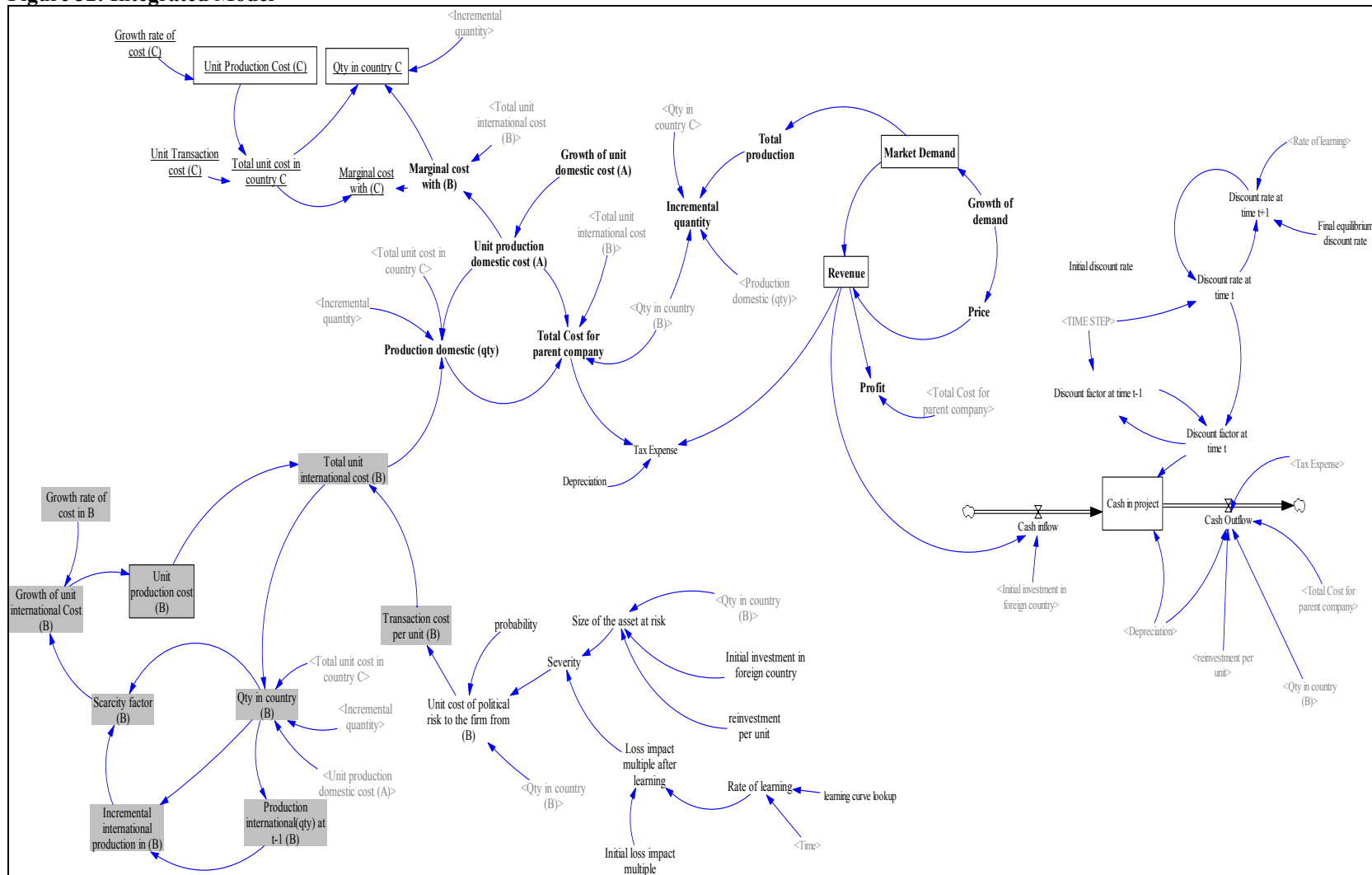
The models discussed so far in this thesis examined the impact of learning, the choice of production location decision, and the impact of political risk in isolation. The simultaneous impact of all the three components is discussed in this section. This integrated model gives a holistic perspective to the study of the impact of political risk on an MNC's choice of manufacturing location in the presence of political risk and learning.

Various interactions can be observed in the integrated model. A brief description of the integrated model is given below followed by a discussion of the simulation results. Figure 32 shows the complete model with all of the components integrated into a single model. Here an MNC that is operating in a home country is considered. As discussed previously, this MNC operates in the manufacturing sector and serves local demand. The MNC seeks to optimize its production costs by seeking an alternative location to which they can shift all or part of their manufacturing.

The excess demand is shifted to the international location if the total international cost of manufacturing (including transaction cost) is less than the total cost of domestic production. Country B and Country C are the alternatives available for the MNC. Country B although attractive, has a constraint that the available resources are small and therefore scarcity of resources will set in following continued operations. Further, country B is seen as a politically risky country. The cost of operating in country B therefore increases after some point in time because of political risk. The monetary loss

for the MNC due to political risk arises from damage to both tangible and intangible assets in the country.

Figure 32: Integrated Model



Political risk is modeled as a part of the transaction costs for doing business in country B. As the quantity of production increases in country B, the amount of assets at risk due to political risk increases, and this increases the cost of doing business. The learning curve module is also integrated and accounts for some reduction in risk as a result of learning in the foreign operating environment. Different levels of learning are explored in the simulation. Firm learning helps to reduce the cost of doing business and also reduces the excess risk discount premium that is charged when analyzing overseas project returns.

The simulation model is designed to select the cheapest manufacturing location for the MNC, taking into consideration the impact of political risk and the impact of learning. In order to understand the interaction effects of learning and political risk on the MNC four different scenarios were considered, varying the level of risk of the host country and the rate of learning of the MNC (Table 2). In the following cases, Pakistan with a risk level of 80% is considered as a country with high political risk and Romania with 30% risk is considered as a politically low risk country. An 80% learning rate by the MNC is considered as a high learning rate and a 30% learning rate is considered as a low learning rate.

Table 2: Framework for analyzing the impact of risk and learning

		Learning	
		Low	High
Risk	Low	Case 1	Case 3
	High	Case 2	Case 4

Case 1 represents the scenario of an MNC with a low level of learning (around 30%) considering expansion into a low risk country such as Romania (30% risk). Case 2 considers the same MNC with low level of learning (30%) expanding into a high risk

area such as Pakistan (80%). Case 3 considers an MNC with high levels of learning (80%) considering expansion into a low risk country, Romania (30%) and case 4 represents an MNC with high capacity for learning (80%) considering operating in a high risk country, Pakistan. In each of the above cases, the cost of political risk for operating in the country and the level of investment received by each country is observed.

Combined impact on the cost of political risk of operating in host country

It can be seen that the best case scenario is case 3 where a high learning MNC invests in low risk environment. This is consistent with a priori expectations. Similarly, the worst case scenario where the MNC's cost is highest is case 2 where a slow learning MNC is operating in a high risk environment. It can be inferred that an MNC could keep its operating costs at a minimum by choosing to invest in a low risk country. However, the firm does not gain much if the rate of learning is slow. Also, comparative cost advantages may not be as readily available in developed low-cost environments. Hence, in the choice of location selection, it is not enough to analyze only the risky nature of the environment but one has to also pay attention to the learning capabilities of the MNC. From an MNC's perspective, substantial efforts need to be directed towards monitoring and improving organizational learning.

Figure 34 shows the graph of the cost of political risk for the MNC in all four cases. As shown before, the cost of political risk for operating in a host country declines with an increased learning (comparing case 1 with case 3 and case 2 with case 4). Also, given the same level of learning, the maximum cost of operating in a country increases with an increased level of risk (comparing case 1 with case 2 and case 3 with case 4). It is expected that the best scenario, that is a scenario where the cost of political risk of

operating in a host country is minimum, would be the case of a high learning MNC operating in a low risk environment.

Figure 33: Combined impact of learning and political risk on cost

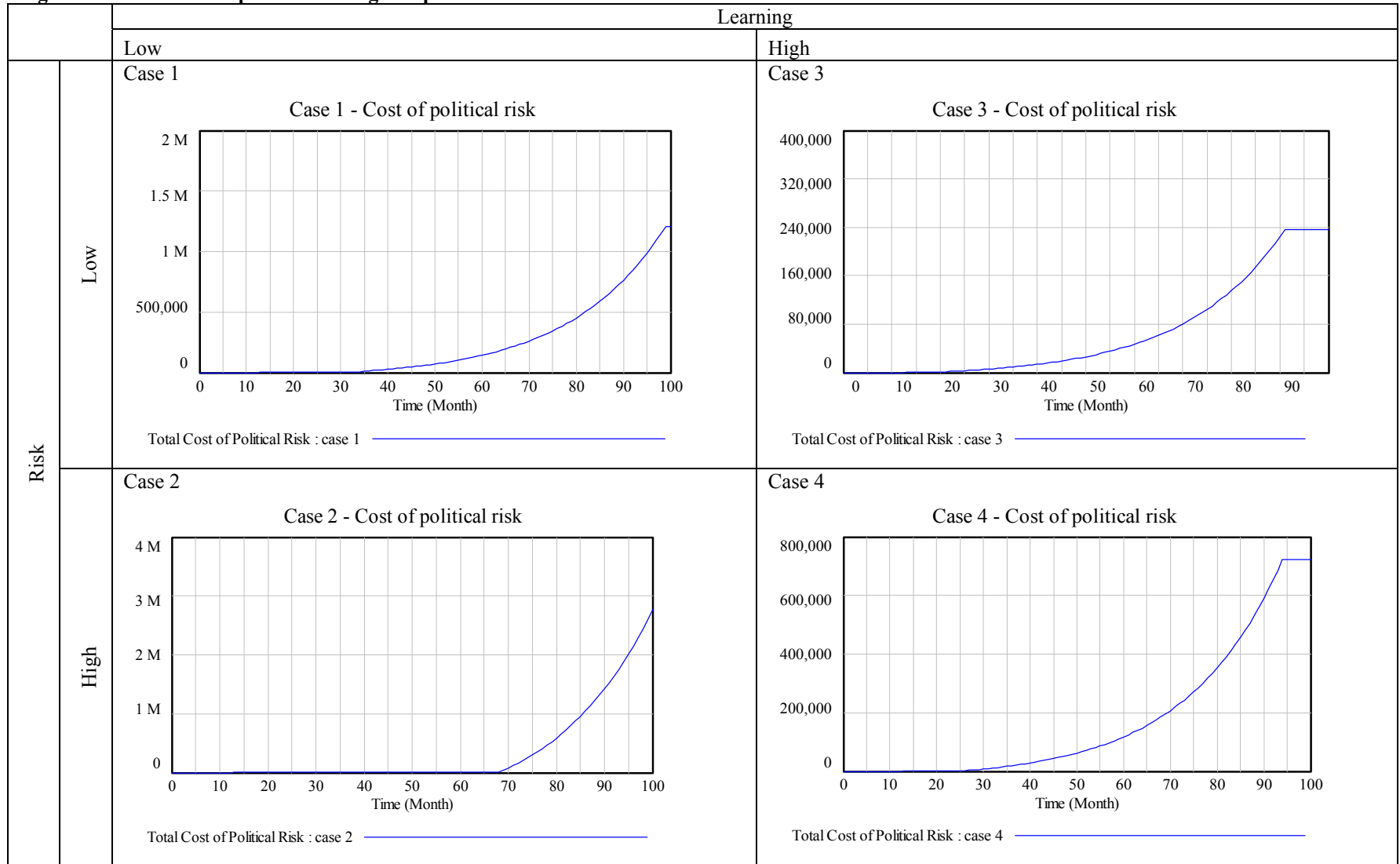
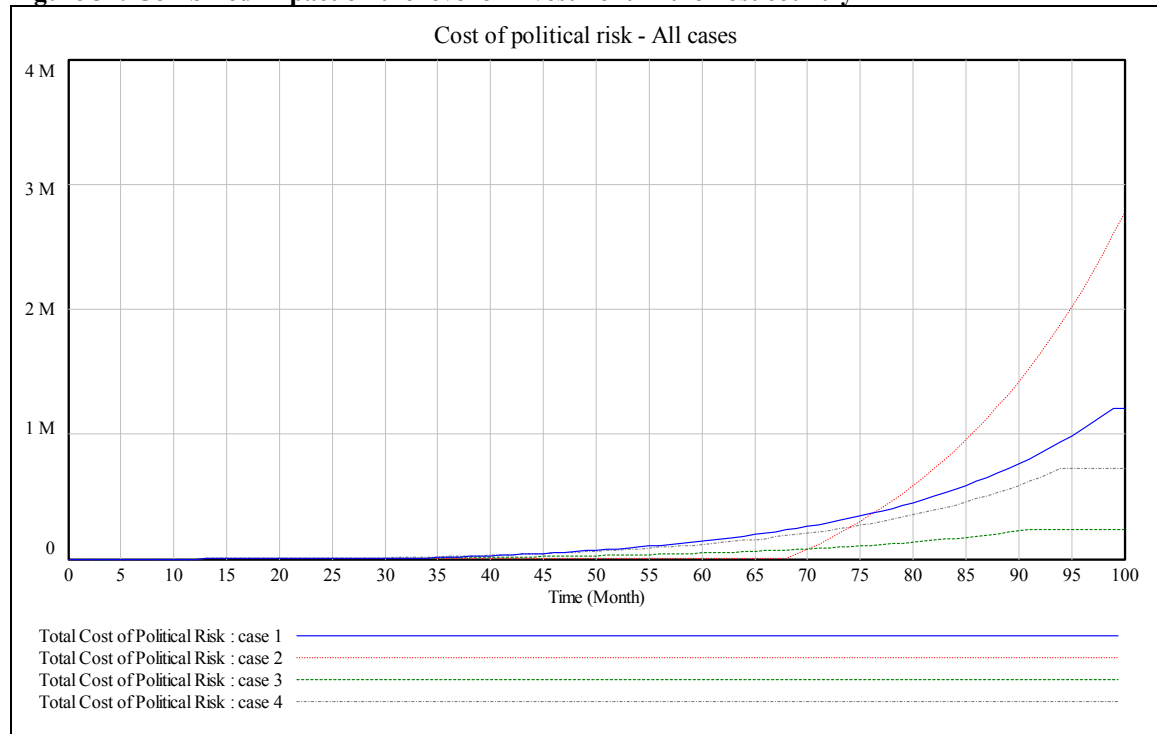


Figure 34: Combined impact on the level of investment in the host country



Combined impact on the level of investment in the host country

The combined impact of learning and political risk on the level of investment in the host country is analyzed next. Figure 36 shows the graph of the level of investment in each of the above cases. Figure 37 graphs the level of investment of all the cases in a single graph. As the risk level increases, the time at which the host country receives investment also increases. From table 3 we can see that in case 1 the level of investment begins to increase at month 32 whereas in case 2 (which is more risky) the level of investment only begins to increase at time 69. Similarly, when comparing case 3 and case 4, case 3 receives investment at time 19, whereas case 4 receives investment only in time 26.

Table 3: Timing and Size of investment

Variable	CASE 1	CASE 2	CASE 3	CASE 4
Timing of Investments	32	69	19	26
Size of the Asset	3116	14096	2101	2567

An interesting data point is the maximum level of investment received by the host country in each case. Although the investment in risky countries is delayed, these countries get a higher level of investment than the less risky countries presumably due to the kind of cost advantages discussed previously. For example, comparing case 1 and 2, the maximum level of investment received by the host country in case 2 is higher than the maximum level of investment received in case 1. Similarly, the maximum level of investment received by the host country in case 4 is more than the maximum level of investment received by the host country in case 3.

Figure 35: Size of the MNC over time

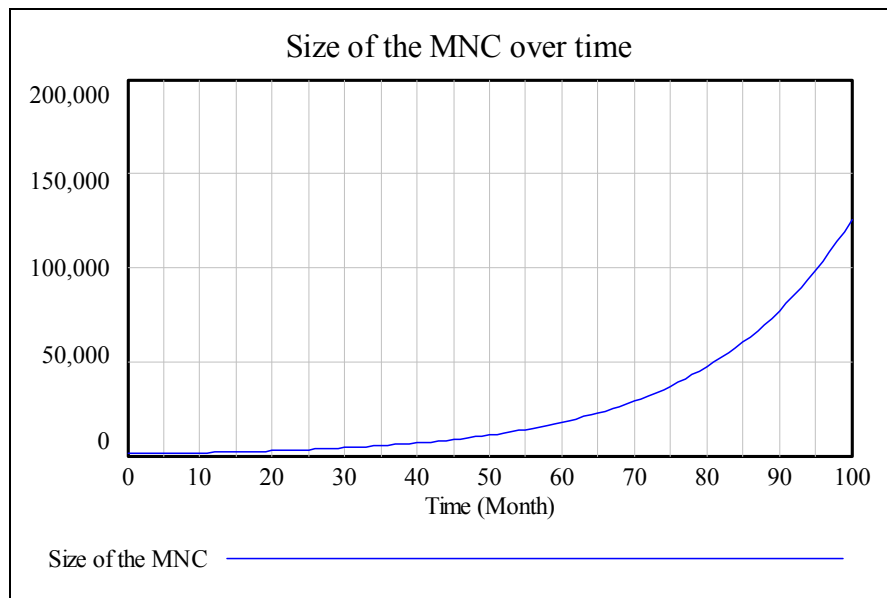


Figure 35 shows the economies of scale effect. That is, when an MNC's operations are small, it makes economic sense to invest in a low risk country. However, when the host country is more risky, shifting to an international location makes economic sense only when the size of the MNC is large.

The total number of quantities produced by the MNC, which is an indicator of the size of the MNC over time, is shown in Figure 35. In case 2, the MNC's level of investment in the host country picks up at time 69. At this time the size of the MNC is around 30,000 units. However, in case 3, the MNC entered into the host country at time 19 but the size of the MNC was only 1400 units. Therefore when the host country is risky, MNCs can invest only at a later time when they have grown in size. The size of the MNC gives a scale advantage for investments in high risk countries which cannot be exploited by smaller companies.

Figure 36: Combined impact on the level of investment in the host country

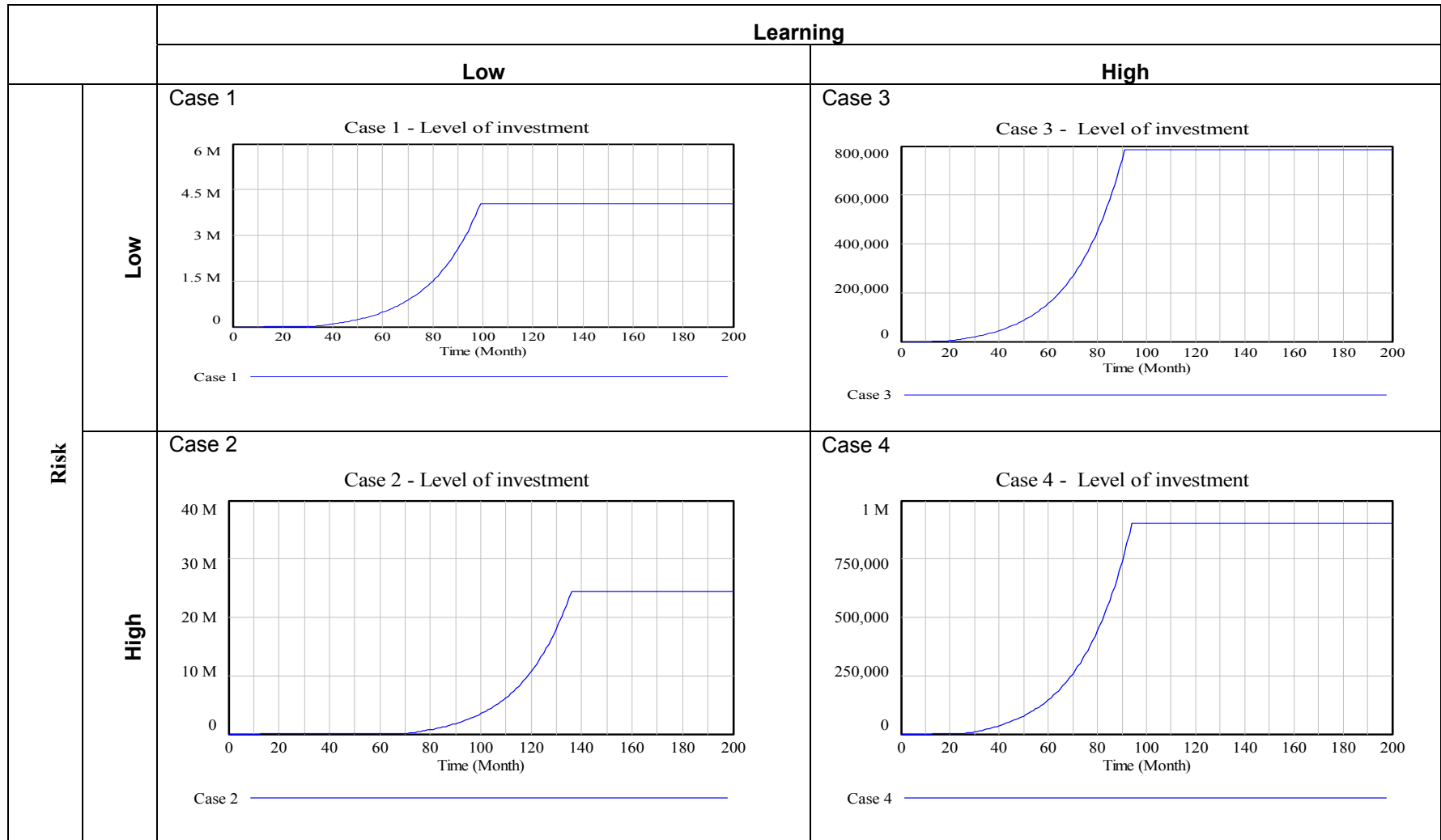


Figure 37: Combined impact on the level of investment

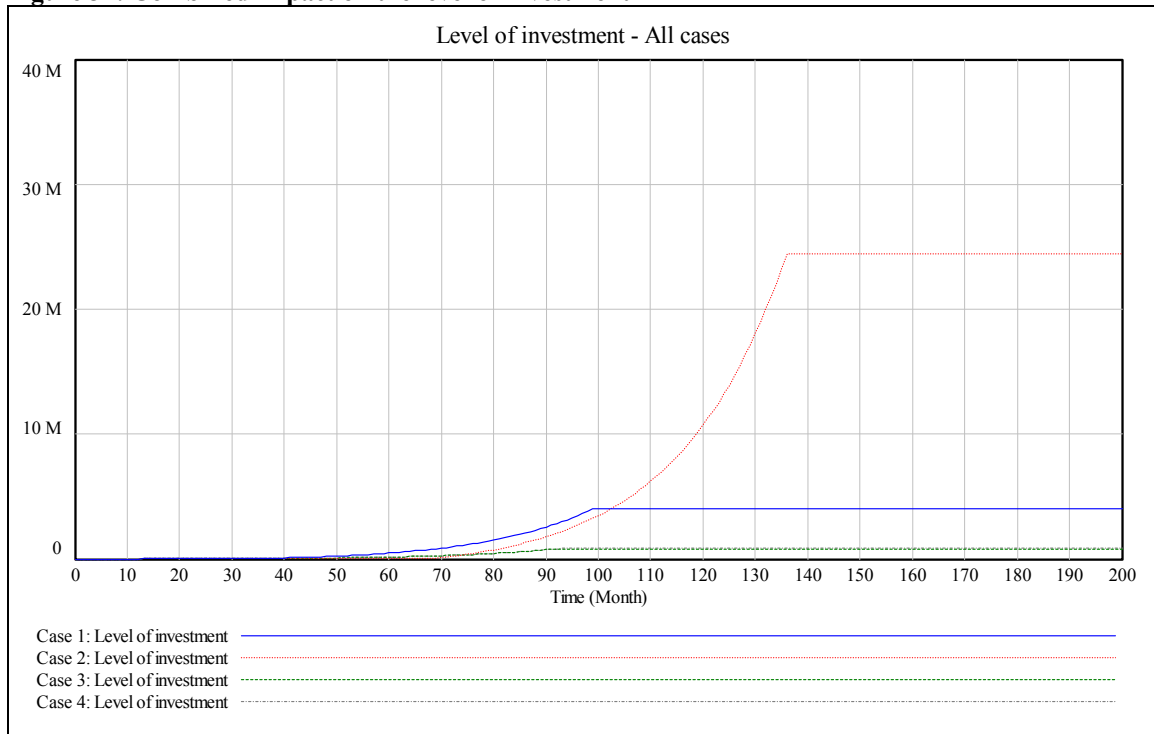


Figure 38: Time varying rate of learning

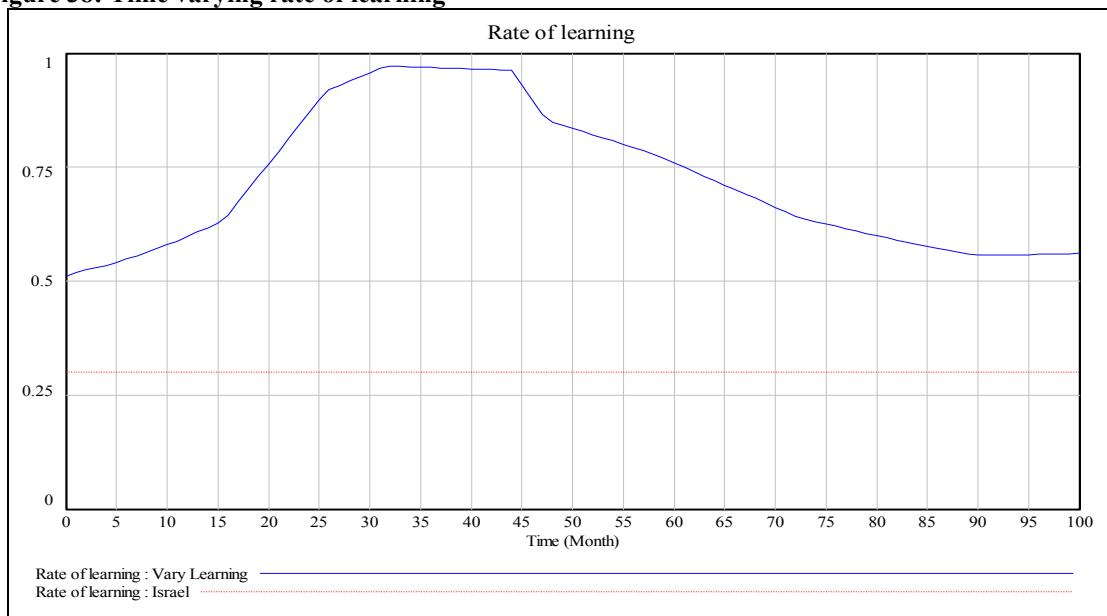


Figure 39: Impact of variable learning on cost of political risk

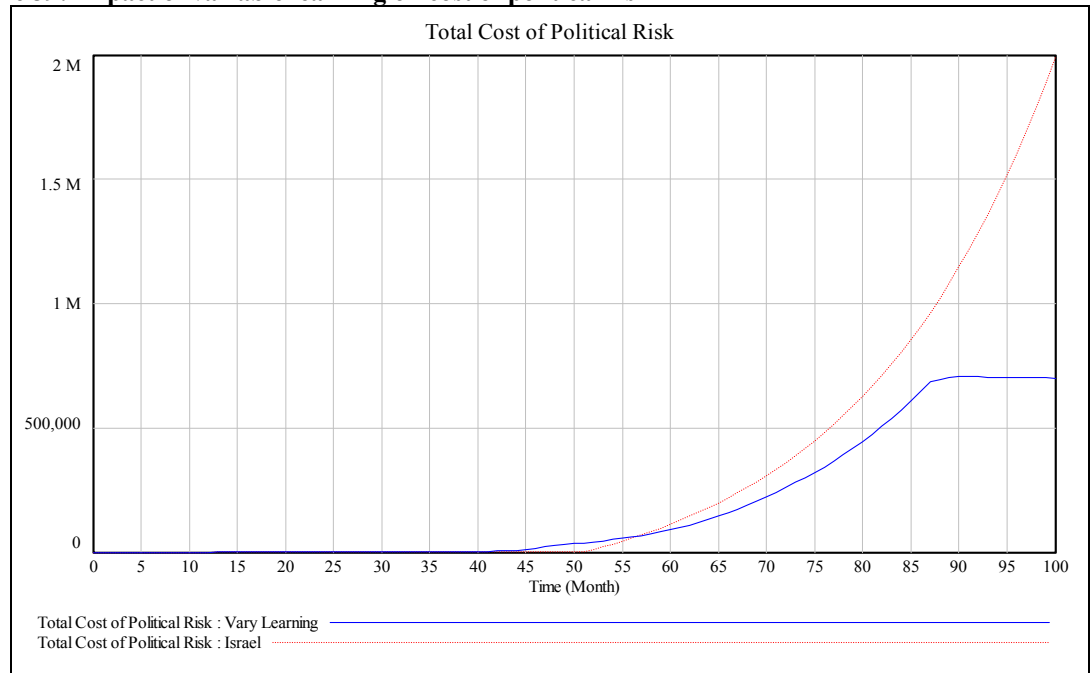
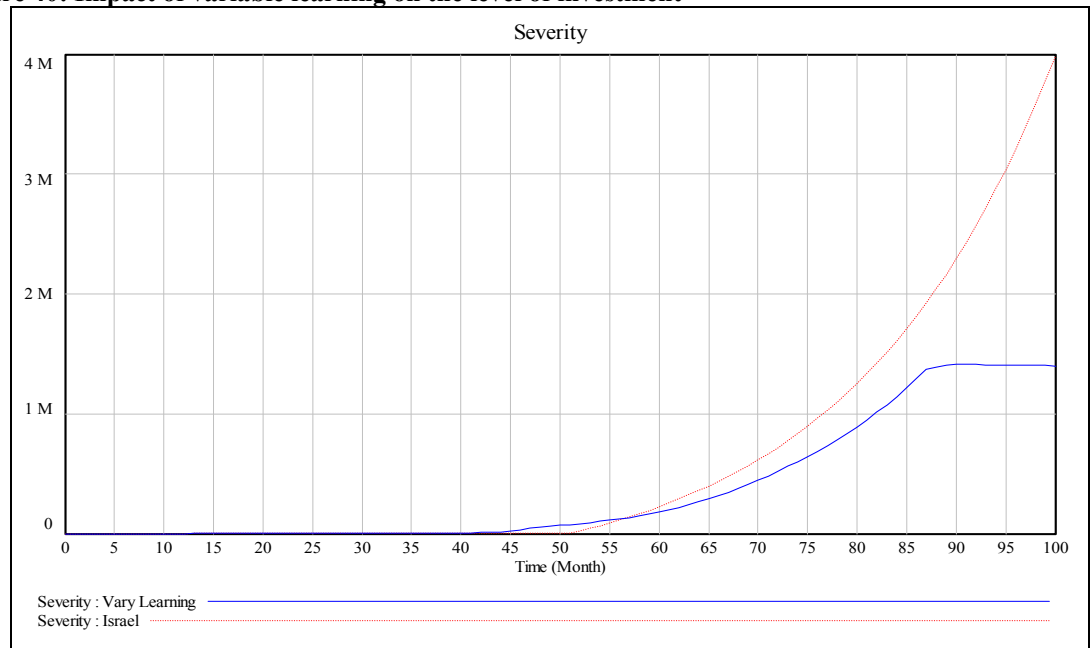


Figure 40: Impact of variable learning on the level of investment



The impact of a variable learning rate

The above simulations were based on a steady learning rate for the MNC. A slight modification is introduced by employing a variable learning curve and the combined impact of learning and political risk are observed on the process of location selection. For this simulation, Israel was chosen as the host country. The rate of learning was assumed to increase over time up to a certain point (time 30) after which time the learning rate decreases (from time 45 onwards) and reaches a steady state. Figure 38 shows the graphical representation of a varying learning rate over time compared with the base case of steady learning.

The impact of varying the learning rate on the cost of political risk in country B and the level of investment received by country B are observed over time. Figure 39 shows the impact of varying learning rate on the cost of political risk and Figure 40 shows the impact on the level of investment in country B along with the respective base cases. With a variable learning rate, the cost of political risk in country B increases over time from time 45 (this is the time when the learning rate begins to decline) onwards and after time 85 country B becomes unattractive and investment shifts to country C.

CHAPTER 5

CONCLUSION

With the increasing complexity of the FDI process, managers need more sophisticated tools to analyze investment decisions. Traditional management techniques, concepts, and tools cannot sufficiently respond to the increased expectations of business, financial and policy organizations, which have to deal with complex decisions and time and cost constrained projects. Earlier studies in the area of foreign direct investment have analyzed FDI decision making from fundamental perspectives such as risk, cost, and quality. However, they have all dealt with the problem of FDI investment in a linear fashion, and have studied the impact of the various decisional factors in isolation. With an increase in both the size and complexity of FDI projects, the number of stakeholders has increased and there is a concomitant need for a broader common language to foster communication. A higher level framework which can still be of practical use for managers is thus needed to understand and explain the dynamics behind the FDI process.

The goal of this thesis was to build a practical tool for the managers of MNCs which could enable them to foresee the impact of their policy decisions in a holistic perspective. The tool is designed to allow managers to model the world in a risk free environment. While this cannot be a substitute for real world experience, it nevertheless adds value to the decision making process. A simple problem was chosen, where an MNC was engaged in manufacturing and was on the lookout for alternative locations,

which could serve their excess demand in local markets. A simple model of two countries was chosen, resource constraints were established, and a simulation model was built that would allow a domestic company to choose the production location which was the most cost effective at any given point in time. Clearly, the decision of selecting a production location involves the interaction of more factors than manufacturing cost alone. This thesis was limited to exploring the impact of learning and the impact of political risk on the location decision.

The key findings of the thesis follow. First, the cost of political risk for operating in a host country increases with an increasing probability of political risk. A country with high political risk receives investment at a much later stage than a country with lower political risk. Therefore from a country perspective, policy decisions aimed at reducing the cost of political risk (treated as a part of transaction cost) would help those countries to receive FDI at an earlier stage in the investment process and in their development process. These countries need to focus on institution building and reduce the overall transaction cost for MNCs in order to attract high levels of FDI. The second finding concerns the impact of learning on political risk. Learning helps to reduce the cost of political risk of operating in a host country. Also, when learning is increased, MNCs can begin their international expansion at an earlier time period compared to MNCs with lower levels of learning. Therefore when faced with alternative choices for manufacturing location MNCs cannot decide solely on the level of risk of the host country. That is if country A is less risky than country B then an MNC deciding to go to country A does not

guarantee a lower operating cost over time (which has a direct bearing on the profitability of the firm). It was shown via simulation that a fast learning MNC achieves lower operating costs than a slow learning MNC, irrespective of the risk level of the host country. In this case, it was shown that the choice of location does not rest solely on the risk level of the target country. Under conditions of increased levels of learning, MNCs can still gain by moving to high risk locations. Hence an important factor for determining the success (i.e., lower operating costs) of the operation is the rate at which the MNC can learn and adapt itself to the foreign environment. As a result monitoring an MNCs learning ability is crucial and must form an integral part of their strategy. More sophisticated tools have to be developed to capture the dynamics of organizational learning. Monitoring can occur by developing metrics through techniques such as the Balanced Scorecard to measure learning at every level of the organization along a variety of different dimensions. For example, cultural learning, learning to manage the time necessary to get through the local bureaucracy to sanction a contract, or the rate of increase in the number of local employees are some typical measures of organizational learning. When monitored over time, an MNC can increase its learning rate throughout the organization. Because of this, when considering foreign direct investment decisions, it pays for the organization to invest up front to learn about its foreign environment. This up front investment can greatly reduce the cost of doing business in an international location over time. The last finding of the thesis is that although risky countries receive delayed investments, the magnitude of investment is substantially higher than in the low risk countries. This finding implies that when a cheaper alternative is found but the level of risk is high, smaller MNCs cannot readily take advantage of the cost difference because

of their small size. It would make economic sense for smaller MNCs to invest in low risk countries. Only MNCs with large capitalization can take advantage of the low cost resources in a high risk host country. As a result, it does not make economic sense for smaller MNCs to invest in high risk areas. The development of the simulation model incorporating feedback mechanisms is a novel methodological contribution of this thesis. The simulation model developed here allows the user to change their assumptions (such as the growth rate of cost, the level of political risk, the rate or shape of the learning curve) and observe the impact of these changes on location choice. A firm specific analysis can be undertaken using this model. Hence, it is a practical as well as a theoretical tool for managers which can significantly improve FDI decision making.

APPENDIX

a. LEARNING CURVE - MODEL PARAMETERS

<u>Model Variables</u>	<u>Model Constants</u>
$R_{t+1} = R_t * (1 - \alpha)$	$\alpha = 20\%$
$DF_t = DF_{t-1} * (1 + \text{Max}(R_t, R_{eq}))$	$R_{eq} = 5\%$
$CIP = (C_{inf} - C_{outf} + D) / DF_t$	$Ro = 16\%$
$C = 0.9 * \rho$	$\sigma_0 = 1\%$
$C_{outf} = C + D + \tau$	$D = 6000$
$\tau = (\rho - C - D) * 0.34$	$P = 2000$
$\rho = S * P$	
$C_{inf} = \rho + I_0$	
$S = 100 + \int_{t=0}^{20} \sigma_t * S_t dt$	

Symbols used in the model and explanation

<u>Symbol</u>	<u>Variable</u>	<u>Symbol</u>	<u>Variable</u>
R_{t+1}	Discount rate	α	Rate of Learning
DF_t	Discount Factor	R_{eq}	Equilibrium discount rate
CIP_t	Cash in project	Ro	Initial discount rate
C	Cost	σ_0	Growth rate of sales
C_{outf}	Cash outflow	D	Demand
τ	Tax expense	P	Sales Price
ρ	Revenue		
C_{inf}	Cash inflow		
S	Total Sales		

b. CHOICE OF PRODUCTION LOCATION – MODEL

PARAMETERS

<u>Model Variables</u>		<u>Model</u>
		<u>Constants</u>
$Q_{dom,t} = \int d(Q_t)$ $\text{If } ..(U_A < TU_B) \text{ And } (U_A < U_C)$	$\delta(Q) = P - (Q_{dom} + Q_B + Q_C)$	$\varsigma_{A,0} = 6\%$
$Q_{B,t} = \int \delta(Q_t)$ $\text{if } ..(U_A > TU_B)$	$\rho = P * MD$	$\varsigma_{B,0} = 1\%$
$Q_{C,t} = \int \delta(Q_t) dt$ $\text{If } ..TU_C < \mu_C$	$MD_t = 1000 + \int M_{t-1} * \nu D_t$	$\varsigma_{C,0} = 3\%$
$U_{A,t} = \int U_{A,t-1} * \varsigma_A$	$\pi = \rho - C$	$\nu_B = 4$
$U_{B,t} = \int U_{B,t-1} * \varsigma_B$	$\chi_{B,t} = \int \delta(Q_{B,t})$ $\text{if } ..(Q_B > 0)$	$\nu_c = 6$
$U_{C,t} = \int \varsigma_{C,t} * U_{C,t-1}$	$P_t = \int P_{t-1} * \nu D_t$	$\nu D = 5\%$
$\mu_B = \text{Min}(U_{dom}, TU_B)$	$TP = MD$	
$\mu_C = \text{Min}(\mu_B, TU_C)$	$C = (Q_{dom} * U_{dom}) + (Q_B * TU_B)$	
$TU_B = \nu_B + U_B$	$\varsigma_{B,t} = (\varsigma_{B,t-1} + 1\%) \text{ If } (\chi > 1\%)$	
$TU_C = U_C + \nu_C$		
$\delta(Q_B) = \frac{Q_{B,t} - Q_{B,t-1}}{Q_{B,t-1}}$		

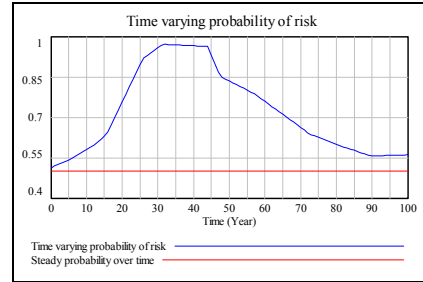
Symbols used in the model and explanation

<u>Symbol</u>	<u>Variable</u>	<u>Symbol</u>	<u>Variable</u>
$Q_{dom,t}$	Quantity of domestic production	$\delta(Q_B)$	Incremental quantity produced in country B
$\delta(Q)$	Total incremental quantity	νD	Growth of demand
$Q_{B,t}, Q_{C,t}$	Quantity of production in country B and country C	$\chi_{B,t}$	Scarcity factor
$\varsigma_A, \varsigma_B, \varsigma_C$	Growth of cost in country A, B, and C	P_t	Price
μ_B, μ_C	Marginal cost for the parent company with respect to cost in country B, and country C	TP	Total Production
U_A, U_B, U_C	Unit production cost in country A, B, and C	C	Total Cost for parent company
ν_A, ν_B, ν_c	Transaction cost in country B and C		
π	Profit		
MD	Market Demand		
ρ	Revenue		
TU_B, TU_C	Total Unit cost of production in country B, and country C.		

c. IMPACT OF POLITICAL RISK ON MNC – MODEL

PARAMETERS

Model Variables	Model Constants
$\Theta = \Theta_0 * (1 - \Lambda)$	$\Theta_0 = 5$
$A_t = I_0 + \int RI_t$	$Pr_0 = 10$
$Q_{int} = \int \delta Q_t$ <i>if</i> $..TU_{int} < TU_{dom}$	$\varsigma_{int} = 10\%$ $\varsigma_{dom} = 5\%$
$\Psi = \Theta * A$	$I_0 = 1000$
$TU_{int} = MC_{int} + T$	$\Lambda = 20\%$
$T = \Phi + E$	$\nu D = 3\%$
$\Phi = P * \Psi$	$E = 5$
$Q_{dom,t} = \int \delta D_t$ <i>if</i> $..TU_{dom} \leq TU_{int}$	$P = 0\%, 35\%, 50\%, 85\% \text{ (OR)}$
$RI = \delta Q_t * 3$	
$\delta D_t = TP - (Q_{dom} + Q_{int})$	
$\rho = Pr * MD$	



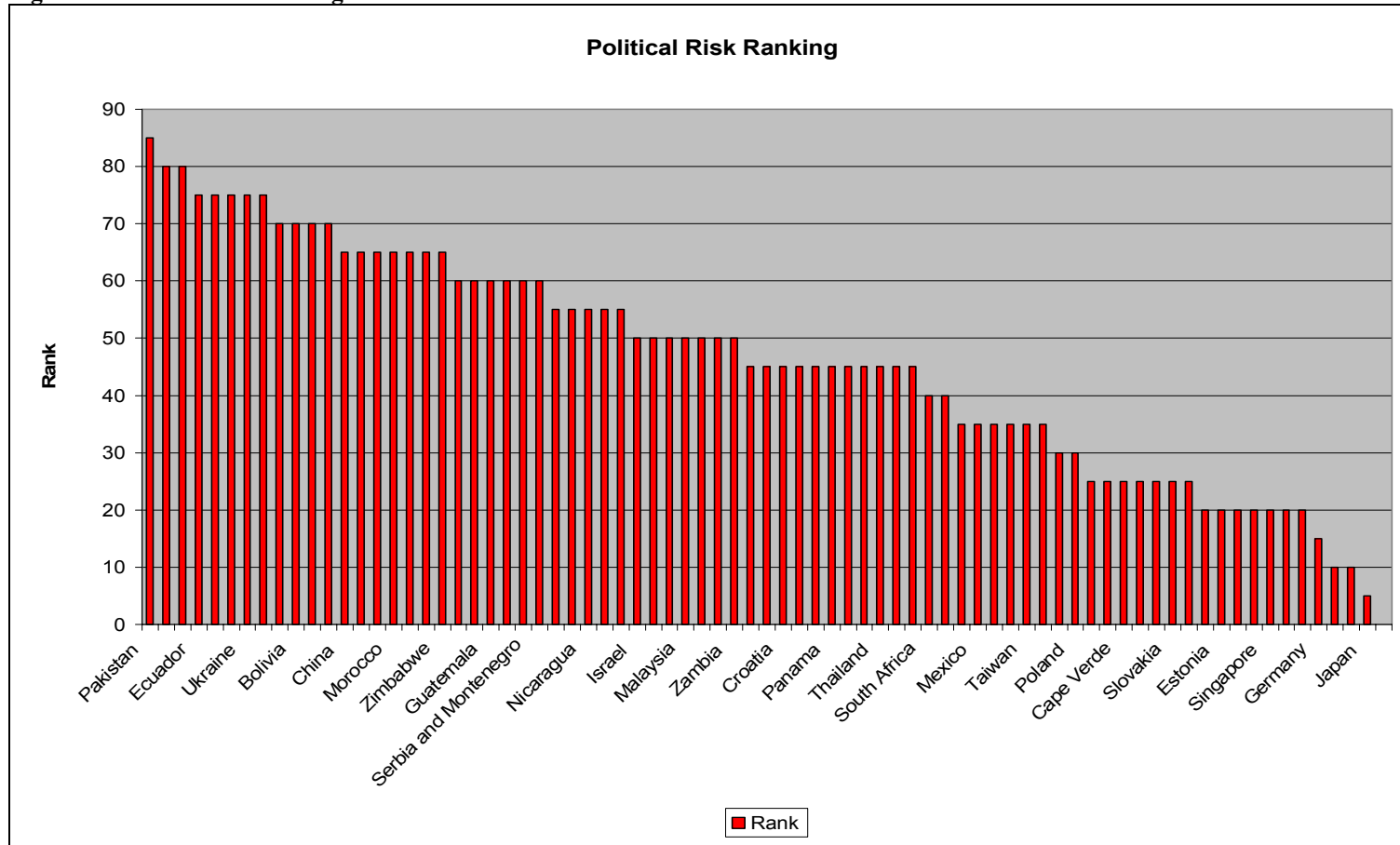
$\delta Q_t = \delta D_t$ $\text{if } \dots TU_{dom} > TU_{int}$ $MC_{int,t} = \int MC_{int,t-1}, * \zeta_{int}$ $TP = D$ $D_t = 1000 + \int D_{t-1} * \nu D_t$ $Pr_t = \int Pr_{t-1}, * \nu D_t$ $\pi = \rho - C$ $C = (Q_{dom} * TU_{dom}) + (Q_{int} * TU_{int})$ $TU_{dom,t} = \int TU_{dom,t-1}, * \zeta_{dom}$	
--	--

Symbols used in the model and explanation

Symbol	Variable
T	Transaction cost
Φ	Cost of Political Risk to the firm
E	Other Transaction costs.
Ψ	Severity
B	Loss Impact Multiple
P	Probability
A	Size of the asset at risk
Θ	Loss Impact Multiple After Learning
I_0	Initial Investment
Q_{int}	Quantity produced internationally
MC_{int}	International Manufacturing cost
TU_{dom}	Total unit domestic cost of manufacturing
TU_{int}	Total unit international cost of manufacturing
RI	Reinvestment
δQ_t	Incremental quantity
δD_t	Excess demand
νD	Growth of demand
Λ	Rate of Learning
TP	Total Production
Pr	Price
ρ	Revenue
D	Demand
$\varsigma_{int}, \varsigma_{dom}$	Growth of international and domestic manufacturing costs
C	Total cost for the parent company

d. POLITICAL RISK RANKING

Figure 41: Political Risk Rating



Source: EIU Views Wire

Table 4: Political Stability Risk Ranking:

The rankings are based on aggregate scores related to Social unrest, Orderly transfers, Opposition stance, Excessive executive authority, and International tensions. The scores are weighted to generate rankings between 0 and 100 with smaller numbers indicating lower risk and higher numbers indicating higher risk

#	Country	Rank	#	Country	Rank
1	Pakistan	85	40	Croatia	45
2	Azerbaijan	80	41	Hong Kong	45
3	Iran	80	42	Indonesia	45
4	Ecuador	75	43	Panama	45
5	Egypt	75	44	Qatar	45
6	Kyrgyz Republic	75	45	Sri Lanka	45
7	Ukraine	75	46	Thailand	45
8	Uzbekistan	75	47	Turkey	45
9	Bahrain	70	48	UAE	45
10	Bolivia	70	49	South Africa	40
11	Nigeria	70	50	Tanzania	40
12	Swaziland	70	51	India	35
13	China	65	52	Mexico	35
14	Ethiopia	65	53	Romania	35
15	Kenya	65	54	South Korea	35
16	Morocco	65	55	Taiwan	35
17	Peru	65	56	Uruguay	35
18	Venezuela	65	57	El Salvador	30
19	Zimbabwe	65	58	Poland	30
20	Algeria	60	59	Brazil	25
21	Equatorial Guinea	60	60	Bulgaria	25
22	Guatemala	60	61	Cape Verde	25
23	Philippines	60	62	Czech Rep	25
24	Saudi Arabia	60	63	Mozambique	25
25	Serbia and Montenegro	60	64	Slovakia	25
26	Honduras	55	65	Spain	25
27	Kazakhstan	55	66	Chile	20
28	Nicaragua	55	67	Estonia	20
29	Oman	55	68	Hungary	20
30	Vietnam	55	69	Italy	20
31	Israel	50	70	Singapore	20
32	Jordan	50	71	Slovenia	20
33	Kuwait	50	72	USA	20
34	Malaysia	50	73	Germany	15
35	Russia	50	74	Costa Rica	10
36	Uganda	50	75	Greece	10
37	Zambia	50	76	Japan	5
38	Argentina	45	77	Switzerland	0
39	Colombia	45			

Source: EIU Views Wire

REFERENCES

- Aharoni, Y. (1966) *The Foreign Investment Decision Process*, HARVARD GRADUATE SCHOOL: BOSTON.
- Aliber, R.Z.1. (1975) 'Exchange Risk, Political Risk, and Investor Demand for External Currency Deposits', *Journal of Money, Credit & Banking*, 7(2):161-179.
- Allen, B.T. (1992) *Managerial Economics*, Harper & Row New York:.
- Baglini, N.A. (1976) *Risk Management in International Corporations.*, Risk Studies Foundation, Inc:NY.
- Bass, B.M., McGregor, D.W. and Walters, J.L. (1977) 'Selecting Foreign Plant Sites: Economic, Social and Political Considerations', *Academy of Management Journal*, 20(4):535.
- Bennett, P.D. and Green R.T. (1972) 'Political Instability as a Determinant of Direct Foreign Investment in Marketing.' *Journal of Marketing Research*, May: 182-186.
- Brewer, T.L. (1983) 'The Instability of Governments and the Instability of Controls on Funds Transfers by Multinational Enterprises: Implications for Political Risk Analysis', *Journal of International Business Studies*, 14(3):147-157.
- Brooke, M.Z. and Remmers H.L. (1970) *The Strategy of Multinational Enterprise*, Longman Group Ltd:London.
- Buckley, P.J. and Casson, M.C. (1976) *The Future of the Multinational Enterprise*, Homes & Meier: London:London.
- Buckley, P.J. and Hashai, N. (2004) 'A Global System View of Firm Boundaries', *Journal of International Business Studies*, 35(1):33-45.
- Carlson, S. (1969.) *International Financial Decisions: A Study of the Theory of International Business Finance.*, Amsterdam, London, North Holland Pub. Co., 1969:.
- Casson, M. (1990) *Enterprise and Competitiveness : A Systems View of International Business*, Clarendon Press; Oxford University Press:Oxford; New York.
- Copeland, T. and Tufano, P. (2004) 'A Real-World Way to Manage Real Options', *Harvard business review*, 82(3):90-9, 128.
- Copeland, T.E. and Antikarov, V. (2001) *Real Options: A Practitioner's Guide*, Texere:.
- Daniels J., Radebaugh L., Sullivan D. (2003) *International Business*, 10th edn, Prentice Hall:NY.

- Dunning, J.H. (1988) 'The Eclectic Paradigm of International Production: A Restatement and some Possible Extensions', *Journal of International Business Studies*, 19(1):1-31.
- Dunning, J. (1993) *Multinational Enterprises and the Global Economy*. Wokingham.
- EIU Viewswire, (2006) *Economist Intelligence Unit*. [www document] <http://www.eiu.com> (accessed Jan 2004).
- Erol, C. (1985.) 'An Exploratory Model of Political Risk Assessment and Decision Process of Foreign Direct Investment', *International Studies of Management and Organization*, Vol. XV(No.2):75-90.
- Fatehi S. and Safizadeh K. and Hossein M. (1989) 'The Association between Political Instability and Flow of Foreign Direct Investment', *Management International Review*, 29(4):4-13.
- Formica, S. (1996) 'Political Risk Analysis in Relation to Foreign Direct Investment : A View from the Hospitality Industry', *The Tourist Review*., Vol.51(No.4):15-23.
- Ghemawat P. (2002), '*How Business Strategy Tamed the "Invisible Hand"*', [www document] <http://hbswk.hbs.edu/item.jhtml?id=3019&t=> (accessed Jan 2004).
- Ghemawat, P. (1985) 'Building Strategy on the Experience Curve', *Harvard business review*, 63(2):143.
- Globerman, S. and Shapiro, D. (2003) 'Governance Infrastructure and US Foreign Direct Investment', *Journal of International Business Studies*, 34(1):19-39.
- Green, R.T and Cunningham, W.H. (1975) 'The Determinanats of US Foreign Investments: An Empirical Examination', *Management International Review*, February(3):113-120.
- Green, R.T and Smith, C.H (1972) 'Multinational Profitability as a Function of Political Instability', *Management International Review*, 6:23-29.
- Haendel, D., West, G.T. and Meadow, R.G. (1975) *Overseas Investment and Political Risk*, Foreign Policy Research Institute:.
- Henderson, B.D. (1974) *The Experience Curve-Reviewed – I, II & III. Why does it Work?*, BCG Publications:Massachusetts.
- Howell, L.D. and Chaddick, B. (1994) 'Models of Political Risk for Foreign Investment and Trade: An Assessment of Three Approaches', *Columbia Journal of World Business*, 29(3):70–91.
- Hymer, S.H. (1976) *The International Operations of National Firms : A Study of Direct Foreign Investment*, MIT Press:Cambridge, Mass.

- Keat, P.G. and Young, P.K.Y. (1992) *Managerial Economics: Economic Tools for Today's Decision Makers*, Prentice Hall:.
- Keegan, W.J. (1974) 'Multinational Scanning: A Study of the Information Sources Utilized by Headquarters Executives in Multinational Companies', *Administrative Science Quarterly*, 19(3):411.
- Kobrin S. (1976) 'The Environmental Determinants of Foreign Direct Manufacturing Investment: An Ex Post Empirical Analysis', *Journal of International Business Studies*, Volume 7(Number 2):29-42.
- Kobrin S. (1984) 'Expropriation as an Attempt to Control Foreign Firms in LDCs: Trends from 1960 to 1979', *International Studies Quarterly*, 28(3):329-348.
- Kobrin, S.J. (1978) 'When does Political Instability Result in Increased Investment Risk?', *Columbia Journal of World Business*, 13(3):113.
- Kobrin, S.J. (1979) 'Political Risk: A Review and Reconsideration', *Journal of International Business Studies*, 10(1):67-80.
- Lessard D (2000) *The Strategic Management of Large Engineering Projects, Shaping Institutions, Risks and Governance*, Massachusetts Institute of Technology:USA.
- Lessard, D (1996) 'Incorporating Country Risk in the Valuation of Offshore Projects', *Journal of applied corporate finance*, Vol 9(No. 3):52.
- Li, Q. and Resnick, A. (2003) 'Reversal of Fortunes: Democratic Institutions and Foreign Direct Inflows to Developing Countries', *International Organization*, 57(1):175-211.
- Loree, D.W. and Guisinger, S.E. (1995) 'Policy and Non-Policy Determinants of U.S. Equity Foreign Direct Investment', *Journal of International Business Studies*, 26(2):281-299.
- Mackenzie S. (2003) 'The Timken Company: Market Entry into Romania (A)', *Stanford Graduate School of Business Cases*, CaseIB-39A.
- Nehrt, L.C. (1970) *The Political Environment for Foreign Investment*, Praeger Publishers:NY.
- Nigh, D. (1985) 'The Effect of Political Events on United States Direct Foreign Investment: A Polled Time-Series Cross-Sectional Analysis', *Journal of International Business Studies*, 16(1):1-17.
- Olibe, K.O & Crumbley, C.L. (1997) 'Determinants of U.S. Private Foreign Direct Investments in OPEC Nations: From Public and Non-Public Policy Perspectives.', *Journal of Public Budgeting, Accounting & Financial Management*, Summer(1):331-55.

- Ostrovsky, A. (2005) *The New Oligarchs? Winners and Losers in the Kremlin's Grab for Oil Wealth*, London Edition 1 edn, Financial Times:LONDON, ENGLAND.
- Pedersen, T. and Petersen, B. (2004) 'Learning about Foreign Markets: Are Entrant Firms Exposed to a "Shock Effect"?', *Journal of International Marketing*, 12(1):103-123.
- Porcano, T.M. (1993.) 'Factors Affecting the Foreign Direct Investment Decision of Firms from and into Major Industrialized Countries.', *Multinational Business Review*, 1(2):26-36.
- Renshaw, E.F. (1979) 'A Note on the Aggregate Learning Curve and CEA Productivity Goals', *Growth & Change*, 10(4):10.
- Rivoli, P. and Salorio, E. (1996) 'Foreign Direct Investment Under Uncertainty.', *Journal of International Business Studies*, 27(2).
- Robock, S.H. (1971) 'Political Risk: Identification and Assessment', *Columbia Journal of World Business*, 6(4):6.
- Rodriguez, R.M, and Eugene, C.E. (1976) *International Financial Management*, Englewood Cliffs: Prentice-Hall:.
- Root Franklin R (1972) 'Analyzing Political Risks in International Business', in: *The Multinational Enterprise in Transition; Selected Readings and Essays*, Princeton, N.J.:Darwin Press, pp. 505.
- Root, F.R. (1968) 'Attitudes of American Executives Towards Foreign Governmental Investment Opportunities', *Economics and Business Bulletin*, January(20):14-23.
- Root, F.R. and Ahmed, A.A. (1979) 'Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries', *Economic Development & Cultural Change*, 27(4):751.
- Rugman, A.M. (1981) *Inside the Multinationals: The Economics of Internal Markets*, London:Croom Helm:London.
- Samii M. and Rajamanickam, M. (2005) *Choice of International Production Locations - Dynamic Perspective*, Working Paper Series edn International Business Modeling Lab Working Paper Series.
- Samii M., Rajamanickam M and Thirunavukkarasu A (2005) 'Learning Curve Effect of Multinationals', *The Journal of Current Research in Global Business*, 7(11):73-82.
- Schneider, F. and Frey, B.S. (1985) 'Economic and Political Determinants of Foreign Direct Investment', *World Development*, 13(2):161-175.

- Schollhammer, H. (1974.) *Locational Strategies of Multinational Firms.*, Los Angeles: Pepperdine University..
- Sethi, D., Guisinger, S., Phelan, S. and Berg, D. (2003) 'Trends in Foreign Direct Investment Flows: A Theoretical and Empirical Analysis', *Journal of International Business Studies*, 34(4):315-326.
- Shapiro, A.C. (1978) 'Capital Budgeting for the Multinational Corporation', *Financial Management (Financial Management Association)*, 7(1):7-16.
- Sparks, C., Bikoi, T. and Moglia, L. (2002) 'A Perspective on U.S. and Foreign Compensation Costs in Manufacturing', *Monthly Labor Review*, 125(6):36.
- Statistics Department, International Monetary Fund (2003) *Foreign Direct Investment Trends and Statistics*, 2003rd edn, International Monetary Fund:Washington.
- Stefan, T. and Nimgade A. (2001) 'Siemens AG: Global Development Strategy (A)', *Harvard Business Case 602061*, (Oct 16):27.
- Stobaugh, R.B. and Jr (1969) 'How to Analyze Foreign Investment Climates', *Harvard business review*, 47(5):100.
- Stonehill, A. and Nathanson, L. (1968) 'Capital Budgeting and the Multinational Corporation', *California management review*, 10(4):39-54.
- Techintgroup.com (2005)'*Techint in the World*', [www document] <http://www.techintgroup.com/> (accessed 06/26 2006).
- The Economist (1986) *Who's on the Skids?* [www document] <http://www.economist.com> (accessed Jan 2004).
- Thunell, L.H. (1977) *Political Risks in International Business*, Praeger Publishers:NY.
- UNCTAD (2005) *World Investment Report: Transnational Corporations and the Internationalization of R&D*, UNCTAD:..
- UNCTAD. (1992) *The Determinants of Foreign Direct Investment: A Survey of the Evidence.*, sales No. E.92.II.A.2 edn, United Nations publication: New York, United Nations.
- Vernon, R. (1971.) *Sovereignty at Bay: The Multinational Spread of U.S. Enterprises.*, New York: Basic Books:NY.
- Vidal, A.W (2005) *Chavez Orders Venezuela Land Title Revision*, London Edition 1 edn, The Financial Times Limited: LONDON, ENGLAND.
- Weston, V.F. and Sorge, B.W. (1972) *International Managerial Finance*, Richard D. Irwin, Inc.:Homewood, IL.

- Wilkin S. and Minor J. (2001) 'Managing Today's Political Risks', *The Risk Management Letter*, 22(6).
- Wilkin, A S. (2003)'*Measuring and Managing Country Risk*', [www document] http://www.aon.com/us/busi/pdf/politicalrisk_prep_prep.pdf (accessed April 26 2006).
- William D. (1972) *Multinational Business Strategy*, McGraw-Hill:New York.
- Woodward, D.P. and Rolfe, R.J. (1993) 'The Location of Export-Oriented Foreign Direct Investment in the Carribean Basin', *Journal of International Business Studies*, 24(1):121-144.
- World Trade Organization (2005) *International Trade Statistics*, 2005th edn, WTO Publications:Geneva, Switzerland.
- Zink, D.W. (1973) *The Politicial Risks for Multinational Enterprise in Developing Countries*, Praeger: NY.