Corso di Laurea Magistrale in

Economia e Gestione delle Aziende

Tesi di Laurea

INTERNATIONAL ENTRY STRATEGIES AND REAL OPTIONS

AN MCDA PERSPECTIVE

Relatore

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A mio padre e mia madre,

mio riferimento e mia forza in ogni situazione.

"There is no longer any such thing as a purely national economy. The rest of the world is just too big to ignore, either as a market or as a competitor. If business schools do nothing other than to train their students to think internationally, they would have accomplished an important task."

John Young,
CEO, Hewlett-Packard

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Introduction

In the last decades, international expansion has become a critical issue for any company and nowadays being international has become necessary for any durable company.

Although the subject has been deeply studied, and is still the object of analysis and discussion, only few managers look at international projects in the right way, especially concerning the entry mode. This phenomenon hits mainly the small and medium enterprises, whose managers don't have the experience and the competences to fairly evaluate and international expansion project. Furthermore, these small firms often have binding budget constraints that push them to opt for the less expensive solution, without making a deep analysis of the situation.

Through the development of a simple model, the aim of this work is to build a framework to evaluate international entry mode strategies, considering the most important variables at stake.

With this model, we analyse how the optimal entry mode changes depending on the value of some major factors. We also create a framework to be used in international expansion projects that finds the optimal entry mode solution in the different possible scenarios. Finally, we demonstrate that the real option valuation actually changes the optimal solution in entry mode selection, and that companies can take advantage of the uncertainty by creating real options.

In the first chapter, after a short introduction on international trade, we present the different steps of a foreign investment project, analysing which factors concur in the choice of the market and of the entry mode. Then, we will introduce the real option perspective to international projects.

In the second chapter, we present the main frameworks used in our research for the valuation of a real investment project: the discounted cash flows – net present value framework, and the real option valuation framework.

The third chapter is dedicated to the analytical model we propose to support the firms. We will see that many different techniques are combined in order to capture the complexity of the decision process. After having introduced the instrument and the variables at play, we study how different variables influence the entry mode decision in an international project, in a real option optic.

Chapter 1. Internationalisation

1.1 The international trade – historical background

Since the ancient age, entrepreneurs and enterprises of all countries have been looking at international trade to develop their business and create new business opportunities.
The history of international business is nearly as old as civilization.

The first records of international trades date back to the 19th century B.C., when the presence of an Assyrian merchant colony is registered at Kanesh, Cappadocia.
Other important examples of trade in the Ancient age are the commercial activity of Egyptians in the Red sea to import spices from Arabia, the creation of the Incense route, a major channel for the trade of incense and spices from the Mediterranean coats to India and the far East, from the 7th century BC to the 2nd century AD, the Silk Road, that allowed the exchange of goods from China to the Roman Empire and vice-versa (fig. 1)

One of the most first and famous examples of international trade, a milestone that certainly deserves to be cited, is the travel of the Venetian merchant Marco Polo to China, between 1271 and 1295 (fig. 2)

Figure 1: Main international trading routes in 1st century AD

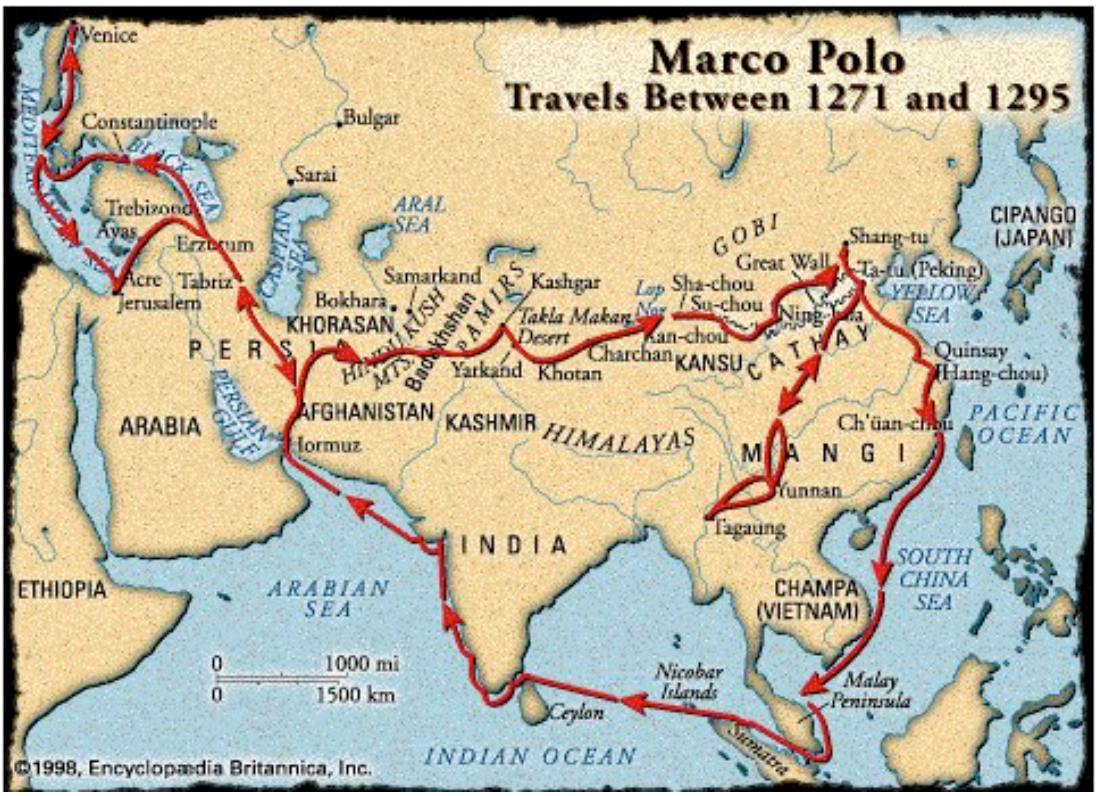

Figure 2: Marco Polo Travels between 1271 and 1295. In those years the family of Marco Polo lived in Venice and owned a trading company based in Constantinople (now Istanbul). (V. Della Valle, introduction to il Milione, 1994)

Jumping directly to the Modern Age, the period of the big world explorations, a milestone is certainly the creation of the Dutch East India Company in 1602, and its failure in 1799 due to the increasing competition of free trade; the signature of the Cobden-Chevalier Treaty, between the United Kingdom and France in 1860, which represents the first international free trade agreement and opens the way to successive trade agreements Europe.

After the World Wars period, the second part of the XX century sees an exponential rise in the international trade:

- 1946: the Bretton Woods system goes into effect, with the aim of abolishing trade barriers between countries as war-preventing method
- 1947: 23 countries stipulate the General Agreement on Tariffs and Trades (GATT)
- 1951: Italy, Belgium, Luxembourg, France, the Netherlands and West Germany sign the Treaty of Paris that creates the European Coal and Steel Community (ECSC)
- 1957: with the treaty of Rome, the same six countries give birth to the European Economic Community (EEC), also known as the Common Market
- January 1st 1994: the North American Free Trade Agreement (NAFTA) officially enters into effect.
- January 1st 1995: with the aim of facilitating free trade and exchanges between adherent nations, the developed countries create the World Trade Organization
- January 1st, 2002: as a conclusion of years of meetings, studies, votes, twelve countries of the European Union decide to adopt a unique currency, the Euro, the second most used currency in the world and create the Eurozone, which has then been extended to comprise 19 countries (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the

Netherlands, Portugal, Slovakia, Slovenia, and Spain). Kosovo and Montenegro adopted the Euro but are not formally part of the Eurozone and do no have representation in the ECB.

The situation today

During the last years, with the abolition of trade and entry barriers and with the growth of the emerging markets and particularly China, international business has grown exponentially.

To give an idea of the current situation, we present some charts taken from the most notorious international economic organization that well represent the current situation.

Changes in goods and service exports 1998 – 2008

During the decade 1998-2008, export of good and services has grown exponentially; while it is undiscussed the boom of the emerging countries like China, India, Russia, and Brazil (the so-called BRICs) even developed countries more than doubled their exports.

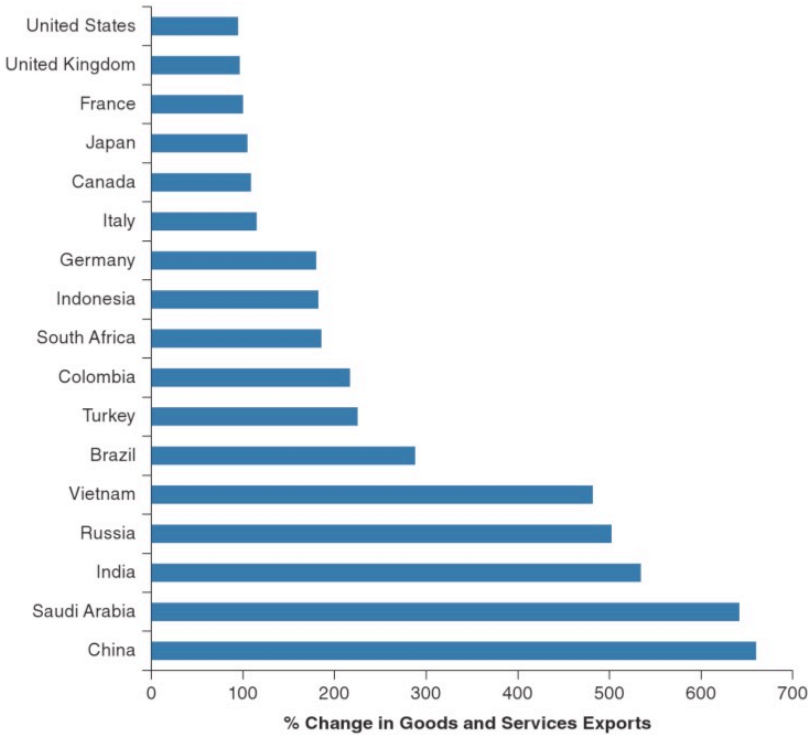

Figure 3: changes in goods and service export, 1998-2008

Top-Exporting Countries, 2013

Top exporting countries are China, the United States, and Germany. Far behind we find Japan, the UK and France.

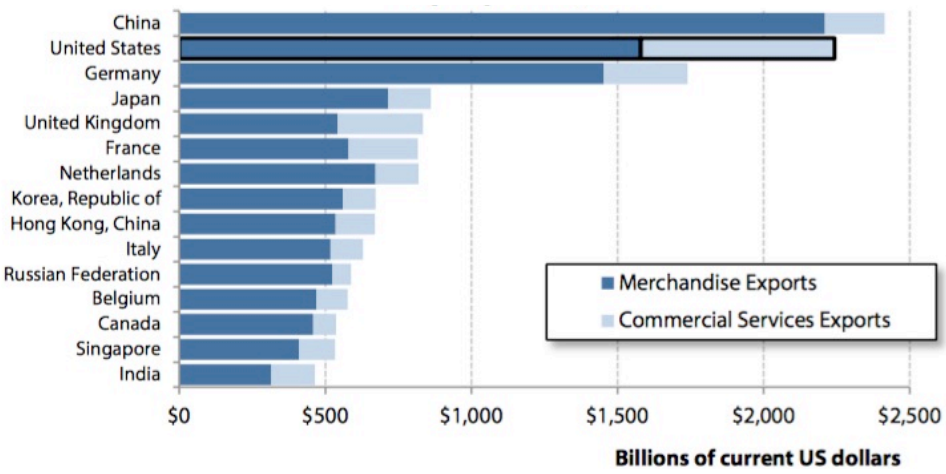

Figure 4: Top Exporting Countries, 2013 (source: WTO, 20144)

Percentage Change In World Trade And Output

- Globally, trade accounts for more than 60% of GDP.
- Trade volume typically ouspaces real GDP growth, and is expected to do so over the next five years (WTO)

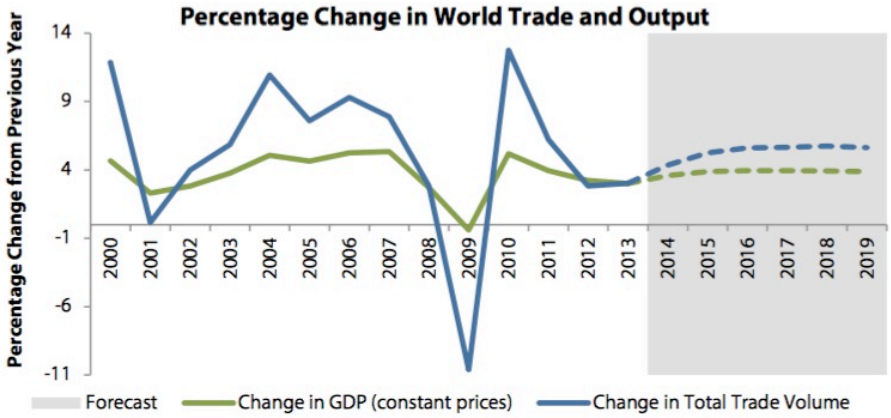

Figure 5: Percentage Change in World Trade and Output. Source: IMF World Economic Outlook; WTO International Trade statistics; Bureau of Economic analysis, US Dept of Commerce

Merchandise Trade By Country, 2013

This chart shows the world's countries according to their Merchandise trade.

Figure 6: Merchandise Trade by Country, 2013 (WTO, 2014)

1.2 Reasons behind international expansion

Now that we gave an idea of the entity of the phenomenon, we try to draw the reasons behind it, particularly, at firm level, what pushes an enterprise to go international.

An firm may decide to become international expanding its influence to the foreign market for a number of reasons, and essentially to reduce production costs, expand sales on new markets, create new assets, and /or to improve and innovate its functions. All these motivations should be examined in deep, to increase their positive potential and minimize risks.

A study over 600 German and British firms found that "the incidence of internationalization increases over time. For the majority of new firms the question is not whether the firm will internationalize but when." (Bürgel et al, 2001).
Czinkota and Ronkainen (1995) divide the reasons that push a firm to enter a foreign market into proactive and reactive.

1.2.1 Proactive motives

Proactive motives include a series of actions taken before any substantial decision push:

Profit and growth. This is specially the case for firms oriented to short-term profit, willing to expand their market or even trying to sell their goods at higher price to customers that will accept to buy at higher costs.

Management decision. Managers like to work in an international environment, often with genuine enthusiasm, and this may play a substantial role. Previous experience abroad or for a multinational enterprise speeds up the process towards internationalization; however this experience does not seem to add significant benefit in terms of performance of the firm. (Bürgel O et al, 2001).

Opportunities in the foreign market. Firms should always seek opportunities expanding their activity in a larger market. New markets can help in this sense.

Economies of scale. Global marketing activities may be a way to increase outputs rapidly. Normally this will reduce production costs, and consequently the cost per unit, thus increasing profits. At least up to the optimum design point, after which costs per additional unit will increase again.

Fiscal advantage. Governments may establish tax reduction or other forms of advantage to attract foreign investors and some countries have simply lower taxes. This may be a strong motivation since reducing costs increases profit.

1.2.2 Reactive motives

Reactive motives are defined as those referred to decisions that follow relevant issues.

Competitive pressures. Competitors going hard internationally may influence foreign and domestic market share. The international projection may increase profit through market expansion and cost reduction, but also improve

the image of a firm with a positive weight even on domestic sales. Coca-Cola and Pepsi are best known testimonials in this sense.

Market inadequacy. This refers to a series of different situations. For instance, saturation of domestic market strongly pushes towards foreign market, at least for companies with adequate resources and ability to make a correct analysis. Also changings in environment conditions, like for example increasing costs of production, government instability or reduction of customer spending ability, often constitute the motivation for internationalization.

Overproduction. The ability to produce in excess of the market capacity may easily push a company to one of the easiest way to reach foreign market, in most of cases exporting inventory excess.

Unexpected foreign orders. Information technology brings to market globalization even before a company can choose it: orders may arrive from unsolicited customers abroad. This may be an invitation to discover and exploit new markets.

Seasonal products. The seasonal product demand may have different timing in different countries and this may push a company to extend seasonal sales period over border.

Proximity. Company location may be so close to another country with similar market demand and rules that going abroad may not even be perceived as a real foreign market entry. This may be the case of countries sharing same language and culture like for example Belgium and The Netherlands, both sharing large part of same Flemish subpopulation.

Westhead et al. (2002) in a study found the main reasons to start exporting among medium/small size companies:
-Being contacted by foreign customers to place orders.
-One-off order (no continuous exporting).
-Availability of foreign market information.
-Part of growth objective of the firm.
-Export markets actively targeted by key founder/owner/manager.

1.3 The internationalization process

Kotler and Armstrong (2001) identify five steps in the internationalization process of a firm, and precisely:

1. The decision to go international or not.
2. The decision of which market to enter.
3. How to enter the chosen market, or entry mode decision.
4. Deciding on global marketing programs: standardization or adaptation of the marketing mix.
5. Deciding on global marketing organization: companies start from having an export department, then they set up a local office, and finally they become an international organization.

Koch (2001) presented a holistic model describing the process of market selection and selection of market entry mode or MEMS (market entry mode selection). This model groups all factors influencing the process in three main categories: external, internal and mixed, but inter and cross relations are also possible.
In another work, the author applied this model in a more descriptive way, including its personal international business experience.

In the following part, we present the MEMs model, first for the market selection, then for the entry mode selection.

1.3.1 Market selection

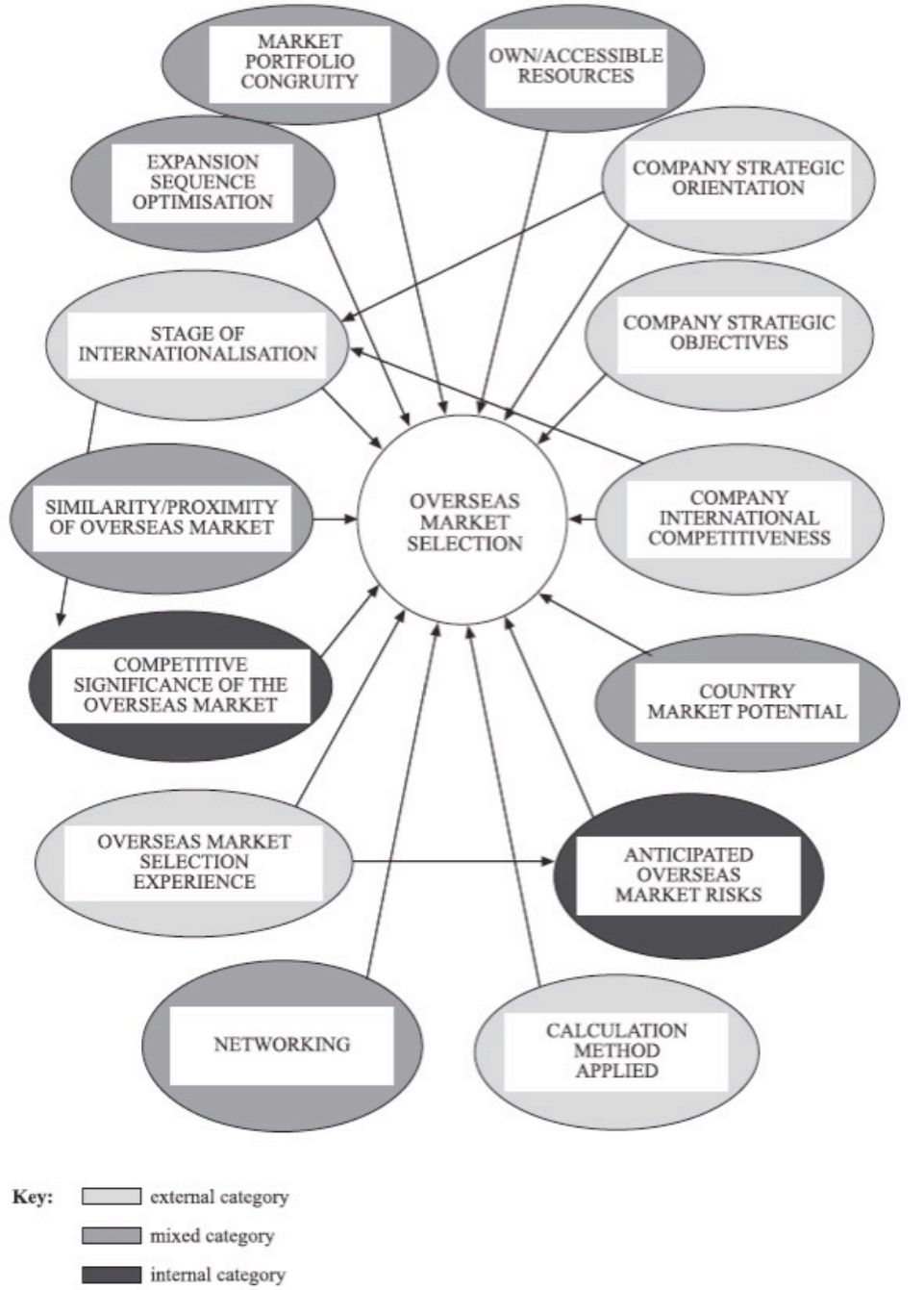

Figure 7: Factors Influencing Market Selection (from Koch, 2001.)

Internal factors

According to Koch, the internal factors that concur in the choice of the foreign target market, and precisely:

Company strategic orientation

The strategic orientation of a company is the result of a multiple factors, coming from individual components and their experience, attitudes, business environment, company commitment, and objectives. According to Glaister & Thwaites (1992) strategic orientations may be classified as proactive, reactive and planned and consequently companies may be defined as prospectors, analysers and defenders (Miles and Snow, 1984).

Internationalization stage

The level of internationalization of a firm may be referred in general to international business or to the export activity. It is anyway influenced by company strategic orientation and its international competitiveness. The first factor correlates directly with the interest for the foreign market, the second is just the throttle lever, that determines the speed of international involvement.

Company strategic objectives

Strategic objectives are someway correlated to characteristics of the company and aspects more representative of the efforts spent, like for example market share, revenues, growth level, export, total sales. Another interesting point is strategic horizon: long-term prospects are preferred when countries have stable conditions. In other cases companies prefer a shorter horizon, implicitly limiting their potentiality.

Overseas market

The international business experience of a company may be useful reducing risk sensation and allows a better expression of the potentiality, also as a character or choice of strategies. The learning process may be influenced, and in turn the efficiency and effectiveness.

International competitiveness

Specific skills and abilities are the bases for a successful marketer. If monetary criteria may be enough descriptive for economic success factors, international competitiveness needs something more. It is for example the access to information of market shares and the ability to conduct correct analyses with those data, understanding the reasons for a development or underdevelopment and how this was possible.

Calculation method

Main distinctions are between risk assessment versus benefits or costs against degree of marketing control (Porter 1980, Root 1994). The choice is dependent by the relative ease of access to specific data, from market share to the country business structure.

External factors

There are also some external factors, or factors that are not inherent to the company, that should be considered in the choice of the target market. Those factors are:

Market potential

Country market criteria are widely used to select a market. (Root, 1994; Johansson, 1997). On the contrary, the role of judgment and potential political contamination of relevant statistics are often underestimated (Samli 1977). Moreover, Koch (2001) suggests intensifying "the discussion of product market specific variables to be used in market potential estimation, in education and in concrete business context".

Competitive market value

Leading markets may serve as a reference point for company performance. They are usually large, strong and with fewer regulations, acting as a powerful stimulus testing abilities and capabilities and as a wonderful opportunity of company promotion. The interactions of performance and expectations in leading and other markets may reveal some gaps that constitute the measure of the actual abilities and skills between companies. Trying to undermine competitors at home is a good test to prepare next move to a new market.

Anticipated risks

Foreign market risk assessment is most of the time driven by the interest and guarantee for banks and international enterprises. As described by Czinkota & Ronkainen (1996) there are three main categories:

- Ownership risks (expropriation, confiscation and domestication)
- Operating risks (exchange risk, overinvestment and price control) and
- Transfer risks.

Another important area, that of risk perception, is especially useful when risk calculation is difficult or a validate method does not exist.

1.3.2 Entry mode selection

The Importance of Entry Mode Selection

An entry mode is defined as the channel through which a company enters a new market.

A company willing to enter a foreign market must well evaluate which channel wants to choose, and shape its strategy accordingly.

Obviously, each entry mode has its advantages and disadvantages, which are linked to many specific factors, so there is never a perfectly right or perfectly wrong solution, but surely the choice of the entry mode can strongly define the success or the failure of a business project. Thus, entry mode choice is considered a key issue in international marketing.

In the following part we will briefly present the different entry modes, with a focus on the most used, then we will discuss which factors can influence entry mode choice.

Factors influencing entry mode choice: the MEMs model

When a firm decides to enter a new foreign market, there are several factors that must be considered.

Similarly to what he does for the market selection, Koch (2001) identifies the most important factors that influence market entry mode (MEM) selection and divides them according to their nature:

- Internal factors
- External factors, those that the company cannot change or influence
- Mixed factors

Internal factors

Internal factors are factors inherent to the company. According to Koch, the most important internal factors to be considered are:

Company size/resources

Since many entry modes, and particularly the investment entry modes as defined before, require a high commitment in terms of resources, time, management knowledge, the availability of resources often linked to the size of a company, can limit the freedom of choice to the less expensive modes. The strength of the relation between availability of resources and freedom of choice depends on the industry (for instance, it will be more true for a chemical company than for an IT company).

Locus of control

Any manager prefers to hold strongly and alone the locus or site of control. The higher the number of managers, the easier it will be the discord for bigger and smaller questions. Loci of control may be better articulated in multiple subdivisions with different stimulating meanings influencing manager perceptions. The choice of type of general control, authoritarian versus collaborative, will mark the difference with negative or positive effects especially in less experienced firms.

Experience in using MEMs

The experience in using a particular entry mode, the rate of success and reliability of the entry mode, certainly influence the management's choice. Also, if the company has a good experience in a certain region, it will be more eager to invest in business ventures than in seek contractual entry modes.

Management risk attitudes

The company's level of acceptance of a determined level of risk depends on many contextual factors, such as "the company's financial situation, its strategic options, the competitiveness of its environment, its relevant experience, etc.". However, a great influence is given by the personal risk perception and attitudes of the managers: a high risk-aversion enhances the probability that the manager's choice fall on short-term investment modes, neglecting the long-term perspective of development.

Market share targets

If main objective of the international experience and the principal decision criterion is the maximization of sales or market share, managers will choose the entry mode that is most likely to give the expected result in the established time. For instance, "if maximization of market share appears to be contingent on the development of own distribution and aftersales network, the company may decide to prefer a fully owned/majority marketing subsidiary to be the entry mode into a certain foreign country. If it seeks to maximize export sales revenue growth over the next two or three years, it may be prone to use indirect exporting over other entry modes into new markets" (Koch, 2001).

Calculation methods applied

According to the method used to determine costs and benefits, the decision can be different. For instance, as we will demonstrate later, if managers choose to adopt the real option analysis to evaluate future expansion possibilities or waiting options, instead of the simple Discounted cash flow method, results can be quite different. This is one of the central points of our work.

Profit targets

Profit targets and moreover the time profits will show up can are often a binding criterion in the choice; actually, while indirect export shows the first profits nearly immediately, that however level off soon, not all companies can wait several years for the first profits to enter, which can be the case of greenfield entries, due to "construction cycle, time needed to establish all necessary market contacts, acquire/build all necessary assets, train the sales force as required, develop customer base, etc". There is then a trade-off between profit time and possibility of profit growth.

According to Johansson (1997), a low target rate of returns is often accompanied by the selection "countries that show greater long-term prospects and promise to enhance the firm's capabilities".

Mixed factors

Mixed factors are factors that can be placed halfway between internal and external factors, since they are both inherent to the company characteristics and to the external environment. Those factors are identified as:

Competencies, capabilities and skills required/available for each MEM

Importance of individual competencies, capabilities and skills depends on the context components: product category, area of (contemplated) presence, form of business and company strategic objectives (Koch, 1997).

According to Luostarinen and SvaÈrd (1982), "human resource policy should lead, rather than follow, company overall international strategy", meaning that the internationalization strategy should fit the management's "competencies, capabilities and skills."

Sufficiency and reliability of information inputs

The author here wants to insist on the importance of having reliable information, low or no biases, consistence in the definitions, to be able to compare effectively the various options.

External factors

External factors are factors that belong to the external environment in which the company competes or wants to compete. They are out of the control of the company; managers can just recognize them and act consequently. The most important external factors influencing entry mode selection are:

Characteristics of the overseas country business environment

While country specific characteristics are easily available on the net, even though often biased, old or incomplete, industry and company-specific data are not freely and easily accessible, being this information quite sensitive, and its cost expensive.

The most interesting information and data for a potential new entrant are "the similarity and volatility of general business regulation/practices, business infrastructure and supporting industries levels of development, forms, scope and intensity of competition, customer sophistication and customer protection legislation" (Koch, 2001)

Market barriers

There are different types of market barriers; the most interesting for a new entrant are (Johansson, 1997):

- Tariff barriers;
- Governmental regulations;

- Distribution access;
- Natural barriers (market success and customer allegiances);
- Advanced versus developing countries;
- Exit barriers

Market entry barriers can be natural or artificial, the latter being created by the firms already operating in an industry to protect themselves by the threat of new entrants, or by governments or public authorities to protect national companies.
The effect of entry barriers is to heighten the level at which foreign firms are disposed to enter the market.
The impact of trade barriers has been studied in literature (e.g. Karakaya and Stahl, 1992; Paliwoda and Thomas, 1998; Varian, 1992).

Industry feasibility/viability of MEM

Not all entry modes are practically feasible or convenient; in some cases, there may be factors of different nature that make an entry mode unfeasible or not convenient. For example, licensing often implies an excessive risk of "know-how dissemination", especially in lack of the appropriate international conventions. Other entry modes can be excluded by local laws or regulations (it is the case of some countries where law imposes that any new foreign venture must be done in society with a local partner, which must have a minimum capital participation in the venture, thus excluding the creation of wholly owned subsidiaries in the country.

Restrictive local labour regulations, lack of skills, and labour cost can also discourage a company from establishing a new subsidiary on the terrain.
However, sometimes, establishing a foreign subsidiary makes the company gain huge tax advantages (in case of low-taxation countries) and avoids custom duties.

Other factors, such sales potential, risks and costs, influence the feasibility of certain MEM.

Popularity of individual MEMs in the overseas market

A particular entry mode can be more popular than others for an industry in some countries, so that new entrants are influenced to adopt the popular one. Factors influencing the choice of new entrants are "the experience, degree of success of the former entrants and the anticipated product market situation".

Market growth rate

According to some literature (Zekiri and Angelova, 2011), a high market potential is associated with the choice of internationalize, with any entry mode.

However, if the growth of the market is thought to be high but not to be sustainable, so that it could stop of fall in the short term, the company will opt for an entry mode that is fast to set up and easy to divest, to be able to catch the most of good times and not bear the costs of a bear market.

On the contrary, if the growth is forecast high and stable over the course of many years, the direct investment option may be more apt to catch market opportunities.

Image support requirements

If a company wants to build or maintain a global brand, it might be interested in having its image represented and its products sold in determined countries. For instance, a company producing industrial robots may want to have Japanese among its customers, while a producer in of high-quality shoes has probably interest in having Italians in its reference list.

To reach this target, some companies recur to licensing; however, in the aim of maintaining a constant high-level standard, some actors prefer to install their own subsidiary to have more control on the processes and the products.

Global management efficiency requirements

As a company's international involvement increases, big multinational companies have to decide whether to adopt standardization or adaptation strategy across the countries. So, in some cases, the entry mode will be dictated by the overall company strategy. A common good advice would be for companies to avoid excessive diversity in their portfolio of foreign market entry.

The scheme in figure 8 below represents all the factors (internal, external and mixed) and the relations between them.

Essentially, business analysis of the target country is an influential factor when deciding the entry mode in a foreign market. (Root 1994, Shama 2000, Pan &Tse 2000, Taylor et al 2000).

Shama (2000) recognised that business activity, year of entry, level of competition and market potential are fundamental variables influencing entry mode. The same author in 1998 tested a few hypotheses on post-entry performance and found that survival and sales growth depend on structural entry barriers (sunk costs and irrecoverable investments).

Figure 8: Factors Influencing Entry Mode Selection (from Koch, 2001.)

1.3.3 Entry mode types

According to Bradley (2002) a company selecting the most appropriate entry mode have essentially two factors to consider and weight:

1. The level of resource commitment that they are willing or able to achieve
2. The level of control over the international operation they desire to have.

The factor that influences these two choices is the perceived risk in the new venture

Once the choice made, the company can select the right entry mode.

According to Bradley (2002), entry modes can be divided into three main categories and the correspondent subcategories:

1. Export entry modes
    a. Indirect
    b. Direct with agents
    c. Direct branch / subsidiary
2. Contractual entry modes
    a. Licensing
    b. Franchising
    c. Technical agreements
    d. Service contracts
    e. Management contracts
    f. Construction contract
    g. Contract manufacture
    h. Co-production agreement
3. Investment entry modes
    a. Solo venture: new establishment, or Greenfield entry
    b. Solo venture: acquisition
    c. Joint venture

According to Root (1994), the main difference between export modes and the other two modes is that the final product that the company sells is manufactured outside the target country, and then transferred to it.

Further, contractual entry modes are "long-term non-equity associations between an international company and an entity in the foreign target country that involve the transfer of technology or human skills from the former to the latter" (Root, 1994).

Finally, investment entry modes involve the ownership of a manufacturing plant or other production units in the target country. The distinctive traits of these entry modes are the equity ownership and the high degree of control on the foreign operations. According to the type of the property and the control can be fully detained by the mother company or partially shared with a partner in the case of the joint venture (Root, 1994).

In the following part, we briefly describe the main entry modes, their characteristics, advantages and disadvantages.
Then we will study which factors a company must consider in the choice of the entry mode.

Exporting

To export means to send a product to be sold in another country (the Merrian-Webster dictionary, 2014). This implies direct marketing and sale of domestic goods, thus managing the interactions between exporter, transporter, importer and government. This choice is a "going alone" solution.
We can distinguish into two types of export: direct export and indirect export. The first one sees the firm exporting its products or services through its own

representatives, whereas in the second case the firm makes use of local representatives to sell its products or services.

Export has several advantages, like low initial investment, direct contact with customers, full control of the production and possibility of learning better the market. Most of the costs are associated to marketing expenses. Among potential disadvantages you may consider trade barriers and transportation costs, interactions with local economies and troubles to directly reach and respond to customers.

Export becomes convenient when there is cost advantage with home production, low trade barriers and when customer loyalty is not critical.

Licensing agreement

A company that owns exclusive rights on a design, idea, logo, service mark or know how or other kind of intellectual property like a patent, trade mark, copyright, allows a licensee to use these rights normally within specified limits, in exchange of a fee. (businessdictionary.com, 2014)

Advantages are again a low initial investment, the absence of trade barriers, a better use of local economies, an improved better local expertise, and a fast and easier (but indirect) way to customers. On the other side investor will have not control of operations, on negotiations on knowledge transfer and price, and least but not last, on the potential creation of a competitor. This choice may be right when the know-how is well codified, there is solid property rights legislation, and other conditions, like strategic locations.

Franchising

Franchising is an agreement where the franchiser grants another part the right to use its trademarks as well as certain business systems and processes, to produce and market goods or services according to certain specifications (businessdictionary.com, 2014). It is a special form of licensing, with greater know-how and trademarks transfer and greater revenues.

The franchisee normally pays fixed fees and a sales' percentage in exchange of selling well-known products in properly design-adapted shops with specific marketing formation. Both parts share the same interests on business: the franchisee may have obey to specific rules, but runs on a well tested and appreciated road (goods, sales technique, shop design) and the franchiser increases its market share starting new activities with limited effort, but has to assure high standards. A famous example is the American fast-food chain Burger King, which in the last years has been progressively franchising all its restaurants around the world, reducing costs and increasing profitability.

Management contract

The company invests in services, eventually given through a subsidiary unit, to a local firm and expecting profit from it.

This allows access to local management expertise and avoids unnecessary purchases of other assets, still maintaining control over strategic points. Critical points are potentially on motivation and selection of a proper manager. The ideal application is for a manager with consolidate reputation, typically for hotels and consulting companies, and contract should be based on well codified performance objectives.

Joint venture

It is an agreement where two parties collaborate to work together for a definite time or project and share exercise control, investments and revenues. May be used to share for example the know-how of one partner and brand name or market expertise of the other.

At the end of the specified time, or at specified time or if certain conditions are verified, or even at one or both partner's discretion, the contract of Joint Venture can give the possibility to one partner to acquire the other partner's stake in the Venture, thus giving him the possibility to fully and immediately exploit an eventual market demand explosion. This possibility is defined in literature as growth option, is characteristic of the contract of joint venture and, if properly considered, increases the value of the investment project. Real option valuation will be the object of further discussion in Chapter 1.4.2 and will be the central theme of the model developed in Chapter 3.

Also, the contract can give a party the possibility to sell its stake to the other, or to close the venture.

In general, a joint venture can be dissolved for the following reasons:

- Achievement of the initial aims and goals
- Not achievement of the initial aims and goal
- Changing on one or both parties' goal
- The time initially agreed has expired
- One party acquires the other

Obviously, the growth option is not the only advantage of joint ventures. The partners of a Joint Venture may share local expertise, with reduction on overpayment risks and with shared technology and incentives, still maintaining a certain level of control over operations; as Kogut (1991) puts it, "joint ventures not only share risks, but also decrease the total investment. Because

the parties bring different capabilities, the venture no longer requires the full development costs. Due to its benefits of sharing risk and of reducing overall investment costs, joint ventures serve as an attractive mechanism to invest in an option to expand in risky market" (Kogut, 1991).

However, this feature incorporates the risk of sharing (and loosing) also the proprietary knowledge with possible conflicts between the investor and local firm, both having no full incentive levels and potential conflicts on control. This may be appropriate if both partners contribute mutually and expect large mutual gains and both have interest in maintaining trade secrets. One of the well-known joint venture example is Sony Ericsson founded in 2001 and Ericsson's share acquired by Sony in 2012.

To sum up, the main advantages of building a joint venture are:

- Sharing the risk of the project with the partner
- Reducing the resource commitment: with the remaining, the firm can invest in other assets and better hedge the risk
- Profit from the partner's assets (technology, knowledge, brand, etc.)
- The option to expand, which will be at the center of our analysis.

Foreign direct investment

Foreign direct investment (FDI) is defined as the direct ownership of a firm by another foreign firm, with managers of the latter having control on the former. It may be the result of the acquisition of an existing enterprise or the creation of a new one. FDI allows direct control of production but normally requires high commitment in resources, personnel and technology.

With a Foreign Direct Investment (FDI) the control of operations may remain:
-Wholly owned in case of a "green field" investment creating a new entity, or with the full acquisition of a local firm;
-Partially owned when the choice is the partial acquisition or a joint venture with a local firm.

More often enterprises prefer to invest in an intermediate way, a mixture of merging and acquisition. This seems faster and exploits efficiencies and assets of the acquired company.

Other questions are still open, and are specifically related to:

- Timing: the right moment to enter a foreign market may be critical for a specific product, and waiting is a cost.
- Subsidiary's small size: small scale may give way to a better and progressive market knowledge
- Subsidiary's large scale: it may lead to conquer a market, but also to possible big losses
- Speed: low speed allows proper adaptation and learning, while fast speed burns competitors but may be limited by resources

There is a possible ideal profile of local companies that investing enterprises may appreciate: the ability to imitate operations in Research & Development, having an older production technology and being expert of local market and rules. This profile may assure the best complementarity with the typical investor profile: innovation in R&D acting as a guide, newer production technology improving other's process, industrial expertise meeting well with local expertise.

Foreign acquisition

With an acquisition, a company buys enough of another company's ownership stakes to take control (investopedia.com, 2014). In this case the investor will have full access to local firm expertise on its market, and full control over foreign production and operations still maintaining control on its own technology. The process of acquisition may be conducted in a "friendly" or "hostile" way. Normally the acquiring company offers a premium over the market price to facilitate the process, while in the hostile case there will be no such kind of agreement.

Problems may be the real local firm value, the incorporation of possible undesired assets or the absence of corporate control. The first conditions to fulfil are a mature market with corporate control, a good synergy between mother company and subsidiary, and the investor's ability to implement its strategy.

"Green Field" investment

Green field is an investment where a company creates a new operational entity with no constraints in a foreign country starting from the ground up building new factories or stores. (investopedia.com, 2014).

Some countries have particularly attractive government and/or market conditions. Tax reduction is an easy price for new jobs and new technology. Normally this choice is feasible, avoids possible risks of overestimation and problems of integration between investor and local firm, maintaining full control, but generally requires higher investment. On the other hand the start-up is definitely slower, requires full knowledge of local market and rules and

possibly foreign management. In general there is higher risk compared to a foreign acquisition, but still maintaining full operational control. This form of investment is indicate for example when the target is not well defined, or when there is special in-house expertise and when a competitive advantage can be identified.
Besides the traditional channels, there are two more ways for entering foreign market.

International sourcing

Consists of providing goods or technology or support to a local firm in exchange of finite goods.
This is the typical case for processing of products whose costs are lower in the foreign country, for example shoes. By this way, a company gains access to local economies and the possibility to lower the costs thanks to low-cost producers.

Compensation trade

With compensation trade, a firm gives equipment and technology to a local firm and expects output.
This is feasible when local firms do not have access to investments and the investing firm should be able to control the operations and the marketing strategy.

Kumar and Subramanian (1997) developed a contingency table comparing levels of risk, return and control of different modes of entry foreign market.

	Export	Agreement	Joint venture	Acquisition	Green Field
Risk	Low	Low	Moderate	High	High
Return	Low	Low	Moderate	High	High
Control	Moderate	Low	Moderate	High	High
Integration	Negligible	Negligible	Low	Moderate	High

Table 1: Characteristics of various entry modes (Adapted from Kumar & Subramanian, 1997)

1.3.4 Host country analysis

Before deciding to do the first international move, a company should analyse all the different aspects of a country, from politics to economics.

Politics

Any company, large or small, should take in consideration the political environment of the country where they intend to operate (Cateora & Graham, 2002). That means analysing the government structure and political system, to understand how your business may be welcomed or hampered by intents and rules, bureaucracy and traditions. Government duration, political alternatives, trading legislation and proprietary rights protection, times and ways of dispute solution, are other interesting chapters. Any firm engaging in international marketing should also be aware of the importance of sovereignty to national governments and its consequences for global business (Keegan & Schlegelmilch, 2001).

Risk assessment

Knowing the level of risks present in a country is very important and in some cases may be a great level of uncertainty in terms of government stability or economical fault risk.

According to Johansson (1997), risks may be categorized in 4 levels:

Level 1: General instability

Level 2: Expropriation

Level 3: Operations

Level 4: Finance.

If any of these levels hide risk, especially if unacceptable, company should immediately reconsider its business in that country.

Trade barriers

Trade barriers include generically any government measure making imported good less competitive but other aspects, not necessarily government dependent, may have similar effect. There are exit barriers when goods are difficult to relocate or there are huge exit costs., like technical aspects country specific, requiring costly modifications. There are hundreds of possible trade barriers. Entry barriers are when government imposes a fee for imported goods, to protect local industry and eventually pushing towards commercial involvement of local companies to reduce or avoid this additional cost. The price per unit should include also costs of trade barriers.

In 1982 Japan was trying to invade France with videocassette recorders (VCRs). President Mitterrand selected Poitiers, a small understaffed office very far from any port, as the only authorized point of VCRs import, a terrible bottleneck.

Bureaucracy rules were enforced and respected carefully: inspectors checked serial numbers and French manuals and arrive to dismantle a number of VCRs to verify the country of production. In a short time tens of thousands of marvellous electronic items were stacked up. Hitachi, a famous Japanese producer, published a full-page advertisement to plead: "We are not Saracens", referring to the other battle of Poitiers, in 732 AD, with François the Hammer instead of Mitterrand winning against Muslims. (Liberally adapted from Essay; the battle of Poitiers of Safire W, 22 Nov 1982, The New York Times).
Germany, Netherlands and Denmark filed a complaint with EC, which in turn accused France at the European Court of Justice for violation of free trade rules., and Japan brought its complaint to GATT. (The world bank: World development report, 1987).

Cultural differences and language should no more constitute a sort of trade barriers, but conversely for the skilful manager be exploited in the right way, transforming an obstacle in a profitable objective.

Legal environment

Companies face a vast amount of problems in their effort to develop successful global marketing programs. Just as cultural, political, geographical differences pose threats to global firm so even the varying legal systems of the world and their affect on business transactions (Cateora & Graham, 2002).

From a schematic point of view there are four legal systems in the world:

- The C*ommon law system* derived from English law and present in the United Kingdom, USA and British Commonwealth countries including New Zealand, Australia and Canada, but also India and former British colonies in Africa.
- The *Civil law system* or civil code found in Italy and many European countries, Japan and non-Islamic and non-Marxist countries.
- The Islamic legal system derived from interpretation of Koran and used in Saudi Arabia and other Islamic countries.
- The Marxist legal system present in Marxist socialist countries like Russia and the remaining of previous USSR countries (others being passed under European legal, political and economical influence), China and a few others.

The influence of the legal system on business is really critical, thus a deep knowledge (and exact comprehension) of the legal system at least for parts concerning your economic activity is the basis for a safe entrance in a foreign market. Great importance should be give to proprietary right legislation, for obvious implication. But full legal proper application may not be enough and should include analysis on costumes and other cultural aspects.

Economic aspects

Economic aspects of the target country are of first interest for a company intending to move internationally, and sometimes "primum movens" (the main reason) to the business itself. Thus they should be deeply and panoramically evaluated with accurate studies on specific interest areas.

Interestingly, Walt Rostow, proposed a country classification based on level of economic development and “the relationship between economic development and types of products a country needs and the sophistication of its industrial infrastructure” (Cateora & Graham, 2002, p 241):

- Stage 1: the traditional society
- Stage 2: the preconditions to take off
- Stage 3: the take off
- Stage 4: the drive to maturity
- Stage 5: the age of high mass consumption.

Others may find more informative Hollensen's degree of industrialization (Hollensen S., 1998), which distinguish three groups:

1. Less developed countries. This includes underdeveloped countries and those at initial phases of development, with low GDP per capita, scarce industrial infrastructures and limited industrial activity.
2. Newly industrialized countries. These are emerging countries and sometimes areas of special economic development inside a larger country.
3. Advanced industrialized countries. In this point are included highly non-industrialized countries, with strong infrastructure network and high GDP per capita.

Economic considerations should be analysed deeply since they are of first interest and represent a solid base of a business plan.

Market estimation

When giving an esteem of the potential of a market, a company has to keep in mind possible customer interests but also whether they have the means to buy the products. According to Wood & Robertson (2000), the central focus is on whether the export market of interest has the necessary means to purchase imported products, and whether the needs of the market are being adequately satisfied.

Assessment of market size is composed by potential share a firm may obtain, considering actual domestic and international competitors (= local production

minus export plus import) and evaluation of products, comparing their quality and characteristics.
Fast and roughly potential market esteems may be obtained from GDP, its variation, population size and annual import of selected goods.

Culture

Culture resides deepest in people attitude, thoughts, needs, wills and dreams. While single persons may have different -often antagonistic- political orientation, people in a culturally homogeneous country share the same behaviour like a natural identifying card. And since people means customers, if a company finds the right way to communicate through their culture, it will reach them one directly. Obviously, if the message is culturally wrong, the business risks to be terribly damaged.
Therefore, culture is necessarily integrated to the business, meaning that "when designing a product, style, and other related market activities, and if they are to be operative and meaningful, they have to be acceptable to the related cultural market" (Cateora & Graham, 2002).

Specifically, cultural distance is one of the first things to consider when deciding to go international. Needless to say that cultural issues have been at the origin of many business failures in history; just to cite one, famous is the case of the Daimler-Chrysler merger in the early '90s (see Hollmann et al., 2010, for a complete treatment of the case).
Those failures are either originated by the lack of consideration for cultural issues, or by the difficulty to understand, treat and sometimes even recognize cultural differences.

One of the most famous and effective frameworks to describe cultural distance is found in the **Hofstede's cultural dimensions theory,** developed by Geert Hofstede in 1984 and successively updated until 2012.

This model focuses on 6 aspects to identify and appreciate distance and differences between two cultures. Specifically, those cultural dimensions are:

- **Power distance index**: "Power distance is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally." This translates, for instance, on which type of relation employees have with their boss.
- **Individualism vs. collectivism**: "The degree to which individuals are integrated into groups".
- **Uncertainty avoidance index**: "A society's tolerance for uncertainty and ambiguity".
- **Masculinity vs. femininity**: "The distribution of emotional roles between the genders".
- **Long-term vs. short-term orientation**: First called "Confucian dynamism", it describes societies' time horizon. While long-term oriented cultures give more importance to the future than the present, in short-term oriented cultures more emphasis is put on values related to present and past conditions (respect of traditions, reputation, social obligations).
- **Indulgence versus restraint**: indicator of the extent to which members of a society try to control their desires and impulses. While indulgent cultures allow the free gratification of human desires and needs, restrained cultures see this as a something not ethical and tend to regulate and limit such gratification.

Rothaermel FT et al (2006), with a study of over 7000 country entry decisions of US firms, tested and verified the effect of some cultural dimensions on the probability of a US firm to enter foreign market:

- Higher country risk[1]: negative
- Greater cultural distance with the target country: negative
- Uncertainty avoidance: negative
- Individualism: positive
- Masculinity: positive
- Power distance: positive

Furthermore, they crossed these variables and found that the size of international market positively improves the situation: small size markets increase the negative effects and reduce the positive effects present in some conditions lowering the probability to enter a foreign market, while large size market seems to facilitate internationalization reducing negative and increasing positive factors weight.

Another interesting framework is the Trompenaars' model of national culture differences, developed by Fons Trompenaars and Charles Hampden-Turner.

This model of national culture differences is articulated around seven dimensions:

1. Universalism vs. particularism (the importance that people give to rules rather than relationships)

[1111] Country risk as indicated by Euromoney composed by nine indicators: political risk (25), economic performance (25), debt indicators (10), debt in fault or rescheduled (10), credit ratings (10), access to bank finance (5), access to short-term finance (5), access to capital market (5) and discount on forfeiting (5). In Euromoney, 100 is a perfect score; the higher the score, the lower the risk.

2. Individualism vs. collectivism
3. Neutral vs. emotional (the extent o which people externalize emotions)
4. Specific vs. diffuse (the extent to which people separate working life and private life)
5. Achievement vs. ascription (the need to prove one's self-value)
6. Sequential vs. synchronic (the measure to which people are able to make more thing at a time)
7. Internal vs. external control (the extent to which people control or are controlled by the environment).

Technology

Technology is vital for many aspects of business activity in foreign market. Good communication network in and outside company is the first need, but other applications are welcomed: online orders/ services, fast distribution of goods, at-home generation of tickets/service vouchers, customer support, data banking.

The distance between countries – The CAGE model

As we have seen, there are many factors that come into question and that must be considered when analysing a country.

To help international managers in this process, Pankaj L. Ghemawat, a professor at the University of Navarra - IESE Business School in Barcelona and guru in international management science, developed the CAGE framework, a model that aims at defining distance between different countries according to four criterion. We report the table as developed by Ghemawat.

	Cultural Distance	Administrative Distance	Geographic Distance	Economic Distance
Country Pairs (Bilateral)	Different languages Different ethnicities; lack of connective ethnic or social networks Different religions Lack of trust Different values, norms, and dispositions	Lack of colonial ties Lack of shared regional trading bloc Lack of common currency Political hostility	Physical distance Lack of land border Differences in time zones Differences in climates / disease environments	Rich/poor differences Other differences in cost or quality of natural resources, financial resources, human resources, infrastructure, information or knowledge
Countries (Unilateral / Multilateral)	Insularity Traditionalism	Nonmarket/closed economy (home bias vs. foreign bias) Lack of membership in international organizations Weak institutions, corruption	Landlockedness Lack of internal navigability Geographic size Geographic remoteness Weak transportation or communication links	Economic size Low per capita income

Table 2: the CAGE framework (Ghemawat, 2007)

To help managers identifying the real distances between countries, Ghemawat has developed an online CAGE comparator.

Importance of the variables - Wood & Robertson model

Wood & Robertson (1999) ordered by relevance selected variables involved in the process of entering a foreign market. According to this model, market potential is the most powerful variable, and culture is the less important. If anybody may agree that high market potential gains the first place, probably the value and thus the place of each other variable should be better carefully checked at the light of specific markets and activities, including, moreover, culture.

	Relevance
Market potential	max
Legal	
Politics	
Infrastructure	
Economy	
Culture	min

Figure 9: scale of variables to consider in foreign market entry (Wood & Robertson, 1999)

1.4 Entry mode choice and stages of internationalization

According to the classical literature (Albaum, Strandskov, Duerr and Dowd, 1994) and practice, a firm aiming at expanding abroad in a new and uncertain market undertakes a gradual process of entry mode adoption, going from the less risky to the most risky-one, following the definition of risk that we gave before. And the first step of the internationalization process is often the export (Albaum et al, 1998, Hollensen, 1998, Albaum, Strandskov, Duerr, 1998).

Traditional literature wants the internalization process of a firm to take 4 stages (He, 2011):

- No regular export activities:
  - No resource commitment;
  - Scarce information to reach the market;
- Export activities via independent sales representatives:
  - The firm has a channel to the market;
  - Information about demand and sales;
  - Commitment to the market (more moral than in terms of resources);
- Implantation of a sales subsidiary in the foreign market:
  - Direct channel of information;
  - Strong commitment to the market;
- Construction of a production subsidiary in the foreign market:
  - High control of the international subsidiary and constant;
  - Large resource and time commitment;

These stages are different for the degree of involvement of the firm in the market, in a scheme that sees the resource commitment augmenting in every different stage.

1.4.1 The Uppsala Model

Johansson and Vahlne (1977) developed a model of internationalization (the Uppsala Model) that expects the firm to acquire, integrate and use the knowledge about the foreign market, in a model that implies a progressive resource involvement.

According to the model, firms first gain experience in the domestic market, then move to foreign markets close, geographically and culturally, to their region, to finally move to more distant countries.

In doing that, firms start from low-commitment modes like export, first occasionally, then more steadily, and then switch to more engaging solutions like subsidiary. If the results are lower than expected, the commitment to the foreign operations can be reduced.

The model offers also an interesting definition of commitment, defined as:

Commitment = size of the investment x degree of inflexibility

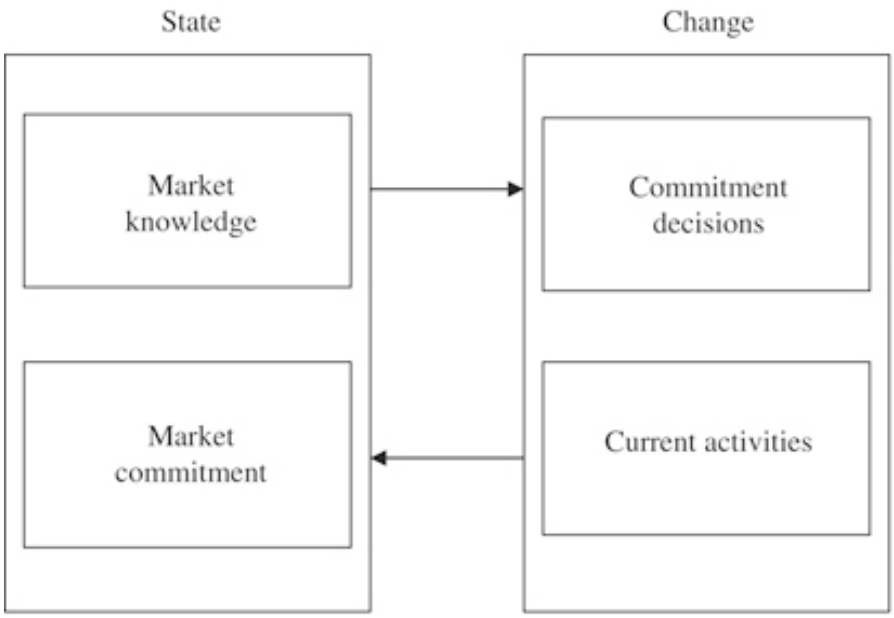

Figure 10: the Uppsala model (Johanson & Vahlne, 1977: 26)

The model has then been revisited (Johanson & Vahlne, 2009), to keep up with the modern competitive environment.

1.4.2 The real option optic

Real options in international investment decision

Real option theory applies the rules of financial options to real investment projects (see Chapter 2 for a full explication).

Real options have a broad range of applications; mostly, they have been used to valuate R&D projects, natural resource investments, and project management, given the standard structure of those investments as options.

In internationalization projects, real options have seen a large, even if narrower than in other domains, literature.

The real option analysis adds a new and revolutionary perspective to the valuation of international investment projects, opposed to the traditional one.
In international management, this implies that while the traditional theory suggests that risky projects should be undertaken only after other less-risky modes (basing on the basic, all-day-life concept that risk is a negative thing that should be avoided and that lowers a projects value), in option theory, as we know, the risk level of the underlying asset enhances the value of the option.
Thus, if the project incorporates a real option, the riskier the project, the more valuable the option.

The limits of the traditional internationalization theory

Classical International Business theory suggests that firms with operations abroad should consider to build a Wholly Owned Subsidiary (WOS) to overcome the imperfections of intermediate market (the firms the company relies on to take on its operations abroad) in terms of technology, brand and methods (Buckley & Casson, 1976; Rugman, 1981; Hennart, 1982).

However, building a WOS often requires an enormous commitment in terms of resources and since those investments are irreversible, the firm cannot adjust its decisions as new and more information about the market becomes available (eg: if the product works, the level of demand, regulations, etc.). Clearly, this is a situation that most modern firms cannot afford, and are not willing to be into.

So why should a firm willing to expand in a new and foreign market consider the implantation a WOS, instead of less expansive and more flexible modes, like the export or the WOS?

Classical internationalization literature tends to see uncertainty as a transaction cost, and suggests the use of high control strategies, like the WOS or JV, to reduce it. Thus, what most managers do is to "taste" the market with some export, and if things work, go for more high-control strategies (Kogut, 1991).
Real option analysis allows viewing things under a different perspective.

Under the real option optic, uncertainty is a positive factor that increases projects incorporating real options. Actually, uncertainty (volatility) is associated not only with downside risks but also with upside potential.
Real options theory suggests that, in presence of real options, firms can benefit from this upside potential without worrying about the downside risk. The higher the uncertainty, the greater the upside potential.

Therefore, for what has been said before, not always a riskier alternative has to be avoided, since it can be even more profitable and less risky than it appears under the NPV optic, and not always export is the best entry mode
The only condition to profit from this situation is the creation of real options, as well as the ability to recognize and exercise them when it is the case (Li, 2007; Jing Lia, Alan M. Rugmanb, 2007).

Where to "buy" real options

The next question is, how to have a real option, of any sort, when considering an internationalization project?
Are there entry modes that embody a real option?

As seen before, there are many types of real options, and most of them can be found in international investment decisions; for example, a firm could have a deferral option on an international expansion investment that requires the construction of a WOS abroad. Or it could have an option to abandon, if it considers expanding through the market with export.
Options can also be created, of course, and managers should be able to create the conditions that make real options. Most managers do this unconsciously.
For example, a study shows that MNCs are more prone to invest in their home region when they think their chances to create or exercising real options in non-home regions is lower. This is one of the factors that explain why the majority if Fortune Global 500 firms register 70% of the sales in their home region; this phenomenon is called "regionalization" (Jing Lia, Alan M. Rugmanb, 2007).

However, all these situations are circumstantial, depend from case to case, and are not proper of the entry mode.

Real options and joint ventures

Instead, an entry mode that for its nature embodies a real option, and particularly a growth option, is the Joint Venture.

Actually, as we introduced before, the contract of Joint Venture often gives one party the possibility to buy the other party's stake, at a determined price, and under some conditions that are not relevant for our study. The party that deserves this option, obviously, will exercise it only if it is financially convenient, so, for instance, if there is a strong increase in the demand. The exercise of the option will allow the firm to fully profit from the demand increase. On the contrary, if the demand remains flat or decreases, the firm will

not be forced to buy the partner's stake, so that it won't fully bear the consequences of the market decrease.
It is clear how this mechanism is structured as a call option, particularly a growth option.
Joint ventures, like a classical call option, actually allow the firm to fully benefit from the upside gain potential, without having to worry about the downside risk.
And since an option is more valuable as uncertainty increases, the growth option incorporated in an international Joint Venture may have an interesting value, given the high level of uncertainty that normally characterizes international expansion operations, and makes the Joint Venture a particularly attractive entry mode.
This is the idea at the base of our model.

According to K. D. Brouthers et al. (2008), combining NPV framework and real options theory is the best way to weight an international investment decision.
In fact, while NPV focuses on cost minimization, real option theory focuses also on value creation, and the two theories are not, and shall not be, mutually exclusive.

The authors depict some of the characteristics and the pros and cons of each mode, the authors formulate three hypotheses to study the effects of demand uncertainty and strategic flexibility on the choice among the different entry modes.

They demonstrated that if demand uncertainty in the foreign market is high, investors will be more prone to choose a Joint Venture to aggress a foreign market, for at least four reasons: first, as mentioned before, JVs "provide an option to take advantage of upside opportunities if they occur, while simultaneously minimizing downside risks" (Buckley et al., 2002; Kogut, 1991;

Reuer, 2002); second, as in finance, investing in options gives the possibility to invest in a greater number of projects, so to better hedge the risk (McGrath and Nerkar, 2004); third, JVs provide fast and direct access to proprietary knowledge (Bowman and Hurry, 1993); finally, they provide first mover advantages closing distribution channels to competitors and restricting competitors' access to limited resources. (Brouthers et al.)

On the contrary, if demand uncertainty is low, investors will choose export or WOS, because the upside benefits of a foreign investment can more accurately be determined.

Also, they found a negative relationship between firm's strategic flexibility and the choice of a JV as internationalization technique, since JVs offer those firms the flexibility they already have. Instead, wholly owned subsidiaries provide the mother company direct control and fast decision-making processes (Williamson, 1991). In addition, changes in product mix are easier with wholly owned subsidiaries or export.
Finally, their study demonstrated that firms using combined real option/TCE framework to evaluate entry mode choices achieve higher subsidiary performance.

According to Keith D. Brouthers et al. (2008), JVs are structured as real options because they incorporate the right, but not the obligation, for future investment.
JVs provide both deferral options and growth options.
Deferral options allow the investing firm to wait before investing, to see how the situation evolves and if it will be convenient to do invest. Time can be particularly valuable "when investments are irreversible, or partially irreversible, and the future value of an investment is uncertain" (Leiblein, 2003).

On the other side, "growth options are valuable where knowledge spill overs can reduce the value of the investment and/or there is uncertainty about the growth potential of the investment" (Leiblein, 2003).

When constituting a joint venture, firms reduce their risk exposure, and gain access to the knowledge of the partner, thus gaining an immediate and powerful know-how on the foreign market, uses, etc, and on the business, if the venture represents a new sector for the firm. Furthermore, the firm gains also an expansion option, since the contract of joint venture grants it the right to buy the counterpart, if the conditions are favourable, to fully reap the benefits of, say, an eventual boom in the demand (Folta, 1998; Folta and Miller, 2002; Kogut, 1992).

Other variables to keep into account

However, the situation is not as plain as it might appear.
According to Tong and Reuer (2007) "the benefits held out by real options theory might not be all so immediate and granted".
Three important contingencies that play a central role must actually be considered when analysing the convenience of multinational operations:

- The complexity of the multinational network
- The coordination challenges
- Incentive misalignments

The first hypothesis they formulate and verify is that there is a curvilinear relationship between multi-nationality and downside risk, so that risk initially decreases at the first stages of internationalization, but as the multinational operations of a company multiply, risk increases and the convenience of taking

on a new project falls.

Possible explanations for that might be the emerging of greater complexity and coordination costs, as managers have to manage more and more subsidiaries, and a "likely declining marginal benefits of switching options as multi-nationality increases".
According to Tong and Reuer (2007), these factors « may finally even outweigh the benefits of investing in new countries at high levels of multi-nationality » (Hitt et al., 1997; Contractor et al., 2003)

The second obstacle that MNCs encounter in their multinational operations is cultural distance between the home base and host countries.
Using Kogut's (1988) formula to measure cultural distance, they were able to demonstrate that « Cultural differences within a multinational firm's portfolio of foreign subsidiaries can reduce the benefits that the firm attains from its latent options, for several reasons » (see Zaheer and Mosakowski, 1997, Ghoshal and Nohria, 1989).

The third point to consider is the level of control of the mother company in the subsidiary. In fact, the higher the control over the foreign subsidiary, the higher the chance of giving a global shape to the operations and avoiding that the subsidiary act following local interests. In addition, the higher the degree of control, the faster the decision making process.
However, the authors have not been able to demonstrate this hypothesis using their model and data.

The nature of uncertainty

As seen before, the higher the uncertainty of the underlying asset, the higher the value of the option.
This is true for financial options as well as real options.

However, when talking about real options, we cannot limit our focus on the magnitude of the uncertainty, but we have to consider also the type of uncertainty. Uncertainty can be of two kinds, exogenous and endogenous: the first one is not controllable by the firm, while the second depends on the actions of the firm.

According to Lia & Rugmanb (2007), "the choice of market entry mode essentially depends both on the magnitude of uncertainty and the type of uncertainty. When uncertainty is high, firms are inclined to invest in low-commitment entry modes such as export/licensing because these modes provide valuable options to abandon. However, if uncertainty that an MNE faces is mainly endogenous, firms may change their decisions by investing in high commitment market entry modes such as a JV or a WOS because such high-commitment entry modes are likely to provide valuable growth options, such as first mover advantages.

Particularly, we find that, provided that uncertainty an MNE faces is high and endogenous, a JV is likely to be the optimal choice of entry mode because it provides the best combination of the option to abandon and the option to grow. Compared with export/licensing, using a JV provides the MNE with the opportunity to reduce endogenous uncertainty and obtain the growth option. Compared with a WOS, using a JV defers the initial large investment and thus exposes the MNE to less risk in the future".

Timing of exercise of a growth options

When is the best time to exercise the option? We saw that, in finance, the optimal timing of option exercising depends on different factors: for example, European options cannot be exercised before maturity, while an American option's optimal exercise date is always at the expiration. However, for American options written on dividend-paying stocks, it might be convenient to exercise the option before maturity, and in this case, always the moment before the payment of the dividend (Hull, 1989).

For real options, things complicate a little bit. Admitted that JVs are real options equivalent to American option, we should, by comparison, think that the real option is never exercised before the "maturity" (if there is one), unless the JV "pays some dividends" (which is not always the case: we should not forget that the value of a real option does not lie on the present value, but on future opportunities, so it wouldn't be unreasonable to think that a company could invest in a non-profitable or even money-destroying project just to profit from uncertain future gains).

In the real economy, exercising a growth option translates into acquiring the other party's stake in the JV.
Obviously, given that we are in a real world, there are other factors to be taken into account. For instance, if often an investment decision implies the simultaneous valuation of a deferral option and a growth option: the value of deferring the investment to see "how the situation evolves" is often counterbalanced by an opportunity cost that is heavier in the real world than in finance.

Actually, deferring the investment implies not only in the loss of the cash flows

(dividends) generated in the waiting time, but also in the lacked gain of "experience with the technology", the missed first-mover advantages in terms of opportunity exclusion, and the retarded establishment of a "brand image with the customers".

That said, the problem is: when would it be profitable to exercise the option, or buy the partner's stake in the JV?
According to Kogut (1991) the acquisition is only made if the estimated value of the remaining stake in the JV is higher than the "strike price". This depends on how a firm valuates the venture, the opportunities it gives, and so on, from its particular point of view.

But, he adds, "once it is profitable to exercise the option, there are sound reasons not to wait".
"For two reasons: first, the value of the real option is only recognized by making the investment and realizing the incremental cash flows. If the investment in new capacity is not made in a period, the cash flows are lost; second, the necessity to increase the capitalization of the venture invariably requires a renegotiation of the agreement, often leading to its termination. The option to expand the investment is likely to coincide with exercising the option to acquire the joint venture" (Kogut, 1991).

Chapter 2. Technical instruments and frameworks - The valuation of a project

The domain of our research is international investment projects.
In this part, we aim at presenting the theoretical framework, models and instruments that we used in our research. Particularly, we will focus on the two main theories on the valuation of an investment in a real project: the classical Discounted Cash Flows (DCF) framework, and the one, more unusual, of Real Option Valuation (ROV).
We will begin introducing the classical investment valuation methods, then, after a necessary preliminary introduction to financial options theory, we will introduce the real option valuation framework.

2.1 The Classical NPV/DCF framework

Anybody is interested to invest in projects with positive returns. When you propose an investment, you have to demonstrate that you will expect a greater return, bigger than other investments with similar risk. Shareholders have to decide which project is more profitable to invest in. A very well known and strong measure of project evaluation is its Net Present Value (NPV).

In general, the NPV of an investment is defined as the sum of present value of the net cash flows of the project, discounted at the firm's opportunity interest rate.

Project revenues must be balanced with assets to calculate the book rate of return. But someone may classify some expenditures as investments and others as operating expenses.

While these lasts are directly deductible from income, capital investments are put on the balance sheet and the annual depreciation rate is deducted from income. Consequently, the book rate of return depends on capital investments and their depreciation. If the profit calculation depends on what you consider cash flows, probably the book rate of return may not be the best measure of profitability.

Payback period (PBP) is the time the investor needs to cover with cumulative cash flows the initial capital, and should be below a specific cut-off. The duration of PBP may be used as a criterion of choice for projects.
Investors use two techniques to exploit PBP:

1. Ignore all cash flows after the cut-off date
2. Assume all cash flows are equals before the cut-off.

Choosing the cut-off date, a company should consider the characteristics of the project.

PBP is a criterion of basic simplicity, and some investors may prefer projects with shorter time, either because they look at earlier revenues as a good mark of personal performance, or because they are scared by long-term capital investments, even if with a longer time the NPV would be greater.

For periods with different cash flows, the NPV is defined as:

$$NPV = CF_0 + \frac{CF_1}{1+r} + \frac{CF_2}{(1+r)^2} + \ldots + \frac{CF_n}{(1+r)^n}$$

This discount rate that makes NPV= 0 is called Internal Rate of Return (IRR).

$$NPV(IRR) = 0$$

The IRR is a profitability measure that depends solely on the amount and timing of project cash flows (Brealey, Myers, Allen, 2011), not to be confused with the opportunity cost of capital that is a measure of profitability.
According to the IRR rule, investors may accept a project if the opportunity cost of capital (OCC) is less than IRR, thus with a positive NPV. This is true only until NPV remains a declining function of the discounted rate.

Limits of the IRR

If a project starts with positive inflows followed by negative cash flows, NPV will increment when discount rate increases, thus profitable projects will be those with IRR lower than OCC.
And if a project has more than one change of sign in cash flows, there will be more than one IRR, or no IRR at all.
What's more, choosing among mutually exclusive projects, IRR may be misleading when projects differ in duration of the period or size of investment or in presence of capital limits. To compare projects, NPV is better. Alternatively one may use IRR on incremental cash flows.
And in case with different opportunity costs of capital, to apply the IRR rule (accept a project if IRR is greater than OCC) you have to calculate the weighted average of IRR.

All the above discussions presumed that the company accepts all projects matching pre-set positive characteristics, with no limits in raising funds. When capital is limited, managers have to look at the project with highest profitability index, defined as the ratio between NPV and the capital invested:

$$Profitability = \frac{NPV}{Investment}$$

Other restrictions may apply and trying to identify the best projects/investments, need driving through combination of several criteria. This is a sophisticated way for performing optimization, although presuming that all future opportunities are known, while projects and ideas are actually continuously evolving.

Finally, when internal company planning rules limits investments, these may be changed if this is the case and project accepted. But when both company and shareholders have hard limits to funding access, there is a barrier or a market imperfection between market and company and in this case looking at investment opportunities has no sense.

2.2 Real Option Valuation (ROV)

Again, we rely on the works of Brealey & Myers and Berk & De Marzo for the theory framework.
Real option valuation applies the traditional financial options pricing methods to evaluate real investment projects, where the conditions allow it.

Real option theory is applicable only to certain types of investments that we will specify later.
For the moment, it is important to underline that real option analysis does not replace the NPV method; instead, it is based on it, and takes the analysis further.
To fully understand real option theory, it appears necessary the introduction of the financial option theory.

2.2.1 Financial options

Financial options are part of the so-called third class of financial instruments, the derivatives, that due their name to the fact that their value depends on the value of another asset.
An option is a contract that grants the owner the right to buy or to sell a given underlying asset (actions, obligation, currency, commodity, etc.) at a predetermined price (strike price), on an established date or time window.

The basic elements of an option are:

- The type of the option
- The quantity and type of underlying asset: equity, bond, future, index, commodity.
- The strike price
- The expiration date
- The settlement terms
- The option price

Different types of options

The first macro distinction that can be drawn in the option group is between CALL and PUT options
A call option gives the owner the right to buy the specified amount of underlying asset on or before a certain date at a specified strike price[4].
Depending on the fact that the option can be exercised only at maturity or during the period preceding the maturity, options are named, respectively, EUROPEAN or AMERICAN

Other distinctions in the options group can be made according to:

- The market where they are traded
    - Exchange-traded options, traded in a regulated market with the intermediation of a Clearing House (the Options Clearing Corporation, OCC).
      Options traded in a regulated market include stock options, bond options, index options, options on futures

- Over-the-Counter options, traded between two private parties, and not listed. Commonly, OTC options are currency cross rate options, interest rate options, or options on swaps (or swaptions).

- The option style:
    - **European style**: the option can only be exercised at the determined date.
    - **American style:** the option can be exercised before the determined date.
    - **Other:** financial engineers have invented many types of options; however, their treatment goes beyond the aim of this work.

- The underlying asset:
    - Equity option
    - Bond option
    - Future option
    - Index option
    - Commodity option

In our work, we will limit the analysis to the case of options written stocks.

Investors buying a call expect the stock's value to rise, whereas an investor buying a put expects the stock value to decrease.

In every option contract, there are two positions:

- The long position, or the position of the investor who buys the option

- The short position, or the position of the investor who sells (writes) the option

To depict these positions, we can use payoff diagrams, charts that represent the value of the option (y-axes) for different values of the stock price (x-axes).

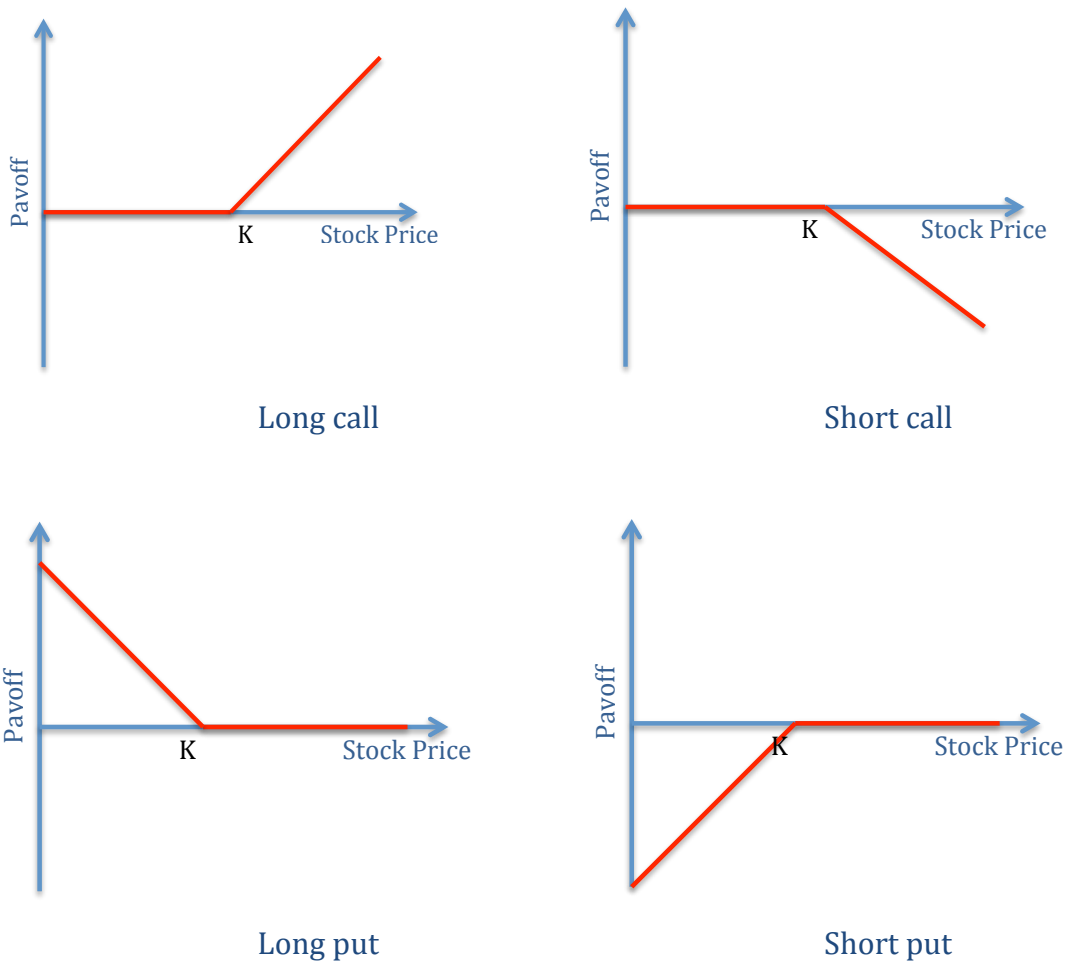

Figure 11: Position diagrams for a call and a put with option price S_0 and strike price K; y-axes represent the final value of the option

Payoff diagrams do not take into account the initial cost of the option.
Let be S_T the final stock price, and K the option strike price; then, payoffs for the different positions will be:

POSITION	PAYOFF
Long call	$\max(S_T - K, 0)$
Short call	$-\max(S_T - K, 0) = \min(K - S_T, 0)$
Long put	$\max(K - S_T, 0)$
Short put	$-\max(K - S_T, 0) = \min(S_T - K, 0)$

Table 3: Payoff of different types of options

Factors influencing option prices

There are essentially six factors influencing the value of an option:

1. Stock price (S_0) and option's strike price (K): as seen before, the payoff of a call option is given by the difference between the value of the underlying stock, S_t, and the exercise price, K. therefore, the higher the value of the stock and the lower the strike price, the higher the payoff of the call option. Opposite reasoning can be made for put options, for which the lower the value S_t and the higher the strike price, the higher the put's payoff.
2. Time to maturity (T): usually, time to maturity increases the value of an option, since, ceteris paribus, an higher time to maturity gives the holder more chances to exercise it. This is particularly true for American options, which can be conveniently exercised before maturity in presence of dividends; for EU options, time to maturity has no effect,

since, as seen before, it is never convenient to exercise an EU option before the maturity.

3. Stock price's volatility (σ): Volatility is a measure of the risk of the stock. The volatility of the stock represents the uncertainty about its future price movements. As volatility increases, the stock price can assume a broader range of values in the future; so higher values in the best cases, and lower values in the worst cases. Since the option written on the stock has a value just if the stock price S_t is greater than K, the option holder looks only at the highest values, and simply does not care about the low values the option can take, as long as they are all under K (which, usually, is placed near the stock's expected value). So, the option holder can benefit from the upward volatility, without worrying of the downside risk.

   Hence, the volatility of the underlying stock increases the value of the option.
4. Risk-free rate (r): the risk free interest rate affects the value of the cash flows in an inverse relation. Thus, the higher the interest rate, the higher the value of the call and the lower the value of the put. Note that this analysis implies a movement of the risk-free rate *ceteris paribus*; in the reality, an increase in the interest rate usually causes the stock prices to decrease, and vice versa, so that the net effect on the option value might be different.
5. Dividends expected from the stock (D): as we know, after the detachment of a dividend, the value of the stock decreases by the amount of the dividend ($P_{ex} = P_{cum} - D$). Hence, also the value of the call decreases (and, symmetrically, the value of the put increases): dividends have a negative effect on the call option price.

The following table, taken from the Hull, summarizes the effects that the external factors have on options.

Variable	EU Call	EU Put	American Call	American Put
Current stock price	+	-	+	-
Strike price	-	+	-	+
Time to expiration	/	/	+	+
Volatility	+	+	+	+
Risk-free rate	+	-	+	+
Future dividends	-	+	-	+

Table 4: Effects of external factors on option value.

In our analysis, we will use the notation taken from Hull (2008):

- S_0 = current value of the stock
- K = strike (exercise) price
- T = time to expiration of the option
- S_t = value of the stock at the expiration date T
- r = composedly compounded risk-free interest rate (nominal and always greater than 0)
- c = value of the EU call option
- p = value of the EU put option

As seen before, the standard method for valuing an investment consists in the estimation of the future cash flows, and the determination of the NPV discounting the cash flows at the opportunity cost of capital (OCC) that, for

assumption of the NPV framework, is supposed to be constant over the entire period.

This technique is not applicable to option valuation; in fact, option value, as well as its risk, depends on the value and risk of the underlying asset, and this value changes several times during the investment period. That means, there is not a single constant opportunity cost of capital that can be used to discount the value of the option, because this rate changes each time the value and risk of the underlying asset change.

Therefore, alternative methods to the NPV must be found to price an option.
There are three classical ways to determine the value of an option. Those are:

- Construction of a replicating portfolio
- Binomial trees
- The Black & Scholes formula

Other option pricing methods have been developed; however, their treatment goes beyond the aim of this work.

Construction of a replicating portfolio

The basic method to evaluate an option, whose utility is more conceptual than practical, is to build a portfolio that replicates the same payoff conditions of the option. Since they have the same payoff (FV), they will also have the same PV, according to the law of the unique price.

Let's suppose that the stock price, in t=1 can increase of *u* and decrease of *d,* that the risk-free rate is r_f and that the option is in the money.
The payoff of the option will be 0 if the stock price goes down, and x if the stock

price goes up

Now, it is demonstrated that if we buy Δ shares and "borrow the present value of the difference between the payoffs from the option and the payoffs from Δ shares" (Hull), we will obtain the same payoff.

To do this, we first have to calculated the option delta, or hedge ratio (Brealey, Myers)

$$Option\ delta = \frac{spread\ of\ possible\ option\ prices}{spread\ of\ possible\ stock\ prices}$$

This represents the number of shares needed to replicate the payoff of the call option

$$Value\ of\ call = \ value\ of\ \Delta\ shares - money\ borrowed$$

The risk-neutrality hypothesis gives us the opportunity to compute the option value in another way. If investors are neutral to the risk, they don't pretend a risk premium, so the discount rate will simply be the risk-free rate. To calculate the value of the option, therefore, we just need to calculate the future value of the option and discount it back at the risk free rate.
The following steps demonstrate the validity of this statement:
In a risk-neutral world, there is no risk-premium; thus, the expected return on the stock equals the risk-free interest rate:

$$Stock's\ E(r) = r_f$$

Since we supposed that the stock could either go up by u or down by d, the expected return on the stock will be

$$E(r) = [pu * (1-p)d]$$

So:

$$E(r) = [pu * (1-p)d] = r_f$$

Solving for *p*, we obtain

$$p = \frac{1+r_f-d}{u-d}$$

This is the so-called risk neutral probability of an increase, or the probability that, given u, d, and the risk-free rate r, the underlying asset increases its value of u.

Called f_u the value of the option at t=1 in case of option price's increase, and f_d the value of the option at t=1 in case of option price decrease, the expected future value of the option will be:

$$EV = pf_u * (1-p)f_d$$

and since we won't exercise the option if the value of the stock is lower than the strike price, the value of the option in case of stock price decrease is $f_d = 0$ at t=1 and the expected value of the option will be:

$$EV = pf_u$$

and the expected present value of the option under the risk-neutral probability will be:

$$pf_u * (1+r)^{-1}$$

To sum up, we have seen two basic techniques to determine the value of an option:

1. Construct the equivalent portfolio of stock and loan. Since the future value of the two strategies is identical, then, for the law of the unique price, they their future value will be identical, too.
2. Introduce the risk-neutrality hypothesis (investors do not care about risk), calculate the expected future value of the option and discount at the risk-free rate.

Binomial trees

The direct application of the valuation technique that assumes risk neutrality is by means of binomial trees. Our analysis is based on the studies of Cox, Ross and Rubinstein (1979), and on the works of Hull (2008) and Brealey&Myers (2011). Under the assumption that stock prices follow a random walk, binomial trees are diagrams that depict all the possible prices the stock will assume over the course of the option's life. The tree is composed of knots and branches. At each knot of the tree, the stock's price has a certain probability of moving up and down of a certain percentage.

Let's consider a portfolio composed by a stock whose initial price at t=0 is S_0, and an option on this stock whose price is f.
The option will expire at time T, and during that period the stock price can either go up to S_0u or down to S_0d, with u>1 and d<1.
Consequently, the value of the option will be, respectively, f_u or f_d.
The binomial tree representing this situation will be the following:

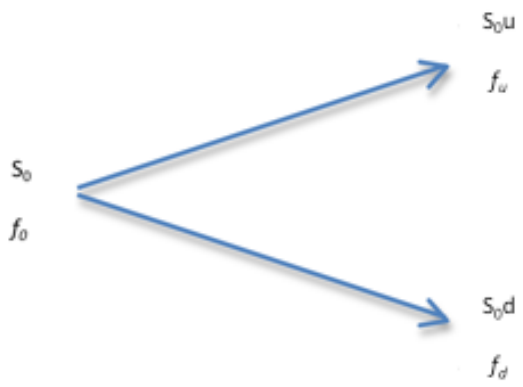

Figure 12: one-step binomial tree

To determine a fair estimation of the values the stock price will reach, we can use a simple formula.

Under the following notation:

σ = annual standard deviation of the stock prices (compounded continuously)
h = period as a fraction of the year

u = 1 + positive percentage variation
d = 1 + negative percentage variation

Then:

$$u = e^{\sigma\sqrt{h}}$$

$$d = 1/u = 1/ e^{\sigma\sqrt{h}}$$

if we think of a portfolio of portfolio of Δ stocks and a short position on one option, the value of the portfolio will be:

$S_0 u\, \Delta - f_u$ in case of upward movement

$S_0 d\, \Delta - f_d$ in case of downward movement

The two expressions are equivalent when

$$S_0 u\, \Delta - f_u = S_0 d\, \Delta - f_d$$

Or, solving for Δ, when

$$\Delta = (f_u - f_d) / (S_0 u - S_0 d)$$

Δ is the ratio between the option price variation and the stock price variation, that occur when going from a knot to the following one.

It can be demonstrated (see Cox, Ross & Rubinstein, 1979) that, under a risk-neutral probability assumption, the value of the option will be:

$$f = (1+r)^{(T-t)} * [p\, f_u + (1-p)\, f_d]$$

$$\text{with } p = \frac{r-d}{u-d}$$

Using these two equations, we can evaluate the option using the one-step binomial tree method.

Since we are now evaluating the option price relatively to the underlying stock's price, the stock expected return becomes irrelevant.

The principle of the risk-neutral valuation

A basic principle in the derivatives pricing theory, is the assumption that investors are risk-neutral, so that we operate in a risk neutral world, where the options returns and the discount rate used to actualize the option's payoff are both equal to the risk-free rate

In this risk neutral world, it is natural to think of p as the upward movement probability, and, consequently, to 1-p as the probability of a downward movement of the stock price (Hull, 2008), so that

$$p\, f_u + (1-p)\, f_d$$

represents the expected value of the option.

Thus, according to the equation

$$f = (1+r)^{t*} [p\, f_u + (1-p)\, f_d]$$

The current price of the option equals the its expected future value $p\, f_u + (1-p)\, f_d$ actualized at the risk-free rate.

Two-step binomial trees

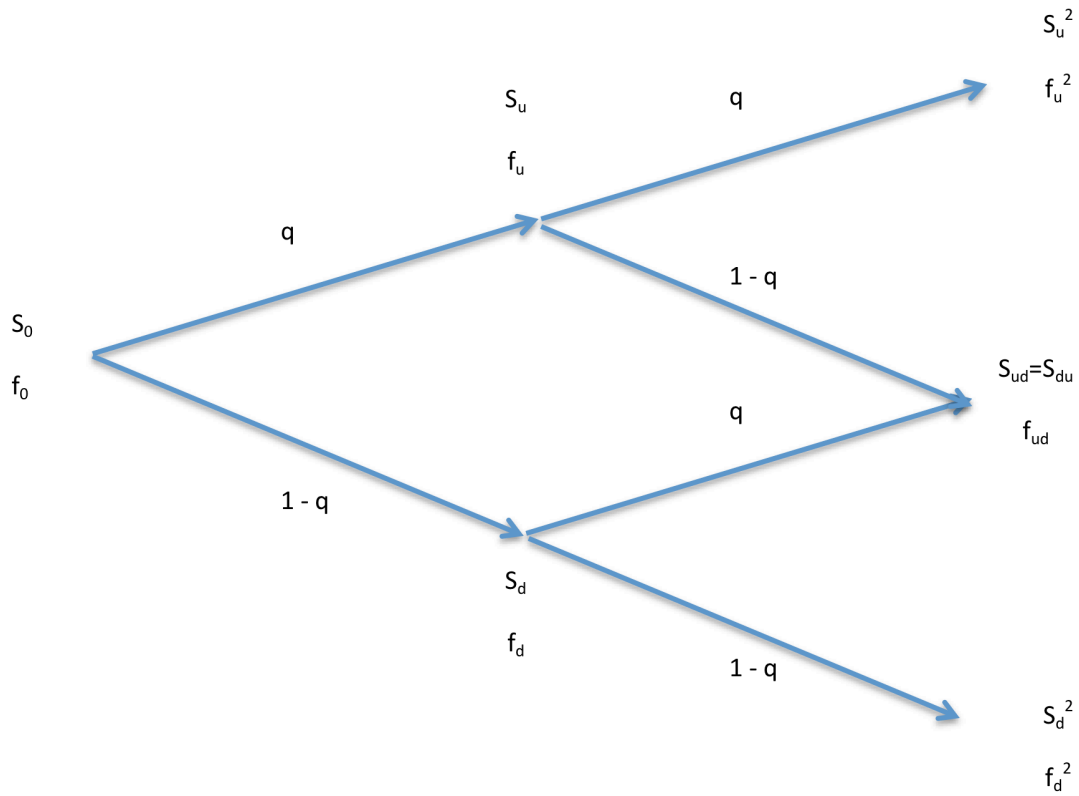

Figure 13: two-step binomial tree

Two-step binomial trees represent situations of two periods. As usual, the value on each node can be determined looking at the two following node values, so to calculate the value of the option the analyst should proceed backward, from the end to the beginning.

The value of the option at t=0 will therefore be determined as follows:

$$f_u = (1+r)^{(T-t)} * [p\, f_{uu} + (1-p)\, f_{ud}]$$

$$f_d = (1+r)^{(T-t)} * [p\, f_{du} + (1-p)\, f_{dd}]$$

$$f = (1+r)^{(T-t)} * [p\, f_u + (1-p)\, f_d]$$

Thus, substituting f_u and f_d for their formula, we obtain the general formula for a 2-period binomial tree:

$$f = (1+r)^{(T-t)} * [p\, f_u + (1-p)\, f_d]$$
$$= (1+r)^{(T-t)} * [p^2 f_{uu} + 2p(1-p) f_{ud} + (1-p)^2 f_{dd}]$$

with the discount rate being always the risk-free rate.

The Black and Scholes model

If we divide the life period of an option in infinite sub-periods, we find that the possible price variations at maturity have the shape of a lognormal distribution

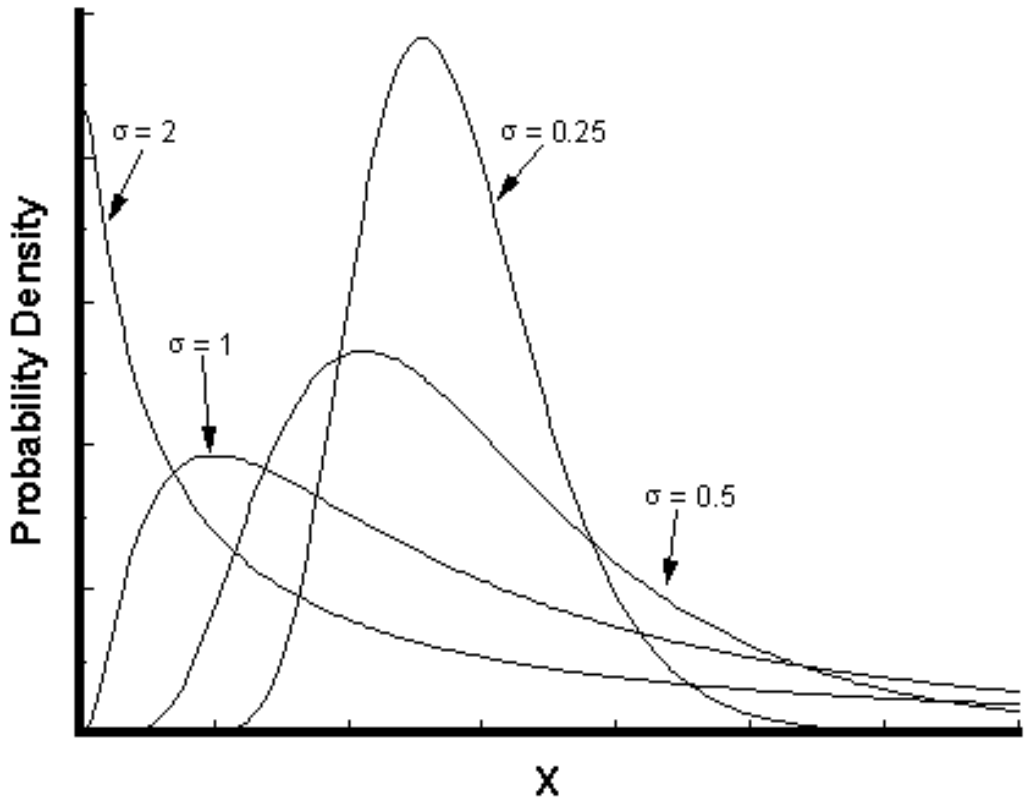

Fig. 14: Density function of lognormal distributions varying δ(σ)

Although not perfectly in line with real market data, the Black&Scholes model is more precise and realistic than binomial tree valuation, since it assumes that there are infinite sub periods before the option expiration in which the option

price can change, and this is closer to the reality, even though stock prices do not fluctuate continuously.

The Black&Scholes formulas derived under the Black&Scholes assumptions to price a call option and a put option are the following

$$c = [N(d1) * S_0] - [N(d2) * PV(K)]$$

$$p = [N(-d2) * PV(K)] - N(-d1) * S_0]$$

$$d_1 = \frac{\ln[S_0/PV(K)]}{\sigma\sqrt{t}} + \frac{\sigma\sqrt{t}}{2}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

with:

N (d) = cumulative normal probability density function

K = strike price of option;

PV(K) : the present value of K, calculated by discounting at the risk-free interest rate rf

t = number of periods (variations) to exercise date

σ = standard deviation stock price

The call and put in the Black & Scholes formula maintain all the properties listed before.

Other types of options

Until now, the analysis was focused on European options written on assets that do not pay dividends.
How things change if we consider American options, and options on stock that pay dividends?

European Calls and Puts on Dividend-Paying Stocks

Since the Black & Scholes model does not allow for early exercise, and the owner of the option ha snot the right of dividends, when valuing an option, the value of the stock should be reduced by the present value of all the dividends that will be paid before option maturity

American calls

American options can be exercised anytime before the maturity date; however, since the option value increases with time, an early exercise is never recommended for a call. Since an American option written on a stock that doesn't pay dividends is exercised at the same time of European options, they have the same value and the same valuation methods (both binomial and B&S)
Different is the case of a dividend-paying stock: in this case, early exercise can be convenient the instant before the payment of the dividend. In such a case, however, the Black & Scholes method cannot be applied, and the only way to price the option is the binomial method, checking at each stage whether the option value is greater if exercised before of after the dividend date.

2.2.2 Real options

Among the first scholars to study real options, we can remember Brennan and Schwartz (1985) and Mcdonald And Siegel (1986).
Recently, real option analysis has been used to study agency conflicts (Grenadier And Wang 2005), and specific industries (see Williams, 1991 for the real estate and Brennan And Schwartz 1985 for Natural Resources). Finally, real options have been applied in the study of corporate internal decision, such as Mergers (Lambrecht 2004; Hackbarth And Morellec 2008; Hackbarth And Miao 2011) and Defaults (Leland 1994).

Under the standard techniques of capital budgeting, future cash flows are discounted at a rate that is supposed constant and that should reflect the risk of the project.
Standard DCF/NPV analysis is unable to consider flexibility in the valuation; in fact, the standard NPV framework hypothesizes the management to be passive once the investment has been done. To partially compensate for this limitation, some analysts augment randomly the IRR of the project.

On the contrary, real option valuation assumes that once the investment has been made, managers can still actively influence and modify the situation if needed, giving the course of the events a different shape.
Thus, there is not a single fixed discount rate, and risk changes each time market changes. To price an investment, the real option framework uses the risk-neutral valuation, used in the financial options analysis (see previous chapter), which adjusts the probability distribution with the volatility of the "underlying asset" and discounts then at the risk-free rate

Real option analysis adds another dimension to the analysis investment valuation, allowing firms to capture eventual opportunities that under the NPV framework would be neglected.

That said, investment projects valued with the real option approach result usually more valuable, with the difference being more marked as volatility increases, ceteris paribus.

VAN/DCF valuation	Real Option Valuation
Assumes investors cannot modify their decision; once made, the investment is not modifiable	Considers the possibility that managers change their investment decision over the course of the investment time. In this sense it adds a dimension to the valuation
Risk is a negative thing: it increases the opportunity cost rate and decreases the value of an investment	Risk is a positive thing: it enhances the value of the option and thus of the whole project.
The discount rate is fixed	The discount rate is variable, since the risk of the option changes with the value of the underlying.

Table 5: Differences between VAN and Real Option Valuation

Types of real options

Real options can be referred to the project size, to the project life, or to project operations

Options related to project size

Often, when evaluating a new investment, the market is uncertain, and the investing firm has doubts concerning the optimal size of the project and tends to add as much flexibility to the project size as possible. The traditional Transaction Cost Theory sees this as a cost; in a real option optic, size flexibility creates a real option that adds value to the project.
We can distinguish different cases:

Option to expand

To create an expansion option, managers can build the project (production plant, warehouse, etc) with capacity in excess, so that it can absorb the higher demand if needed. Obviously, the exercise of the option is just a chance, and not an obligation.
Building a project with excessive capacity is more expensive and it can turn out to be useless, if market remains stable; however, a project embodying the possibility to expand is more valuable than a regular project.
In a real option optic, the cost of setting up additional production capacity corresponds to the cost of buying the option. This is equivalent to a call option.

Option to contract

When, on the contrary, management is not so optimist concerning the market trend, it could prefer to build a project that can be contracted at a relatively low cost if the market falls.

This corresponds to a put option, where the cost of setting up the reduction option is the option price; the cost of reducing the production when the market falls is the strike price.

Option to expand or contract (switching option)

If market demand volatility is particularly high, so that any choice of non-flexible production would be too risky, managers could decide to build a Flexible Manufacturing System (FMS), that embodies the possibility to expand or contract according to the market needs. To our knowledge, this type of real option has no direct correspondent in the financial world.

Options related to project life and timing

When the uncertainty concerns the time when a certain market condition will be verified (eg. how demand evolves, or whether a certain regulation is withdrawn) managers might want to try to "take time" to see how the situation evolves before taking the final decision about the investment. This time and this possibility has a value, the value of the option.

We can distinguish the following cases:

Initiation or deferment options

Managers can wait before investing. This option is particularly valuable in natural resource investments, where, for example, a company can wait before starting to exploit a gold mine until the market price of gold has grown enough. These options are of American style.

Option to abandon

If staying on the market costs more than it makes gain, and there are not future perspective of a positive inversion, managers can decide to abandon the project and exit the market, and realise at least the salvage value. Particularly, if the present value of the future cash flows falls below the liquidation value of the

project, this one can be sold to realise at least the money from the liquidation. This is actually an American put.

Sequencing options

This real option type derives from the more general initiation option, but it concerns more inter-connected projects. The choice here is whether to implement those projects sequentially or at the same time, or Intraproject vs Interproject choice.

Options related to project operation

In a fast-changing competitive environment, it can be source of competitive advantage the ability to rapidly change the product mix to immediately take satisfy market needs. Flexibility can concern the product, the production process, or the operating scale. This flexibility can be seen as a real option.

Output mix options

These options allow product flexibility, since they allow the firm to produce different output from the same plant or facility. These options are particularly valuable in case of high market volatility and low quantities demanded. Clearly, to build a plant able to produce different products has a higher cost, which can be identified as the cost of buying the option

Input mix options

Input mix options are options that allow process flexibility, meaning that the firm can choose to produce the same output with different inputs. This option is useful to choose the more qualitative or the more economic input (for example, a plant could be fuelled with different types of combustible, so that the less expensive one can be chosen time by time). Clearly, setting up such an option has a considerable cost.

Operating scale options

When managers can change the output/time rate or modify the length of the production process, they have a operating scale option.

Valuation inputs

Inputs needed to price a real option are the same that are needed for financial options. The trick here is to well set the correspondences between real world and the financial world.

We try here to make a short recap of the situation:

The option's underlying asset is the project, which embodies

- The current value of the project, defined as the present value of the future cash flows at the opportunity cost rate is S_0
- The project's risk plays the role of the stock's volatility σ
- Cash flows can be seen as dividends, something that, after its reception, reduce the value of the project (relevant moreover in the timing option, where lost dividends are the cash flows not perceived)

Option characteristics:

- Strike price K: any non-recoverable cost sustained to exercise the option (Eg. the cost of buying the joint venture to exercise the growth option, the cost of delaying an investment to exercise the timing option etc.). Obviously, if, at maturity, the strike price exceeds the value of the underlying asset, managers will not exercise the option.
- Time to maturity T: the time span during which the real option can be exercised. An example can be the time, contractually agreed, after which it is no longer possible to exercise the waiting option

Option type:

- The option to contract, correspondent to an American put
- The option to abandon also correspondent to an American put
- The option to expand or extend the project, correspondent to American call options);
- Switching options or other composed options; these do not have a strict correspondence in the financial world, at least to our knowledge

Financial	Notation	Real
Value of the underlying at T	S_T	Value of the project at T
PV of the underlying	S_0	PV of project discounted at r_F
Strike Price at T	K	Strike Price at T
Underlying asset's volatility	σ	Underlying project's volatility
Option maturity date	T	Final decision date
Risk-free rate	r_F	Risk-free rate

Table 6: Correspondences between real options and financial options.

Valuation methods

To valuate real options we use the techniques derived from the financial world (see before)

- Black&Scholes valuation, since it is applicable only to European options, finds limited applicability in the real world
- Binomial trees (or lattices) can, on the contrary, be used to price American options; that's why this technique is the most useful in real option valuation. Furthermore, binomial trees allow the decision-maker to analyse the situation at each node of the tree.
- Specialised Monte Carlo Methods have been developed and take place especially for high-complexity problems. The treatment of Monte Carlo methods goes beyond the objective of this work.

Other methods, that go beyond the interest of the present work and will not be treated, have been developed.

Real options and financial options

Is there a perfect correspondence between real options and financial options?
Although real option analysis is based on financial option theory, according to the main literature (Bowman and Hurry, 1993; Buckley and others, 2002; Li, 2007), real options differ from financial options in different aspects:

Organizational aspects:

- Managers must recognize and understand real options, and also create them to enhance the value of their firm
- The company must be flexible enough to profit from the real option opportunities

- As in the financial world, the company must have the resources necessary to exercise the options.
- When an investor buys a financial option (eg. a call on a stock), he does not access any other inside knowledge on the firm; there is no asymmetric information, and all the investors have the same knowledge on the stock. On the contrary, investors buying I real options (for example: opening a joint venture) gain also the access to complementary interior knowledge on the firm or project
- Investing in a real economy project can give some advantages that a financial investment, if done in a competitive market, does not give, as for example the first mover advantage, or the fact that investing in a project or in a market can prevent other investors from doing the same thing
- If the investment option proves to be worth the exercise price, and the real option is exercised, the investor can benefit from some learning curve advantages that do not exist when investing in financial options.

Technical aspects:

- In real option theory the underlying asset is not traded, as it is in the financial world. This implies a constant uncertainty about the value of the asset and the volatility.

  To solve this issue, a Marketed Asset Disclaimer (MAD) can be adopted.
- In standard option pricing models, the volatility of the underlying asset is supposed constant, so that the risk-neutral valuation can be applied at each state of the decision tree simply substituting the discount rate with the risk-free rate.
- Here, managers can change the course of the events with their decisions during the life of the option, and, consequently, also the risk of the underlying asset. This implies the rate of return can change period to

period, with some periods requiring a risk premium over the risk-free rate; so, the risk-neutrality assumption cannot be made.

- To overcome this issue, some analysts use the replicating portfolio approach instead of the risk-neutral valuation to price real options., or use models allowing the use of a variable risk-free rate.
- Exercise rules are not always as clear and defined as in finance.

The following table summarizes the situation:

Financial Options	Real Options
Perfect information	Asymmetric information
No other advantages	Real-economy advantages (first-mover adv., learning curves, knowledge acquisition, etc.)
The underlying is traded ➔ value and risk well defined	The underlying is not traded ➔ value and risk well defined
No actions on the Underlying ➔Underlying's volatility is constant	Managers' action influence the reality ➔ Volatility changes over the life of the option
Clear and defined exercise rules	Exercise rules not always defined

Table 7: Differences between real options and financial options

Since the aim of this work is the comparison of different entry modes, and the study how the choice is influenced by certain variables that will be introduced later, we make use of a simple instrument that allows the comparison of different alternatives taking in consideration multiple criteria of different nature.

Chapter 3. The analytical model

3.1 The applicative context

The model is addressed to the myriad of Italian manufacturing firms that represent an excellence in our country, but are not known at all abroad. In this chapter, we want to develop a general and illustrative framework to help SMEs go international, finding the right country and moreover the right entry strategy.
We illustrate a representative and basic case study to apply our methodology and verify the hypotheses formulated.

Consider the case of a traditional Italian manufacturing firm active in the clothing business. The firm is on the market since the beginning of the century, always inherited from father to son. It produces hand-made luxury clothes, and its products are a well-recognized excellence, in the national market, where the firm has been registering growing revenues and margins and an increasing market share in the past years. The firm is not present at all abroad, where its products are almost unknown. Until now, this was not a problem in Mr. Rossi opinion, CEO of the firm, since the Italian market granted enough revenues and profit. Today, however, the crisis is hitting hard on the Italian economy, and future perspectives are not so encouraging.
Feeling the pressure of its competitors, strong of the excellence and know-how of the firm, and conscious that Italian high-quality products are strongly appreciated abroad, the CEO decides that the moment has come to expand the business abroad.
However, the company's management is very good in doing what they've always done, but lack of the experience in international markets and do not have any idea where to start from to internationalize the company.
They decide therefore to rely on a strategic consulting firm for the choice of the country and the entry strategy.

The consulting firm starts by analysing which market could be targeted first. They considered the different variables (See chapter 1) suggested by Koch (2001) in the MEMs model, and they found that, for the enormous market potential and the appreciation for luxury Italian products the best market was the United States.

Such a complex and far market posed other issues, such as the best entry mode strategy. The CEO of the company was firmly convinced that, as a first step, export would have been the best choice for the entry mode. Actually, export requires a low resource commitment and, in the CEO's view, low risk, and would be perfect to "taste" the market.

The consultants explained that this was not always the case, and that, given the high probability of an explosion in the demand (hypothesis), a joint venture would result to be less risky and more profitable.

To put more evidence on his reasoning, the consultant provides a technical report considering four of the possible entry modes: Export, the Joint Venture, the acquisition of a Wholly Owned Subsidiary, and the creation of a Wholly Owned subsidiary (see Chapter 1).

As suggested by the literature, they considered three fundamental country variables[2]: political risk, strength of the competition, and cultural distance from the home country (see again Chapter 1).

2

Note that the market potential, maybe the most important variable to consider when investing in a new project, does not appear as a variable here, since it is part of the previous phase of market selection.

To have the intuition of the customer, the consultant assumes that each independent variable can assume two values, high and low, so that there are eight possible scenarios that the company might face.

Moreover, he considered four company variables, positive traits (benefits) of the company that depend on the entry mode selected: the degree of control that the entry mode allows, the ability to face competition, the flexibility, and the gains, estimated in terms of present value of the future revenues. Each entry mode performs differently in each company variable.
Country variables influence the importance (weight) that the company variables have in the choice of the entry mode, except for the revenues, which are always important and weight for half of the total.

So, once it has been determined how each entry mode scores in the different company variables, it is possible compare the results with the costs of each entry mode to make the choice, scenario by scenario.

However, since we still don't know which scenario will prevail, and we need to take a decision before knowing it, the consultants must provide an aggregate result. To this aim, many criteria can be implemented (Chapter 3.1.1, Decision Criteria). Depending on the CEO's attitude, the consultant will choose the best fit for his attitudes and risk aversion, and compare it with the costs.

To determine the costs of each project (entry mode), the consultant estimated the present value of all the costs that the firm could face in the following five years.

Furthermore, the consultants explained the company's CEO that the Joint Venture embodied a growth option, encompassing the possibility to expand immediately in case of a sudden increase of the market demand.

Thus, the cost of the Joint Venture was reduced by the value of the growth option, calculated by the consultant using the methodology illustrated in Chapter 2.

Once the best entry mode has been determined, according to the different decision criteria, the company's CEO can benefit of this analysis to take a more conscious decision, also considering his experience, attitude towards risk, and personal opinion.

Before introducing the model, it is appropriate to define some important terms that are employed in the study, and precisely:

- External variables (or external factors, or country factors): factors that out of the control of the firm, and that cannot be changed by the firm's management.
- Internal variables (or internal factors, or company factors): factors that depend on the entry mode choice. Their importance (weight) changes scenario by scenario, depending on the value of external variables.
- Decision criteria: the criteria adopted by the decision maker to aggregate the data of the scenarios and take a final decision.
- Efficient solution: a solution that is not strictly dominated by any other solution, or a solution that lies on the efficient frontier (see Chapter 3.2.3 for further explications).
- Efficiency (ratio): the ratio between benefit and cost of that derive from the adoption of a determined entry mode.
- Efficient frontier: the concave growing curve that represents the ensemble of all the optimal efficient solutions (see again Chapter 3.2.3 for further explications).

- Growth option: the option to expand the business, as defined in Chapter 2; for hypothesis, the growth option is incorporated in the contract of joint venture (see Chapter 1 for more).

The objectives and propositions of this research are:

1. Analyse how selected external factors, put in relation with some internal variables chosen by the firm's management, influence the optimal entry mode choice, according also to different scenarios and to the decision criterion adopted.
2. Demonstrate that real option valuation better represents the value of an international project, and that this may have an impact on the optimal entry mode solution.
3. Demonstrate that different levels of volatility change the optimal entry mode solution, and particularly, that a higher volatility increases the value of the joint venture, allowing firms to take advantage of the uncertainty.

To perform our analysis we use the classical MCDA SMART technique, which will be described in the next paragraph, introducing some variations to the classical model. In particular, before applying the SMART model, we perform a first scenario analysis where we study how some independent variables, notably country factors external to the firm's control, influence the weight that specific dependent variables, selected by the management among company factors important for the selection of the entry mode, assume in the payoff matrix, to form different scenarios.

In the following part, we will begin introducing the basic model, the variables we considered and we used, then we will present the model applied to our case, both the cost and benefit part, we aggregate the results, and finally we will discuss the results and make some conclusions.

3.1.1 Multi-Criteria Decision Making (MCDA)

To carry out our study, we make use of an MCDA technique that we briefly introduce here.
Multi-criteria Decision Making aims at giving a criterion to take a decision when multiple factors concur to influence the decision maker.
Among the different MCDA techniques the most direct and used is the SMART (Simple Multi Attribute Rating Technique), a method developed by Edwards in 1971 that finds application in a variety of situations.
This method allows the decision-maker comparing on one side multiple figures of benefits, even of different nature, embodied in an investment project, and on the other side, the costs of the project.

The steps to perform a SMART analysis are the following:

- Determination of the possible projects (or alternatives)
- Choice of the variables: the decision-maker chooses which variables (factors) are important for his decision
- Assignment of the expected benefit value to each couple alternative-variable: how much benefit each project will pay out on each variable?
- Rescaling according to the linear method (facultative): each value of benefits is rescaled according to the formula

$$y=100*(x-x_{worst})/(x_{best}-x_{worst})$$

- Assignment of the weight to each variable: how important is each variable compared to the others? How much weight do I want it to have in the decision, compared to the others?
- Aggregation of the different rescaled benefit values, multiplying each one by its weight.
- Comparison of the results with the costs; again, we can assign a weight to the costs and another to the benefits, and proceed as before to find the aggregated value that is definitely the answer of the most efficient alternative. However, this is not forcedly the best answer for the decision-maker; in fact, there could be more than one efficient solution.
- Plotting the results on a chart and construction of the efficient frontier; on the x-axes we represent the costs, while on the y-axes we represent the aggregated value for the benefits. All the combinations of cost-benefit on the chart that are efficient (following the definition given in previously in Chapter 3.1) form the so-called efficient frontier. Those who, compared to the others are not efficient in terms of cost/benefit ratio, are out of the efficient frontier.

  Now the decision-maker has all the tools to take his decision, which will be taken according to one of the possible decision criteria (see below).
- Sensitivity analysis: how robust is the result? Sensitivity analysis aims at studying the robustness and stability of the results found, analysing how results change changing the input data.

Normally, SMART analysis is performed in a deterministic context; however, since we must deal with risks, we decided to build and develop the model on different scenarios.

When a decision must be made among different alternatives, it is appropriate to determine the criterion that we want to use to make our decision. Decision criteria represent simply different ways of aggregating the results of the different scenarios. Among the possible decision criteria, we can recall the most used, the same that we will employ in our model:

Maximax

The Maximax criterion involves the choice of the alternative that maximizes the maximum payoff attainable. This criterion is the most optimistic one, and is fit for risk-lover decision makers.

Maximin

According to the Maximin criterion, the decision maker selects the alternative that maximizes the worst payoff achievable. This criterion aims at minimizing the hypothetic loss of the worst-case scenario. The choice of this criterion highlights a strong risk aversion and pessimism in the decision-maker.

Minimax regret

This strategy minimizes the maximum regret that the decision-maker would have if the reality were different than expected. 'Regret' is defined as “the opportunity loss through having made the wrong decision” (Kaplan Financial).
This criterion, although not properly fit for a risk-lover, is less pessimistic then the Maximin.

Mean - standard deviation

This criterion balances the Expected monetary Value and the Standard deviation of each entry mode corrected with the risk aversion of the decision-maker.

By keeping into account the attitude towards risk of the decision maker, this criterion allows a more precise and personalised valuation of the alternatives.

Hurwitz

This criterion, like the previous one, introduces the risk aversion of the decision-maker in the analysis, thus allowing a personalisation of the choice.

The idea is simple but effective: making an average of the maximum and minimum value attained by each alternative, weighted with the risk aversion coefficient of the decision maker. For more details, see Chapter 3.2.4.

3.1.2 The variables of the model

As explained before, one of the aims of this work is to study how the optimal entry mode choice varies varying some specific variables, here defined as factors determinant in the choice of the entry mode.

We identified two types of variables that are determinant in the choice of an entry mode: country (or external) factors, those factors that are referred to the environment in which the firm competes or will compete, and that do not depend on the characteristics of the company, and company (or internal) factors, whose value depends on the characteristics of the company.

Country (or external) factors are independent variables, since their value is given and depends from external conditions. Company (or internal) factors are

dependent variables, since their value depends on the value assumed by independent variables.

Country factors (independent variables)

Country factors are external factors that the firm cannot control or influence, at least at the moment of the decision. For this reason, we define them independent variables. We decided to take into consideration three factors that, in our opinion, according to the main literature (e.g. Wood & Robertson, 1999; Shama, 2000; see Chapter 1.3 for more) represent the most important factors that a firm should take into account when selecting the entry mode.

Those factors are:

- Political risk
- Strength of competition
- Cultural distance

Political risk

It has been demonstrated (e.g. Zekiri & Angelova, 2011) that in case of high political risk, managers prefer to adopt low-control entry modes, since in such cases the possibility to divest rapidly and without too many losses is judged more important than having a direct control on the operations and on the general management of the subsidiary. See Chapter 1.3 for complementary explanations and extensive literature references.

Strength of competition

To face a hard competition, managers will choose the entry mode that most effectively accomplishes this task. According to some literature (e.g. Zekiri & Angelova, 2011; Koch, 2001), a strong competition is associated with equity entry modes.

Cultural distance

Cultural distance is an important issue when considering the entrance in a foreign market (1.3.4). It is long the list of international projects failed because of cultural misunderstandings and/or incompatibility; famous is the case of the Daimler-Chrysler merger in the early '90s (see Hollmann et al., 2010).
According to the main literature (Koch, 2001), high levels of cultural distance push managers to choose low-control entry modes.

Company factors (dependent variables)

We decided to consider four factors that, according to the main literature (e.g. Wood & Robertson, 1999; Shama, 2000; see chapter 1.3 for more), are important in the choice of the entry mode.

These factors are characteristic of the company, and are partly in the span of control of the company's management, in the sense that they depend on the entry mode chosen. For instance, the variable "Degree of control" will have a higher value if we choose the entry mode "WOS" than "Export".

The importance that managers give to these variables depends on the country factors defined before; therefore the weight of each dependent variable in the payoff matrix (3.2.2) depends on the value assumed by independent variables. Each entry mode scores differently in each company factor. The variables chosen are:

- Degree of control
- Ability to compete
- Flexibility
- Present Value of the revenues

In our model, to simplify the analysis, we supposed that each dependent variable is influenced by one and only one independent variable.

Degree of control

The degree of control of the mother company on the subsidiary can depend on many factors. One of the main factors influencing the degree of control that MNCs want to have on their subsidiaries is country risk; specifically, when the subsidiary operates in a risky environment, the mother company tends to choose a low degree of control, while if the country risk is fairly low, the MNC prefers to have a higher level of control on the subsidiary (Gatignon and Anderson, 1987). Another factor related to the degree of control is cultural distance; to avoid misunderstandings or misalignments of interests and values, managers tend to choose low control entry modes in case of high cultural distance with the foreign country.

Ability to compete

This parameter indicates the attitude of the entry mode to compete in a highly competitive environment. As said before, some literature (Koch, 2001) demonstrated that equity entry modes are more adapt to face strong competition than market or contractual modes.

Flexibility

Flexibility is here defined as the ability of the mother-company to change its commitment in the project if conditions require it. Particularly, flexibility can be defined as the ability to divest from the project, or switch production, or change location, without loosing too much time and money in case of adverse political events (war, revolution, expropriation, etc) or in case of a demand decrease.

Clearly, market entry modes give the mother-company much more flexibility than equity entry modes.

Expected Revenues

The main driver of any financial project, and the first variable to consider is the profitability of the investment. In our model, we considered the present value of the revenues that each entry mode could give.

However, the present value of the revenues is not weighted with the external factors, given its importance in the choice of any project. Therefore, it will have the same weight in all the different scenarios.

Since revenues are a benefit for the firm, we accounted for them in among the other benefits; to do that, we had to rescale the value as explained in Chapter 3.2.2.

3.1.3 Entry modes

We considered four different entry modes, each one with different characteristics:

- Export
- Joint venture
- Acquisition of a wholly owned subsidiary
- Creation of a wholly owned subsidiary

For the reasons extensively detailed in Chapters 1 and 2, and since one of the hypotheses of the model is that there is a fair probability of a strong market growth for the product of the firm (3.1), the Joint venture incorporates a real

option of expansion (growth option), which will be considered among the costs (see 3.2.1)

For a detailed description of the characteristics of each entry mode, see Chapter 1.3.

3.2 Application of the methodology to the case study

As specified before, the SMART method, which is the basis of our model, aims at the comparison of costs and benefits of each alternative (in our case, the entry modes).
We will therefore start from analysing the costs of each alternative, included the value of the growth option included in the Joint Venture, and then we will shift to the benefits

3.2.1 The costs

The values for the costs are a basic estimation of the creation cost or purchasing cost of the different entry modes.

It is important to note that values have been chosen without a direct link to a real situation; nevertheless, they are tuned in order to compare the different alternatives considered on the case study.

Entry Mode	Cost
Export	100
Joint Venture	153,46
WOS Acquisition	400
WOS Creation	350

Table 8: the cost of each entry mode

For example, set that the cost of buying the foreign WOS is 400, the cost of building up a new one will cost less, since you don't pay the goodwill, which we supposed to be 50.

Obviously, revenues will decrease consequently.

Another assumption that we made for the simplicity of the model is that the cost of building a JV equals half the cost of buying an entire subsidiary of equal entity, therefore 200.

From this value we subtracted the value of the real option of expansion, calculated as explained later.

We decided to account for the value of the real option by subtracting it from the cost instead of adding it to the revenues, because, since the revenues have been rescaled to be considered among the benefits, the option value would have lost its significance.

Finally, we supposed the cost of going for the market to be 100, which includes the shipping costs, the payment of the custom fees, and all the related costs.

Clearly this values are symbolic, and do not pretend to be a fair representation of the reality, but just a value for our model that we tried to make as consistent as possible.

Determining the value of the growth option

For hypothesis, the Joint Venture incorporates a real option of expansion (see Chapters 1.4.2 and 2.2.2 for deeper explications) that gives an additional value to this entry mode compared to the others.

If there is a boom in the market demand, which is probable in our case (see 3.1) managers of the mother company have the possibility to acquire the other half of the joint venture to fully profit form the demand increase. This is the value of the growth option.

The additional value depends on the market potential, and is accounted for even if there will not be an actual demand increase. We should remember, in fact, that we are reasoning ex-ante, since the decision maker has to take a decision before seeing which scenario becomes true.

To determine the value of the option, we used a two-step binomial tree (supposing that the opportunity of expansion will reveal after two periods).

We used a standard deviation of 0,3 that represents the standard deviation of the project; the opportunity cost of capital for the firm has been fixed at 0,2, while the risk-free rate is 0,03

Using the formulas explained in chapter 2, we determined the positive and negative variation of value of the project, respectively, u and d:

$$u = e^{\sigma\sqrt{T}} = 1{,}53$$

$$d = 1/u = 1/ e^{\sigma\sqrt{T}} = 0{,}65$$

Then, we determined the risk-neutral probabilities (see chapter 2.2.1 for extensions) according to the following formulas:

Probability of High market $p = \frac{r-d}{u-d} = 0{,}43$

Probability of Low market $1 - p = 0{,}57$

Finally, we supposed the strike price K to equal the value of the project at the moment of the analysis S_0, and we set this value to 200 (see chapter 3.2.2 on how this value has been determined).

First period (t=1)

Multiplying the initial value of the project per its rate of increase *u* and rate of decrease *d*, we determined the value of the project in case of high market (S_u) and in case of low market (S_d):

$$S_u = S_0 * u = 305{,}69$$

$$S_d = S_0 * d = 130{,}85$$

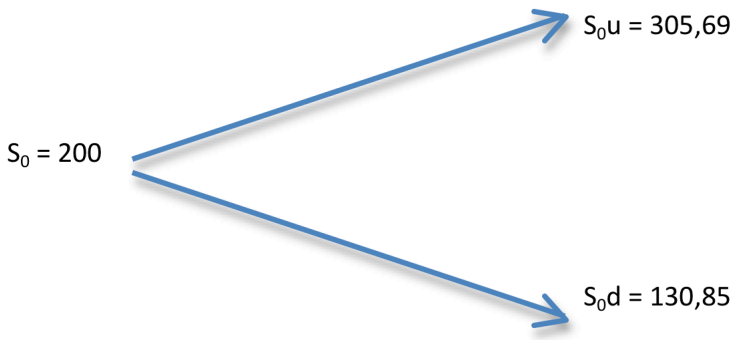

Figure 15: real option's binomial tree after the first period

Second period (t=2)

The procedure is the same to determine the values in the second period.

The risk-neutral probabilities, as well as the values *u* and *d,* remain the same.

Starting from the values S_u and S_d calculated for the first period, we can thus determine the values for the second period:

$$S_u^2 = S_u * u = S_0 * u * u = 467{,}24$$

$$S_{ud}=S_{du} = S_u * d = S_d * u = 200$$

$$S_d^2 = S_d * d = S_0 * d \ *d = 85{,}61$$

We can now determine the value of the option. In each case, it will be given by the difference:

$$f_u^2 = S_u^2 - K = 267{,}24$$

$$f_{ud} = S_{ud} - K = 0$$

$$f_d^2 = S_d^2 - K = 0$$

The values f_{ud} and f_d^2 are negative, but since, as we know, an option with negative value is not exercised, their value is considered to be zero for the option holder.

Now, proceeding backwards, we can calculate the value of the option in the first period, and finally the value of the option at t=0

$$f_u = (1+r)^{(T-t)} * [p\, f_{uu} + (1-p)\, f_{ud}] = 111{,}52$$

$$f_d = (1+r)^{(T-t)} * [p\, f_{du} + (1-p)\, f_{dd}] = 0$$

at t = 0, the value of the option will be:

$$f = (1+r)^{(T-t)} * [p\, f_u + (1-p)\, f_d] = 46{,}54$$

A two-step binomial tree represents the situation:

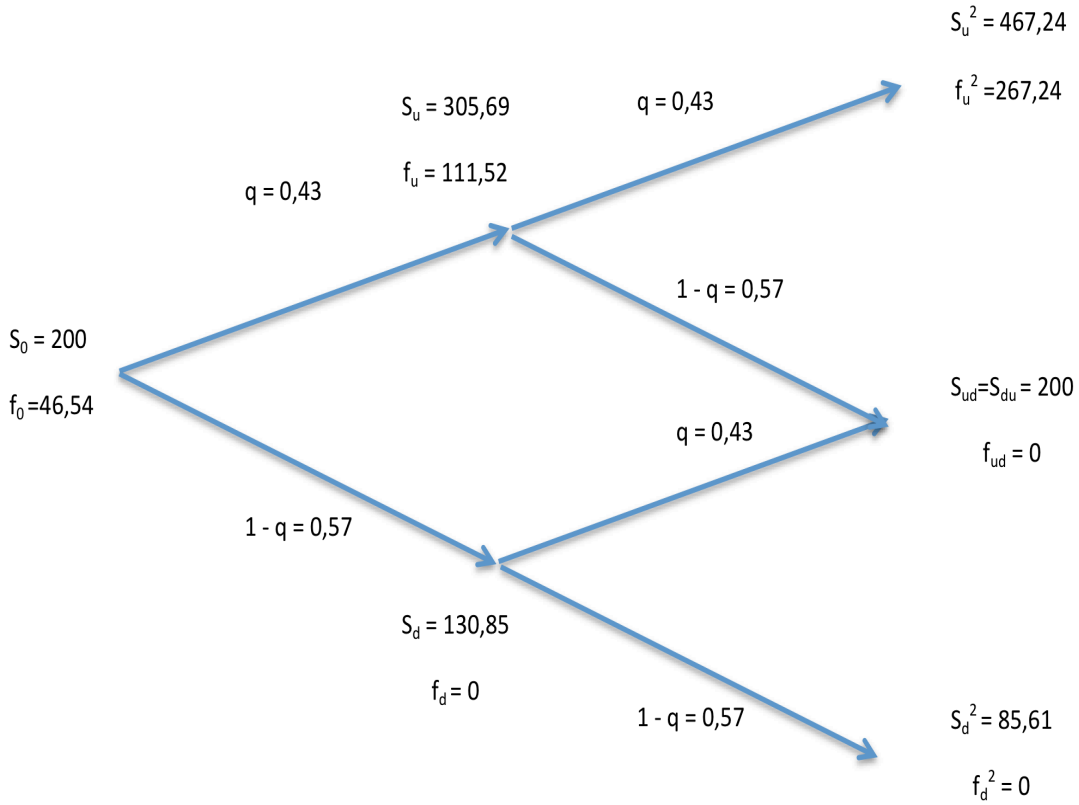

Figure 16: the real option's binomial tree on two periods

The value of the option has so been determined to be 46,54.

Let's now get back to the SMART model and the cost part.

The option in the model

As said before, the real option gives an additional value to the joint venture, since it takes into account the monetary value of the expansion possibilities. Normally, we would have considered the value of the option among the benefits, since it is a (benefit) surplus that the Joint Venture has compared to the other entry modes.

However, we remember that, since the revenues have been rescaled to be compared to the other benefits in the SMART model (3.1.2), we decided to consider the value of the option as a non-cost for the Joint Venture, so we subtracted it from the cost of creating it. This has been done to give relevance to the value of the option, and to be able to perform a more precise and effective sensitivity analysis (see further explication at the beginning of the chapter).
Specifically, the cost of the joint venture has been determined as follows:

$$\text{JV cost} = 200 - f_0$$

where f_0 is the value of the growth option.

3.2.2 The benefit

Payoff matrix

The SMART payoff matrix shows how the different alternatives (here, the entry modes) perform in the different variables taken into account. Thus, we represent the different entry mode possibilities considered in 3.1.3 on the lines, and the variables (the dependent, or company, variables introduced in Chapter 3.1.2) on the columns, and we estimate how each entry mode performs in each variable.

For the simplicity of the model, and since the aim of the analysis is more a comparison of the performance of the different alternatives among them rather than an evaluation of the absolute performance of each entry mode, we decided to use for the payoff matrix values that are symbolic, not linked to the reality;

however, we still tried to guarantee the maximum possible level of consistence of the values among the different alternatives, not to affect the value of an entry mode relatively to the others.

The payoff matrix looks as follows:

	Degree Of Control	Ability To Compete	Flexibility	Revenues PV
Export	10	10	90	25
Joint Venture	50	50	50	50
WOS Acquisition	90	100	10	100
WOS Creation	90	100	10	83,33

Table 9: payoff matrix

Explanation of the values:

- Degree of control: export modes allow a low degree of control, while a WOS allow a high level of control. JV is halfway, since it doesn't give control.
- Ability to compete: entering a market just with export doesn't give many chances to compete with firms who are present in the market, while having a subsidiary on the territory is source of competitive advantage in case of strong competition; again, JV is paced halfway.
- Flexibility: entering a market just with export allows the firm a great level of flexibility, defined here as the ability to divest, or switch production, or change location, if market conditions require it. On the

contrary, a WOS requires a high commitment that cannot be interrupted in a short time. The JV is again place halfway.

- Present Value of revenues: starting from the costs (see next part for a presentation of the costs), we estimated that each project has an IRR of 10%, so that:

$$PV\ (revenues) = PV\ (costs) * (1+10\%)$$

For the joint venture, the revenues have been calculated starting from the cost of the project, without subtracting the value of the real option.

The values we obtained have then been rescaled.

However, instead of using the linear method illustrated in chapter 3.1.1, we adopted a different solution: we set the maximum value of revenues (440 for the WOS acquisition) at 100, and we rescaled the values of the other entry modes proportionally. This allows to better keep account for the revenues of the export, that otherwise with the linear method would be rescaled to zero.

The result is the following:

	Costs	Revenues PV	Rescaled Revenues PV
Export	100	110	**25**
Joint Venture	153,46	220	**50**
WOS Acquisition	400	440	**100**
WOS Creation	350	385	**83,33**

Table 10: rescaled revenues by entry mode

Determining the weight of the variables

In our model, each independent variable (3.1.2) can assume two values, high (H) and low (L).

We therefore have 8 possible scenarios that managers might have to face.

The possible scenarios for the independent variables are summarized in the following table:

	1	2	3	4	5	6	7	8
Political risk	H	H	H	L	L	L	L	H
Strength of competition	H	H	L	L	L	H	H	L
Cultural distance	H	L	L	L	H	H	L	H

Table 111: independent variables - scenarios

Furthermore, even dependent variables (3.1.2) can assume two values, high (H) and low (L). Each independent variable (country/market factor) has an effect on a selected dependent variable (company factor).

The following table illustrates the relations between dependent and independent variables (we remind that the expected revenues are excluded from this analysis: see the previous section on payoff matrix).

Independent variable	Dependent variable	Type of relation
Political risk	Flexibility	Positive
Strength of competition	Ability to compete	Positive
Cultural distance	Degree of control	Negative

Table 12: relations between independent and dependent variables

Following the independent-dependent variables relations of Table 2, we are able to determine the eight different scenarios in which company variables can be combined:

Scenario 1:

- High political risk increases the need for flexibility
- High competition requires a high ability to compete
- High cultural distance imposes a low degree of control

Scenario 2:

- High political risk increases the need for flexibility
- High competition requires a high ability to compete
- Low cultural distance allows a high degree of control

Scenario 3:

- High political risk increases the need for flexibility
- Low competition requires a low ability to compete
- Low cultural distance allows a high degree of control

Scenario 4:

- Low political risk reduces the need for flexibility
- Low competition requires a low ability to compete
- Low cultural distance allows a high degree of control

Scenario 5:

- Low political risk reduces the need for flexibility
- Low competition requires a low ability to compete
- High cultural distance imposes a low degree of control

Scenario 6:

- Low political risk reduces the need for flexibility
- High competition requires a high ability to compete
- High cultural distance imposes a low degree of control

Scenario 7:

- High political risk increases the need for flexibility
- Low competition requires a low ability to compete
- High cultural distance imposes a low degree of control

Scenario 8:

- Low political risk reduces the need for flexibility
- High competition requires a high ability to compete
- Low cultural distance allows a high degree of control

The situation is summarized in the following table:

	1	2	3	4	5	6	7	8
Degree of control	L	H	H	H	L	L	H	L
Ability to compete	H	H	L	L	L	H	H	L
Flexibility	H	H	H	L	L	L	L	H

Table 13: dependent variables - scenarios

This table allows us to understand the importance (therefore the weight) of each company (3.1.2) variable in the different scenarios.

We thus proceed assigning the weights in each scenario, following the simple rule that variables with a low value have weight zero, and variables with a high value receive the same weight. As said before, given the importance of the future revenues in any investment project (1.3.4), the weight of expected revenues is not influenced by any variable; therefore, the present value (2.1) of the future positive cash flows accounts for half of the total weight, and all the other variables for the remaining half.

The result is the following:

	1	2	3	4	5	6	7	8
Degree of Control	0%	17%	25%	50%	17%	0%	25%	0%
Ability to Compete	25%	17%	0%	0%	17%	50%	25%	0%
Flexibility	25%	17%	25%	0%	17%	0%	0%	50%
PV Revenues	50%	50%	50%	50%	50%	50%	50%	50%
TOT	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Table 14: weight of company variables in each scenario

This table represents the weights that each dependent variable (3.1.2) assumes in relation to the scenario.

For example, in the first scenario, a high political risk requires an entry mode that allows high flexibility, a strong competition requires a high ability to

compete, and a high cultural distance suggests a low-control entry mode. Therefore, the dependent variable "Degree of control" has value zero, while the two other dependent variables "ability to compete" and "flexibility" share the total weight, assuming a weight of 0,5 each. This is just for half the total weight: the other half is dedicated to the expected revenues. This fact is highlighted in the table.

This is the starting point to perform an MCDA SMART analysis (3.1.1) on multiple scenarios. In fact, as said before, those weights will influence the value of the variables in the payoff matrix (3.2.2), so that in each scenario there will be a different combination of values.

The previous part has helped us determine the weight of each internal variable in the different scenarios.

In the following part, we will enter in the real MCDA SMART analysis (3.1.1), which will allow us to aggregate the benefit values of each entry mode in each internal variable, in the different scenarios. Then, the results obtained will be aggregated according to different decision criteria (3.1.1).
We have, actually, two levels of aggregation of the benefit for each entry mode:

- At a first level, we aggregate by scenario the benefit paid by the entry modes in the different internal variables (3.2.3)
- At a second level, this result is aggregated according to different decision criteria (3.2.4)

At the beginning, for each entry mode, we have 4 benefits, 8 scenarios and 8 entry modes, for a total of 4*8*8= 256 values of benefits, if we consider the ensemble.
After the first aggregation, we will have 8*8 = 64 values

After the second aggregation, we will have 8 results, one for each decision criterion.

Only the decision maker, selecting his decision criterion, will be able to reduce this result to one optimal value.
For each level of aggregation, we will analyse the efficiency of the entry modes.

3.2.3 Aggregation of the benefit by scenario

Starting from the payoff matrix determined in 3.2.2, we proceed to calculate the aggregated benefit that each entry mode pays off in each scenario.
To compute it, for each entry mode, we multiplied the payoffs in the different variables by the corresponding weight of table 14, and repeated this operation for each scenario.
For each entry mode, the formula used is:

$$\sum_{i=1}^{4} payoff_i \times w_{ij}$$

=

$$Payoff_1 * w_{11} + payoff_2 * w_{21} + payoff_3 * we_{31} + payoff_4 * w_{41}$$

Where $payoff_i$ is the payoff of the entry mode in the variable *i*, and w_{ij} is the weight of the variable *i* in the scenario *j*.
For example, let's consider the entry mode "Export". In the payoff matrix, we can see that it performs 10 in "degree of control", 10 in "ability to compete", 90 in "flexibility" and 25 in "Revenues PV". These values will be multiplied for the respective weight, particularly 0%, 25%, 25%, 50%. The results are then

summed to find the aggregated benefit of "Export" in the "Scenario 1". The operation is illustrated below:

Export aggregated benefit (1) = 10*0% + 10*25% + 90*25% + 25*50% = 37,5

The following table illustrates the results for all the entry modes in all the scenarios.

	1	2	3	4	5	6	7	8
Export	37,5	30,8	37,5	17,5	30,8	17,5	17,5	57,5
Joint Venture	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0
WOS acquisition	77,5	83,3	75,0	95,0	83,3	100,0	97,5	55,0
WOS creation	69,2	75,0	66,7	86,7	75,0	91,7	89,2	46,7

Table 15: entry modes' aggregated benefit by scenario

We proceeded to calculate the aggregated benefit of each scenario, weighting each output with the corresponding weight.

At a first level, the entry mode "WOS acquisition" is the top performer in every scenario. As we will see further, the situation will completely change when other variables are added to the analysis (see next section)

What we determined represents the situation (just for the benefit) in each scenario. However, the decision maker still does not know which scenario will become real, and he needs to make his choice ex-ante.

As announced before, to combine these results and create a useful decision instrument we will need to aggregate these data, using different decision criteria (see chapter 3.2.4). But first, it will be interesting to compare the entry modes' benefits with the cost in each scenario.

Analysis of the efficiency by scenario - The efficient frontiers

Comparing benefit and cost of each entry mode in the different scenarios will enable us to determine which alternative is the most efficient by scenario in terms of benefit/cost ratio.

An efficient solution is defined as a solution that is not strictly dominated in terms of cost or benefit by any other solution (3.1). The efficient frontier, as defined in Chapter 3.1, is the frontier of all the efficient solutions. In a virtual world of infinite solutions, this means that only the solutions that lie on the efficient frontier are efficient, and all the solutions that lie below the efficient frontier, are not efficient, since there will always be a solution that either pays out the same return with a lower cost, or for the same cost, pays a higher return.
However, since in our model we considered just four solutions (and not infinite) as the number of the entry modes considered, and since our model wants to be a framework applicable to real situations, in which you don't have infinite solutions, we will consider efficient any solution that is not strictly dominated by another solution in the model. This means that there can be a discrepancy between efficient solutions and efficient frontier; in other worlds, there can be situations in which an efficient solution does lies below the efficient frontier.
We have therefore two definitions of efficient solution, a narrow one, which exists just in theory, and a broader one, more adaptable to real cases.

We decided to adopt the second solution; for completeness, we drew in any case the ideal efficient frontier, but readers should keep in mind that not all solutions below the frontier are inefficient: a solution is inefficient only if strictly dominated by another existent solution.

For each scenario, we plot the different entry modes on a chart with on the x-axes the costs, and on the y-axes the benefits.

Furthermore, we draw an imaginary efficient frontier, defined the as the ensemble of all the combinations cost-benefit that are efficient.

We will present the charts and discuss the results for each scenario.

Scenario 1

In the first scenario, characterized by high political risk, high strength of competition and high cultural distance, Export entry mode scores the maximum value in terms of Benefit/Cost ratio. This is a case where the two definition of efficiency given at the beginning of the chapter do not correspond: in fact, WOS creation is not on the efficient frontier, but is not dominated by any other solutions of those considered. According to the definition we adopted (see beginning of this section), all the alternatives are efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	37,5	**0,38**
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	77,5	0,19
WOS creation	350	69,17	0,20

Table 16: Scenario 1

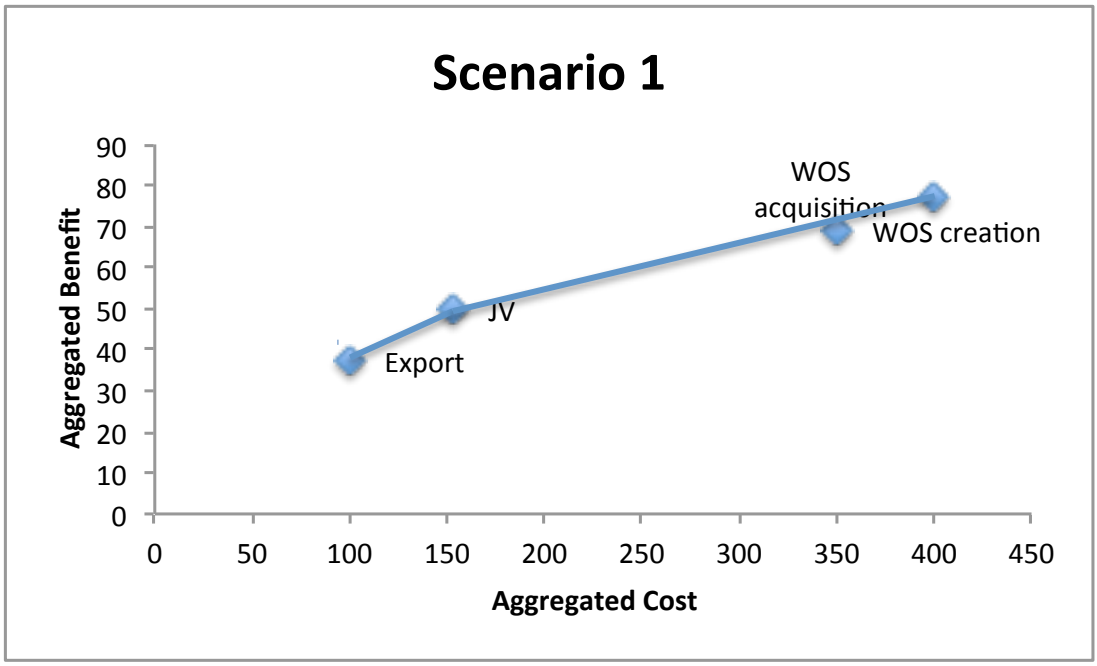

Figure 17: Scenario 1 – the efficient frontier

Scenario 2

In the second scenario, characterized by high political risk, high strength of competition and low cultural distance, the best alternative in terms of Benefit-Cost ratio is the Joint Venture, followed by the Export

WOS acquisition and WOS creation score the same value.

All the solutions are on the efficient frontier.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	30,83	0,31
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	83,33	0,21
WOS creation	350	75,00	0,21

Table 17: Scenario 2

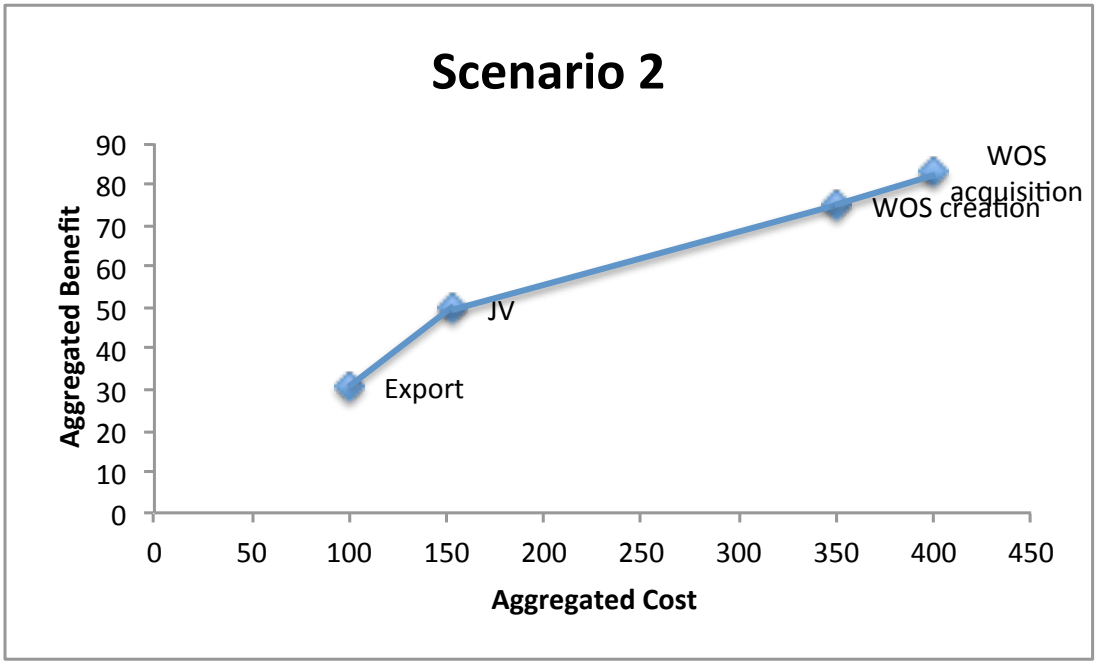

Figure 18: Scenario 2 – the efficient frontier

Scenario 3

In the third scenario, characterized by high political risk, low strength of competition and low cultural distance, the best alternative results to be the Export; not far behind, the JV scores a 0,33 on the Benefit-cost ratio. This is another case where the two definition of efficiency given at the beginning of the chapter do not correspond: again, WOS creation is not on the efficient frontier, but is not dominated by any other solutions of those considered. According to the definition we adopted (see beginning of this section), we consider it to be efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	37,50	0,38
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	75,00	0,19
WOS creation	350	66,67	0,19

Table 18: Scenario 3

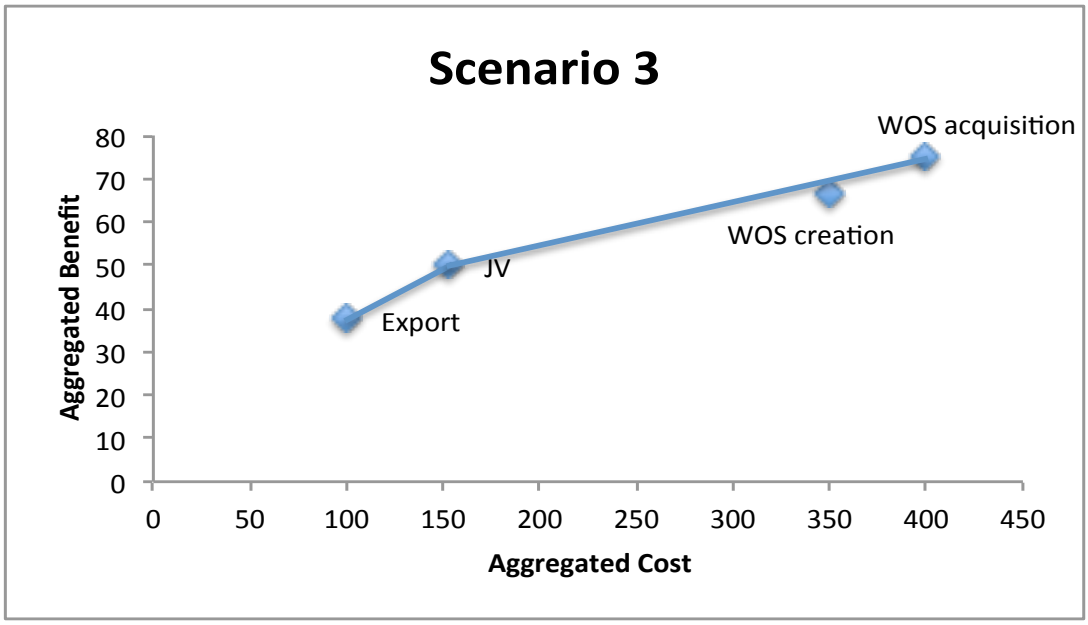

Figure 19: Scenario 3 – the efficient frontier

Scenario 4

The fourth scenario, characterized by low political risk, low strength of competition and low cultural distance sees the Joint Venture as the most efficient alternative, while the two alternatives including the WOS are essentially equivalent. Export is the less efficient.

Anyway, every alternative is efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	17,5	0,18
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	95	0,24
WOS creation	350	86,67	0,25

Table 19: Scenario 4

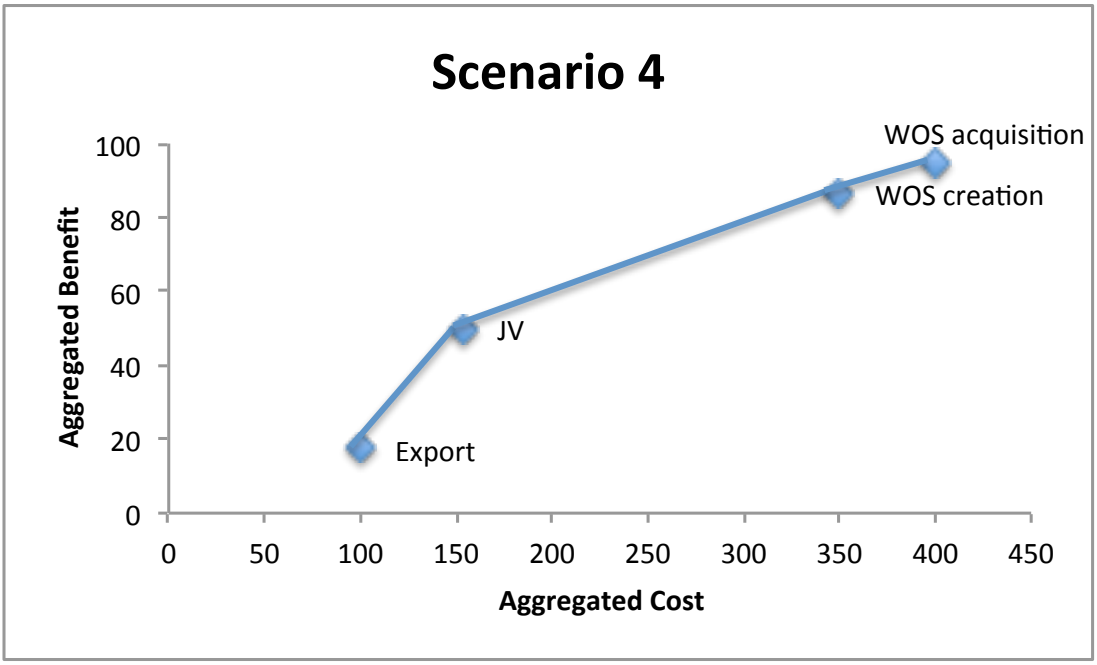

Figure 20: Scenario 4 – the efficient frontier

Scenario 5

In the fifth possible scenario, characterized by low political risk, low strength of competition and high cultural distance, the most efficient alternative is the Joint Venture, followed by the Export.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	30,83	0,31
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	83,33	0,21
WOS creation	350	75,00	0,21

Table 20: Scenario 5

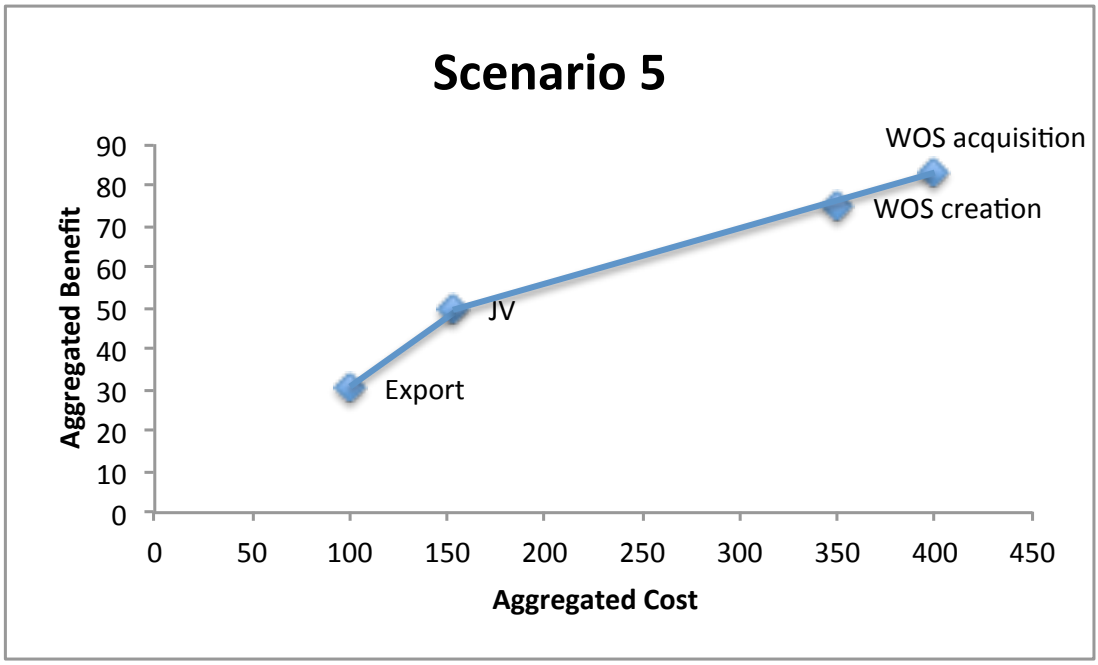

Figure 21: Scenario 5 – the efficient frontier

Scenario 6

The sixth scenario, characterized by low political risk, high strength of competition and high cultural distance sees the Joint Venture as the most efficient alternative, followed by WOS creation, WOS acquisition and the Export finally as the less efficient.

Every alternative is on the efficient frontier.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	17,50	0,18
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	100,00	0,25
WOS creation	350	91,67	0,26

Table 21: Scenario 6

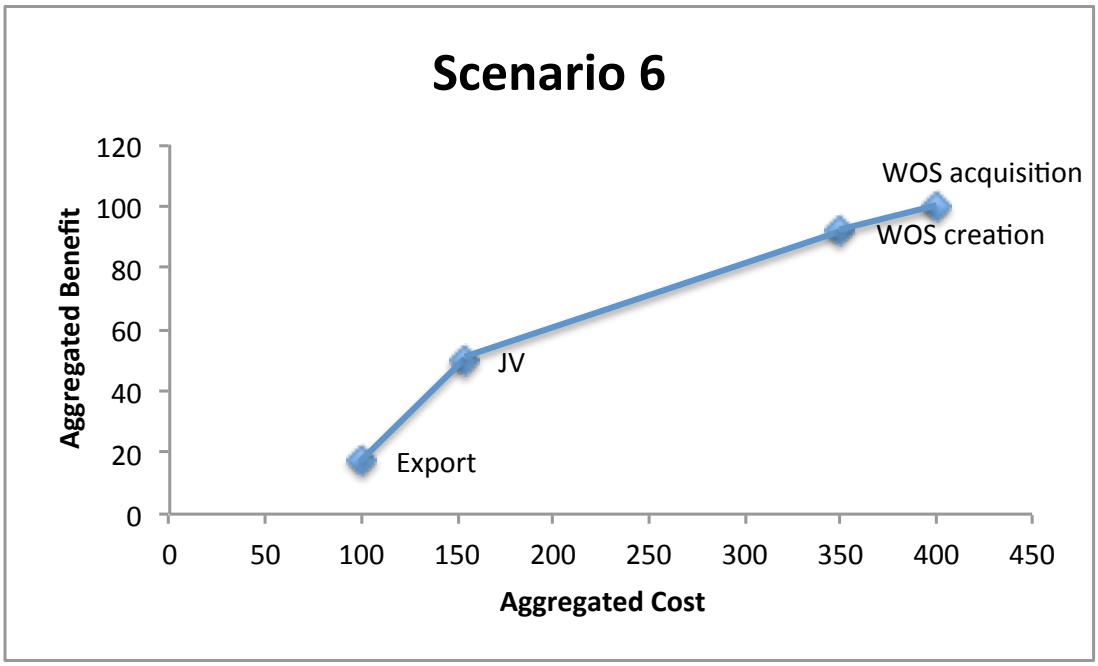

Figure 22: Scenario 6 – the efficient frontier

Scenario 7

This scenario, characterized by low political risk, high strength of competition and low cultural distance sees the Joint Venture as the most efficient alternative and every solution lying on the efficient frontier. Export is the less efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	17,5	0,18
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	97,5	0,24
WOS creation	350	89,17	0,25

Table 22: Scenario 7

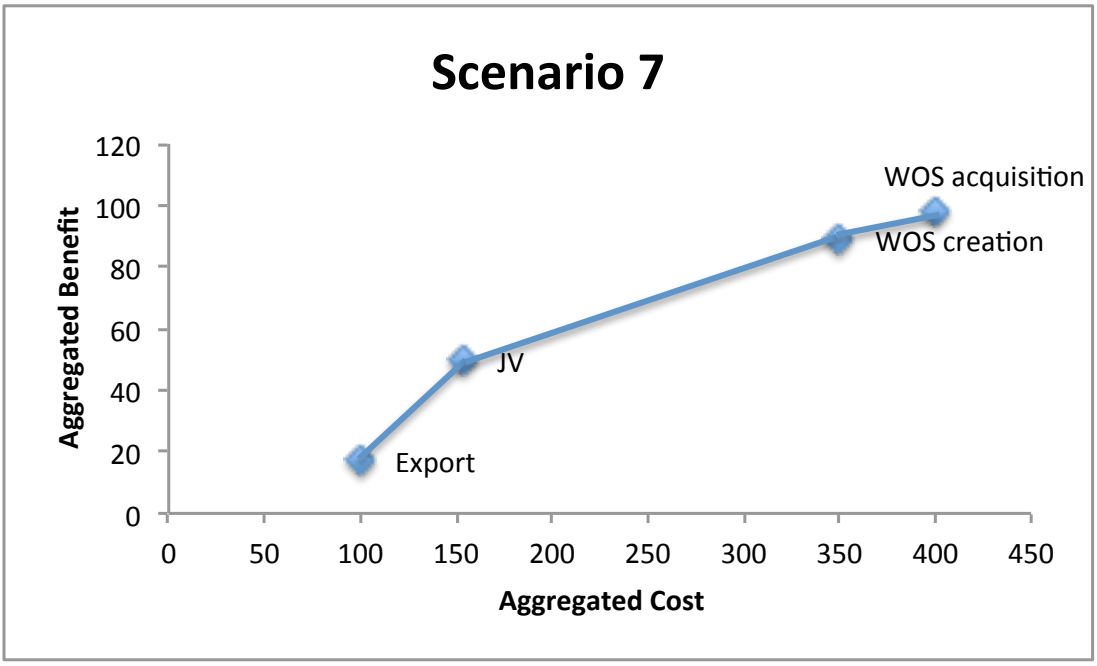

Figure 23: Scenario 7 – the efficient frontier

Scenario 8

In the last possible scenario, characterized by high political risk, low strength of competition and high cultural distance, the Export scores the highest point, followed by the Joint Venture, and again the two alternatives including the WOS are nearly equivalent.

Only the Export is efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	57,5	0,58
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	55,0	0,14
WOS creation	350	46,67	0,13

Table 23: Scenario 8

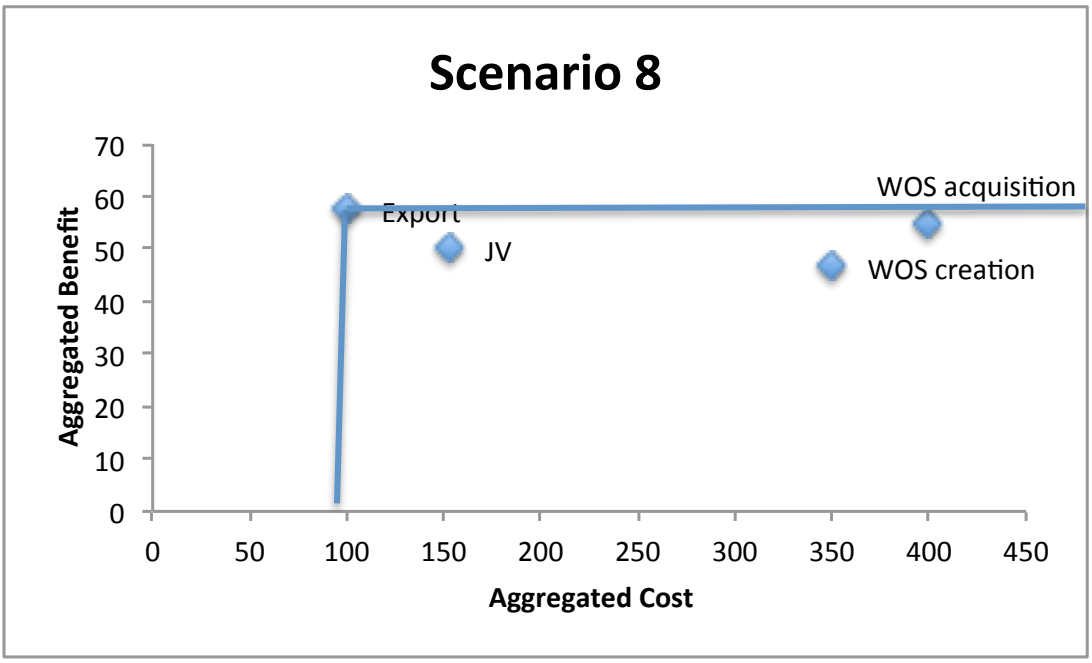

Figure 24: Scenario 8 – the efficient frontier

Analysis of the results obtained

The chart below illustrates how the efficiency of each entry mode changes in each scenario, making it easier to understand the situation. We can see that, in general, the Joint Venture dominates the WOS acquisition and WOS Creation in any scenario, while the Export dominates the Joint Venture in three scenarios.

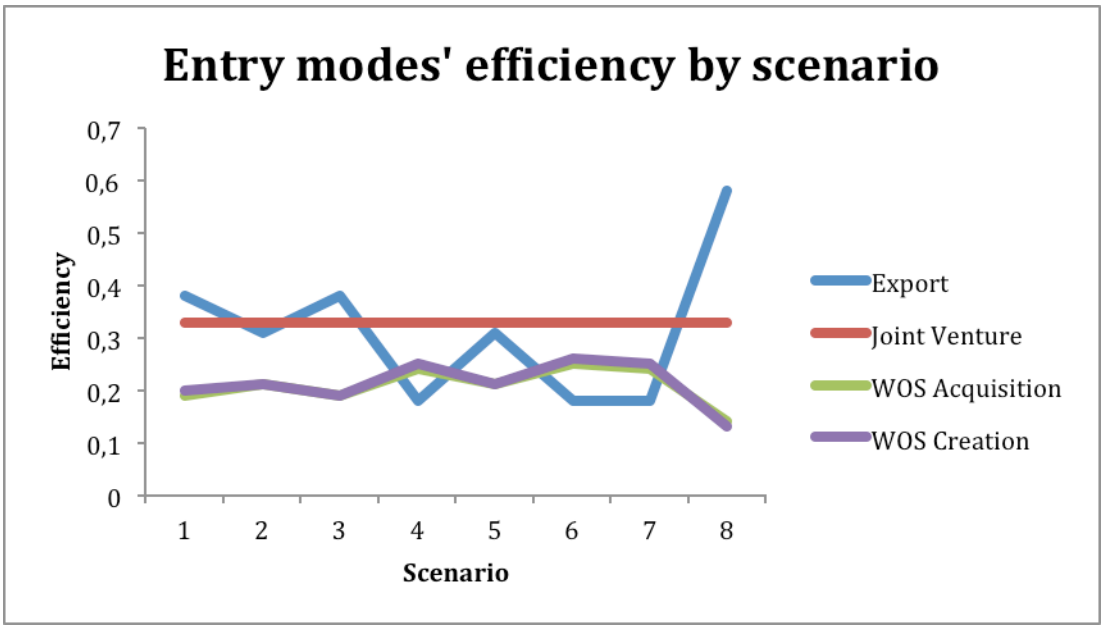

Figure 25: Entry modes' efficiency by scenario

Looking at the previous chart, we can make some considerations and deeper analyse the results we obtained.

First of all, the reason why the joint venture dominates the other solutions in most of the cases can be found in the value of the real option that it incorporates, which gives it an additional value compared to the other entry modes (the value of the real option, in our model, is subtracted from the cost; see chapter 3.2.1 on how the real option value is calculated and accounted for in the model, and chapter 1.4.2 on the meaning of the real option value).

Actually, if we look at the table below (table 24), which shows the results of the analysis performed without considering the value of the real option for the joint venture, we will see how the joint venture is never the only optimal solution. In fact, if we do not consider the growth option, the export mode results to be the optimal solution in five scenarios, the joint venture together with WOS creation is the optimal solution in two scenarios, while in one scenario the WOS creation dominates the other solutions; never will the WOS acquisition be the optimal solution.

Another issue is that the model suggests the Export in Scenario 1, 3 and 8, and the Joint Venture in the others. The reason is that scenarios 1, 3 and 8 have in common a high political risk (see table 11), a situation that, as seen before (3.2.2), strongly pushes investors towards flexible entry modes.

Another question that may arise looking at the chart in fig. 25 is why, in the eighth scenario, the Export mode over performs so remarkably all the other entry modes. We know from the table 11 and 13 that the eighth scenario is characterized by high political risk, low strength of competition, and high cultural distance. Those external variables have an impact on the internal variables, and precisely we need an entry mode that have a high flexibility, but we don't need a high ability to face competition nor a high level of control. All these characteristics are proper of the Export entry mode, as it can be evinced from the payoff matrix (Chapter 3.2.2). Therefore, the Export performs largely better than all the others.

Finally, we can see that, on a scenario-by-scenario analysis of the efficiency, the joint venture is the less volatile alternative, while the Export is the alternative that varies the most scenario by scenario. For example, in three scenarios the Export performs lower than the WOS acquisition and creation, while this never happens to the joint venture.

This is easily explained looking at the payoff table of Chapter 3.2.2: the joint venture performs 50 in all the variables, so, even if the weight of the variables changes, the joint venture will perform always the same in terms of efficiency (0,33).

On the contrary, Export performs 10 in the first two variables, and 90 in the third (the fourth is not weighted). Therefore, changing the weight of the variables has a strong impact on the efficiency of this entry mode.
Actually, as we noticed before, export has the maximum efficiency coefficient in the eighth scenario, the one where the third variable (flexibility) weights most.

	1	2	3	4	5	6	7	8
Export	**0,38**	**0,31**	**0,38**	0,18	**0,31**	0,18	0,18	**0,58**
Joint Venture	0,25	0,25	0,25	**0,25**	0,25	0,25	**0,25**	0,25
WOS acquisition	0,19	0,21	0,19	0,24	0,21	0,25	0,24	0,14
WOS creation	0,20	0,21	0,19	**0,25**	0,21	**0,26**	**0,25**	0,13

Table 24: The optimal solution without considering the real option.

Best alternative by scenario – the influence of the costs

We can notice that the inclusion of the costs (3.2.1) in the analysis changes completely the optimal answer; particularly, while if we consider only the benefits, the optimal entry mode is always the WOS acquisition, when we consider the costs, the best solutions are the Export and the Joint Venture, depending on the scenario.

This because the WOS modes pay out a larger benefit (see payoff matrix in Chapter 3.2.2), but require an even higher resource commitment (see Chapter 3.2.1), which affects efficiency.

3.2.4 Aggregation of the scenarios by Decision Criteria

In the previous part we (Chapter 3.2.3) determined the efficiency of each entry mode scenario by scenario. However, the decision maker does not know, at the moment of the decision, which scenario will be realized. Therefore, to make a useful instrument of decision, we have to aggregate the data of each scenario in unique information, which will be then compared to the costs to determine the efficiency of each entry mode in the different decision criteria. But let's start with the benefit part.

The data of the scenarios can be aggregated according to different decision criteria, described in Chapter 3.1.1. Below we explain how we proceeded in the calculation:

Maximax: for each entry option we take the scenario that scores the maximum benefit. Then we choose the alternative that maximizes the benefit. This criterion is the most optimistic one, and is fit for risk-lover decision makers

Maximin*:* this criterion aims at minimizing the hypothetic loss of the worst-case scenario. For each entry option, we consider the worst scenario in terms of benefit; then, we choose the alternative that minimizes the loss (thus the maximum of the minimums). The choice of this criterion denotes a strong risk aversion and pessimism in the decision-maker.

Minimax regret: we construct a regret table where each number is the result of the difference between the payoff and the max benefit of each scenario. Then we

choose, for each line of the matrix, the lowest number (corresponding to the worst regret), and we choose the max among those values. This criterion, although not properly fit for a risk-lover, is less pessimistic then the Maximin criterion.

To be able to compare the results with the other criteria, we normalized the results using the formula

$$X = -(x) - 100$$

so that the values can be placed on a positive scale. The alternative that scores the maximum is the best.

Mean-standard deviation: starting from the data of the scenario, we calculate the variance of each entry mode using the Excel function VAR.VALORI. Then, we compute the standard deviation of each entry mode.

After having set a coefficient Lambda of 0,4 for the risk aversion of the decision maker, we compute the expected value of each entry mode using the formula:

$$\textit{Expected value} = \textit{Expected Monetary Value} - \lambda * \textit{Std.Dev}$$

Hurwitz: as said before, this criterion allows keeping into account the risk aversion of the decision-maker in the analysis. To implement this method we proceeded as follows:

- We chose a certain degree of optimism α with $0<\alpha<1$, so that $1-\alpha$ represents the degree of pessimism
- We determined the maximum and the minimum of each alternative
- For each alternative, the value will be the result of the following formula:

$$P = \alpha * \text{max value} + (1-\alpha) * \text{min value}$$

- We chose the alternative that gives the maximum value of P

In our model, to consider in the average case, we supposed the value of α to be 0,5.

The following table illustrates the results of the application of the decision criteria to the benefit of each scenario, showing how each entry mode performs in general (and not by scenario) according to the decision criterion.

	Maximax	Minimax	Minimax Regret	EMV	Mean-Std.D	Hurwitz
Export	57,50	17,50	10	30,83	25,31	37,50
Joint Venture	50	50	**50**	50	50	50
WOS Acquisition	**100**	**55**	20	**83,33**	**77,44**	**77,50**
WOS Creation	91,67	46,67	20	75	69,10	69,17

Table 25: aggregated benefit by decision criterion

As we can see, even consolidating the scenarios by decision criteria, when we consider only the benefits, the WOS acquisition hits the top score with every decision criterion, except for the Minimax Regret. Even in this case, the result will completely change when costs are included in the analysis (next paragraph). It may sound inconsistent that, for example, when choosing with the Minimax criterion, the optimal solution is the WOS acquisition, which certainly embodies more risk than export. The explication can be found in the payoff matrix (3.2.2): the high level of revenues, whose weight is not influenced

by the external factors, of the WOS acquisition, makes that this alternative never attains very low levels of aggregated benefit, in any scenario. Certainly the values change scenario by scenario, but the revenues grant the WOS acquisition a minimum level of aggregated benefit.
This is also the reason why the WOS acquisition dominates all the other solutions in any scenario.

This reasoning allows us to introduce another consideration: the risk incorporated in the decision criterion does not always perfectly correspond to the risk embodied in the entry mode, but it just applies to the specific benefit value considered (actually, we did not consider, in the model, the probability of having the payoffs in each entry mode). The fact that the most pessimistic criterion gives WOS acquisition as optimal solution is the demonstration.

The only decision criterion where the WOS acquisition does not dominate the others, and is instead the joint venture the optimal solution, is the Minimax Regret. The reason for this difference can be found in the meaning of this criterion: it suggests the alternative that minimizes the regret of the decision-maker in case the reality is different from expected. Looking at the payoff matrix, and also at the aggregated benefit by scenario, we can see that the joint venture scores always the same performance. Therefore, the regret in case of unexpected scenarios is minimum

Analysis of the efficiency by decision criteria – The efficient frontiers

As we did before for the scenarios (3.2.3), we will analyse the efficiency of the entry modes in each decision criterion, where efficiency is defined as the benefit/cost ratio (see chapter 3.2.3 for a complete definition of the efficiency).
We will compare on a chart, one for each decision criteria, the aggregated benefit and the cost of each entry mode, as they have been determined in the previous parts.

Maximax

Using the Maximax criterion to make the choice, the most efficient alternative in terms of benefit/cost ratio is the Export. The Joint Venture is excluded, since it pays out less and costs more than the Export, while the other two alternatives are still efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	57,5	0,58
Joint Venture	153,46	50	0,33
WOS acquisition	400	100	0,25
WOS creation	350	91,67	0,26

Table 26: entry mode efficiency – Maximax criterion

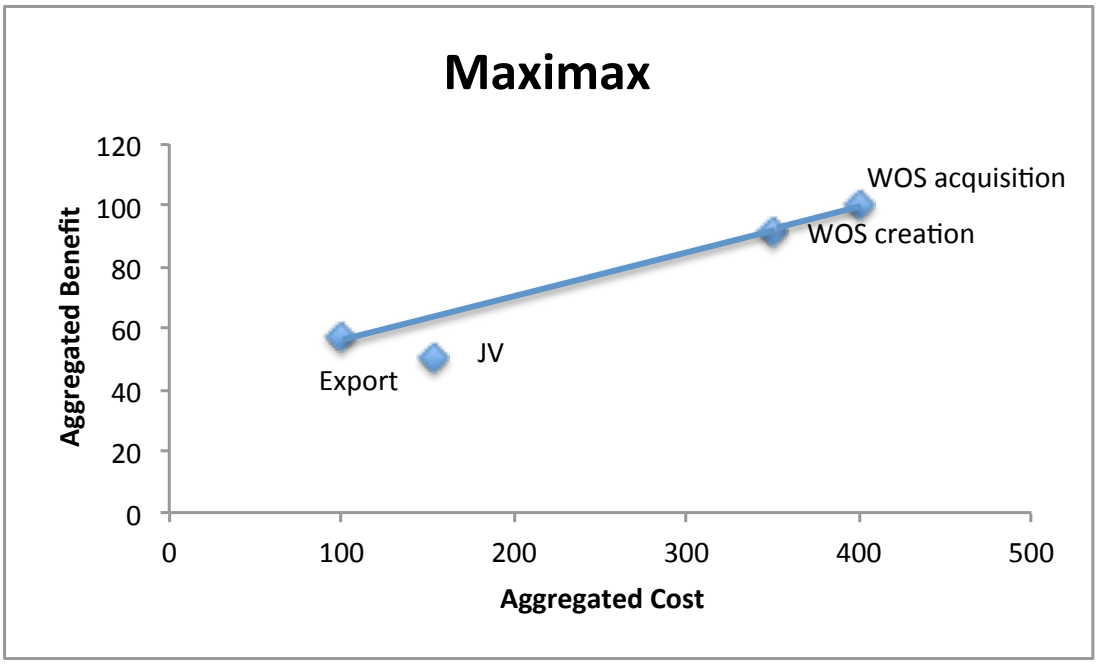

Figure 26: Efficient frontier - Maximax criterion

Maximin

According to the Maximin criterion, the most efficient alternative is the Joint Venture, followed by the Export.

Except for the WOS creation, that results not efficient, all the other alternatives are efficient and lie on the efficient frontier.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	17,5	0,18
Joint Venture	153,46	50	0,33
WOS acquisition	400	55	0,14
WOS creation	350	46,67	0,13

Table 27: entry mode efficiency – Maximin criterion

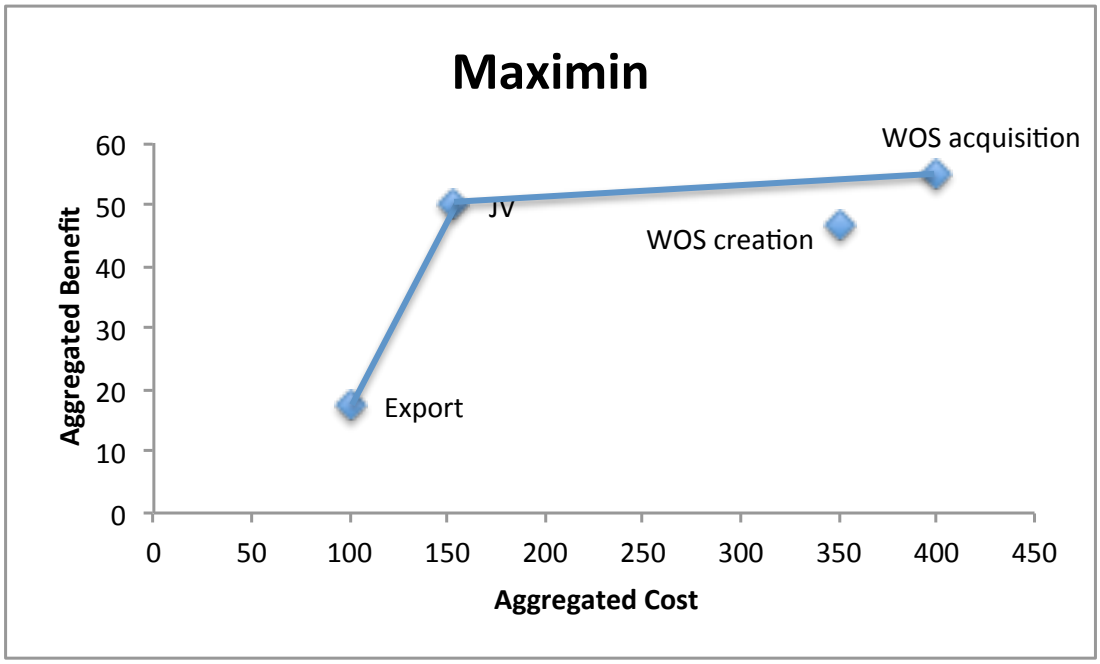

Figure 27: Efficient frontier - Maximin criterion

Minimax regret

To be able to compare the results with the other criteria, we normalized the results using the formula

$$X_{normalized} = -(x) - 100 = x + 100$$

so that the values can be placed on a positive scale. The alternative that scores the maximum is the optimal one, as for the others criteria.

With the Minimax Regret criterion, the best alternative is by the Joint Venture, followed the Export, while the WOS acquisition and WOS creation are not on the efficient frontier.

Entry mode	Cost	Benefit	Normalized Benefit	Benefit/Cost
Export	100	-90	10	0,10
Joint Venture	153,46	-50	50,00	0,33
WOS acquisition	400	-80	20	0,05
WOS creation	350	-80	20	0,06

Table 28: entry mode efficiency – Minimax regret criterion

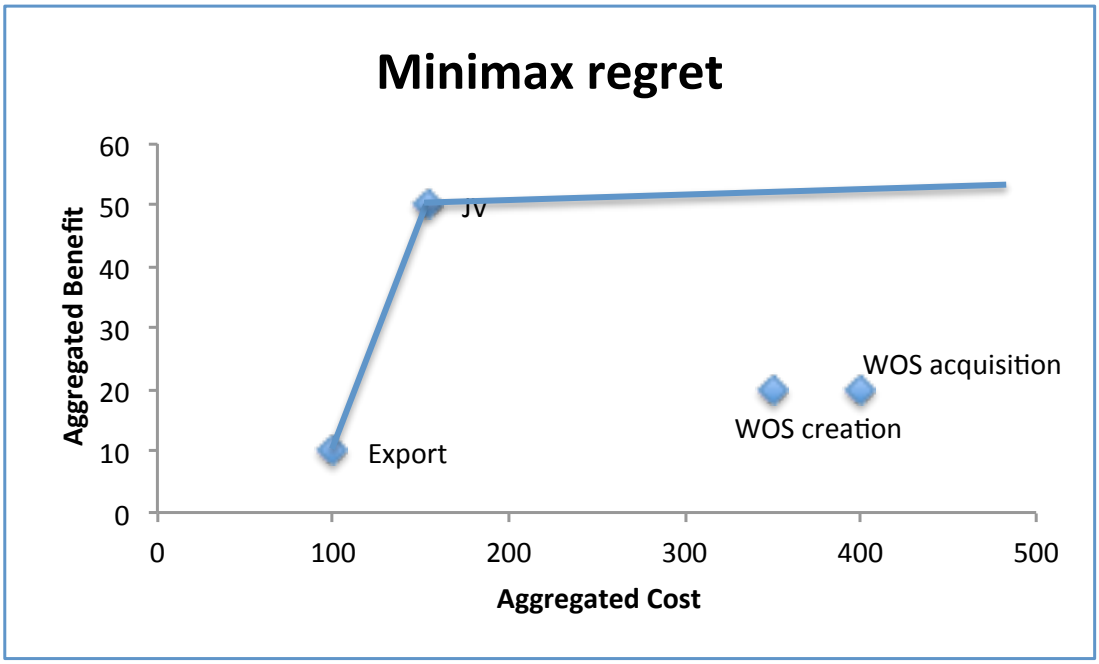

Figure 28: Efficient frontier – Minimax regret criterion

Expected Monetary Value (EMV)

According to the EMV criterion, the Joint Venture is the most efficient alternative, followed by the Export.

All the alternatives appear to be efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	30,83	0,31
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	83,33	0,21
WOS creation	350	75,00	0,21

Table 29: entry mode efficiency – Maximax criterion

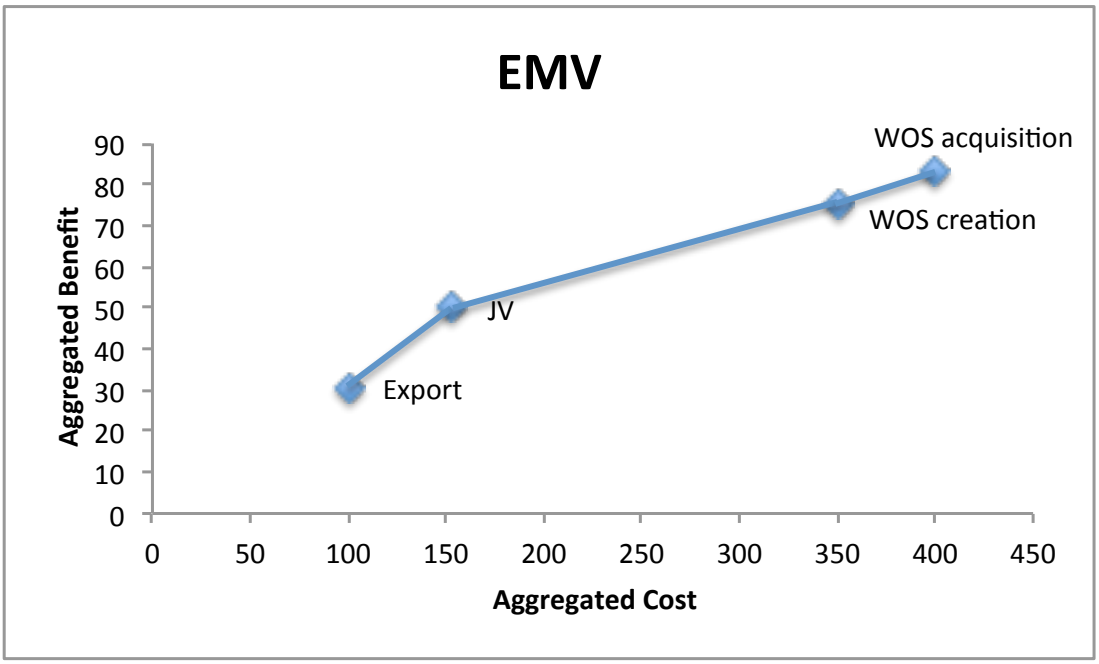

Figure 29: Efficient frontier - EMV criterion

Mean – Standard Deviation

Using the Mean-Standard deviation criterion, the most efficient alternative is again the Joint Venture, followed by the Export. The other entry modes can be considered efficient either. The WOS creation is not on the efficient frontier, but since it is not dominated by any existing alternative, for the reasons detailed in Chapter 3.2.3, we consider it efficient.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	25,31	0,25
Joint Venture	153,46	50,00	0,33
WOS acquisition	400	77,44	0,19
WOS creation	350	69,10	0,20

Table 30: entry mode efficiency – Mean-SD criterion

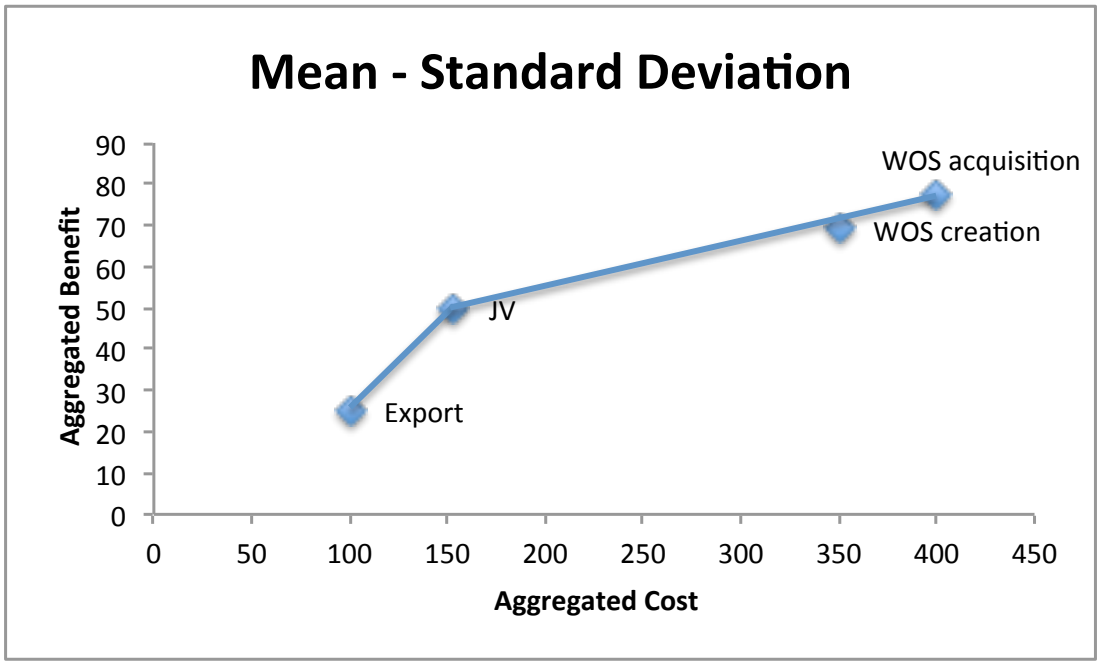

Figure 30: Efficient frontier – Mean - SD criterion

Hurwitz

According to the Hurwitz criterion, the best alternative is the Export, followed by the Joint Venture.

Although WOS creation is slightly below the efficient frontier, we consider it efficient, for the reasons detailed in Chapter 3.2.3.

Entry mode	Cost	Benefit	Benefit/Cost
Export	100	37,5	**0,38**
Joint Venture	153,46	50,0	0,33
WOS acquisition	400	77,5	0,19
WOS creation	350	69,17	0,20

Table 31: entry mode efficiency – Hurwitz criterion

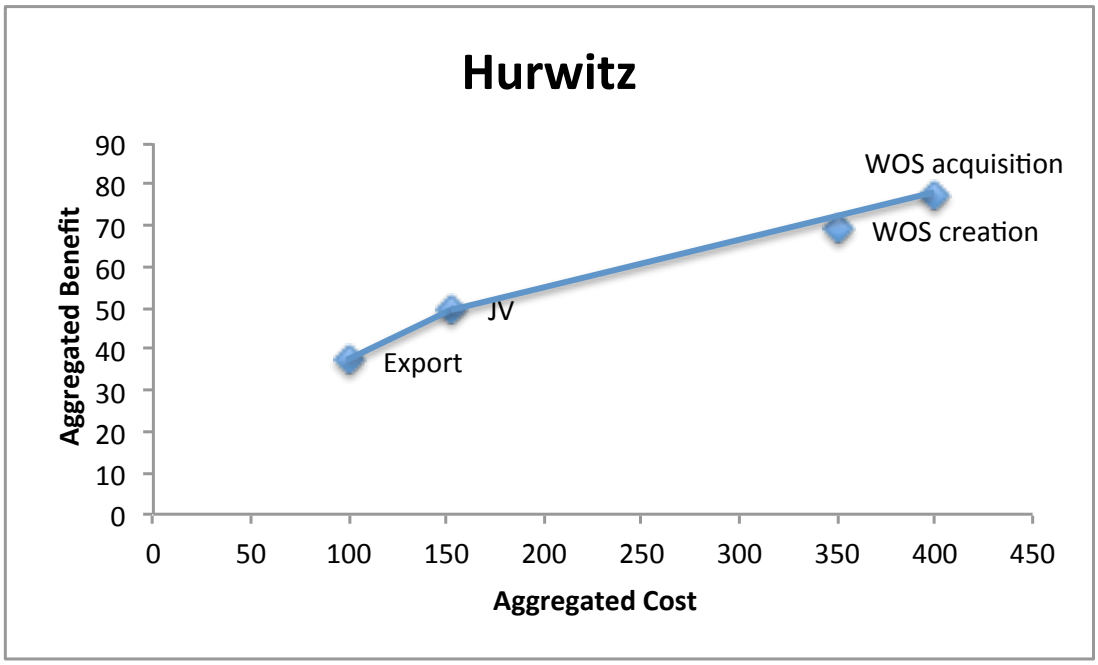

Figure 31: Efficient frontier - Hurwitz criterion

Analysis of the results

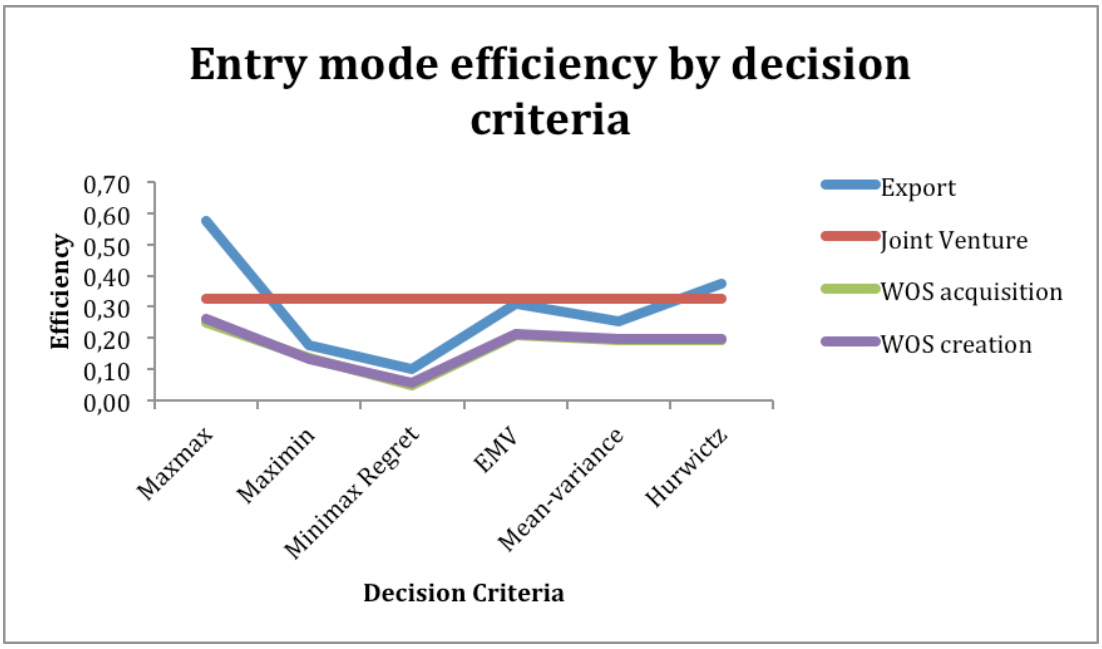

Figure 32: entry mode efficiency by decision criterion

It appears clear that, depending on the decision criterion, the best alternatives are either Export or Joint Venture. In any case, the model never suggests the creation or the acquisition of a WOS as the best entry mode. As happened for the analysis by scenario, the fact that the joint venture be the dominant solution in most of the cases is due to the fact that it incorporates a growth option that confers it a plus value.

To study how the result changes and to appreciate the influence of the real option, we performed the same analysis without accounting for the value of the real option. The result is showed on the table below (table 32): the joint venture's benefit/cost ratio lowered in all the criteria, and in some cases the optimal solution changed.

Particularly, the difference is found in the EMV criterion, where the export replaces the joint venture as the best solution, and in the Mean-variance criterion, where Export and joint venture score the same value.
The interpretation of this result is always the same: the growth option provides the joint venture an additional value, since it allows managers taking full profit of the eventual growth opportunities (see chapter 1 and 2 for further explication and detailed literature review).

Getting back to the analysis including the real option, how can we interpret the results?

Differently from what happened when the results depended on the scenario and therefore on the weight that the single internal variables assumed varying the external factors, here the results depends on the attitudes of the decision maker towards the risk.
Particularly, we can say that, for a risk-lover, one that would choose the Maximax as decision criterion, the export would be the optimal solution, while for somebody very pessimist that uses the Maximin to choose, the best solution would be the joint venture.

Is this result consistent? Apparently no, since the WOS acquisition is not properly the less risky alternative. However, as highlighted in the previous section, the risk considered in the decision criteria does not correspond perfectly to the risk incorporated in the entry mode. In other words, the model does not take into account the risk of each alternative.
The proof is, when we choose the Hurwitz criterion, which allows accounting more precisely for the risk aversion of the decision-maker, the span between the efficiency of joint venture and export is reduced.

Another interesting question would be why WOS creation and WOS acquisition perform so poorly with the Minimax Regret criterion. Studying the data, we see that, considering only the benefits of the entry modes, the WOS alternatives perform both better than Export, which is the alternative that registers the greatest differences in its benefit values (see payoff matrix Chapter 3.2.2). However, the higher-than-proportional cost of the WOS alternatives compared to the Export makes them less efficient.

	Maximax	Maximin	Minimax Regret	EMV	Mean-variance	Hurwitz
Export	**0,58**	0,18	0,10	**0,31**	**0,25**	**0,38**
Joint Venture	0,25	**0,25**	**0,25**	0,25	**0,25**	0,25
WOS Acquisition	0,25	0,14	0,05	0,21	0,19	0,19
WOS Creation	0,26	0,13	0,06	0,21	0,20	0,20

Table 32: entry mode efficiency without the real option – decision criteria

Sensitivity analysis

The sensitivity analysis allows us to study how the results change when we change some parameters.

Particularly, since one of the aims of this work is to study the effect of the real option valuation on the entry mode selection, we focused our attention on the standard deviation (sigma) of the underlying project, which, as we know from option theory (Chapter 2), influences the value of the real option in a positive way.

It is important to remember that the value of the real option is kept into account by subtracting it from the cost of the Joint Venture; however, in our model, the revenues of the Joint Venture are supposed to be fixed, and do not change as the costs change (in the reality, it is normally the opposite).

Actually, the variation of sigma influences the opportunity interest rate of the firm, which is the rate used to discount future cash flows of the projects. Therefore, an increase in the volatility increases the risk and the rate that the investors require to invest in the project.

In our model, however, we assumed that this effect had equal consequences on all the entry modes, and since the aim of the model is the comparison between the different entry modes, we decided that it was not worth including the effect that the variation of sigma has on the cash flows.

Medium volatility (Sigma = 0,3)

This is the standard value chosen for sigma, thinking that it was reasonable that a foreign investment project could attain this value of volatility.

The real option has a value of 46,54, and the cost of the Joint Venture is therefore

$$200 - 46{,}54 = 153{,}46$$

The following table summarizes the results seen previously in terms of efficiency:

	Maxmax	Maximin	Minimax Regret	EMV	Mean-variance	Hurwitz
Export	**0,58**	0,18	0,10	0,31	0,25	**0,38**
Joint Venture	0,33	**0,33**	**0,33**	**0,33**	**0,33**	0,33
WOS acquisition	0,25	0,14	0,05	0,21	0,19	0,19
WOS creation	0,26	0,13	0,06	0,21	0,20	0,20

Table 33: entry mode efficiency by decision criteria – 30% volatility

With a volatility of 30%, the Export is the best alternative in two cases (Maximax and Hurwitz), while the Joint Venture is the best alternative in the other four.

High volatility (Sigma = 0,5)

If the variance of the underlying project is higher, the real option has a higher value.

Particularly, the real option will have a value of 71,81 and the cost of building a Joint venture will be reduced to:

$$200 - 71{,}81 = 128{,}19$$

Actually, we can notice that, for any decision criterion, the value of the Joint Venture in terms of efficiency has increased.

Sometimes, this difference changes completely the situation compared to the previous one, making the best alternative different. It is the case of the Hurwitz criterion, where the Joint Venture becomes the most efficient entry mode instead of Export.

Globally, we can say that, with a value of sigma (volatility) of 0,5, the Joint Venture is the best solution independently of the decision criterion adopted, except for the Maximax.

	Maximax	Maximin	Minimax Regret	EMV	Mean-variance	Hurwitz
Export	**0,58**	0,18	0,10	0,31	0,25	0,38
Joint Venture	0,39	**0,39**	**0,39**	**0,39**	**0,39**	**0,39**
WOS acquisition	0,25	0,14	0,05	0,21	0,19	0,19
WOS creation	0,26	0,13	0,06	0,21	0,20	0,20

Table 34: entry mode efficiency by decision criteria – 50% volatility

Low volatility (Sigma = 0,05)

If the standard deviation of the underlying asset is 5%, a quite low value, the real option loses importance, attaining a value of 13,8 and a cost for the Joint Venture of

$$200 - 13{,}8 = 186{,}2$$

This higher cost makes the efficiency of the Joint Venture decrease, so that, compared to the first criterion (sigma = 0,3), the Joint venture loses its position of best entry mode in the EMV criterion.

Globally, we can say that, with a low volatility, the Joint venture is not as efficient as before.

	Maximax	Maximin	Minimax Regret	EMV	Mean-variance	Hurwitz
Export	**0,58**	0,18	0,10	**0,31**	0,25	**0,38**
Joint Venture	0,27	**0,27**	**0,27**	0,27	**0,27**	0,27
WOS acquisition	0,25	0,14	0,05	0,21	0,19	0,19
WOS creation	0,26	0,13	0,06	0,21	0,20	0,20

Table 35: entry mode efficiency by decision criteria – 5% volatility

The following table shows how the real option value and the Joint Venture cost vary for different values of the volatility sigma, and the effect on the best solution (last two columns of Table 36).

Volatility	Sigma	Option Value	JV Cost	JV - Export	% of JV as best choice
Medium	0,3	46,54	153,46	4 – 2	66,66%
High	0,5	71,81	128,19	5 – 1	83,33%
Low	0,05	13,85	186,2	3 – 3	50%

Table 36: JV – export convenience by volatilty

With a medium level of volatility, the Joint Venture is the best choice in 4 out of 6 criteria.

In case of high volatility, the joint venture becomes more efficient, in 5 out of 6 criteria, while with a low volatility the joint venture loses its convenience, becoming the best choice in just 3 criteria.

In which criteria the result is most robust? Looking at the previous tables, we see that Joint Venture remains the optimal solution independently from the level of volatility, with Maximin, Minimax Regret and Mean-Variance criteria.

However, while with Maximin and Minimax Regret criterion the Joint venture is always by far the optimal solution, with the Mean-Variance criterion, the result is less robust, since the value of the export nearly reaches the value of the Joint Venture in case of low volatility (Table 35).

The following chart (fig. 33) depicts the real option value varying the volatility of the project (sigma).

As we can see, the value of the real option increases as volatility increases. The trend is nearly linear.

The fact that the value of the joint venture increases with the uncertainty means that companies may take advantage of uncertainty by using real option valuation and creating real options

Furthermore, given the high uncertainty of international expansion projects, this makes the joint venture a particularly interesting entry mode. In fact, as it incorporates a growth option, a joint venture in a foreign investment project would be more valuable as uncertainty increases. Certainly, this is not the only way of profiting from uncertainty, and there are many other occasions and ways of creating real options.

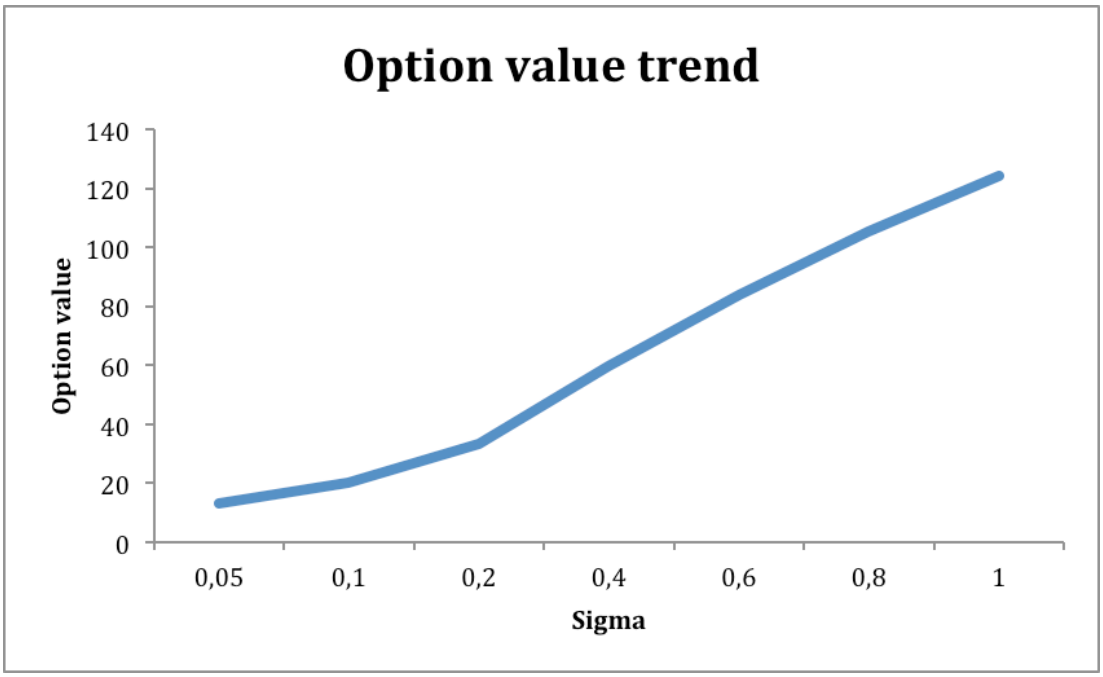

Figure 33: Option value by volatility

Conclusions

Through the construction of a simple model, we aimed at studying the effects that certain external variables (political risk, strength of competition, cultural distance) have on the choice of the best entry strategy in a foreign market, given some factors (degree of control, ability to compete, flexibility and expected revenues) that we hypothesized to be important for the decision, and the monetary cost of implementing each entry strategy.

We considered four different entry modes that, in our opinion, well represent the different possible strategies: export, joint venture, company acquisition, company creation.

Our main framework is the SMART method. The model can be divided in two parts: the benefit part and the cost part, which have been worked out separately and only at a certain point compared.

As for the cost part, we estimated the cost of each entry mode, taking into account the value of the growth option incorporated in the joint venture. To do this, we had to calculate the value of the real option with the binomial method.

This value has then been subtracted from the cost of the joint venture.

As for the benefit part, we first determined which external factors (independent variables) could influence the decision of a firm going international. For simplicity, we supposed that each independent variable could assume two values, high and low. We have then eight possible scenarios.

Then, we figured out which internal factors (dependent variables) could be relevant in the choice of the foreign entry mode, and the relations between independent and dependent variables. This process allowed us to determine the weights of the variables in each scenario of the SMART model.

For each entry mode, we determined how it performed in each dependent variable and constructed the payoff table.

Then, for each entry mode, we weighted the payoff in the variables with the corresponding weight, obtaining the payoff of the entry modes for each

scenario, and, comparing it to the cost, we analysed the efficiency of the entry modes in the different scenarios to determine the optimal solutions.

Using the different possible decision criteria, we aggregated the benefit by scenario found before; again, we compared the results with the cost, we determined the optimal solution for each decision criterion.

To study how the results changed, we also performed the same analyses without considering the value of the real option.

Finally, we performed a sensitivity analysis to study how the optimal answer changes varying the project's volatility.

The research questions have been addressed. We studied the effect of external variables to the entry mode choice, using a MCDA model based on four variables.

We included in the analysis the real option valuation, to analyse how the real option influences the choice among the different entry modes.

On a scenario-by-scenario analysis, when considering just the benefit of each entry mode, the optimal answer was always the WOS; however, when we compared the benefit to the cost, we found that the optimal entry modes were the Export or the Joint Venture, due to the high costs of acquiring or building a WOS, and to the fact that the joint venture incorporates the real option (whose value has been deducted from the cost).

The same result has been verified aggregating the results according to the different decision criteria considered, where we found that Export is the best solution with the Maximax and criteria, while the Joint Venture is the optimal choice in all the others.

What can we suggest to our entrepreneur? Well, this depends on his attitude towards risk, but in general, unless he has a real passion for risk, he should really consider the joint venture. In fact, the joint venture can be considered as

the optimal solution: it maximizes the result in the worst case (Maximin), minimizes the regret in the case that the reality is different than expected, and it's still the optimal choice according to the expectation criterion, or EMV, if we consider the variance of the results (Mean-variance).

By repeating the analysis without the real option and comparing the results, we also demonstrated that the real option, when considered and recognized, provides the joint venture an additional value that makes it the best entry mode solution in most of the cases considered.

Finally, we studied how the last results varied for given values of the project's volatility sigma (30%, 50%, 5%), and we demonstrated that the volatility of the project is positively correlated with the value of the growth option incorporated in the Joint Venture.

On a side, we can therefore conclude that firms willing to invest in foreign markets should take into consideration, if it is the case for the market situation, the growth option that the joint venture provides, making it particularly interesting as entry mode, given the high volatility of international investment projects.

More in general, we demonstrated that companies can take advantage of uncertainty by creating real options.

On the other side, we demonstrated that real option valuation represents the reality more fairly than the classic discounted cash flow framework, and should therefore be used in all investment projects, since it allows accounting for growth (or waiting, etc.) opportunities when valuating an investment.

We think this model provides a useful framework for firms willing to expand to foreign countries, since it takes into consideration fundamental external variables (both country and market factors) showing how they influence the optimal entry mode. We suggest that the model be adapted to company's

specific needs and conditions, moreover in the choice of the variables considered.

Future developments for this research could go in the direction of enlarging the applicability of the model. Particularly, scholars can study how the situation changes when costs and benefits are weighted differently (in our model, they were weighted at the same level).

Furthermore, more and different variables, both external and internal, can be considered, and the relations between internal and external variables can be modified and adapted to the conditions, and more entry modes can be compared.

Bibliography

1. Albaum, G., Strandskov, J., Duerr, E., Dowd, L. "International Marketing and Export Management (International Business Series)". 1994 (2nd Ed.), Addison-Wesley.
2. Blomstermo, A., Sharma, DD. "Learning in the Internationalisation Process of Firms". 2003, Edward Elgar Publisher.
3. Bradley, F. "International Marketing Strategy" 2004 (4th Ed.), Prentice Hall.
4. Brealey, A.R., Myers, S.C., Allen, F. "Principles of Corporate Finance". 2011 (10th Ed.), McGraw-Hill.
5. Brouthers K.D.; Brouthers, L.E.; Werner, S. "Real Options, International Entry Mode Choice And Performance". *Journal of Management Studies* 2008, 45(5): 936-960.
6. Bürgel O., Fier A., Licht G., Murray G. "Timing of international market entry of UK and German High-Tech Start-ups". 2001, Discussion paper 01-51, ZEW (Zentrum für Europäische Wirtschaftsforschung) GmbH.
7. Cateora P.R., Graham J.L. "International Marketing". 2002 (11th Ed.), New York, Mc Graw Hill Companies.
8. Cox, J.C., Ross, S.A., Rubinstein, M. "Option Pricing : A Simplified Approach" *Journal of Financial Economics* 1979, 7(3) : 229-263.
9. Cuypers, I.R.P; Martin, X. "What Makes And What Does Not Make A Real Option? A Study Of International Joint Ventures". 2006, Academy of Management Best Paper Proceedings. Research Collection Lee Kong Chian School of Business.
10. Czinkota, M.R., Ronkainen, I.A. "Global Marketing". 1996, The Dryden Press, Forth Worth, TX.
11. Damodaran, A. "The Promise and Peril of Real Options". 2005, NYU Working Paper No. S-DRP-05-02.
12. Fernandes R., Gouveia B., Pinho C. "Exploring Modes of Entry Into International Markets: Direct Investment Or Contractual Relations". *Journal of Business Economics & Management*, 2014 15(1): 56-37.

13. Fisch, JH. “Internalization and Internationalization Under Competing Real Options”. *Journal of International Management* 2008, 14: 108–123.
14. Fisch, J.H. "Investment In New Foreign Subsidiaries Under Receding Perception Of Uncertainty". *Journal of International Business Studies* 2008, 39 (3): 370-386.
15. Folta, T. B., Miller, K. D. “Real Options In Equity Partnerships”. *Strategic Management Journal* 2002, 23(1): 77–88.
16. Folta, T. B., O’Brien, J. P. “Entry In The Presence Of Dueling Options”. *Strategic Management Journal* 2004, 25: 121–138 .
17. Gatignon, H, Erin, A. “The Multinational Corporation’s Degree of Control over Foreign Subsidiaries: An Empirical Test of a Transaction Cost Explanation”. *Journal of Law, Economics, and Organisation* 1988, 4(2) 305-336.
18. Ghemawat, P. “Redefining Global Strategy: Crossing Borders in a World where Differences Still Matter”. 2007, Harvard Business School Press, p.41.
19. Ghemawat, P., Siegel, J. “Cases About Redefining Global Strategy”. 2011, Harvard Business Review Press, Chapter 2.
20. Ghemawat, P: “CAGE Comparator ™”. 2014, www.ghemawat.com/cage/.
21. Glaister, K., Thwaites, D. ``Managerial perception and organizational strategy'' *Journal of General Management* 1993, 13(4): 15-33.
22. Guthrie, G. “Missed Opportunities: Optimal Investment Timing When Information Is Costly”. *Journal of Financial and Quantitative Analysis* 2007, 42(2): 467-488.
23. Hennart, J-F., Park, Y.R. “Greenfield Vs. Acquisition: The Strategy Of Japanese Investors In The United States”. *Management Science* 1993, 39(9): 1054-1070.
24. Hofstede, G. “Culture's Consequences: International Differences In Work-Related Values”. 1984 (2nd Ed.), SAGE Publications, Beverly Hills, CA.

25. Hofstede, G. "Riding the Waves of Commerce: A test of Trompenaars' "model" of national culture differences". *International Journal of Intercultural Relations* 1996, 20(2): P. 189-198.
26. Hofstede, G., Hofstede, G.J., Minkov, M. "Cultures and Organizations: Software of The Mind" 2010 (3rd Ed.) New York, McGraw-Hill.
27. Hollensen S. "Global marketing - Market respective approach". 1998, Hertfordshire, Prentice Hall.
28. Hollmann, J., Capres, A., Beuron, T.A. "The Daimlerchrysler Merger – A Cultural Mismatch?" Rev. Adm. UFSM, Santa Maria, 2010, 3(3): 431-440.
29. Hull J.C. "Options, Futures, and other Derivatives". 2011 (8th Ed.), Prentice Hall.
30. Johanson, J., Wiedersheim-Paul, F. "The internationalization of the firm – Four Swedish cases". Journal of Management Studies 1975, 12(3): 305–323.
31. Johansson, J., Vahlne, J.-E. « The internationalization process of the firm - a model of knowledge development and increasing foreign market commitments ». *Journal of International Business Studies* 1977, 8: 23-32.
32. Johanson, J.K. "Global Marketing: Foreign Entry, Local Marketing and Global Management" 1997, McGraw-Hill, Chicago, IL.
33. Johanson, J., Vahlne, J-E. "The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership". *Journal of International Business Studies* 2009, 40(9), 1411–1431.
34. Keegan W.J., Schlegelmilch B.B. "Global marketing management - A European perspective". 2001, Harlow (GB), Pearson Education Limited.
35. Kim, DY., Ashuri, B., Han SH. "Financial Valuation of Investments in International Construction Markets: Real-Options Approach for Market-Entry Decisions". *Journal of management in Engineering* 2013, 29(4): 355-368.
36. Koch, A.J. "Selecting overseas markets and entry modes: two decision processes or one?" *Marketing Intelligence & Planning* 2001, 19(1): 65-75.

37. Koch A.J. "Factors influencing market and entry mode selection: developing the MEMS model". *Marketing intelligence & planning* 2001, 19(5): 351-361.
38. Kogut, B. "Foreign Direct Investment As A Sequential Process". In "The Multinational Corporations In The 1980s." Eds. Kindelberger, C.P. & Audretsch D., 1983 Cambridge, MA, MIT Press.
39. Kogut B. "Joint Ventures and the Option to Expand and Acquire". *Management Science* 1991, 37(1): 19-33.
40. Kogut, B., Kulatilaka, N. "Operating Flexibility, Global Manufacturing And The Option Value Of A Multinational Network". *Management Science* 1994, 40(1): 123–139.
41. Kotler, P., Armstrong, G. "Principles of Marketing ". 2001 (9th Ed.), Prentice Hall.
42. Kulatilaka, N., Perotti, E.C. "Strategic Growth Options". *Management Science*, 1998, 44(8): 1021–1031.
43. Kumar V., Subramanian V. "A contingency framework for the Mode of Entry decision". *Journal of World Business* 1997, 32(1), 53-72.
44. Li, J. "Real Options and International Strategy: A Critical Review". *Advances In Strategic Management* 2007, 24: 67–101.
45. Li J, Dhanaraj C., Shockley R. "Joint Venture Evolution: Extending The Real Options Approach". *Managerial and Decision Economics* 2008, 29(4): 317-336.
46. Lia, J., Rugman A.M. "Real options and the theory of foreign direct investment." *International Business Review* 2007, 16: 687-712.
47. Miles, R., Snow, C. "Designing strategic human resources systems''. *Organisational Dynamics* 1984, 13: 36-52.
48. Porter, M.E. "The competitive advantage of nations". 1990, New York: Free Press.
49. Porter, M.E. "Competitive Strategy: Techniques for Analyzing Industries and Competitors". 1998, New York, Free Press.

50. Rawlinson, H. G. “Intercourse between India and the Western World: from the earliest times of the fall of Rome”. 2001, Asian Educational Services.
51. Root, F.R. “Entry Strategies for International Markets” 1994 (Rev. ed.),, Lexington Books, San Francisco, CA.
52. Rothaermel F.T., Kotha S., Steensma H.K. “International market entry by US Internet firms: an empirical analysis of Country risk, national culture and market size”. *Journal of Management* 2006, 32(1) 56-82.
53. Sahaym, A., Treviño, L.J., Steensma, H.K. “The Influence Of Managerial Discretion, Innovation And Uncertainty On Export Intensity: A Real Options Perspective” *International Business Review* 2012, 21: 1131–1147.
54. Samli, A.C. “An approach for estimating market potential in East Europe''. *Journal of International Business Studies* 1977, 8(2): 49-53.
55. Shockley, R. “An Applied Course In Real Options Valuation”. 2006, South-Western College Pub.
56. Shouchao, H. “The Influential Factors on Internationalization of The SMEs in China: On Wenzhou’s Shoe Industry and Policy Implications” *Research In World Economy*, 2011 2(1): 48-57.
57. Stearns, P.N. “The Encyclopedia of World History: Ancient, Medieval, and Modern, Chronologically Arranged”. 2001, Houghton Mifflin Company.
58. The World Bank. “World development report 1987” 1987, Oxford University Press, New York, p 141.
59. Tong, T.W., Reuer, J.J. "Real Options In Multinational Corporations: Organizational Challenges And Risk Implications". *Journal of International Business Studies* 2007, 38 (2): 215-230.
60. Tong, T.W., Reuer, J.J., Peng, M,W. "International Joint Ventures And The Value of Growth Options". *Academy of Management Journal* 2008, 51 (5): 1014–1029.

61. Trigeorgis, L. "Real Options: Managerial Flexibility and Strategy In Resource Allocation". 1996, Cambridge, MA. MIT Press.
62. Trompenaars, F., Hampden-Turner, C. "Riding the Waves of Culture : Understanding Cultural Diversity in Business". 1977 (2nd Ed.) London, Nicholas Brealey publisher.
63. UNESCO, World Heritage List. "Incense Route - Desert Cities in the Negev". 2014, whc.UNESCO.org.
64. Westhead P., Wright M., Ucbasaran D. "International market selection strategies selected by "micro" and "small" firms". *The International Journal of Management Science* 2002, 30: 51-68.
65. Wood V.R., Robertson K.R. "Evaluating international markets". *International marketing review* 1999, 34: 34- 55.
66. Zekiri, J., Angelova, B. "Factors That Influence Entry Mode Choice In Foreign Markets". *European Journal of Social Sciences* 2011, 22(4): 572-584.