Chapter 10

Support International Business Expansion with Sequential Reviews

Rui Fernandes and Carlos Pinho

Additional information is available at the end of the chapter

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Abstract

This chapter is about the multinational company's decision on whether to enter new foreign markets using direct investment, exporting, or developing a local partner for distribution, with the possibility of scaling the investment under different demand levels. The perception of the host market demand does not remain the same during the investment period due to additional information and economic or political reasons. Therefore, the influence of uncertainty can be addressed by recombining a trinomial lattice model with changing uncertainty, to value investments with several interacting options. Overall, in this chapter we enhance the knowledge associated with exploring foreign markets subject to different demand uncertainties, valuing the flexibility of sequential options.

Keywords: multinational corporations, international business, investments, demand uncertainty, real options

1. Introduction

The recent global financial and sovereign debt crisis stressed the impact of globalization in the world business environment. In this scenario, international transactions and foreign investment continue to be key drivers of globalization and, in the aftermath of the crisis, the impact of the latter has become even more relevant.

The technology has shortened the distance between countries [1, 2]; consequently, it became easier for companies to expand on new foreign markets (FMs), and globalization became an important factor for the world's economy. Hence, competition among multinational companies (MNCs) and also countries is growing. Therefore, it is important for small, middle-sized,

and big companies to constantly find new ways to stand out, and expanding on the global market is one way to grow fast since MNCs reach out to new customers' acquisition.

A fundamental problem in new foreign market approach is how the market should be served, considering the inherent costs of doing business abroad, the investment time, and the decision risk frame. There are many reasons, such as limited home market, cost advantages, scale economies, product differentiation, or brand reputation, to support business enlargement into FMs. Despite the possible advantages, there are always doubts regarding the entry mode (EM) choice, related investment scale and time, the demand uncertainty, and consequent risk that the MNCs wish to afford.

The foreign market demand variation is challenging, as there is not always known process (linear or not) and the volatility does not remain the same during the investment period. Volatility tends to decline over time when many investment projects are scaled, as new information and knowledge is gathered. Then, after gathering information about FM and MNC's own activity development over time, more reliable estimation of the investment's expected value and its volatility can be made. Therefore, FM demand volatility is often time changing and declining [3]. The valuation method used for investment return evaluation should also take this into account.

Research on FM direct investment has focused considerable attention on the moment of market entry and EM choice, but less on the dynamics of investment in the postentry phase [4]. In this chapter, we alternatively provide a sequential approach to the traditional evaluation using a discounted cash flow technique, to support the choice of the EM (own company, direct exporting, local distributors, or joint ventures). In fact, managerial decisions related to the projects are usually not taken continuously but rather at certain time periods (milestones). The decisions and subsequent options are made mostly at specific time points when new information from own experience and markets is gathered and analyzed. As a result, an investment can be considered as a staged investment or like a sequence of options.

The setting when an MNC seeks to sell its products in a new FM is that the revenues are uncertain during time. In entering the FM, the MNC can decide to invest immediately, in its own sales operation, or eventually invest later, using better market knowledge. An investment decision in FMs is subject to several different host market volatilities over time (modeling period), which requires adjusting the exercise dates, values, and risk frame to support such decision nodes. As such, any contribution that addresses the market challenges that early internationalizing MNCs face is of key importance, when they compete in constantly changing FM.

The purpose of this research is to find a solution to the following research questions (RQs), while deriving some hypotheses (HPs) that need to be tested:

RQ(1): New information and time experience will decrease the demand volatility level in the host market, what is the impact on the subsequent investment decisions?

HP(1): Testing different host market volatilities for each investment period.

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RQ(2): Scaling the investment will decrease the risk and the costs of an abandonment option in postentry phases, more steps means less risk and valuable options?

HP(2): Scaling investment, that is, testing different investment values during the analysis period using a sequential approach.

MNCs must meet the challenge of establishing direct investment under high levels of uncertainty in the host market. A common procedure is to start a foreign subsidiary with little capital and enlarge it later on with additional investments. In this chapter, we study the influence of different perceived levels of uncertainty, by using a sequential approach, to explain the scale of investment in new FM. In spite of a large amount of literature about foreign direct investment, these sequences have to be supported in a dynamic quantified model.

This chapter is organized as follows. Sections 2 and 3 describe the background theory and the reasoning for sequential investments, respectively. Section 4 explores the entry mode theory. Section 5 presents the formulation of the model, with generic sets. Section 6 describes model application, and presents and discusses the results. Finally, the chapter concludes in Section 7 with some final remarks, limitations, and a discussion on future research.

2. Sequential investments

Most of the theories on foreign direct investment center on the decision to initially enter an FM [5–8], but pay less attention to investment decisions after market entry. Since subsequent investment decisions are often substantial [9], the postentry phase and strategic positioning deserve greater attention [10].

Some analyses of international investment recognize the need to investigate the time dimension, but postpone it to future research [11, 12]. Other studies observe sequences of investment, but do not intend to explain their timing [13, 14]. Studies on the timing of investment are limited to international entries [15–17]. The knowledge gap between the initial setup and final operation of an MNC may result from a dynamic deficit of the established theories of internationalization [18].

In a learning process that starts at entry, investors perceive different levels of uncertainty and tend to shift their reasoning for investment over time as new information is gathered; however, most of the times it is based only on market experience. The quantification of the investment returns indicated that economic models highlight the importance of uncertainty to the flow of foreign direct investment [19, 20], as market experience does not fully explain subsequent investment decisions under environmental uncertainty. Uncertainty is a key factor influencing a firm's rate and scale of investment [21–24]. According to the results of these studies, under uncertain environments, investors tend to wait, that is, keep their decisions open instead of investing right away. It has been suggested that international investors react to uncertainty by maintaining flexibility (investment or not) as well [25–27].

3. The Uppsala model

There are many steps for MNC internationalization and several factors that need to be considered, such as transports, communication, contracts, and hired personnel, but one of the most important factors is to find the right location. These factors can be a challenge when the distance and the business differences between home market and FM are big. The lack of knowledge might post barriers of entry on the FM for MNC. To be able to face these internationalization challenges, time, money, and information are important MNC resources [28]. The information flow between the MNC and the host market is an important challenge for MNCs, since the language, business rules, traditions, and industrial setup mostly differ from the home market. In the internationalization process, MNCs can explore their new FM in a more effective way when they improve knowledge about the host market [29, 30] to support the right decisions. Businesses have to first develop on a local, regional, or national level before taking the next step to expand on a new FM. The Uppsala model, developed by Johanson and Vahlne [30], explains the internationalization process using a step frame.

The Uppsala establishment chain model is one of the most frequently cited models in the internationalization of MNCs [31–33]. Based on the concept of postentry phase, it proposes that the progressive acquisition of market experience is the major factor which influences the growth of an MNC. The distance is a key factor in this model, which means that differences in the business environment, language, and habits could be obstacles for MNCs that are planning to expand on FMs. Another key factor is the knowledge about the FM. With detailed knowledge, the uncertainty could decrease; for this reason, MNCs usually decide to do business with geographically close countries instead of long-distance countries and markets. Based on this model, it is assumed that many MNCs, at least in the beginning, use for instance intermediates, such as agents or others, to be able to sell abroad within a limited level of committed resources [30].

MNCs have to first develop on a home market level before taking the next step to expand on FMs. The Uppsala model suggests that MNCs could generate knowledge by exploring the FMs on their own. The more knowledge MNCs collect about an FM by own experience, the better they will manage future uncertainties and risks [30].

According to the Uppsala model, MNCs face four challenges while exploring FMs. These four challenges are as follows: (1) market knowledge, (2) market commitment, (3) commitment decision, and (4) current activities. Market knowledge and market commitment have an impact on implementation of activities and investment decisions. The model therefore suggests that an MNC should invest in one or a few close markets to be able to, later on, and step by step, after having gathered relevant information and experience, expand to other long-distance markets. The model is categorized into two types of knowledge: objective knowledge, which can be transferred from one market to another; and the experiential knowledge, which is the type of hands-on knowledge an MNC learns by doing business abroad. When the MNC has gained relevant knowledge about a specific foreign market, it can decide how to enlarge commitment and establish a plan for further resources allocation [29, 30].

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Despite the reasonability of the model, some critical views can be discussed. The step-by-step functionality of the model has been highly criticized. Studies have shown that it is possible to achieve internationalization faster as MNCs tend to overlook some steps that are described in the model [34]. Theoretical assumptions of perfect information, symmetry in risk aversion, and rational decision making may not occur in real circumstances [35] and decision makers can be affected. It is important, however, to support the decisions and options taken on a quantitative approach to understand the impact of a smooth investment versus a fast investment, highlighting the positive impact of decreasing the value of abandonment options during an internationalization process timeframe.

4. Entry modes

Exporting is seen as the first step for entering an international market since it works as a platform for future international expansions [35, 36, 37]. Exporting means the least change for the company. Most often MNCs begin with indirect exporting, which means working through intermediaries, like agents. This means less investment to commit and fast "new" market acquisition. Direct exporting is usually the second step and it means that the company handles their own exports [29]. The risk is higher with this strategy, but the possible future return is also higher. There are different ways to handle the direct exporting. One way is to setup an export department in the home country of the company, which carries out all the export activities. The company could also settle an international foreign sales representative office to handle sales and distribution tasks abroad [38].

Joint venturing is another way of entering a market with proved advantages [39]. This method means joining a foreign company to market the products or services (market acquisition). There are four types of joint ventures: licensing, contract manufacturing, management contracting, and joint ownership. When a company joins with foreign investors to start a local business, they join ownership. This ownership is owned and controlled by both parties, on a uniform basis. An MNC can either buy a local existing firm or two companies can start a whole new business idea. Some countries demand companies to joint ownership as an entry mode because of certain political reasons [38, 40].

Direct investment is about entering the FM by developing foreign-based subsidiaries. When using this kind of entry mode, an MNC can strengthen its image since it creates job opportunities, and it can also strengthen the relation with the government, customers, local suppliers, and distributors. It is adequate for a push strategy, when training and communication are the key factors. Responsibilities, currencies, and legal changes are additional risks that a firm has to deal with when operating through direct investment [38, 41].

5. The model

Let us consider an MNC that has recently decided to expand its operation abroad. Following the initial decision to expand activity by direct exporting, investors must make subsequent

decisions to commit additional capital and resources. These decisions are made under host market demand uncertainty, and such decisions are often irreversible once the capital is invested and resources are committed. We assume that the initial and following investments are at least partly irreversible because the subsidiary's activities require specific assets (normally locally located) such as service tools or store facilities, and there are initial installation costs, such as licensing and other legal requirements. Although our research does not specifically focus on FM location choice, we introduce the tax rate in the model formulation to support several alternatives regarding FM location. Tax issues are relevant as different countries have different rules and apply different tax rates.

Despite these daunting aspects of such decisions, the investor is free to choose the timing of additional investment, which can bring a change in the EM—sequential approach from one stage to another—and also an increase in investment at a particular stage. The opportunity to add capital to such expanding operation at a later stage, eventually through a foreign subsidiary or a branch, can be considered as a "call option"—buy additional returns [42]. Under high demand uncertainty, the investor may have retained part of the investment and created a tradeoff purposely to possibly invest more at a later moment, when the uncertainty level has decreased or proves to be constant. Or, perhaps the investor recognizes ex-post that the initial investment was a precondition for a larger investment, even though this expanded financial commitment was not originally intended [43]. Thus, the level of uncertainty at entry and the amount of the initial investment are not causal determinants for subsequent investment decisions.

In the model formulation, we will use the Uppsala theory that explains two important patterns in the internationalization of the firm [44]. First, firms investing in FMs follow an establishment chain, which means that investments are partial and broken down into small steps. At a first moment, there is no regular export activity, so companies start approaching independent foreign sales agents. When the firm acquires additional knowledge and experience about the host market, it often decides to establish a local partnership, preparing conditions for a further step creating its own sales structure [45].

We will quantify the impact of future additional alternatives to support changes in the investment value to be committed versus an initial option on one of the available entry modes.

To support the model formulation, we assume that the demand in the FM to be explored is uncertain, depending on the market size and potential growth opportunities [46, 47]. We include factors such as operating revenues and costs in the model to support the expansion alternatives [48].

Generally, we consider a situation in which an MNC "X" of established portfolio $P = \sum p_i$, located in origin country (C_0), has decided to sell its products in an FM, $f \in F$, a market in which "X" has no sales experience. Among the options available for selling in *f*, we find the following five factors as potentially profitable: (a) direct exporting (DE), (b) using local distributors (DELD), (c) establishing a own company (OC) in the form of a subsidiary (SUB) or (d) a representative office/branch (BRA) to support the sales operation, and (e) eventually a participation in a joint venture (JV).

The main source of uncertainty affecting the investment decision is the market demand D_f. As a consequence of MNC's unfamiliarity with the host country, the investor perceives a significantly higher degree of uncertainty than in a domestic environment [49]. It is possible that the investor consciously reacts to uncertainty by limiting the capital at entry and waits for an increase in the demand to support the decision to commit capital [43].

We assume that the demand is a stochastic variable, denoted by "D_f." To simplify the model formulation, we also assume that the decision to invest in an FM is mainly affected by profit advantages (simplification also defended by Hamada [50]; however, we stress on the importance of firm-specific competitive advantages in FM strategy through proper market positioning such as the degree of product differentiation. Hymer's [51] theory highlights the reasons that justify the existence of an MNC based on the inclusion of firm-specific advantages such as better access to raw material and intangible assets such as trade names, patents, and superior management.).

The problem resolution will be performed according to each hypothesis and research question already discussed in Section 1.

We now list the sets and indices to support a general application for different EMs and business realities:

- $F = \{1, 2, .., l\}$: foreign countries (=FMs), each country is represented by $f \in F$, where l represents the total number of available locations: $|F| = l$.
- $R_f \subset F$: R_f is a subset of F that represents the profit tax rate inside each FM $f \in F$ and is represented by $r_f \in R_f$.
- r_0: it represents the profit tax rate on the origin country C_0.
- $\lambda = \{\text{DE}, \text{DELD}, \text{SUB}, \text{BRA}, \text{JV}\}$: alternative foreign EM, represented by λ, where $|\lambda| = 5$.

To facilitate the formulation of the model, we introduce the following notation:

- $K_f(\lambda)$ represents the present value of investment scaled by $n \in N$, where N refers to the number of steps (nodes), for each EM $\lambda \in \lambda$ and FM $f \in F$.
- $\phi_f(\lambda)$ represents the operating costs to run the business after investment, for each EM $\lambda \in \lambda$ and FM $f \in F$.
- c_v represents the unit product variable cost.
- $p_{vf(\lambda)}$ is the unit product selling price for each EM $\lambda \in \lambda$ and FM $f \in F$.
- c_{DELD} represents the coparticipation on sales value, applied to a local distributor.
- tp represents the unit transfer price.
- ρ is the discounted rate.

- χ is the participation (%) on a JV company, where $\chi \geq 50\%$.
- $N = \{0, 1, \ldots, n, n+1, .., n+q\}$: the number of nodes used in the simulation tree.

As Pindyck[52] shows, there is a numerical solution to find an optimal strategy of incremental investment under uncertainty. Let $K_f(\lambda)$ be the capital invested in market $f \in F$ and D_f the demand for a good in market $f \in F$ that is produced using $K_f(\lambda)$. The value of the investment object $\mathrm{ROI}_f(\lambda)$:

$$ROI_f(\lambda) = C\left[K_f(\lambda), D_f\right] + V\left[K_f(\lambda), D_f\right] \tag{1}$$

Eq. (1) consists of two parts: the value C of the capital already invested and the value V of the option to invest more capital, scaled using $\eta \in H$. Deconstructing the capital into marginal units of investment, the equation reads

$$ROI_f(\lambda) = \int_0^n \Delta C\left(v, D_f\right)dv + \int_n^{n+1} \Delta V\left(v, D_f\right)dv + \ldots + \int_{n+q-1}^{n+q} \Delta V\left(v, D_f\right)dv \tag{2}$$

The investor raises the stock of capital until the value of a marginal unit of capital invested equals its costs plus the opportunity cost of the irreversible decision to exercise the related growth option:

$$\Delta C\left[K_f(\lambda)^*, D_f\right] = s + \Delta V\left[K_f(\lambda)^*, D_f\right] \tag{3}$$

where $K_f(\lambda)^*$ stands for the optimal capital.

The simulations done, assuming a stochastically evolving demand and using dynamic programming, suggest that even in environments of moderate levels of uncertainty, the investors tend to wait for demand to increase before they decide to add capital.

To proceed with the modeling and support the return on investment (ROI) calculation $\mathrm{ROI}_f(\lambda)$, we assume the following formulas for each profit function, $\pi_{(f)}(\lambda)D_f : {}^{\lambda \in \hat{\lambda}}$:

http://dx.doi.org/10.5772/62987

$$\left\{\begin{array}{l}\pi_{(f)}(DE)D_f = D_f\left(p_{vf(DE)} - c_v\right)(1-r_o) - \phi_{f(DE)}(1-r_o) - \rho K_{f(DE)}e^{\rho},\\ \pi_{(f)}(DELD)D_f = D_f\left(p_{vf(DELD)} - c_v - c_{DELD}\right)(1-r_o) - \phi_{f(DELD)}(1-r_o) - \rho K_{f(DELD)}e^{\rho},\\ \pi_{(f)}(SUB)D_f = D_f\left[\left(p_{vf(SUB)} - tp\right)(1-r_f) + (tp - c_v)(1-r_o)\right] - \phi_{f(SUB)}(1-r_f) - \rho K_{f(SUB)}e^{\rho}\\ \pi_{(f)}(BRA)D_f = D_f\left[\left(p_{vf(BRA)} - tp\right)(1-r_f) + (tp - c_v)(1-r_o)\right] - \phi_{f(BRA)}(1-r_f) - \rho K_{f(BRA)}e^{\rho},\\ \pi_{(f)}(JV)D_f = D_f\left[\left(p_{vf(JV)} - tp\right)(1-r_f)\chi + (tp - c_v)(1-r_o)\right] - \phi_{f(JV)}(1-r_f)\chi - \rho K_{f(JV)}e^{\rho}\end{array}\right\}, f \in F \quad (4)$$

The return on investment algorithm we propose is based on the following steps:

1. Calculate the jump sizes (moves up, down, and middle). These are *u*, *d*, and *m*.
2. Calculate the transition probabilities of various host market demand movements p_u, p_d, and p_m.
3. Build the options tree.
4. Calculate the payoff of the ROI at maturity, based on the profit function—$\pi_{(f)}(\lambda)D_f$—for each EM $\lambda \in \hat{\lambda}$, at the last node $\in N$;

   Calculate ROI at each node $\in N$ based on (or terminal condition of our ROI at maturity, that is, the end (or leaf) nodes) the following equation:

$$ROI_f(\lambda)_{n,j} = e^{-r\Delta t}\left[p_u ROI_f(\lambda)_{n+1,j+1} + p_m ROI_f(\lambda)_{n+1,j} + p_d ROI_f(\lambda)_{n+1,j-1}\right] \quad (5)$$

   where *n* represents the time position and *j* is the space position.
5. The output is the return on investment $\mathrm{ROI}_f(\lambda)$.

We can calculate the ROI value at interior nodes of the tree by considering it as a weighting of the ROI value at the future nodes, discounted by one time step.

6. Simulation

We tested the application of the model for an MNC with a plant located in Portugal and the possibility to expand its distribution to an FM by selling directly or exporting, or selling through a subsidiary or a distribution center established in a foreign country, Netherlands (NL). The parameters used are adapted from actual figures to ensure the required confidentiality; however, such assumptions will not affect the results as we maintain the same proportion between parameters. In NL, the corporate tax rate is 20% up to EUR 200,000 and 25% above EUR 200,000, for resident and nonresident MNCs. In Portugal, the tax rate is 25%, with

exceptions only for activities not connected with agricultural, industrial, or commercial scope. After the combined analysis of the nature and materiality of the linked transactions, as well as the functions performed and risks assumed by the parties involved in the same corporation, documented policy for setting TP in intragroup transactions adopted the "Principle of Full Competition."

Although case studies inevitably lose representativeness, the power of the case study just lies in its capacity to provide insights and resonance for the reader and it is not true to claim that case studies lack generalizability [53] because case studies can be used like experiments to test a theory.

In the case study, we use a manufacturing company, and the application will mainly point out target, for international expansion, and the expected turnover, however not ignoring operating costs in the model. Dawson [54] stressed the difference in retailing companies' internalization strategy—establish their stores in the foreign markets, just in order to promote the sales growth; and manufactures extend their business outside the home countries, just in search for the cost efficiency, such differentiation will be ignored to enlarge the scope of the model application.

We proceed with two sets of the model. First, the relevance of the market demand uncertainty and the tendency of expected returns over time to test hypothesis 1. The level of international experience that the investor has accumulated prior and following the entry is a variable that drops out in a relation with the increased knowledge of the market. Therefore, hypothesis 1 is also tested.

Figures 1 and **2** are used to test hypothesis 1, specifically, to explore the relation between ROI and FM demand volatility levels for a given number of investment periods.

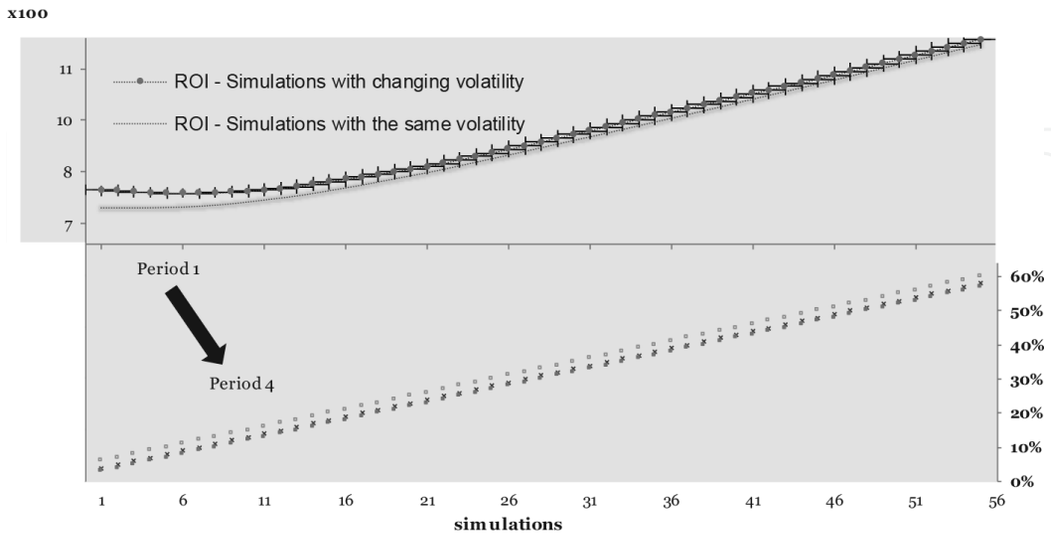

Figure 1. Hypothesis 1: ROI (investment scaled in four periods) and increasing FM demand volatility levels for investment periods.

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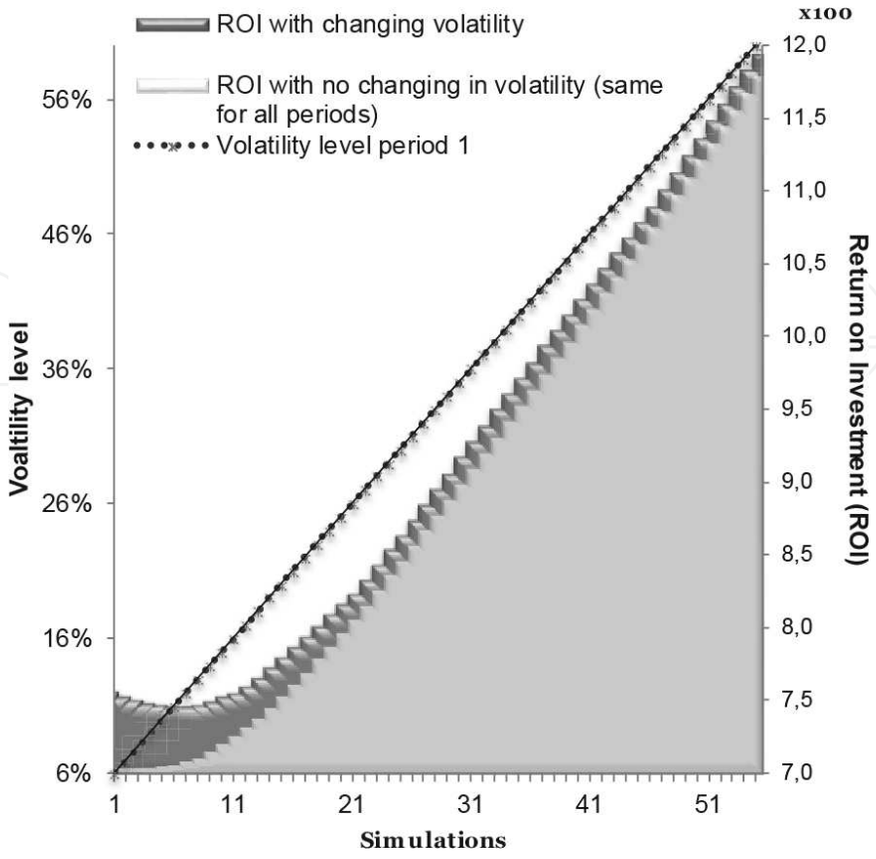

Figure 2. Hypothesis 1: testing the ROI with FM demand volatility level increasing in period 1.

Figures 1 and 2 demonstrate how FM demand volatility changes affect the investment decisions. The higher the volatility, the stronger the ROI, applied for all the periods in which an investment can be scaled. When volatility changes along investment timeframe, assuming that the volatility decreases with market additional information and relevant knowledge along the decision milestones, the return on investment increases, meaning that a flexible investment plan, with different decision points, can be more attractive when compared with an inflexible one [55]. The impact of changing the volatility levels in different periods versus a fixed volatility level (traditional approach) for all the periods is more intensive for low uncertainty levels.

Second, the panel is divided into different phases after entry. Comparing the return on investment of the early phase with those of the latest phases suggests an increasing or decreasing relevance of the sequential approach and enables testing hypothesis 2. Since investors are believed to perceive uncertainty less intensely over time, hypothesis 1 presumes that the negative impact of volatility will be stronger in the first years after entry than in later years. Therefore, it is expected that the investor's international experience will have a positive impact on the investment rate (e.g., reinforcing the equity participation on a JV).

Figure 3 is used to test hypothesis 2, specifically, to explore the relation between ROI and FM demand volatility levels for a different number of investment periods.

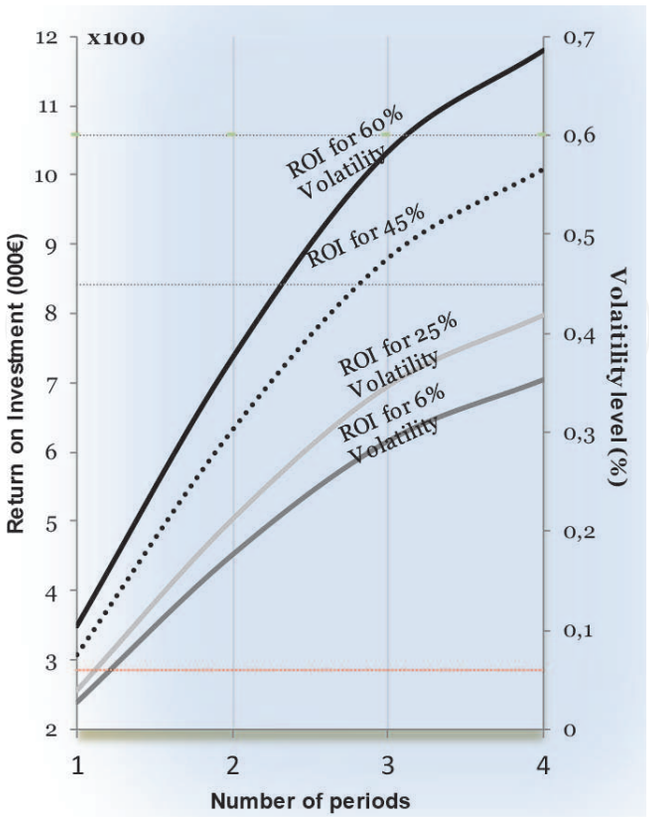

Figure 3. Hypothesis 2: testing FM demand volatility level evolution and ROI for sequential investments.

When the number of periods for investment increases, for the same FM demand volatility level, the ROI is more interesting. These results highlight the importance of flexible decisions on exit options. When companies invest in one single period there is no opportunity to adapt the investment level further, as the knowledge from the market increases. Based on the risk or uncertainty analysis, the MNCs can tailor their own market-entry scenarios. In this situation, a failure of market entry to an FM would not endanger the survival of the whole MNC. It has been generally accepted that step-by-step investments and advancements, as an example, not to build a factory at all, increase knowledge, as an appropriate way to decrease risks (e.g., study presented in [55]. With this simulation, we illustrate an investment scenario involving an interim state that offers either the chance to further invest if things go well or the chance to recoup some investment if not. The results do not consider that entry barriers in the FM can go up. First, rivals could get entrenched by a delay in the entry of an MNC; second, costs will tend to rise as time elapses—the required investment in a single stage can be different from the investment value in several stages. We also recognize that the financial availability of an MNC can vary over time. These facts do not enable the results applicability because the model allows the incorporation of premium costs in the profit function to count with project financing scheme, also as the consideration of a penalty factor for available FM market demand.

Figures 4 and **5** are also used to test hypothesis 2, specifically, to explore the relation between ROI and FM demand volatility levels, considering that demand changes can be either positive or negative along the investment periods.

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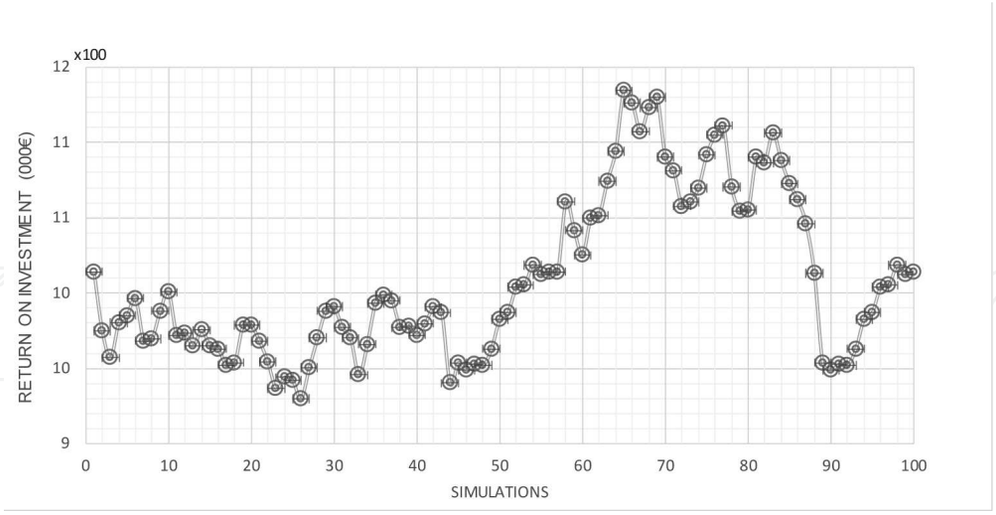

Figure 4. Relation between ROI and foreign market demand volatility levels.

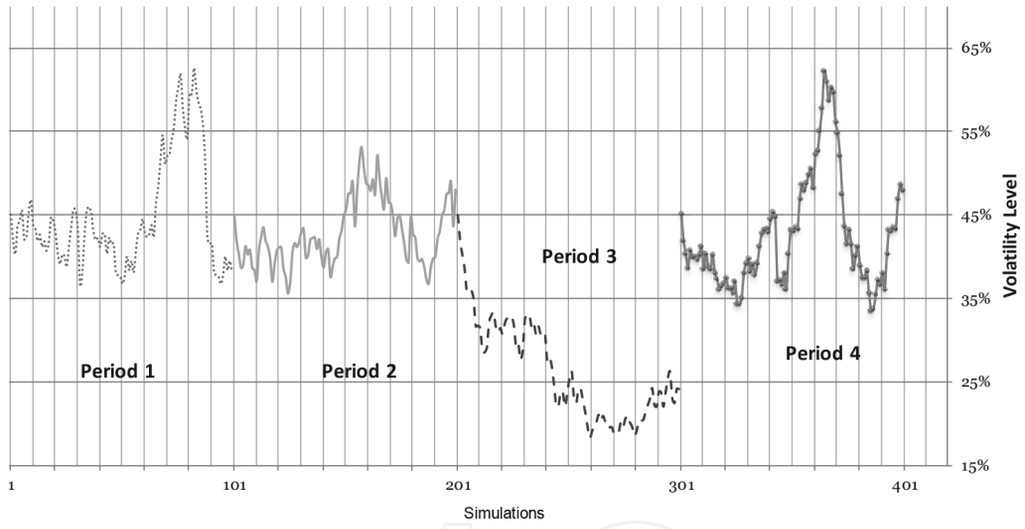

Figure 5. Hypothesis 2: FM demand volatility for different investment periods.

It has been conceptually and empirically validated that sequential investments reduce risk [43, 46, 47]. The previous graphical output indicates that ROI has a consistence positive trend with increase in volatility; however, demand volatility changes can be either positive or negative, and the speed of change within a period is another issue. In Figure 4, the data consider changes in FM demand volatility level for different investment periods and also consider changes inside each investment period. The output of the figure points that when volatility level is higher, the ROI is more interesting; however, the simulations done, using geometric Brownian motion to model the demand, show different possible behaviors in demand over time, which gives a possible range for ROI between EUR 950,000 to EUR 1,150,000.

Finally, we add **Figure 6** to explore the relation between ROI considering different investment values along project timeframe.

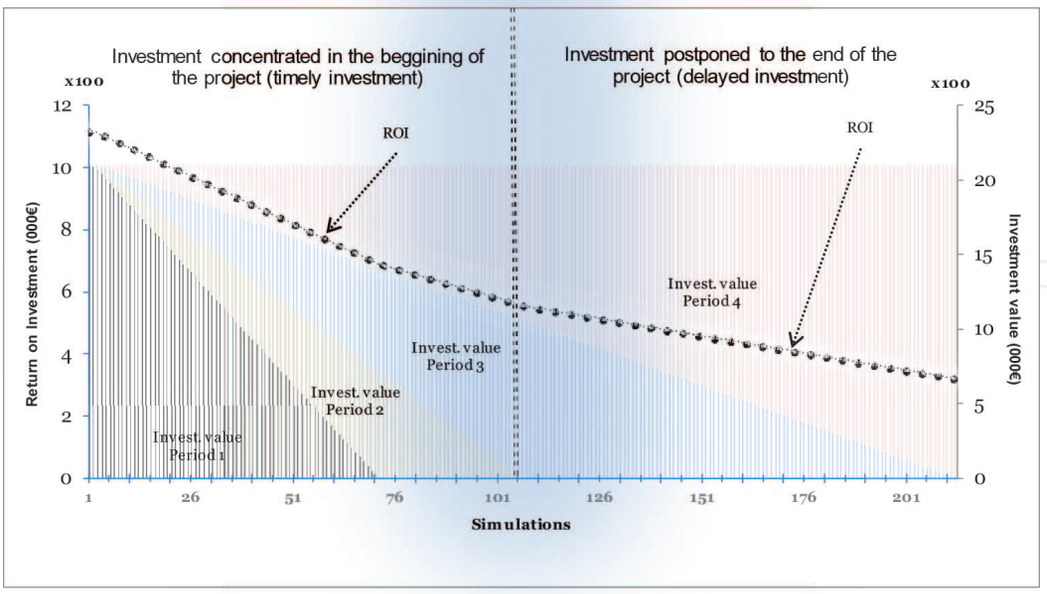

Figure 6. Hypothesis 2: testing ROI for sequential investments with different values.

In Figure 6, we tested the impact of different investment values over time, with different intensities for each period under analysis. In the simulations undertaken, we stated that if MNCs concentrate the investment value in the earlier stages, the ROI is more attractive. These results can be understood as there is a premium for MNCs with the capacity to make/implement decisions faster. In foreign direct investment, there is a gap between the initial entry and the final operation of MNCs; we can identify such gaps with decision points (investment periods) so that a faster MNC can benefit from earlier returns on investment. This analysis is particularly important when a company decides to change the entry mode or increase investment in an existing EM (for instance increasing the equity of a JV or enlarging investment in a new OC).

7. Conclusions

This chapter presents a trinomial tree for investment decision valuation with changing FM demand volatility over investment timeframe. The volatility changes are explored with changing transition probabilities while the space of the trinomial tree is regular, however, with a different number of time steps.

The model of ROI in a new FM is based on growth options acquired by investors in a learning process that starts at the entry to the host country. Later, the investors may exercise the growth option by scaling the investment, depending on the perceived levels of uncertainty and the tendency of the expected payback. The higher the tendency, the higher is the attractiveness of subsequent investment and the higher the uncertainty, and the higher the subsequent returns on investment [57]. Balancing the marginal ROI value of an additional investment unit of

capital helps to reproduce these decisions and explain the sequence of investment in new foreign markets under different forms—with different investment values.

Traditional models of internationalization, for example, the Uppsala approach, have considered such investment sequences in general, but we used a real option theory as it aims at optimal investment decisions. Modeling real investment behavior, however, must take into account that investors make their decisions regarding the uncertainty they subjectively perceive rather than the uncertainty we can objectively measure using any traditional process. The perception of uncertainty is likely to be higher in the first steps of the investment and peak off in the following. The level of uncertainty perception and its receding effect may be stronger in foreign than in domestic environments. Previous models have mainly analyzed overall investment value and paid less attention to the treatment of uncertainty. Comparing an early and a late phase after entry, the model stresses the influence of uncertainty on the investment rate.

As the perception of uncertainty recedes, internationalizing firms seem to change their reasoning for ROI based on option values toward common net present values.

Author details

Rui Fernandes[1*] and Carlos Pinho[2]

*Address all correspondence to: rfernandes.ar@amorim.com

1 Polytechnic Institute of Porto, Porto, Portugal

2 Research Unit in Governance, Competitiveness and Public Policies, Aveiro University, Aveiro, Portugal

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