TOPICS IN FOREIGN DIRECT INVESTMENT

Foreign Direct Investment Under Uncertainty: An Options Pricing Strategy

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Introduction

Foreign direct investment (FDI) is one of the fastest growing strategic activities that corporations are pursing around the world. With over $7 trillion in global sales in 1995 – the value of goods and services produced by some 280,000 foreign affiliates – international production outweighs export as the dominant mode of servicing foreign markets. The global FDI stock, a measure of the investment underlying international production, increased fourfold between 1982 and 1994, over the same time period, it doubled as a percentage of world gross domestic product to 9 percent (UNCTAD World Investment Report-WIR, 1997). The boom in foreign direct investment which began in 1995 (the third boom in the past three decades), saw inflows setting a record of $350 billion in 1996. The two previous booms in 1979-1981 and 1987-1990 (the first being led by petroleum investments in oil producing countries, and the second one being concentrated in the developed world), may pale in comparison to this third boom, which is characterized by considerable developing country participation (WIR, 1997). Two countries, the United States and the United Kingdom are the primary drivers of the investments in this current boom, but developing countries are not far behind.

The rational for making strategic investments of the magnitude being considered – bounded on all sides by a great deal of risk and uncertainty – requires having valuation and decision-making tools capable of providing managers with information that allows for decisions to be made in line with their organization's strategic intent.

Current analytical tools, such as Net Present Value (NPV), provide a logical, rational method for making straightforward decisions. But international investment decisions are anything but straightforward. Issues such as assessing the political risk of an area or what type of marking strategy to use, are issues that are impacted as much by timing as they are costs. Given the magnitude of foreign direct investments and the trend that is being established, one must conclude that the decision is no longer ***whether*** to pursue the investment, but rather ***when***.

The financial markets have long had tools available to them for addressing the issue of when to make an investment. These tools, called options, allow for dealing with issues such as timing as well as value. An outgrowth of this process, which is applicable to the international investment community, is the use of real options. Real Options are an extension of option pricing theory for managing and valuing underlying real or (non-financial) assets. Moving away from a "go, no-go" decision to one of "wait and see", which allows for the assessment of risk and uncertainty, is the major focus of this paper's topic. We begin by examining key issues in foreign direct investment that lead to the consideration of using real options.

From Theory to Investment

In order to move to a model for valuing foreign direct investments, it is important to re-examine some of the classical literature to determine what is included in the literature and what is excluded. Much of the literature on foreign direct investment provides detailed information of the "why", "where", and "who" of foreign direct investment, but with little concentration on the "when" in regards to this issue, (Pivoli, and Salorio, 1996). It is critical to understand when a foreign direct investment is made and under what conditions. The old cliché that rings true today is, "timing is everything". There is a massive cloud of uncertainty surrounding this issue and one not easily explained.

When we consider the premise on which the imperfect market theory was developed, we get a glimpse at the vast array of motivators affecting the decision. Financial market imperfections that allow for greater cash flows, lower cost of funds and a reduction in risk via international diversification are key motivators for foreign direct investment. There are other motivations for engaging in foreign direct investment, such as, sales expansion, resource acquisition, diversification, competitive risk minimization and political objectives (Daniels/Radebaugh,

1998). We cannot ignore the effect of high transportation costs as an additional driving force in seeking foreign direct investment, specifically when high fixed costs are involved.

Issues of ownership and control also give us reason to pause in the decision making process. While international trade (exporting/importing) is one of the most common first mover strategies to penetrate foreign markets, we cannot overlook the fact that other options, such as licensing agreements, franchising, joint ventures, acquisition of existing operations and establishment of new foreign subsidiaries also exist (Madura, 1998).

In his work on the eclectic paradigm, Dunning (1988) clearly states that FDI occurs when its net present value is both positive and greater than those of alternative modes of international production. This definitely provides a rational for investment, but it presumes to reduce the decision-making process to one variable, while ignoring other possible impacting conditions. This view is in contrast to current advances in investment theory.

In the late 70's a shift began to take place from strictly using cost-benefits analysis to a more modern mode of thinking which referenced option thinking. The simple philosophy of options is an investment today provides you the opportunity to invest tomorrow, without obligation. With all the uncertainty surrounding business decisions, managers are most fearful of being obligated to a decision, which they can not reverse. Shareholders can be a most unforgiving lot, and since value creation is central to their reasons for investing in corporations, they need assurances that managers are utilizing the best decisions to accomplish that task.

New models of multinational corporations have come into being. The new agenda highlights uncertainty that is generated by volatility in the international business environment (Buckley and Casson, 1998). To cope with volatility, corporate strategies have to be flexible. Caves, (1996) compares a traditional model with a new and dynamic model of the corporation. In the traditional model, a more static view of the organization is portrayed. It focuses on the nature of firm-specific competitive advantage, the choice of location of production and the determination of the boundaries of the firm. In the new dynamic model, the focus is on: uncertainty and market volatility; flexibility and the value of real options; cooperation through joint ventures and business networks; entrepreneurship, managerial competence and corporate culture; and organizational change. There is a great deal of risk and uncertainty associated with this model.

But how do managers deal with risk and uncertainty, and how can they turn these conditions into strategic advantages? First it begins by understanding the differences and then learning how to understand the benefits that can be derived.

Risk and Uncertainty; Friend or Foe

Our intention in the previous section was to begin to open one's thinking to the various possibilities that exist in making a foreign direct investment. We will discuss later how strategic thinking places a key role in options theory, but for now we need to address the issue of dealing with uncertainty. To begin, a simple definition might be an appropriate starting point. Amram and Kulatilaka, (1999) define uncertainty as "the randomness of the external environment". This is in sharp contrast to their definition of risk, which is the "adverse consequence of a firm's exposure".

Simply because something is random, does not mean it does not or should not have definition. Courtney, Kirkland and Viguerie, (1997), provide a definitions and a model for dealing with their four levels of uncertainty. In level one, they propose that there is a clear future and managers can develop a single forecast that is precise enough for strategy development. Level two raises the issue of alternate futures, where some of not all of the elements would change if the outcome were predicable. Level three provides for a range of futures, which are limited to a key number of variables with the actual outcomes, anywhere along the continuum. And, level four contains multiple dimensions of uncertainty, which interact to create an environment that is virtually impossible to predict.

In considering uncertainty in these terms, managers can bring a level of discipline to their thinking will ultimately will force them to frame their decision in line with the strategic intent of the company. There is an abundance of literature on strategic intent; however, we will not use this paper as a forum for discussion on that topic. We must however remark on the usefulness of rethinking strategic investments. Managers must view their markets in terms of the source, trend and evolution of uncertainty, (Amram and Kulatilaka 1999); determine the degree of exposure

(risk) and then respond by positioning the investments to take advantage of the uncertainty. To do this, managers will need to get a grasp on the concept of using real options. Before taking a look at real options, let us quickly exam the base from which this strategy was formulated, financial options.

Taking a Lesson from the Financial Sector

First we must make a differentiation between the two standard option models. There is an American model, which allows for early exercise; and the European model, which does not account for early exercise (Madura, 1998). The intent of options is to allow the right, but not the obligation, to take an action in the future.

From the context of corporate strategy, the real options approach addresses many similar issues. Real options create a way to learn from past performance – to distinguish luck from foresight. It expands the set of strategic alternatives managers consider and it also creates a link between project level analysis and strategic investments (Amram and Kulatilaka, 1999). Uncertainty is a key input into the real options analysis.

From a financial perspective, we will examine projects in relations to call options using the Black-Scholes model. There are five key elements that are considered under the call options for which we can map project characteristics. The project characteristics will be listed in parentheses; the exercise price (expenditures required to acquire the assets); stock price (value of the operating assets to be acquired); time to expiration (length of time decisions may be deferred); variance of return on stock (riskiness of the underlying assets); and risk free rate of return (time value of money). This simplistic view of mapping should in no way minimize the complexity of the issues of applying real options. Leuhrman, (1994) identifies some issues with simplifying complex projects. Real corporate projects, especially long horizon ones, are complex. They are most often combinations of assets in place and options. The possibility of nesting (sequence of serially dependent choices) could exist. The benefit of using the options approach is that most problems can be abstracted as fairly simple or broken into smaller segments.

This is a powerful tool that helps managers deal with the issues of risk and uncertainty. But simple application of the tool alone won't change the nature of decisions being made, without manager's changing the way they think about and respond to risk and uncertainty. What real options give to the manager is a three-step process that (1) allows for identification and valuation of the options, (2) provides the opportunity to redesign the options, and (3) helps in managing the investment proactively.

There are at least five key business decisions that can be changed by real option analysis: wait and see options; growth options; flexibility options; exit options; and learning options. The warning that must be issued at this point is that real options should not be used in all situations. Some decisions do not require complicated analysis, and traditional tools should be used when applicable. Below are some guidelines to consider when looking at when using real options (Amram and Kulatilaka, 1999):

- When there is a contingent investment decision. No other approach can correctly value this type of opportunity.
- When uncertainty is large enough that it is sensible to wait for more information, avoiding regret for irreversible investments.
- When the value seems to be captured in the possibilities for future growth options rather than current cash flow.
- When uncertainty is large enough to make flexibility a consideration. Only the real options approach can correctly value investments in flexibility.
- When there will be project updates and mid-course strategy corrections.

We must devote some time to talking about risk. In the real options approach, the focus is on total risk and the full range of outcomes. When using standard financial tools, such as discounted cash flow, the discounted rate is adjusted for the systematic risk of the strategic investment.

Simply talking about uncertainty and options is not enough. This is the first step, but it must then be followed by decisions that are based on the value of investment alternatives. This is a critical area for international business. What is lacking is a model to value international investments. This provides a great opportunity to contribute to the research in the field. For managers the critical task will then be to link the options model to corporate strategy.

From Model to Reality

For those companies that have and are comfortable with their corporate strategy, this is a wonderful tool for ensuring that the decisions that your managers are making will stay in line with your strategy position. For those who are searching for a direction, this next section will show how the options approach can be used to create, evaluate and implement a disciplined strategy.

Let's look at how real options can help with strategy creation. It provides an opportunity to see and evaluate the alternatives. It provides a wealth of information before decisions are made. It assists highlighting the risks associated with the alternatives. Remember risk is the consequence of exposure. The goal is to minimize the exposure and make decision in light of possible positive outcomes. Managers need to know that they are comparing "apples to apples". Alignment with the financial markets is key and this approach can assist in doing that. It keeps you focused on the right things by asking the right questions. It also acknowledges that some uncertainty may remain, but that your decision will be made on the best information available.

The real options approach can keep you in touch with the realities of the economic world. Business is not performed in a vacuum. Two factors in particular have a major impact on corporations. In many industries the payoffs to investments are nonlinear. This opportunities should not be ignored or eliminated simply because they may have been difficult to uncover. Secondly, there is a need in many industries to transact business outside of the traditional corporate structure, such as in joint ventures, alliances, etc. These transactions are too complex for any one entity to master all the details. These transactions are also major points of exposure to the financial markets and the intent of this process is to reduce or eliminate unnecessary exposure.

What it boils down to is that the options approach is a new way of thinking the helps or enhances strategy creation. Amram and Kulatilaka, (1999), created a simple model to address how the real options approach can impact strategy creation. Information is collected from the product and factor markets, combined with current and desired competencies in the internal organization, creating a set of strategic alternatives that eventually lead to strategic investment choices.

It is important to understand the financial reasoning for using options as well as the strategic reasoning. Companies regularly use commodity, currency and interest rate options to reduce risk. A Company that wishes to limit its future borrowing costs might take out an option to sell long term bonds. Another reason is the fact that many capital investments include an embedded option to expand in the future. In this case the company would be paying money today for the opportunity to make a future investment (Brealey and Myers, 1999**)**. Quite simply the company is acquiring growth opportunities.

Developing Valuation Models

Options rarely come with a clearly identified tag saying, "I'm an Option". You must spend some time and effort working with the process. However the conceptual process of applying the real options approach is something, which most managers can do and at some point probably already have done, just unknowingly. The real difficulty is in developing the valuation model. Most any advanced financial textbook can explain the Black-Scholes Model. However identifying the correct variables and does require a higher level of technical ability. Some technical calculators come with the Black-Scholes model on it and there are some software programs that can assist in the process. The word of caution is that you need to pay as much attention to the valuation process as you have to the identification of the options.

Conclusion

Corporate mangers and practitioners have not heavily utilized the real options approach to capital investment decision-making despite its many benefits. There are numerous theoretical studies that have shown that a real option approach can enhance capital budgeting modeling and valuation, and enhance the strategic operation process.

The sheer volume of foreign direct investment dollars that are being generated each year should be incentive enough for managers (and corporations) to make this a priority approach to strategic planning in their organizations. Managers need to overcome the fear of uncertainty and learn to use it as a way of creating opportunities, rather than avoiding the process and making decisions based on limited information.

Foreign direct investment theory has identified a number of opportunities in which real options can be applied to provide an alternative process for decision making. What has also been identified is the fact that there has been no model established to value foreign direct investments.

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