Financial Evaluation of a Horizontal Foreign Direct Investment

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The implementation and operationalisation of a thorough financial evaluation of a horizontal foreign direct investment

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Preface

From April 2017, I have been working on my master thesis 'Financial evaluation of a horizontal foreign direct investment'. The research was conducted in the framework of my Master of Science in Business Administration at the University of Twente. I conducted the research in close cooperation with an (anonymous) Dutch multinational company, hereafter called Royal F&D. The company provided me with a realistic case study, which helped me to look into and develop a more practical financial evaluation method for the proposed kind of horizontal foreign direct investments.

First of all, I want to thank my two supervisors at the University of Twente, R. Joosten and H. van Beusichem, and Royal F&D, for their good advice, insights and feedback during the investigation. Moreover, I want to thank all of them for their enormous trust in my performance during this period. In addition to that, I want to thank all other people who have contributed to my master thesis in some way. Without their input and/or criticism, I would not have been able to develop such a thorough financial evaluation method (i.e. blueprint) for the proposed kind of horizontal foreign direct investments.

Finally, I hope that you – as a reader of this master thesis – are able to enhance your insights into (the financial evaluation of) horizontal foreign direct investments.

Leoni Dols, March 9th 2018

Executive Summary

In the framework of my master Business Administration at the University of Twente, I investigate how to perform a thorough financial evaluation of a horizontal foreign direct investment (FDI).

As the opportunity to look into the feasibility to expand production abroad at a Dutch multinational company has presented itself and literature has only been able to come up with abstract theories and models to address (horizontal) FDI, we have defined the following main question:

'To what extent is it possible to perform a thorough financial evaluation of a horizontal foreign direct investment of a Dutch multinational firm on the basis of literature, and what other aspects should be taken into account to let the evaluation be of practical relevance?'

Consequently, our research starts off with a literature review, in which we determine what is already known about (horizontal) FDIs. This leads to the motives, determinants, risks, databases and theoretical models that are readily available to support the financial evaluation of a horizontal FDI.

Next, as we have not been able to identify any realistic and useful theoretical model during our literature review, we design our own FDI-specific financial evaluation method. In order to do this, we first determine and explain the following five (financial) evaluation techniques: the discounted cash flow analysis, the break-even analysis, the decision tree analysis, the Monte Carlo simulation and the multiple-criteria decision analysis (MCDA). Through the assessment and explanation of how these are complemented with the results of our literature review and our research on further requirements, we have laid the foundations for a practical financial evaluation method which we deem to be capable of evaluating a horizontal FDI thoroughly.

Since it is not clear yet whether this financial evaluation method works thoroughly and to what extent it is applicable in practice, we test it in the case study presented. Based on the cooperating company's requirements, wishes and restrictions, we first compare three countries in North-America using a nondimensional scaling compensatory MCDA. In that way, we have identified the United States of America (USA) as the most suitable destination country for the proposed horizontal FDI. Next, we have identified Akron, in the state of Ohio, as a realistic destination location within the USA, by means of which we implement and operationalise our horizontal FDI-specific financial evaluation method (i.e. blueprint).

Subsequently, on the basis of a comprehensive list of necessary specifications, we have implemented and operationalised the following three financial evaluation techniques one by one: the discounted cash flow analysis, the break-even analysis and the Monte Carlo simulation.

The final result is (1) an initial recommendation to the Dutch multinational company whether the proposed horizontal FDI seems financially feasible or not, and (2) a highly automated but practical financial evaluation method for similar kinds of horizontal FDIs, that can easily be altered if necessary or requested. In addition, based on the subsequent results of our case study, we have come to the conclusion that the implemented financial evaluation method is capable of performing a thorough financial evaluation of the proposed (kind of) horizontal FDI. As a result, we are convinced that the blueprint, as included in the additional file *HFDI_Blueprint.xlsm*, makes it possible to evaluate similar kinds of horizontal FDIs in a fast yet detailed quantitative way.

In the end, we close off with several suggestions for future research and mention five specific recommendations for the Dutch multinational company that has provided us with a case study (e.g. to assess the results of a few more locations in the USA as a check-up and/or for comparison).

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Abbreviation List

ATCF(s)	After-Tax Cash Flow(s)	P. 22
CIF	Cost, Insurance and Freight	P. 11
DCF(s)	Discounted Cash Flow(s)	P. 22
DTA	Decision Tree Analysis	P. 23
EBIT	Operating profit (Earnings Before Interest and Tax)	P. 51
FCF(s)	Free Cash Flow(s)	P. 47
FDI(s)	Foreign Direct Investment(s)	P. 1
FOB	Free On Board	P. 11
GDP	Gross Domestic Product	P. 11
IRS	Internal Revenue Service	P. 28
MARR	Minimum Attractive Rate of Return	P. 28
MCDA	Multiple-Criteria Decision Analysis	P. 24
MCS	Monte Carlo Simulation	P. 45
NPV	Net Present Value	P. 21
OECD	Organisation for Economic Co-operation and Development	P. 17
PV	Present Value	P. 47
RTA(s)	Regional Trade Agreement(s)	P. 12
R&D	Research & Development	P. 11
STAN	Structural ANalysis	P. 17
USA	United States of America	P. 14
VBA	Visual Basic for Applications	P. 54
WACC	Weighted Average Cost of Capital	P. 28

1. Introduction

In the framework of my master Business Administration at the University of Twente, I investigate how to perform a thorough financial evaluation of a horizontal foreign direct investment (FDI). In general, literature defines an FDI as a project to expand abroad. However, in the horizontal mode of FDI, a multinational firm has the specific intention to expand its current production abroad to serve the consumers of this destination country [(Boubacar, 2016), (Forte & Silva, 2017), (Garretsen & Peeters, 2009), (Helpman et al., 2003), (Lin et al., 2015), (Monarrez, 2011), (Nayak & Choudhury, 2014) and (Toulemonde, 2008)].

In this chapter, we starts off with some useful information about Royal F&D in Section 1.1. Next, we describe the proposed case briefly in Section 1.2. After that, we state the theoretical and practical relevance of the research in Section 1.3. In section 1.4, we describe the corresponding research design. Subsequently, we define the main and sub-questions in Section 1.5 and the intended deliverables are given in Section 1.6. Finally, we conclude the introduction chapter in Section 1.7 with the demarcation of the research.

1.1. About Royal F&D

Royal F&D[1] is a Dutch company that has been doing business for several decades already. In these years, it has grown into a multinational firm (i.e. an international player) by exporting a large share of its production all over the world and by establishing sales offices and production plants abroad. Despite this internationalisation, the company is still mainly located in the Netherlands. Royal F&D belongs to the fast moving consumer goods sector and focusses on selling to the retail and out-of-home-markets. Efficiency and quality are highly valuated within the company, something which is reflected in its production. At last, it should be noted that Royal F&D serves its customers with a wide range of products.

1.2. The proposed case

Recently, Royal F&D has been experiencing an exceptionally increasing international demand for some of its products. However, as demand is growing and the remaining capacity to fulfil this increasing demand is decreasing, Royal F&D has to find a solution to this challenge. Only by addressing it, the company is able to keep or, preferably, increase its sales.

As a large part of the company's current sales increase is due to its increasing international demand, the company wants to assess a solution abroad, that fits with its current strategy and vision. One potential viable, internal solution and potential next step for Royal F&D would be to start producing these products abroad instead of continuing its exports from the Netherlands. Additional benefits of this solution may be a decrease in transportation costs and an increase in brand recognition. However, the company might have to deal with negative effects as well (e.g. lower product quality).

Royal F&D could have chosen from one of the following options to implement this solution: (1) outsource its production abroad, (2) acquire a foreign firm, (3) start a joint-venture, (4) merge with a foreign firm, or (5) build up its own production location abroad. However, as Royal F&D does not want to give its business processes out of hands and wants to keep differentiating by its high quality, the

[1] Royal F&D is a fictitious company name, which is used in order to increase anonymity of the actual participant in our research.

management is convinced that the only viable option will be to build up its own production location at a suitable place. A solution like this brings along certain costs and investments, and should not be implemented without a thorough analysis. Consequently, Royal F&D seeks to investigate whether expanding its production abroad – at a location close to its consumer market – would be a financially feasible solution (i.e. at least lead to positive net results). Besides, as the corresponding results might differ for each location, Royal F&D wants to find out which one is the most suitable for this solution as well.

1.3. Theoretical and practical relevance of the research

In the past 60 to 70 years, FDIs have been discussed in many academic articles, and several theories have been developed and tested to describe its determinants, effects and reasons (Nayak & Choudhury, 2014). Nevertheless, none of these theories seem to be fully applicable to actual FDIs by firms that want to become, or expand as, a multinational (Nayak & Choudhury, 2014). Therefore, Royal F&D cannot just use one or more of these theories to investigate whether expanding its own production abroad would be financially feasible.

In our research, a more practical alternative is developed to evaluate the proposed FDI financially. Furthermore, through the inclusion of significant theoretical factors, the gap between theory and practice is bridged. Moreover, as soon as the alternative is tested at Royal F&D, we are able to make improvements or changes in the model to let it be of greater use to this company. Likewise, if the model proves to be capable to evaluate the proposed FDI in a reliable (i.e. consistent) manner, other firms should also be able to use it – at least as a base model – for similar kinds of FDIs. Lastly, our research contributes to the literature about FDI as it poses new insights from a more practical perspective into the proposed FDI: the horizontal FDI.

1.4. Research design

First, we present a literature review, in which we determine how an FDI occurs and which corresponding motives companies have for it. In addition to that, we determine which determinants are commonly used and, thus, might be relevant for the more practical alternative to evaluate the proposed FDI financially. Furthermore, we identify which risks often occur with an FDI and what influences the location decision according to the literature. Lastly, we determine which databases might be of interest and why existing theoretical models are not fully applicable. This ensures that our research can be based on a specific set of commonly used and – even more preferably – significant theoretical factors for FDIs. All of the resulting factors are specifically intended to be appropriate for a horizontal FDI as this mode matches the proposed FDI.

Next, the research method is designed. This includes determining and explaining different relevant (financial) evaluation techniques – such as a discounted cash flow analysis and a break-even analysis – on a project level. For this, academic literature is used in case that the theoretical models from the reviewed articles are not applicable. Moreover, we explain how all selected evaluation techniques should be complemented with the previously found theoretical factors. Finally, the research method is completed by clarifying which information is needed in order to use the selected evaluation method and where this information is coming from.

Thereafter, we implement this more practical alternative at Royal F&D around its proposed horizontal FDI, as a case study. This is done in order to be able to eventually draw a realistic conclusion about the degree of applicability of our evaluation method in practice. We believe that this can best be achieved by close cooperation and coordination with the company, as a lot of inside information is necessary as

well to complete the evaluation for Royal F&D in a useful manner. After understanding the wishes and requirements of the company, we start with a quick selection of the most relevant country to then come to a suitable location in this country, which will be chosen in agreement with the company itself. As soon as the implementation is finished for this location, we are able to conclude to what extent our financial evaluation method (i.e. blueprint) seems to be successful in the financial evaluation of (this kind of) horizontal FDIs and whether Royal F&D's proposed horizontal FDI is financially feasible at the selected location. Based on that, we make recommendations.

1.5. Research questions

1.5.1. Main question

As the opportunity to look into the feasibility to expand production abroad at Royal F&D presented itself and literature has only been able to come up with abstract theories and models to address (horizontal) FDI, we defined the following main question:

'To what extent is it possible to perform a thorough financial evaluation of a horizontal foreign direct investment of a Dutch multinational firm on the basis of literature, and what other aspects should be taken into account to let the evaluation be of practical relevance?'

1.5.2. Sub-questions

To answer the main question, we have composed three key sub-questions. Apart from that, we also determined knowledge issues which will help us to find an answer to the corresponding sub-question. Based on this, we are able to draw a conclusion about the main question of the research conducted.

1. *What is already known about foreign direct investments in the literature?*
   - 1.1. How does an FDI occur? What are the different possible modes?
   - 1.2. What corresponding motives exist for companies to engage in an FDI?
   - 1.3. Which determinants are commonly used and, thus, might be financially relevant for the more practical alternative to evaluate the proposed horizontal FDI?
   - 1.4. Which risks are present during an FDI and might influence the results of the financial evaluation?
   - 1.5. What influences the location decision of a horizontal FDI according to the literature?
   - 1.6. Which databases might be of interest for the research conducted?
   - 1.7. Why are existing theoretical models not fully applicable?

2. *How can a horizontal FDI best be evaluated to bridge the gap between theory and practice?*
   - 2.1. Which (financial) evaluation techniques are useful to evaluate a horizontal FDI at project level thoroughly?
   - 2.2. How can the selected evaluation techniques best be complemented with the previously found essential theoretical factors for FDI?
   - 2.3. What information is needed to execute the more practical alternative evaluation method and where is this information coming from?

3. *What is necessary to implement the alternative evaluation method at* Royal F&D *successfully?*
   - 3.1. What is the specific idea of Royal F&D behind a horizontal FDI and how does this influence the alternative evaluation method?
   - 3.2. Which country has the most potential for a successful horizontal FDI and, subsequently, which location in this country is selected in agreement with Royal F&D to serve as our blueprint's location?
   - 3.3. What information is further required from Royal F&D for the implementation?
   - 3.4. How should the alternative evaluation method be altered to be of greater use to Royal F&D?

1.6. Deliverables

The ultimate goal of our research is to find an answer to the previously defined main question and, likewise, to find an answer for Royal F&D whether it is financially feasible to expand its production abroad and, if so, where to do this preferably.

Deliverables to Royal F&D are:

- *A review of the existing literature about (horizontal) FDI,* which provides the company with more knowledge about FDIs and, thus, with a huge advantage in possible future steps and/or negotiations.
- *A practical blueprint for similar horizontal FDIs,* which might be of use in case of a continuing interest to expand abroad.
- *A conclusion for the currently proposed horizontal FDI and corresponding recommendations,* which comes down to (1) an initial advice to the company whether it is financially feasible to expand its own production abroad and, if so, where to do this preferably, and (2) a list of possible next steps to take.

1.7. Demarcation of the research

To prevent that the research becomes too extensive, we mainly focus on horizontal FDIs in the literature review. This is largely due to the fact that the proposed FDI of Royal F&D complies with a horizontal FDI and, thus, other modes of FDIs will be less relevant to investigate.

In addition to that, the decision on where to situate the horizontal FDI's production plant is made in a fast and concise way: First of all, the country will be selected by performing a multiple-criteria decision analysis. Afterwards, only one location within this country will be selected and used in the blueprint. Consequently, a comparison between the financial results of different specific locations is omitted and the selected location only serves as a realistic example out of the many possibilities that exist. In spite of that, Royal F&D should be able to perform the same evaluation for other specific locations on its own due to the design of the blueprint.

Moreover, all financial evaluation techniques that will be selected are used at project level. This already provides the right foundations at one level for our alternative evaluation method, which can be complemented afterwards by implementing other useful factors from the literature and the company.

Furthermore, assumptions and estimations will only be stated and made, if no other solution can be found to the problem of missing information. Of course, these assumptions and estimations will be as accurate as possible.

Besides, the essential theoretical factors that are determined as significant in the literature are not tested again on their degree and direction of influence on the horizontal FDI in the evaluation method of this research as our goal is different.

Apart from that, it must be clear that it is probably not possible to meet all wishes and requirements of Royal F&D in the research conducted due to the limited time frame and the fact that the company's anonymity has to be guaranteed. This also leads to the limitation that we cannot publish the specific results of our case study (at Royal F&D) online. Consequently, the publicly available blueprint will contain fictitious numbers to serve as an illustrative example of our model's operation.

At last, the alternative evaluation method is determined as successful when final results of the implementation appear realistic. This is achieved in cooperation with Royal F&D.

2. Literature Review

This chapter reviews the FDI literature that we studied as the initial foundation of the research that will be conducted. It provides an answer to the first sub-question (p. 3): "*What is already known about foreign direct investments in the literature?".* In the course of this chapter, horizontal FDI will play an increasingly important role as the proposed FDI at Royal F&D complies with this specific mode. Consequently, the research conducted shall concentrate on this mode as well.

First of all, we start off in Section 2.1 by explaining how FDIs regularly occur. Here, FDIs are divided into the existing different modes and, correspondingly, their typical characteristics are determined. In Section 2.2, we identify the possible motives that companies might have to implement a certain mode of FDI. This ensures that our research can finally be concentrated on one specific mode: the horizontal FDI. Next , in Section 2.3, we determine the potential useful determinants of an FDI that may still come in handy later on in the research. Subsequently, we clarify the possible risks that a company might experience while engaging in FDI in Section 2.4. Thereafter, in Section 2.5, we discuss what exactly affects the location decision of a horizontal FDI. In Section 2.6, we identify different interesting databases from the literature studied that may be helpful with regard to the research that is conducted. Furthermore, in Section 2.7, we explain why the theoretical models of the scientific articles studied cannot be a part of the foundation of this research.

2.1. How does an FDI occur? What are the different possible modes?

2.1.1. Identification of different FDI modes

Helpman and Krugman (1985) were among the first to distinguish between two modes of FDI: horizontal and vertical FDI (Ito, 2013). In case of horizontal FDI, a multinational firm has the intention to also produce its current products abroad to serve the consumers of this destination country [(Boubacar, 2016), (Forte & Silva, 2017), (Garretsen & Peeters, 2009), (Helpman et al., 2003), (Lin et al., 2015), (Monarrez, 2011), (Nayak & Choudhury, 2014) and (Toulemonde, 2008)]. Marketing and research and development will both still be carried out in the headquarters of the home country (Forte & Silva, 2017). Nevertheless, trade costs will decrease [(Conconi et al., 2016) and (Lin et al., 2015)].

Meanwhile, vertical FDI results in firms fragmenting their production across home and one or more foreign countries as a way to decrease operating costs as much as possible [(Brainard, 1997), (Lin et al., 2015) and (Monarrez, 2011)]. Despite the fragmentation, these firms usually ship the products back to home to serve their domestic consumers [(Alfaro & Charlton, 2009), (Brainard, 1997), (Nayak & Choudhury, 2014) and (Neary, 2009)].

Recently, however, academic articles suggest other modes of FDI as well [(Boubacar, 2016), (Garretsen & Peeters, 2009), (Ito, 2013) and (Lin et al., 2015)]. One lately suggested mode is the complex vertical, or hybrid FDI (Boubacar, 2016). It is based on the characteristics of both the horizontal and vertical mode and holds the purpose of serving domestic and foreign consumers by operating a fragmented production across home and (some of the) foreign countries that are served (Boubacar, 2016). From this, it follows that the firm might also serve e.g. the neighbouring countries of a destination country. Nevertheless, this should only happen if trade costs between these foreign countries are smaller than the trade costs between these neighbouring countries and the home country (Garretsen & Peeters, 2009).

Another mode that has recently been introduced, is the export platform FDI [(Garretsen & Peeters, 2009), (Ito, 2013) and (Tintelnot, 2017)]. This mode is purely meant to get around the high trading

costs of export from the home country by engaging in horizontal FDI (s) and, then, exporting from each host country to its neighbouring countries [(Garretsen & Peeters, 2009) and (Ito, 2013)]. Export platform FDI is especially relevant in case of regional trade agreements and lower trade costs between a destination country and its neighbouring countries (Ito, 2013). It has a negative impact on export from the production plant located in the home country (Forte & Silva, 2017).

Lin et al. (2015) were able to identify five different FDI modes in their article and tested these modes by forming various pairs and proposing several hypotheses with regard to the influence of different firm-, industry-, and country-specific determinants. The authors (Lin et al., 2015) were able to confirm each proposed hypothesis and, also, were able to distinguish three additional non-traditional FDI modes due to the investigation of firms' productivity differences. According to Lin et al. (2015), horizontal FDIs can be divided into (1) standard horizontal FDI, and (2) heterogeneous horizontal FDI; and vertical FDI can be divided into (1) standard vertical FDI, (2) foreign concentration FDI, and (3) home concentration FDI.

Standard horizontal FDI is equal to the horizontal FDI mode that has already been described: the idea is to produce (and serve the destination country with) products that are identical to the products at home (Lin et al., 2015). Likewise, standard vertical FDI is equal to the previously explained vertical FDI mode.

Meanwhile, heterogeneous horizontal FDI is described as a mode in which the finished products of the destination country somewhat differ from the products produced in the home country (Lin et al., 2015). Furthermore, Lin et al. (2015) explain that in case of foreign concentration FDI and home concentration FDI the production is concentrated abroad and at home respectively, and sales – including distribution and marketing – is concentrated at home and abroad respectively.

Lastly, these authors show that firms in the fast moving consumer goods industry tend to one of the two horizontal FDI modes, while firms in the hi-tech industry tend to a foreign/home concentration vertical FDI or a standard horizontal FDI (Lin et al., 2015).

Consequently, FDIs are turning out to be more diverse and complex than was initially assumed in literature. Figure 1 below summarises all identified modes, including from which traditional mode (horizontal or vertical FDI) each of them evolved.

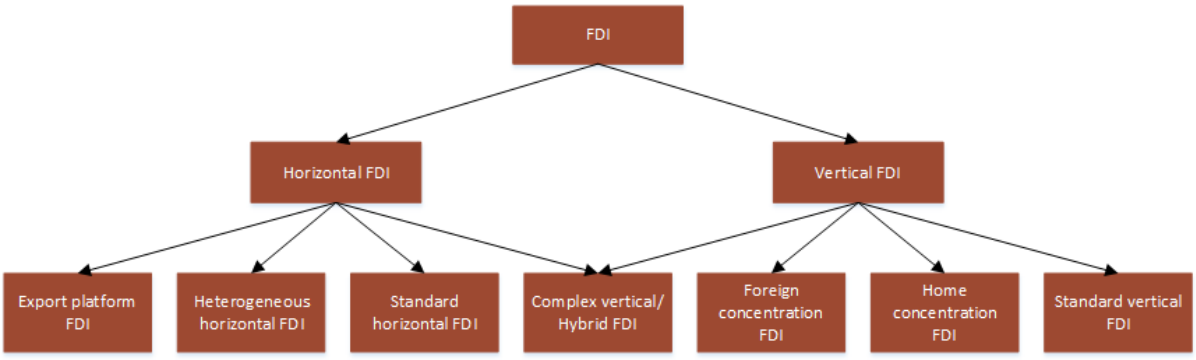

Figure 1 Summary of the identified FDI modes

2.1.2. Consequences of the proximity-concentration trade-off and a firm's productivity level

In addition to the above identification and classification of FDI modes, several papers determine whether a specific company should only have national coverage, use export, or expand internationally (by FDI) – by making the proximity-concentration trade-off (Nayak & Choudhury, 2014) and, moreover, by classifying the firm according to its productivity level [(Conconi et al., 2016) and (Helpman et al., 2003)]. From a financial perspective, the proximity-concentration trade-off includes a trade-off

between (1) trade costs, due to export, and (2) fixed costs, which can be assigned to the implementation of FDI [(Brainard, 1997), (Conconi et al., 2016), (Krautheim, 2013), (Nayak & Choudhury, 2014) and (Neary, 2009)]. Trade costs exist of fluctuating transportation and tariff costs (Helpman et al., 2003) and distribution costs (Kurmanalieva, 2006). Furthermore, Helpman et al. (2003) state that "relative to FDI, exporting involves lower sunk costs but higher per-unit costs" (p. 2). However, whenever the fixed costs for an FDI are high, the productivity level classification will lead to a situation in which "the most productive firms engage in FDI, less productive ones export, and the least productive serve only their home market" [(Conconi et al., 2016, p. 17) and (Buch et al., 2009)]. Apart from that, the foreign demand should always offset the fixed costs of FDI (Pontes, 2004). The implementation of an FDI will subsequently lead to certain profits, which can be calculated by subtracting the fixed investment costs from expected variable earnings (Tintelnot, 2017). A simple visualisation of the profit margin for each productivity level can be found in Figure 6, Appendix A.

Furthermore, Tintelnot (2017) states that the more productive firms are better able to stay in the foreign market than the less productive national firms as the former class is more capable of forcing out the latter from the same market, resulting in an overall increase in productivity due to FDIs. Meanwhile, it is also possible that this leads to lower product prices and a decrease in demand (Tintelnot, 2017). Nevertheless, this may partially be a logical consequence as the competitiveness in the destination country intensifies and the higher consumer price for export products is mainly due to trade costs [(Behrens & Picard, 2005) and (Helpman et al., 2003)]. Apart from that, this overall increase in productivity due to FDIs might be because the firms that engage in FDIs – and thus the more productive ones – are often characterised by maturity (Nayak & Choudhury, 2014). For these firms, it is actually also just undesirable to abandon their FDI during the implementation stage and leave the corresponding foreign market due to the high fixed investment costs (De Maeseneire & Claeys, 2012).

2.1.3. Discussion about FDI as a substitute for and a complement to export

There is an on-going discussion whether and when FDI is a substitute for export, or a complement to export [(Boubacar, 2016) and (Forte & Silva, 2017)]. Boubacar (2016) mentions that some papers even state that an FDI can be one of both, depending on the situation. Pontes (2004) is an example of this. Meanwhile, Forte & Silva (2017) mention that the resulting type "depends on the level of disaggregation of data" (p. 245) and that "studies at a more disaggregated level tend to get a substitution relationship" (p. 245). Notwithstanding, Boubacar (2016) himself confirms that FDI is complementary to export. Consequently, although FDI is often seen as a substitute for export to a certain country and/or continent – especially in the proximity concentration trade-off – (Forte & Silva, 2017), FDI can also serve as a complement according to Boubacar's paper.

Conconi et al. (2016) confirm this complementarity as well, especially for horizontal and home concentration FDI, by deviating from the existing theoretical models for their analysis. The authors conclude that these two modes of serving a foreign market can also be complements to each other in one specific order, and that this is especially the case when a multinational firm faces significant uncertainty in the destination country (Conconi et al, 2016). According to Conconi et al. (2016), an FDI entry is likely to follow on export. However, most of the time this is only likely to happen when the destination country's market potential has been determined to be high enough for an FDI (Conconi et al., 2016). The authors found that in 85.90% of the cases examined an FDI took place only after the firm had gained some experience in the same market by export (Conconi et al., 2016). These findings are in line with the previous results of Lin et al. (2015), who determine that a multinational is better able to engage in FDI when it already has some experience and is export-oriented.

Pontes (2004) and Tintelnot (2017) agree to the possibility of a complementarity between FDI and export too, as both of them explain that FDI cannot be a substitute for export in its entirety due to the

fact that not every firm is able to bear the costs of FDI. Helpman et al. (2003) reinforce these findings by suggestion the possibility of serving the destination country in both forms at the same time, especially if the firm is still somewhat uncertain about the foreign demand. This will decrease the need for external financing accordingly as the period of implementation is extended (De Maeseneire & Claeys, 2012).

An alternative that causes complementarity between export and horizontal FDI, but also substitutability between both, is export-supporting FDI (Krautheim, 2013). In case of export-supporting FDI, a firm only opens a foreign distribution location as it is less productive than is necessary for the traditional horizontal FDI mode (Krautheim, 2013). Consequently, it cannot really be identified as a real horizontal FDI mode. However, whenever trade costs and foreign market demand increase, the firm will be more likely to opt for expanding its foreign location with the necessary production facilities after making the proximity concentration trade-off (Krautheim, 2013). Consequently, export-supporting FDI means that products are distributed by the firm itself within the destination country but also that these products are still exported from the home country.

Besides, a firm may choose to only export the raw materials and/or product components that are necessary for production at a foreign production location [(Boubacar, 2016) and (Pontes, 2004)]. This is especially done in case of newer affiliates (Forte & Silva, 2017). However, the longer that an affiliate is operating, the less likely it is that it will still rely on imported inputs (Forte & Silva, 2017).

2.1.4. Identification of the initial investment costs for horizontal FDI

Whenever a firm engages in horizontal FDI, as Royal F&D might want to, it can count on initial costs for checking the market potential, visiting the destination location(s), the information retrieval about possibilities and requirements (De Maeseneire & Claeys, 2012), and negotiating the FDI (Forte & Silva, 2017). Moreover, the implementation of a horizontal FDI results in costs for:

- Setting up the distribution network (Helpman et al., 2003).
- The necessary overhead and production labour (Helpman et al., 2003).
- Building or buying a foreign affiliate (Helpman et al., 2003).
- Communication and coordination between the home and destination countries' production locations (Toulemonde, 2008).

These costs contrast the variable trade costs in case of export, which include transportation and tariffs (Helpman et al., 2003).

2.1.5. Process of and conditions for external financing of FDI

FDIs are usually financed by "internally generated funds as well as an external bank credit" (Buch et al., 2009, p. 4). To know how much credit can be lent to a company, it is necessary to perform a comprehensive evaluation of the firm's creditworthiness. As the prospective cash flows in case of FDI can be quite uncertain, banks may instead evaluate whether a firm is creditworthy by checking its mutual relationship, and its ability to deploy collateral (De Maeseneire & Claeys, 2012). For large firms, this collateral can partially be covered by assets of the proposed FDI itself [(Buch et al., 2009) and (De Maeseneire & Claeys, 2012)]. After approval, the bank will generally provide credit to this firm – and not to its affiliate – so that it can implement its proposed FDI (De Maeseneire & Claeys, 2012).

Apart from that, De Maeseneire & Claeys (2012) mention that "the risk profile of foreign projects does not lead to higher interest rates due to the perverse effects this would bring along, but rather to higher collateral requirements and credit rationing" (p. 416). Furthermore, restricted enforceability of agreements between firms and banks leads to the prudence of banks in lending the required credit for FDIs (Buch et al., 2009). Moreover, banks are more cautious to lend credit when they are not operating in the destination country itself or when they are not familiar with the investing company (Buch et al.,

2009). Together, this results in a struggle to receive the required credit, which is especially present for large – multinational – firms as they are usually the ones to engage in FDIs, even though they are having the desirable "lower debt ratios and higher cash flows" (Buch et al., 2009, p. 1).

From all of this, it can be concluded that pledging enough collateral is very important to receive the required credit for an FDI: the collateral consisting of the investing firm's assets and/or the affiliate's necessary investment and profits (Buch et al., 2009). Besides, "the larger the required credit, the larger is the minimum collateral needed" (Buch et al., 2009, p. 9). Notwithstanding, collateral has a negative influence on a firm's profits as it leads to increasing costs for being financed (Buch et al., 2009).

2.2. What corresponding motives exist for companies to engage in an FDI?

In this paragraph, we explain the different motives that firms may have to engage in FDIs according to the literature studied. These motives are especially important as a large part of the fixed and variable costs of establishing and operating a foreign production plant can lead to higher initial costs than the costs of production at home, partly resulting from a loss in economies of scale but mainly due to the fixed investment (Tintelnot, 2017). Lin et al. (2015) state that certain motives may belong to one or more specific modes. Therefore, we link the motives to modes whenever possible. In addition, it should be noted that these motives are not mutually exclusive.

Identified motives to engage in FDI, regardless of the selected mode:

- To exploit efficiency in the production process [(De Maeseneire & Claeys, 2012) and (Tintelnot, 2017)]. Also meaning: to maintain a competitive advantage in an alternative way, as the domestic variation in production technology is getting smaller nowadays and, consequently, its competitive advantage decreases accordingly (Bagchi et al., 2014). More precisely, Bagchi et al. (2014, p. 240) explain that "as technology matures and production process becomes routine, production is usually shifted away from where it was invented to the global marketplace where production can be done more efficiently". Hogenbirk and Narula (1999) point out that this especially happens at multinational firms in smaller countries, such as the Netherlands, as they are (domestically) concentrated in more vulnerable niche markets and, consequently, their risks should be spread.
- To increase profits and/or firm growth [(Bagchi et al., 2014), (De Maeseneire & Claeys, 2012) and (Nayak & Choudhury, 2014)].
- To get access to specific (rare) resources [(Bagchi et al., 2014) and (De Maeseneire & Claeys, 2012)].
- To leverage certain ownership advantages [(De Maeseneire & Claeys, 2012), (Forte & Silva, 2017), (Helpman et al., 2003) and (Nayak & Choudhury, 2014)].
- To limit the consequences of potential political instability in the home country [(Brainard, 1997), (Hogenbirk & Narula, 1999) and (Nayak & Choudhury, 2014)].

Identified motives to engage in one of the horizontal FDI modes:

- An FDI leads to an increased domestic (i.e. home country) competition and the encouragement of additional domestic investments by the access to foreign capital (Boubacar, 2016), making it harder for competitors to compete by export to the same foreign market (Behrens & Picard, 2005).
- To gain direct market access in the destination country [(Alfaro & Charlton, 2009), (Bagchi et al., 2014), (Boubacar, 2016), (De Maeseneire & Claeys, 2012), (Forte & Silva, 2017) and (Lin et al., 2015)]. This motive is further supported by Lin et al. (2015) through their statement that

the recent increase in international sales and demand – due to trade liberalisation – is exceeding the growth in export of products.

- To save on trade costs to the destination country [(Alfaro & Charlton, 2009), (Boubacar, 2016), (De Maeseneire & Claeys, 2012), (Forte & Silva, 2017), (Garretsen & Peeters, 2009), (Helpman et al., 2003), (Lin et al., 2015) and (Pontes, 2004)]. However, this reduction in trade costs should offset the necessary investment to build up a production plant abroad (Lin et al., 2015).
- To save on trade costs to the destination's neighbouring countries due to regional trade agreements and lower trade costs by exporting from the destination country instead of exporting from the home country [(De Maeseneire & Claeys, 2012) and (Ito, 2013)].
- To operate closely and locally to the multinational's foreign markets [(De Maeseneire & Claeys, 2012) and (Tintelnot, 2017)], because of "reputational or informational considerations" (Brainard, 1997, p. 538).
- Possession of a technology advantage compared to the destination country's domestic firms [(De Maeseneire & Claeys, 2012), (Forte & Silva, 2017) and (Tintelnot, 2017)], which may lead to an increased market share by the exit of other firms.
- To overcome import restrictions by destination countries [(Brainard, 1997), (Nayak & Choudhury, 2014) and (Neary, 2009)].
- To maintain as much control as possible over the important knowledge within the company when serving a foreign market [(Brainard, 1997) and (De Maeseneire & Claeys, 2012)].
- To further promote or initiate the export of other products (Forte & Silva, 2017), as "presence of the MNE [read: multinational enterprise] in the host country will allow a stronger connection between the company and the consumer, generating satisfaction and loyalty that will provide spill overs for other products exported by the investing company" (Forte & Silva, 2017, p. 248).

Identified motive to engage in one of the vertical FDI modes:

- To save on production costs due to differing factor prices around the world [(Alfaro & Charlton, 2009), (Bagchi et al., 2014), (Boubacar, 2016), (Brainard, 1997), (De Maeseneire & Claeys, 2012), (Forte & Silva, 2017), (Lin et al., 2015) and (Tintelnot, 2017)].

2.3. Which determinants are commonly used and, thus, might be financially relevant for the more practical alternative to evaluate the proposed horizontal FDI?

There are many academic articles (such as Boubacar (2016), El-Sahli et al. (2016) and Lin et al. (2015)) that investigate which determinants are explanatory for FDIs and whether these are distinctive for the investigated modes. Based on the conclusions of such research papers, it is clear that the influence of determinants on FDI tends to vary for different situations. Consequently, the previous discussed various FDI modes can mostly be characterised by their own determinants. Furthermore, it should be noted that the determinants can be firm-, industry-, and/or country-specific factors (Nayak & Choudhury, 2014).

The extensive list below identifies all determinants that have an impact on FDI (sales), and determines their corresponding impact according to the literature studied. An additional explanation (e.g. about a possible measurement unit) has been added for some of them. Table 3, in Appendix A, summarises these determinants again, while including their corresponding impact on each relevant FDI mode and/or the amount of FDI sales.

- *Third-country effects/export* (i.e. the likelihood of exporting from the destination country to neighbouring countries as a replacement of exporting from the home country) [(Boubacar, 2016) and (Garretsen & Peeters, 2009)]:
  Has a positive and significant relationship with FDI (for complex vertical FDI and export platform FDI).
- *Trade costs* [(Alfaro & Charlton, 2009), (Behrens & Picard, 2005), (Boubacar, 2016), (Brainard, 1997), (Forte & Silva, 2017), (Helpman et al., 2003), (Ito, 2013), (Krautheim, 2013), (Lin et al., 2015), (Monarrez, 2011), (Nayak & Choudhury, 2014), (Pontes, 2004), (Tintelnot, 2017), and (Toulemonde, 2008)]:
  According to Lin et al. (2015), it has a negative impact on vertical FDI and a positive impact on horizontal FDI when using the trade freedom index, which measures the degree of trade freedom (trade costs in the host country). According to Ito (2013), it has a significant negative impact on export platform FDI. According to Krautheim (2013), it has a positive impact on the choice of horizontal FDI over export-supporting FDI. According to Behrens & Picard (2005), Brainard (1997), Forte & Silva (2017), Helpman et al. (2003), Monarrez (2011), Nayak & Choudhury (2014), Pontes (2004) and Toulemonde (2008), it has a positive impact on horizontal FDI. Helpman et al. (2003) measured it by CIF/FOB imports, while Alfaro & Charlton (2009), Boubacar (2016), Forte & Silva (2017), Krautheim (2013) and Tintelnot (2017) measured it by the distance between the home and destination country (mostly in km).
- *Market size of the destination country* [(Buch et al., 2009), (Lin et al., 2015), (Monarrez, 2011) and (Nayak & Choudhury, 2014)]:
  Has a positive impact on standard horizontal FDI. Buch et al. (2009), Lin et al. (2015) and Monarrez (2011) all measured it by gross domestic product (GDP)/capita.
- *Factor prices* [(Lin et al., 2015) and (Tintelnot, 2017)]:
  A large difference in factor prices between two countries leads to more vertical FDIs, while a small difference leads to more horizontal FDIs. Lin et al. (2015) measured it by foreign wage rate and found out that a larger difference had a positive impact on home concentration FDI. Tintelnot (2017) measured it by wage rates per country.
- *Fixed investment costs* [(Brainard, 1997), (Buch et al., 2009), (Lin et al., 2015), (Neary, 2009) and (Toulemonde, 2008)]:
  Have a negative impact on FDI as they decrease profits. According to Tintelnot (2017), these costs rise with distance. Buch et al. (2009) discovered that the fixed investment costs mainly affect the FDI decision of smaller firms, meaning that large firms do not suffer much from them.
- *Productivity* [(Buch et al., 2009), (Conconi et al., 2016) and (Lin et al., 2015)]:
  Has a positive impact on home concentration FDI and is measured by R&D intensity (R&D/sales) and firm scale (log(# employees) (Lin et al., 2015). Conconi et al. (2016) used it to examine export versus FDI. Buch et al. (2009) explain that it has a positive impact on horizontal FDI and measured it by firm size.
- *Firm size* (Lin et al., 2015):
  Has a positive impact on (foreign concentration) vertical FDI, and on heterogeneous horizontal FDI over standard horizontal FDI, as the firm will have more resources available; is better able to cover expenditures; and, in case of a heterogeneous horizontal FDI, also is able to retain economies of scale.
- *Being a hi-tech firm* (Lin et al., 2015):
  Has a positive impact on the choice for standard horizontal FDI, due to the firm's specific skills and resources.
- *Experience (to invest) abroad* [(Conconi et al., 2016) and (Lin et al., 2015)]:

Has a positive impact on foreign concentration/standard horizontal FDI, as it decreases uncertainty about the foreign market (demand). This determinant has a higher impact in case of more uncertainty, as uncertainty itself has a negative impact on FDI entry (Conconi et al., 2016).

- *Trade liberalisation* [(Boubacar, 2016), (Conconi et al., 2016), (Ito, 2013), (Nayak & Choudhury, 2014), (Neary, 2009), (Tintelnot, 2017) and (Toulemonde, 2008)]:
  Usually lead to lower trade costs. It has a positive impact on FDI (Neary, 2009), but also a negative impact on FDI as it promotes more export as well [(Conconi et al., 2016), (Nayak & Choudhury, 2014) and (Toulemonde, 2008)]. Besides, it has a larger positive impact on FDIs into smaller countries (Tintelnot, 2017). Boubacar (2016) measured it by a dummy variable for regional trade agreements *(RTAs)*, while Toulemonde (2008) measured it by globalisation.
- *Market potential* (Ito, 2013):
  Has a significant and positive impact on export platform FDI.
- *Economies of scale* [(Brainard, 1997), (Forte & Silva, 2017), (Helpman et al., 2003), (Nayak & Choudhury, 2014), (Neary, 2009), (Pontes, 2004) and (Tintelnot, 2017)]:
  Has a negative impact on (horizontal) FDI, due to lower home production and (small) production abroad. Besides, Kurmanalieva (2006) explains about this determinant that it also has a negative impact on trade costs from a certain level, while at first trade costs keep on increasing due to the corresponding transportation costs.
- *Spread in productivity of firms in an industry* (Helpman et al., 2003):
  Has a positive impact on horizontal and export platform FDI sales and is measured by the distribution of firm size, which depends on elasticity of substitution.
- *Marketing intensity* (Brainard, 1997):
  Has a positive impact on FDI sales due to the firm's local affiliate.
- *Enforceability of financial agreement* (Buch et al., 2009):
  Has a positive impact on horizontal FDI (sales). This impact is enhanced by the presence of home country banks in the destination country, when financing is done at home.
- *Retained profit at the foreign production plant* (Buch et al., 2009):
  Has a positive impact on FDI sales and is preferred over funding by the investing firm.
- *Tax rates, subsidies and/or wages* [(Bagchi et al., 2014) and (Behrens & Picard, 2005)]:
  Against usual expectations, often have no impact or a negative impact on FDI decisions (Bagchi et al., 2014). Therefore, their use for the financial evaluation of an FDI can be doubted. Nevertheless, Behrens & Picard (2005) clearly explain that taxes and subsidies will eventually balance out the financial benefits of FDIs compared to export (also by providing subsidies to export companies). Thereby reducing a firm's incentive to engage in FDI, although the beneficial tax rates or subsidies seem to stimulate FDI in the first place as they influence profit (Behrens & Picard, 2005). In the end, as the amount of FDIs increases in a certain country, profit will decrease and each firm starts to earn lower margins on its products (Behrens & Picard, 2005). Consequently, to achieve the highest payoff possible as a firm, we believe that it is most convenient to engage in FDI as a first mover.

Apart from the above listed determinants, supply factors play an important role as well for FDIs. This is deduced from the statement by Bagchi et al. (2014) that suppliers usually make valuable and essential contributions to the product that is sold to the consumer, possibly leading to a competitive advantage. However, as these factors mainly influence the location decision of an FDI, we will discuss them separately in Section 2.5.

2.4. Which risks are present during an FDI and might influence the results of the financial evaluation?

The following bullet points show the risks that may be present when engaging in FDI, according to the academic articles studied. We believe that some of them can be useful for our evaluation method as they may influence the financial evaluation in an undesired manner. As a consequence of that, various – more realistic – scenarios may be evaluated, which hopefully leads to more advanced results.

- The possibility of a debt crisis in turbulent times may lead to cautiousness of investors to invest in FDIs (Boubacar, 2016). A sudden increase in financial risk in one or more countries may also lead to cautiousness of investors to lend money for FDIs, if companies' creditworthiness is low (Agénor, 2003).
- The risk that RTAs will be voided (Ito, 2013).
- Depending on its home country, the firm needs government's consent to engage in an FDI (above a certain threshold) (Lin et al., 2015).
- The risk of failing to maintain the right focus as a multinational (Bagchi et al., 2014).
- Uncertainty about the extent of demand in the destination country [(Conconi et al., 2016) and (De Maeseneire & Claeys, 2012)], which may also lead to difficult access to the required amount of money for an FDI [(Buch et al., 2009) and (De Maeseneire & Claeys, 2012)]. A solution to this uncertainty would be to make use of a gradual transition to FDI by exporting initially (Buch et al., 2009) and, then, (1) to exit in case of too low profits, (2) to keep exporting in case of medium profits, and (3) to engage in FDI in case of high profits to further reduce variable costs (Conconi et al., 2016).
- Unfamiliarity with the corresponding legal requirements and laws of the destination country [(Conconi et al., 2016) and (De Maeseneire & Claeys, 2012)].
- Uncertainty about the amount of elasticity in demand (Tintelnot, 2017).
- Foreign exchange risk [(De Maeseneire & Claeys, 2012) and (Nayak & Choudhury, 2014)].
- Political risk (De Maeseneire & Claeys, 2012).
- Loss of control over the foreign production location [(De Maeseneire & Claeys, 2012) and (Nayak & Choudhury, 2014)]. This can happen in two ways: (1) when technology gets disclosed to the firm's competitors unwillingly (Nayak & Choudhury, 2014); and (2) due to differences in the culture, the governmental system, or accounting and auditing of the home and destination country (De Maeseneire & Claeys, 2012).
- Subsequent FDI by competitors, resulting in an increased competitive market place [(Behrens & Picard, 2005) and (Nayak & Choudhury, 2014)].
- Subsequent export by domestic competitors to the destination country (Forte & Silva, 2017).
- Uncertainty about the elasticity of substitution (Helpman et al., 2003).
- A large(r) information asymmetry between investors and the company [(Buch et al., 2009) and (De Maeseneire & Claeys, 2012)]. Correspondingly, this may lead to (1) higher information costs, although the increase is smaller for larger firms as these costs are partly fixed; (2) home bias of investors; and (3) more difficult access to the required amount of credit (De Maeseneire & Claeys, 2012).
- A deficiency in collateral (De Maeseneire & Claeys, 2012). This may result in a more difficult access to the required amount of credit as well [(Buch et al., 2009) and (De Maeseneire & Claeys, 2012)].
- Exposure to "expropriation or repatriation restrictions" (Brainard, 1997, p. 529).

- Lower mark-ups in the destination country due to increased competition, leading to financial savings at the customers' side instead of at the firm itself (i.e. the risk of increasing consumer surplus, while decreasing producer surplus) (Behrens & Picard, 2005).
- Limitations to the amount of affiliate sales and the corresponding profits, when credit financing is only provided by having collateral and a firm has only a limited amount of collateral available (Buch et al., 2009).

2.5. What influences the location decision of a horizontal FDI according to the literature?

2.5.1. Identification of the different factors that influence the location decision

Selecting a suitable location for an FDI is important to the general success of a multinational firm, as it determines for example the firm's future efficiency, growth and profit (Bagchi et al., 2014). Consequently, we believe that it is essential to identify the different factors of the academic articles studied that influence this decision and to discuss them. From this, it follows then that there should be no doubt about the importance of the location decision as it influences the success and costs of the proposed FDI.

Supply variables

As there is a deficiency of research about the influence of supply and supply chain factors on an FDI, Bagchi et al. (2014) provide an evaluation of 50 countries with regard to their potential as a destination of United States of America (USA) FDIs, and they are able to confirm the importance of three independent supply variables to assess the inward FDI potential of a country: (1) the country's infrastructure, (2) the supplier's quality, and (3) the availability of necessary replacement parts. The authors of the article state that "a capable and efficient supply environment … is a pre-requisite for … development of international business strategies" (Bagchi et al., 2014, p. 241). Moreover, they state that such an environment can greatly improve the (joint) production process. Monarrez (2011) also addresses the importance of locations' infrastructure level to the decision on where to locate an FDI. Consequently, these supply variables are very important to the location decision of a horizontal FDI.

Besides, Bagchi et al. (2014) suggest that the local supplier's location – relative to the location of the foreign demand – might be useful as well when choosing between different locations.

A firm's motives

According to Forte & Silva (2017), a firm's location decision is affected by its motives to engage in FDI (e.g. when the firm wants to increase its foreign market share, it could look for a large destination country). Nayak & Choudhury (2014) identify some location-dependent advantages while reviewing one of the existing theories of FDI, such as (1) lower input, production and/or transportation costs, and (2) a favourable legal and/or cultural environment. Boubacar (2016) explains that the motives to perform an FDI in a certain country can differ per company.

Market growth opportunities

Boubacar (2016) and Monarrez (2011) state that having a high gross domestic product and/or larger neighbouring potential markets as a country or region lead(s) to more FDIs. Besides, it has been proven that RTAs between different countries further encourage trade between these nations [(Boubacar, 2016) and (Monarrez, 2011)]. Consequently, GDP, the size of neighbouring markets, and RTAs should also be considered when choosing between different countries for an FDI, in particular if the multinational firm wants to increase its market growth opportunities by – for example – third-country export.

Ito (2013) also confirms the importance of large neighbouring potential markets for the choice of a destination country due to their role in case of third-country export. However, in case of the necessity of natural resources for the production of a multinational firm, third-country export is not as important as the availability of such resources (Ito, 2013).

High fixed investment costs

The high fixed costs of an FDI cause a multinational firm to limit the amount of foreign production plants to as few locations as required for the indicated foreign market demand (Tintelnot, 2017). Through this, it is possible to reduce the associated "communication challenges, information frictions, or shipments of intermediate products" (Tintelnot, 2017, p. 165) as much as possible. Besides, this may lay the foundation for the possibility of an export platform FDI, if this is preferred by the multinational firm (Tintelnot, 2017): resulting in the FDI being located in a region that is closer to neighbouring countries (Monarrez, 2011). However, Tintelnot (2017) also explains that whenever export platform FDI is not relevant for the firm's intentions, each country's FDI is independent of the other. Nonetheless, the fixed investment costs usually have a significant impact on the location decision of an FDI, something which is confirmed by Forte & Silva (2017) as well.

Destination country's currency

Something that may influence the location decision too is the destination country's currency compared to the home country's currency (Nayak & Choudhury, 2014). This is especially true as it is more beneficial for a firm to engage in an FDI if – in comparison to each other – the destination country's currency is weaker (Nayak & Choudhury, 2014).

Distance

Distance between home and destination country positively impacts the choice of horizontal FDI over export-supporting FDI since trade costs increase correspondingly (Krautheim, 2013). Thus: the farther away the destination country is (in kilometres), the more likely it is that horizontal FDI will be implemented to serve this foreign market. However, Kurmanalieva (2006) concludes in her paper that firms experience lower trade costs in case of export (from and) to coastal destination countries.

Export experience

Section 2.1.3 explained that a horizontal FDI usually follows on export as this already provides the company with some experience in the foreign market and, thereby, will prevent extremely costly mistakes of entry (Conconi et al., 2016). Consequently, a certain FDI is more likely to be declared as financially feasible in a thorough evaluation when the firm already has some experience in the foreign market of the proposed FDI. Hence, the existence of export to a specific country will probably positively influence the decision to engage in horizontal FDI in this country.

Governments' incentives

Conconi et al. (2016) state that governments often try to encourage FDIs in their country by providing subsidies, well trained staff, technologies and the like. Tintelnot (2017) adds to this finding by mentioning the existence of a clear difference in the degree of encouragement per country.

Apart from that, the incentives tax benefits and/or subsidies need a more detailed discussion as they are often seen as the most valuable governmental incentives in case of FDI. Consequently, these are discussed as follows:

The literature studied states that some governments offer tax benefits and/or subsidies to firms that engage in FDI [(Behrens & Picard, 2005), (De Maeseneire & Claeys, 2012) and (Monarrez, 2011)]. Nevertheless, it is very important to investigate whether these subsidies (together) result in the promised advantages (De Maeseneire & Claeys, 2012) as additional subsidies will decrease final profits, additional rent might be taxed to an undesirable extent and the size of subsidies partly depends on

what profit share is retained by the destination country itself (Behrens & Picard, 2005). Likewise, Monarrez (2011) notices similar differences between the regions/states of a destination country and states that "different state tax rates are a significant determinant of the location of FDI across US' States" (Monarrez, 2011, p. 9). Consequently, the selection for a certain destination country and region partly depends on the tax rates compared to tax rates at home. A conclusion that is confirmed by the paper of Brainard (1997).

Economic growth

Nayak & Choudhury (2014) explain that "countries with relatively higher education levels and financial stability have a tendency to attract a larger share of FDI at the cost of other RIA [read: regional integration agreement] members" (p. 21). The article of Agénor (2003) is in line with this statement as it explains that financial stability is partially realised by an open financial market, which subsequently leads to an increased economic growth, and as it determines a positive impact of economic growth on the attraction of FDIs into a specific country. Apart from that, an increased economic growth may provide financial benefits to a company's FDI, e.g. by reduced interest rates, or easier access to the required amount of money for the investment (Agénor, 2003).

Credit funding

Agénor (2003) also explains that – regardless of a destination country's economic growth – foreign banks in a destination country, including banks from the home country, particularly tend to invest in the successful firms that produce physical products. Thereby, these banks are better able to secure the return of their lendings (Agénor, 2003). Notwithstanding, it is not preferred to borrow credit from domestic banks of the destination country instead, as these banks generally provide more expensive credit and might be underdeveloped compared to banks from the firm's home country (De Maeseneire & Claeys, 2012). From this, we conclude that it will be easier and cheaper for a firm to engage in FDI and borrow the required credit in a destination country, where a bank from the home country is situated and if the firm has a large extent of tangible products that can possibly serve as collateral. This conclusion is confirmed in its entirety by the article of De Maeseneire & Claeys (2012).

De Maeseneire & Claeys (2012) also explain that banks and venture capitalists commonly prefer to lend money not too far away from where they usually do business due to the increase in risk of information asymmetry with distance.

Government's quality

It is stated that the quality of a destination country's government positively influences the implementation of FDI in this country [(Alfaro & Charlton, 2009) and (Forte & Silva, 2017)]; just as it positively influences the size of an FDI, which is especially true for a horizontal FDI (El-Sahli et al., 2016). Four possible government quality measurements are: a country's government effectiveness, regulatory quality, rule of law and control of corruption (Tao et al., 2017). One or all of these variables might be used.

Similarity

Similarity is a factor that has an impact on the location decision at two different levels. First of all, it has an impact at the country level as it is less expensive to engage in FDI in a destination country that is more similar to the home country (El-Sahli et al., 2016). El-Sahli et al. (2016) measured this by the following similarity index:

" $1 - \left(\frac{abs(GDP\ per\ capita_{jt} - GDP\ per\ capita_{sweden,t})}{\max(GDP\ per\ capitca_{jt}, GDP\ per\ capitca_{sweden,t})}\right)$" (p. 3);

where j = the destination country, t = time, and $sweden$ = the home country.

Secondly, it has an impact at the regional level as it may be more convenient to locate the FDI close to similar companies that (1) provide spill over effects due to agglomeration, decreasing the necessary investment accordingly, and that (2) indicate a higher probability for a successful FDI (Monarrez, 2011).

Existence of labour unions

Lastly, Monarrez (2011) notes that the existence of labour unions may be unaccommodating as it may increase the wages of a firm's employees. Especially if one is interested in one of the vertical FDI modes, we believe that this factor may play a key role in the location decision of the firm.

2.6. Which databases might be of interest for the research conducted?

In this section, we state the potentially useful databases from the academic articles studied. In addition to that, we briefly explain what information can be retrieved from each database for the final evaluation. In that way, we try to ensure easy and quick access to the relevant information about FDI (determinants).

The following databases are considered to be of potential use for the research (in connection with the identified determinants and measurements as stated above):

- The World Bank's *World Development Indicators*: This database may contain relevant population and GDP variables (Boubacar, 2016).
  http://data.worldbank.org/data-catalog/world-development-indicators
- The United States' *Bureau of Economic Analysis*: This database may contain relevant inward and outward FDI census type facts and statistics about the USA [(Boubacar, 2016) and (Helpman et al., 2003)].
  https://www.bea.gov/
- *The United Nations Commodity Trade Statistics database*: This database may contain relevant international trade data. It was used by Boubacar (2016) for data on trade costs, which is measured as the ratio of openness (the sum of exports and imports) to GDP.
  https://comtrade.un.org/
- The *Heritage Foundation*: This database may contain relevant indices, as it includes the trade freedom factor and other economic freedom factors [(El-Sahli et al. 2016) and (Lin et al., 2015)].
  http://www.heritage.org/index/
- The *Global Competitiveness Index* of the World Economic Forum: This index may contain relevant information about the performance of 138 countries on lots of different subjects (e.g. infrastructure, education and competition) (Bagchi et al., 2014).
  http://reports.weforum.org/global-competitiveness-index/
- The yearly *World Investment Report* of the United Nations Conference on Trade And Development: This report may contain relevant information, as it shows the changes/score in FDI worldwide (inflow and outflow); the corresponding influences and risks; all being split up between sectors, regions, etc. [(Alfaro & Charlton, 2009), (Bagchi et al., 2014) and (Nayak & Choudhury, 2014)].
  http://unctad.org/en/pages/DIAE/World%20Investment%20Report/WIR-Series.aspx
- The *STructural ANalysis* (STAN) *database* of the Organisation for Economic Co-operation and Development (OECD): This database may contain relevant information about the industrial performance of 25 OECD countries (Tintelnot, 2017).
  http://stats.oecd.org/Index.aspx?DataSetCode=STANI4_2016

Besides the STAN database, the OECD also has other data available, such as data on labour, productivity, globalisation and demography. This data can be visualised by graphs, but is also available in tables.
https://data.oecd.org/ and http://stats.oecd.org/

- The *Economist Intelligence Unit World Investment Service* of the Bureau van Dijk Electronic Publishing: This database may contain relevant information about European firms with regard to their foreign investment decisions (Helpman et al., 2003).
https://eiu.bvdep.com/frame.html
- The World Bank's *World Governance Indicators*: This database may contain relevant information, as it comprises several governance indicators (El-Sahli et al., 2016).
http://info.worldbank.org/governance/wgi/#home
- The French *Centre d'Études Prospectives et d'Informations Internationales*: This database may contain relevant information, as it include useful world economy data from the past few years about geography, macroeconomics, profiles, trade & international investments and trade protection (El-Sahli et al., 2016).
http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele.asp

2.7. Why are existing theoretical models not fully applicable?

Here, we explain why the theoretical models of the scientific articles studied cannot serve as a basis for the proposed financial evaluation in our research and, thus, why we will create our own more practical foundations.

Within the past 60 to 70 years, several theories and model about FDIs have been developed and tested. These are based on various assumptions, ranging from models with perfect competition (i.e. a situation without barriers to entry, where all firms produce identical products and where prices cannot be controlled (Goolsbee et al., 2013)) to models with imperfect competition (i.e. a situation in which a firm has (to gain) market power to partially offset its own disadvantages in the host country compared to domestic firms) (Nayak & Choudhury, 2014). Nevertheless, models based on perfect competition have been found to be of no use, as – in reality – distortion is necessary at least to some extent for actually being able to engage in FDIs (Nayak & Choudhury, 2014). In addition to that, Nayak & Choudhury (2014) remark that none of the remaining theories in their article seem to be fully applicable to FDIs by firms that want to become, or expand as a multinational. De Maeseneire & Claeys (2012) practically face the same problem and, thus, state that it is very difficult to evaluate FDIs too.

Likewise, many studies depend on assumptions that obstruct realistic correlations in models (Boubacar, 2016). Boubacar (2016, p. 141) even explains that "the empirical study of FDI suffers from specification issues which could potentially invalidate the importance of many determinants of FDI". Consequently, this already asks for some cautiousness with regard to the determinants that might be used later on in the research, and it also definitely warns for the lack of realism in empirical models.

Apart from the first few problem explanations above, we have been able to identify many other problems that are also worth mentioning:

- Garretsen and Peeters (2009) remark that the results of their research are influenced to a moderate extent by the model and sample used.
- Lin et al. (2015) state the deficiency of directly available characteristic firm-level data to split their sample in different modes, which partially forces them to use hand-collected data. Hence, we believe that this might have led to undesired biased results. Alfaro & Charlton (2009) validate this supposition by explaining that the separation of firm-level data into the

corresponding modes may be done inaccurately as it is not always easy to perceive with which mode a firm's production complies.

- The model of Bagchi et al. (2014) is too simple to be of use as it ignores – not supply-related – key determinants.
- Ito (2013) and Toulemonde (2008) both make similarity assumptions for each firm's costs and the product demand to simplify their model.
- Helpman et al. (2003) built an extensive model that, although it includes a wide variety of important financial factors, is based on the assumption that export has country-specific fixed costs. This does not comply to their initial statement that trade costs may fluctuate, which was explained in Section 2.1.2.
- Krautheim (2013) explains that proximity concentration trade-off models regularly exclude the possibility that FDI complements export.
- Bilateral models usually ignore the impact of the third-country export determinant [(Forte & Silva, 2017) and (Neary, 2009)]. The model of Brainard (1997) is an example of this.
- Behrens & Picard (2005) build a framework that assumes no varieties in each firm's product, investment costs for its plant, and the available subsidy. Moreover, each firm will receive a subsidy in their framework (Behrens & Picard, 2005).

In addition, it should be noted that most of the scientific articles studied (e.g. Behrens & Picard (2005), Helpman et al. (2003) and Toulemonde (2008)) take a very different perspective on FDIs than is actually needed to evaluate the proposed FDI in our research. They use a perspective in which a wide range of firms is evaluated and being compared in order to identify which one should engage in FDI (and where) and which one should not; while our research is focussed on the financial evaluation of only one firm, unrelated to the (financial) performance of other companies. As a consequence, our model is unlikely to require information about (the performance of) other (competitive) firms. By that means, we try to contribute to the literature and provide new, useful, insights to firms that want to become, or expand as a multinational themselves.

3. Research Method

As the theoretical, FDI-specific, models – mentioned in the previous chapter – are not fully applicable to our research, we design our own research method in this chapter. In addition to that, we provide an answer to the second sub-question (p. 3): *"How can a horizontal FDI best be evaluated to bridge the gap between theory and practice?"*. This is done by describing and discussing the research method used.

In Section 3.1, we explain on which (financial) evaluation techniques our research method is based. We also explain how these evaluation techniques are used. Next, Section 3.2 determines which, and how, FDI determinants and risks (from the previous chapter) complement our research method during the development of our blueprint at Royal F&D. Finally, in Section 3.3, we identify what information and data are commonly necessary for the proposed research method to conduct the corresponding horizontal FDI evaluation and we explain how this information and data are collected.

3.1. Which (financial) evaluation techniques are useful to evaluate a horizontal FDI at project level thoroughly?

Although a fair number of (financial) evaluation techniques are available (e.g. payback analysis, break-even analysis, discounted cash flow analysis, scenario analysis and sensitivity analysis), we have selected the following five methods of analysis: the discounted cash flow analysis, the break-even analysis, the decision tree analysis, the Monte Carlo simulation and the multiple-criteria decision analysis. Together, these make it possible to evaluate the proposed horizontal FDI of Royal F&D from different perspectives as they provide us with the possibility to take into account both the qualitative and quantitative influences. Thereby, we may also achieve final results and recommendations that are more detailed and, thus, increase the practical relevance of our research at Royal F&D correspondingly. Consequently, each of the following subsections deals with one of these methods of analysis and, correspondingly, explains how it will be used in the research conducted.

Additionally, it should be noted that – in the end – we combine these methods of analysis in an Excel file in order to operationalise our financial evaluation method, which we also refer to as our blueprint. In this way, we provide a ready-made possibility to (financially) evaluate similar horizontal FDIs at other locations or with different inputs. Based on the – in agreement with Royal F&D – selected location in our blueprint, we draw a conclusion to what extent the blueprint seems to be successful in its thorough financial evaluation of the proposed kind of horizontal FDIs and whether Royal F&D's proposed horizontal FDI is financially feasible at the location of our blueprint.

When the company later on wants to compare or generate the results of more or different locations, it can repeat the same evaluation for each of these locations by using our blueprint. This should at least lay a foundation for the outcome where "the alternative that requires the minimum investment of capital and produces satisfactory functional results will be chosen unless the incremental capital associated with an alternative having a larger investment can be justified with respect to its incremental benefits" (Sullivan et al., 2015, p. 241). These incremental benefits could be about revenues and/or cost savings (Sullivan et al., 2015). Though, the blueprint does not provide the possibility to make such an incremental comparison due to its focus on one location at a time. Nevertheless, a straightforward comparison is still possible on the basis of each evaluation's net present value (NPV).

Aside from the above mentioned potentially beneficial financial outcome (i.e. a positive NPV), non-financial (qualitative) benefits might also play a key role in the final outcome of our evaluation. This, however, partly depends on one of the following evaluation techniques.

3.1.1. Discounted cash flow analysis

Since it is practically impossible to calculate and evaluate investments as they will likely happen in reality, we are most of all designated to discounted cash flow (DCF) evaluations (Sullivan et al., 2015). For such evaluations, the assumption is made that cash flows only take place at the end of each time period (Sullivan et al., 2015). Moreover, these cash flows will be discounted in a discrete way (at an appropriate discount rate). Consequently, in this analysis method we are only looking at discrete cash flows and assume that 'continuity' does not exist. This is possible since the difference between the discrete and continuous compounding method for interest rates is small (Sullivan et al., 2015).

Another assumption for this method of analysis is that the projected cash flows in each future time period are already known without any doubts [(Shank & Peterson, 2005) and (Sullivan et al., 2015)].

Apart from that, is it necessary to choose an appropriate project horizon for the proposed horizontal FDI's evaluation. First of all, this sets the corresponding time periods of the DCF analysis (Sullivan et al., 2015). Moreover, it influences the terminal value for the selected location, which represents the cash flows of the project after the project horizon.

Furthermore, depreciation and tax rates should be included in the DCF analysis to establish realistic after-tax cash flows (ATCFs) (Sullivan et al., 2015). The properties' market and salvage values contribute to this as they may influence ATCFs as well. Furthermore, interest on received credit for the proposed project can be deducted from its taxable income (Sullivan et al., 2015). Nevertheless, it is not easy to deduct this interest as the corresponding debt is not always known at project level (Sullivan et al., 2015). Besides, as long as the correct discount rate is used in the DCF analysis, one is free to decide on whether to include inflation or not (Sullivan et al., 2015).

Based on the net ATCFs, it is possible to calculate the NPV for the selected location (Sullivan et al., 2015). This value shows whether the proposed FDI in the selected location leads to an economically positive result. An economically positive result is achieved when NPV > 0 and, thus, is positive. Subsequently, when having the NPVs for more locations or different inputs, it is also possible to select the most profitable (or least costly) alternative with help of these NPVs (Sullivan et al., 2015).

As the FDI is initiated by a Dutch company and the destination country might have another currency, it may be worthwhile to use foreign exchange and devaluation rates. These make it possible to calculate the NPV for a location in both foreign and own currency and, thus, make it possible to check whether the proposed FDI is acceptable in the company's own currency as well (Sullivan et al., 2015).

We have chosen this method of analysis because of its straightforward NPV-result, which includes all of the related income and expenses; its possibility to look into the details of each time period; and its usefulness for the subsequent methods of analysis.

3.1.2. Break-even analysis

In a break-even analysis, it is all about finding the required value of a certain influencing factor which will make sure that costs are covered. Consequently, this specific value will determine the break-even point. Sullivan et al. (2015) explain that the break-even point is defined to be the point at which total revenue would start to exceed the corresponding costs to reach this revenue. Furthermore, these authors state that "the lower the break-even point, the less likely that a loss will occur during market fluctuations" (p. 38). Consequently, this value demonstrates the maximum (or minimum) acceptable level of a certain factor for an evaluated alternative.

This also enables a break-even analysis of the proposed FDI's NPV with regard to specific (risk) factors that are or can be included: By checking for the required value of a certain (risk) factor to at least break-even, we are able to perceive the NPV's actual quantitative 'limit' for this (risk) factor to still be accepted. In case of such an analysis, it is important to keep all other influencing factors ceteris paribus (Sullivan et al., 2015).

This method of analysis is chosen as we believe that it further determines the viability of the proposed FDI with regard to its limits and margins for certain (risk) factors and, likewise, that it deepens our financial evaluation.

3.1.3. Decision tree analysis

Decision tree analysis (DTA) can be explained as an analysis that deliberately spreads a (managerial) decision making process – which is related to the necessary capital investments – over more time periods, as the analysis makes it possible to delay (managerial) decisions that may experience less uncertainty in future time periods [(Conconi et al., 2016), (Shank & Peterson, 2005) and (Sullivan et al., 2015)]. As soon as the corresponding situation has evolved over time, the decision maker can be more certain about what to do next. To find out whether one should take actions or just wait during each specific time period and, correspondingly, which decision should be chosen; backwards induction must be used (Sullivan et al., 2015). From the current time perspective, this ensures that the best decisions will be made with regard to all possible outcomes at each (future) time period (Sullivan et al., 2015). Furthermore, Sullivan et al. (2015) explain that, after making the – currently – most favourable decision(s) at the first (few) time period(s) during the real implementation, the analysis should always be updated to represent the (new) situation from that 'current' time period. Besides, the analysis may be based on discounted values to include the impact of time periods (Sullivan et al., 2015).

Aside from that, it should be taken into account that it must be possible to postpone the included decision(s) in order to perform a DTA.

Moreover, the DTA can be visualised in a decision tree diagram to simplify the analysis (Sullivan et al., 2015). This diagram includes different symbols to help people understand and run the decision making process in the right way.

Since the DTA is used in case of (capital investment) decisions that are subordinate to unpredictable changes (Conconi et al., 2016), this evaluation technique is especially useful when determining the potential influence of certain identified risks and uncertainties on these decisions (Sullivan et al., 2015). Thereby, we may be able to provide a different perspective on the impact of e.g. (risk) factors that are also investigated in the break-even analysis. Additionally, we may be able to provide insights on the impact of other, new, factors. Lastly, the inclusion of this method of analysis may lead to the minimisation of unfavourable decisions through time, as their potential consequences are now visualised.

3.1.4. Monte Carlo simulation

Theoretical and/or risk/uncertainty factors can also be included in a Monte Carlo simulation, if they can be expressed in specific probabilities/probability distributions. This simulation provides a 'random' average for e.g. the NPV, after performing a selected amount of trials, which is subordinate to the included factors' probabilities/probability distributions (Sullivan et al., 2015). In addition, an appropriate distribution can be created around this random average on the basis of this simulation. It should be noted that the larger the selected amount of trials, the more accurate the random average will turn out to be (Sullivan et al., 2015).

We have chosen the Monte Carlo simulation as it may provide us with additional insights in the computed NPV-result of the DCF analysis. This supposition is related to the use of probabilities/probability distributions in the Monte Carlo simulation.

3.1.5. Multiple-criteria decision analysis

Not all of the decisions and factors that will be included in our research have or can be expressed in a monetary value to be implemented or have a clear value for their influence on the financial values in one of the analysis techniques above. Despite that, we believe that they are of significant importance for some (final) decisions on the proposed FDI as they might lead to the possibility of a better evaluation of the alternative and clearer differences between possible (location-)options. Consequently, a qualitative evaluation technique has to be added, which is possible by performing a multiple-criteria decision analysis (MCDA).

Some remarks have to be made in order to conduct an MCDA successfully. First of all, Sullivan et al. (2015) explain that the included factors always need to differentiate at least some of the decision options or the evaluated alternative, which form the basis of the analysis. Moreover, they state that a relevant number of – distinctive – factors should be included as this highly influences the outcome of the MCDA. Nevertheless, "judgment is required to decide what number is too few or too many" (Sullivan et al., 2015, p. 578).

In our research, the MCDA will first of all be used to be able to select the most suitable destination country for the proposed horizontal FDI. This is done in accordance with the company's current state of affairs and with help of the relevant FDI factors of Section 2.3, that are measured on a country-level, and the identified country-factors in Section 2.5. These factors can be included in the MCDA as criteria whenever their relationship to the implementation of (horizontal) FDI is clear and measurement units for these factors are available on a country-level. Notwithstanding, overlapping factors and similar factors should, respectively, be combined into and replaced by one factor (Sullivan et al., 2015). For the selection of the most suitable destination country, we use the nondimensional scaling compensatory MCDA method. In this method, each factor is just as important as another one and all measurement units are standardised (Sullivan et al., 2015). Thereby, it is possible to calculate a total score for each destination country as the standardised values simply need to be added up (Sullivan et al., 2015). We believe that this method will do as we intuitively feel that it will lead to – large enough – differing results for the destination countries to make a final decision.

Secondly, the MCDA may be used later on in our research for a final qualitative evaluation. This analysis would make it possible to include the more qualitative (horizontal) FDI determinants of Section 2.3 and to examine their influence on the end decision for the proposed horizontal FDI. Thereby, we make sure that the evaluation is not solely based on known, expected or estimated financial numbers, but also on qualitative factors – that increase the evaluation's practical relevance. For this MCDA, we are using the noncompensatory MCDA additive weighting technique in order to incorporate each included factor's individual importance to the concerning company (in our case Royal F&D) and, accordingly, we calculate a total score for the evaluated location (Sullivan et al., 2015). All of the included measurement units will be standardised by comparing them to their minimum and maximum achievable scores as only one alternative will be evaluated on its total score.

3.2. How can the selected evaluation techniques best be complemented with the previously found essential theoretical factors for FDI?

To make sure that the proposed project can be evaluated in an effective and realistic way, it is important to include all the (economic) influences that vary for each possible alternative (in our case

of the proposed horizontal FDI) (Sullivan et al., 2015). Here, the identified theoretical factors for (horizontal) FDI (sales) and its location decision come into play (Table 3, in Appendix A, and Section 2.5). All other factors identified are not relevant to be included in our blueprint since these relate to other FDI modes. Furthermore, as was already stated before, overlapping factors are combined into one comprehensive factor and similar factors are reduced to one factor. In addition, all of the included factors have their own level and type of measurement (firm-, industry-, region- and/or country-specific; and (non-)financial ratio scale, nominal or ordinal respectively) and, consequently, lead to contributions on different levels in our evaluation. Through this categorisation, it is clear that:

- Several of the (horizontal) FDI determinants can also complement the location decision factors in the MCDA that leads to the selection of the most suitable destination country for the proposed horizontal FDI.
- Some of the determinants can be included directly in the DCF analysis, as these are expressed in monetary value, can be translated to monetary value or have a clear influence on the monetary value, NPV or discount rate.
- All other (non-financial) (horizontal) FDI determinants need to be included in the final MCDA. Thereby, a final decision about the blueprint's horizontal FDI under the inclusion of the residual scientifically relevant factors is possible. Notwithstanding, (horizontal) FDI determinants with an unclear relationship to (horizontal) FDI should be excluded.

Apart from that, it should be noted that all country- and region-specific determinants (and measurements) of section 2.5, that are included in the MCDA for the selection of the most suitable destination country, will not occur again in the final MCDA unless they were explicitly mentioned in section 2.3. Thereby, separating the proposed FDI's location decision from the final more qualitative evaluation of the proposed horizontal FDI as far as necessary.

Table 1 shows all of the included determinants, their (level and type of) measurement(s) and their previously identified relationship(s) to (horizontal) FDI in case of the location decision analysis (on country-level), and in case of one of the two following methods of analysis: the DCF analysis and the final MCDA. Part of the measurements could be taken from the literature, while others have been discussed without a clear statement about their measurements and, therefore, needed to be established by ourselves.

(Horizontal) FDI determinants and/or corresponding location decision determinants	**Level of measurement**	**Type of measurement**	**Measurement(s)**	**Location decision (on country-level)**	**DCF analysis**	**Final MCDA with regard to (horizontal) FDI (sales)**
Trade costs	Country-specific	Financial ratio scale Non-financial ratio scale	- Trade freedom index - CIF/FOB imports - Distance in kilometres between the home and destination country	 +		+ + +
Market size of the destination country	Country-specific	Financial ratio scale	GDP/capita	+		+
Factor prices	Country-specific	Financial ratio scale	(Absolute) average annual wage difference	-	-	
Fixed investment costs	Regional-specific	Financial ratio scale	- Gross fixed capital formation - Cash outflow	- (on # of locations)	-	
Productivity	Firm-specific	Non-financial ratio scale	Firm size			+
Being a hi-tech firm	Firm-specific	Non-financial nominal	Dummy variable			+

Experience (to invest) abroad	Country-specific	Non-financial nominal	Dummy variable	+	+	
Trade liberalisation	Country-specific	Non-financial ordinal and nominal respectively	- Globalisation - Trade protection - Dummy variable for RTAs	+ + +		+/- [1] +/- [1] +
Economies of scale	Firm-specific	Non-financial ratio scale	Plant level economies of scale to corporate level economies of scale			-
Spread in productivity of firms in an industry	Industry-specific	Non-financial ratio scale	Dispersion of the industry's firm size distribution			+
Marketing intensity	Firm-specific	Financial ratio scale	Advertising costs to sales			+
Enforceability of financial agreement	Firm-specific Country-specific	Financial ratio scale Non-financial nominal	- Inverse of the debt ratio - Dummy variable for presence of home country bank in the destination country			+ +
Retained profit at the foreign production plant	Firm-specific	Financial ratio scale	Log cash flow of parent firm		+	
Supply variables	Country-specific	Non-financial ordinal, ratio scale or nominal	- Country's infrastructure - Supplier's quality - Distance to suppliers - Availability of necessary replacement parts	+ + - +		
Firm's motives	Firm-specific	Non-financial nominal	Firm's motive to engage in an FDI	Location selection		
Market growth opportunity	Country-specific	Financial ratio scale and non-financial ordinal and nominal respectively	- GDP - Size of neighbouring markets - Dummy variable for RTAs	+ + +		
Destination country's currency	Country-specific	Financial ratio scale	Foreign exchange rate as destination to home country currency	+	+	
Governments' incentives	Country- and region-specific	Financial ratio scale Financial ratio scale and nominal respectively	- Tax rates - Subsidies - Dummy variable for subsidies	- +	- +	
Economic growth	Country-specific	Non-financial ordinal and financial ratio scale respectively	- Education level - Financial stability (openness of financial market) - Interest rates	+ + -	 -	
Credit funding	Firm-specific Firm- and country-specific Country-specific	Non-financial ratio scale Non-financial nominal Non-financial ratio scale	- Tangible assets to total assets - Dummy variable for presence of home country bank in the destination country - Distance in kilometres	 + -		+
Government's quality	Country-specific	Non-financial ratio scale	- Government effectiveness - Regulatory quality - Rule of law - Control of corruption	+ + + +		

[1] This determinant should not be included due to its unclear relationship.

Similarity	Country- and region-specific	Non-financial ratio scale Non-financial nominal	- Formula for similarity index between countries - Dummy variable for presence of similar firms	+ +		

Table 1 General, horizontal and location decision FDI determinants

In accordance with the explanation about the break-even analysis in Section 3.1.2, a small selection of relevant (risk) factors should be analysed on their quantitative margins and limits for the NPV to still break-even. The (risk) factors, that are included, will comprise of the most important and volatile DCF analysis' theoretical factors from the table above and some additional risk factors (of Section 2.4) that can alter the NPV as well.

Meanwhile, the DTA can only clarify the influence of specific risks/uncertainties on (capital investment) decisions, which are subordinate to changes in uncertainties. The risks and uncertainties, that are to be included here, should have been included in the break-even analysis as well, so that their impact is evaluated from different perspectives (i.e. under stationary and time-dependent changing circumstances) and, thus, might also be taken from Section 2.4.

An identified risk or uncertainty can also be included according to a probability distribution or other appropriate assumptions. In case of a probability distribution, discrete or continuous random variables come into play and corresponding probabilities have to be estimated on the basis of as much information as possible (Sullivan et al., 2015). Having such insights about the identified risks and/or uncertainties will lead to a better understandable situation than a situation without any insights (and, thus, estimates) at all (Sullivan et al., 2015). Based on this, we are able to implement Monte Carlo simulations to simulate the stochasticity of the risks or uncertainties in question.

3.3. What information is needed to execute the more practical alternative evaluation method and where is this information coming from?

The following set of categories needs to be included as it describes the FDI's overall financial structure (Sullivan et al., 2015, p. 75):

1. Capital investment (fixed and working).
2. Labour costs.
3. Material costs.
4. Maintenance costs.
5. Property taxes and insurance.
6. Overhead costs.
7. Disposal costs.
8. Revenues based on sales, etc.
9. Quality (and scrap) costs.
10. Market (or salvage) values.

Such data are likely to be taken from the company's archives and employees or online databases (Sullivan et al., 2015), such as the databases identified in Section 2.6.

Apart from that, the firm's specific idea behind the horizontal FDI has to be identified. This must lead to the range of countries to assess, but also to all relevant firm- and industry- specific factors from a more practical perspective that might influence the decision of engaging in the proposed horizontal FDI.

For the project horizon, we choose a 10-year horizon. This is done since a project horizon of 15 years or more would probably result in unnecessary uncertainty, while a project horizon of only 5 years (or

less) would not do as the capital investment might be too large to achieve profits within such a limited project horizon. This decision is partly related to the statement of Sullivan et al. (2015) that "a long study period, all else being equal, generally increases the uncertainty of a capital investment" (p. 504).

For the project's terminal value, we assume that the project continues after the project horizon. Consequently, an appropriate stable growth rate should be included.

By determining the right "Minimum Attractive Rate of Return (MARR)" (Sullivan et al., 2015, p. 188) for the project, we should be able to obtain correct results in our DCF analysis. This value is depending on factors such as the project's perceived risk, the size and costs of internal and/or external funding and the number of project options available (Sullivan et al., 2015). Moreover, it is depending on the decision to include or exclude inflation and, subsequently, to include the market interest rate and cash flows in actual values or the real interest rate and cash flows in real values respectively (Sullivan et al., 2015). After this value is determined, the after-tax MARR should be computed as it will be used as our discount rate to calculate the NPV for ATCFs. According to Sullivan et al. (2015), this value at least equals the "weighted average cost of capital (WACC)" (p. 332); but even more preferably the after-tax MARR should be above the WACC to compensate for possible risks, uncertainties and/or capital investment problems. Despite that, it should be taken into account that the higher this rate is set; the closer to zero the NPV will be (Shank & Peterson, 2005). By using the WACC or after-tax MARR, the (debt and/or equity) financing decisions can be ignored when it is evaluated whether a certain project (alternative) can be profitable or not (Sullivan et al., 2015). As a result of that, we will use the real after-tax MARR as our discount rate to calculate the discounted ATCFs that together represent the NPV of the proposed FDI.

Sullivan et al. (2015) give the following explanation to translate a foreign based NPV to a firm's own, domestic, currency: First, the average devaluation rate of the foreign currency – over the upcoming years – has to be estimated. Moreover, its current foreign exchange rate has to be determined. Then, it is possible to compute the foreign exchange rate of each year in the project horizon, convert these years' ATCFs from the foreign currency to the firm's domestic currency and, finally, calculate their corresponding NPV. Hereby, the domestic currency equivalent of the foreign based NPV can be assessed on its acceptability. Notwithstanding, it should be noted that such a translation cannot change a positive NPV into a negative NPV or vice versa and, therefore, does not necessarily add value to the assessment of one financial evaluation. This is true as long as the NPV of one financial evaluation is not compared to the NPV of another financial evaluation with a different currency.

Depreciation can be included by different methods (Sullivan et al., 2015). In our research, we include it by using the straight-line method. In this method, depreciation of property takes place at a constant rate from its initial costs to its final salvage value (Sullivan et al., 2015). This straight-line depreciation is computed according to the Alternative Depreciation System. The depreciation recovery period of this system is somewhat larger than of another system (the General Depreciation System), whereby it is possible for a firm – with regard to the probably large necessary capital investments for its proposed horizontal FDI – to "slow down its depreciation allowances in hopes of postponing its income tax advantage until it [becomes] a profitable concern" (Sullivan et al., 2015, p. 324). A consequence of this is a lower NPV (Sullivan et al., 2015). Worldwide, the Internal Revenue Service (IRS) Publication 946 is one of the most (valuable and) known sources to get details from for depreciation of properties.

Sullivan et al. (2015) distinguish four different kinds of taxes: (1) income, (2) property, (3) sales, and (4) excise taxes. All of these taxes have their own consequences for a firm and must be applied correctly. In our research, we might be using an effective income tax rate that is similar to the widely known American "effective income tax rate [:] $t = State\ rate + Federal\ rate(1 - State\ rate)$, or $t =$

$Federal\ rate + (1 - Federal\ rate)(State\ rate)$" (Sullivan et al., 2015, p. 334) in order to simplify the calculation of the income taxes.

Based on the availability of the following kind of sources – although here only exemplified for the USA (as this country's sources are the most widely known) – we should be able to calculate at least the effective income tax rate for each proposed location and, subsequently, use it for each year's taxable income:

- A source like the IRS Publication 542, which contains all relevant and up-to-date information about tax laws and income tax rates for corporations on federal/country level.
- A source like the Tax Foundation[2], which each year presents a file that includes income tax rates for each state within a country.

Under the inclusion of uncertainties and/or risks, each cash flow is usually assumed to be normally distributed and independent of another cash flow (Sullivan et al., 2015). In order to check for an alternative's acceptability under this kind of circumstances, the expected NPV and its standard deviation have to be calculated with help of the associated uncertain cash flows.

Fixed costs of, for example, sales and marketing can be ignored in the evaluation model if the firm already served the destination country by export as these costs will stay the same, regardless of how the destination country is served (Neary, 2009).

Values for the included theoretical (risk) factors can be taken from the identified databases (Section 2.6) and, otherwise, reasoned in a logical way or determined in agreement with the company that proposes the horizontal FDI.

[2] https://taxfoundation.org/state-corporate-income-tax-rates-brackets-2017/

4. Practical Expectations for the Proposed FDI

In this chapter, we discuss the first knowledge issue of the third sub-question to find out what is necessary to implement the alternative evaluation method at Royal F&D (our case study) successfully (p. 3): *"What is the specific idea of Royal F&D behind a horizontal FDI and how does this influence the alternative evaluation method?"*. This is done by briefly describing the company's current wishes, requirements and restrictions for the (evaluation of the) proposed horizontal FDI, based on personal (internal) communication. On the basis of that, we indicate the subsequent implications for our alternative evaluation method and, thus, blueprint.

4.1. Royal F&D's view on the proposed FDI

As already described in Section 1.2, Royal F&D has been experiencing an exceptionally increasing international demand for some of its products. The company believes that a horizontal FDI might be a good solution to its expected future capacity problem because of this increasing international demand. Building up its own production location abroad, gives the company the opportunity to not reveal its business processes to others and, subsequently, to keep differentiating by its high quality standards.

4.1.1. Requirements

The proposed horizontal FDI is intended to – at least – serve Royal F&D's clients situated in North-America. Moreover, Royal F&D requires its own production location due to confidentiality of its production process. Despite these requirements, an increase in overhead costs at Royal F&D's current production location(s) is believed to have an absolutely detrimental effect on the benefit of the proposed FDI and is, therefore, out of the question.

In addition, Royal F&D initially demands to lease the real estate in order to reduce its risk of being stuck with unwanted real estate in case of failure. The lease agreement should be arranged in such a way that the company also has the option to buy the property at a prespecified price after, for example, five or ten years.

4.1.2. Wishes

Royal F&D sees an advantage in locating the new production plant in the USA. Hereby, it hopes to bypass most of the corresponding trade-tariffs and to save on transportation costs to most of its North-American clients. However, as this is thought intuitively, the company is not completely sure whether the new production plant should be located there. Additionally, Royal F&D has no idea yet about a suitable state (and city) for the new production plant. Although a location close to suppliers, distributors and/or clients might be beneficial, Royal F&D is not sure that this always leads to the largest overall benefits as well.

Apart from that, the company wants to gain some insights into the effect of the proposed shift in production on its current production plant(s), if possible. Furthermore, it wishes a gradual transition from its current production (in the Netherlands) for this export market to this new production location abroad to prevent (an increase in) property of unused production lines.

4.1.3. Restrictions

The following restrictions are set by Royal F&D:

- The company does not have the intention to use the new production plant for export to other foreign markets than indicated above.
- Raw materials, product and/or packaging components are to be supplied & fabricated locally.

- The company limits the horizontal FDI only to an FDI for the production of specific product(s) of its current export portfolio for North-America.
- The company further requires to assume a standardised production of just one type of product in the horizontal FDI. Notwithstanding, two different packaging techniques are used for this product.
- Control and monitoring of the new production plant is still done at the headquarter in the Netherlands.
- The size of the new production location is approximately equal to the size of one of the Dutch production locations.
- Logistics is outsourced.

4.2. Implications for the alternative evaluation method and blueprint

Due to the fact that Royal F&D does not know where to locate the production plant exactly and the company only has the intention to serve its North-American clients by the horizontal FDI, we will compare the three largest countries on the continent for the destination country decision: Canada, the USA and Mexico. We will only compare these countries as they have the largest domestic market potential and most of Royal F&D's North-American clients are situated within or close to these countries.

In order to select a specific state and city for our blueprint, a list of possibly important factors will first be created on the basis of theoretical location factors and internal information. Based on Royal F&D's subsequent decision on the most important factors from this list, a quick analysis will be performed to find a suitable place for its proposed horizontal FDI within the most appropriate destination country. The resulting location will serve as the basis of our initial advice to Royal F&D on whether to engage in the proposed horizontal FDI or not and, likewise, as a starting point in our attempt to implement and test our alternative evaluation method. In spite of that, Royal F&D would still need to be able to alter the implications of this location after our research, in order to be able to test the proposed horizontal FDI under different settings.

Apart from that, as was already stated before, we will only need to focus on the general and horizontal FDI theoretical (location) factors as the export component is not directly relevant to be included.

Besides, we limit our blueprint to a production with only one type of product and two packaging techniques. As a result of that, we should be able to translate all product component and packaging costs to costs per piece. However, due to the inclusion of two different packaging techniques, this means that the right annual weights for the use of each type of packaging technique have to be determined and incorporated to simplify our evaluation.

Because of Royal F&D's requirement for its own production location, the proposed horizontal FDI cannot be located within an existing and operating facility of another (similar) manufacturer. This means that the company needs to invest in its own real estate and facilities. At the beginning, this will be done by leasing an appropriate real estate and buying the required facilities. As soon as it appears that the new production plant is successful (e.g. after five or ten years), it should be a possibility for Royal F&D to purchase the real estate as well.

Finally, we will try to keep track of all the company-specific implications due to the construction of this new production plant abroad. This is done by creating an additional (privately-held) list of possible company-specific effects that we come across during the execution of our research. In addition to that, the financial model of the new production plant will be constructed in such a way that the amount of installed and operating production lines perfectly tracks the future demand of its market. This ensures

that as little efficiency as possible is lost in production within the company's original plant(s) and as much capacity as possible is used of the total capacity within the new production plant, in the meantime, to achieve an optimal balance. On the one hand this provides a clear analysis that is independent of the production within the company's current production plant(s), but on the other hand this means that a gradual transition in production (from the firm's current production location(s) for this export market to this new production location abroad) cannot be included in our evaluation.

5. Location Decision

Now that the first knowledge issue of the third sub-question has been addressed in the previous chapter and its implications (as stated in Section 4.2) are clear, we are ready to investigate the second knowledge issue of this sub-question (p. 3): *"Which country has the most potential for a successful horizontal FDI and, subsequently, which location in this country is selected in agreement with Royal F&D to serve as our blueprint's location?"*. This is investigated in accordance with the relevant identified implications of Section 4.2.

In Section 5.1, we describe the analysis to decide on the most suitable country for the proposed horizontal FDI. This decision is made by using the nondimensional scaling compensatory MCDA method, as was already explained in Section 3.1.5. Sheet *"Country Decision"* of the additional file *HFDI_Blueprint.xlsm* includes the concerning analysis. Section 5.2 goes into more detail as it discusses the location decision within the country that has now been identified as the most suitable destination country for the proposed horizontal FDI. The resulting specific location will serve as our blueprint's location.

5.1. Country decision

Section 4.2 explains that only the three largest countries on the North-American continent are to be compared to decide on the most suitable destination country. Consequently, the USA, Canada and Mexico are included in our MCDA.

As might be visible from the first column of the upper table on Sheet *"Country Decision"* of the additional file *HFDI_Blueprint.xlsm,* the analysis is based on all determinants that are indicated to have a clear influence on the location decision (resulting from Table 1). Per determinant, more – different – measurements might be available to be included for this analysis (Table 1). Whenever this is the case, an equally weighted average standardised outcome is created for the concerning determinant over the included countries (Columns G, H and I) on the basis of the individual unstandardised performance of these measurements (Columns D, E and F). The determinants that are based on just one measurement are likewise standardised. Hereby, it becomes possible to compare the different countries with regard to their performance on each determinant individually.

When comparing the measurements of Table 1 – as indicated for all relevant determinants – with the included measurements in the second column (B) of the upper table on Sheet *"Country Decision"* of file *HFDI_Blueprint.xlsm*, it should become clear that four measurements with a specific influence on the country decision are missing in our analysis: (1) the dummy variable for RTAs under the trade liberalisation and market growth opportunity determinants; (2) the dummy variable for presence of similar firms under the similarity determinant; (3) the distance to suppliers measurement under the supply variables determinant; and, lastly, (4) the availability of necessary replacement parts measurement also under the supply variables determinant. There are three reasons why these measurements are excluded from our nondimensional scaling compensatory MCDA:

- The dummy variable measurements (for RTAs and presence of similar firms) are excluded because no difference in outcome could be identified for the three compared countries.
- The measurement distance to suppliers is excluded here as it is not confirmed in the literature that this variable is truly relevant.

- The last measurement, availability of necessary replacement parts, is excluded as it is an additional alternative measurement to measure a country's supply environment (Bagchi et al., 2014) and the local supplier quality measurement is already included in the MCDA.

We assume that the exclusion of these measurements has no (negative) influence on the final result of our analysis as each determinant still has (an)other included measurement(s) that is/are highly reliable and as it is not expected that including these measurements would have led to different results.

When moving over each cell in Column B of the upper table on Sheet *"Country Decision"* of file *HFDI_Blueprint.xlsm*, more details on each measurement's use, interpretation and source is visible in its comment. By following the link in this comment, it would be possible to look into the concerning data for different countries and/or different periods of the specific measurement and, subsequently, to implement desired changes in our nondimensional scaling compensatory MCDA.

Column C of the upper table on Sheet "*Country Decision*" of file *HFDI_Blueprint.xlsm* shows the sign of effect for each measurement as has been indicated in Table 1. In spite of that, Rows 7 and 8 of Column C state a contradicting sign of effect in parentheses to show that the finally implemented measurement (as described in the corresponding comments in Column B) contradicts the initially indicated sign of effect (of Table 1). This influences the way in which both of the implemented indexes should be understood and the formula that is necessary for standardisation. The added comment in Cell C2 explains this change in sign of effect as well.

Depending on the concerning measurement and its corresponding sign of effect, one of the following two formulas is used in order to standardise the measurement's value for each country to a value between zero and one:

- In case of a measurement with a positive sign of effect (where a higher score is better), the standardised value should be computed by using: $(Score - Min.) / (Max. - Min.)$.
- In case of a measurement with a negative sign of effect (where a lower score is better), the standardised value should be computed by using: $(Max. - Score)/(Max. - Min.)$.

Additionally, the corresponding standardised values for each determinant are computed by using the first mentioned formula again, while assigning equal weights to each of its standardised measurements. Due to the inclusion of IF functions, measurements with equal results for all of the compared countries will be excluded in these standardised values.

The bottom table on Sheet *"Country Decision"* of file *HFDI_Blueprint.xlsm* includes home and potential destination countries' GDP per capita and average annual wages. These data are necessary in order to compute the appropriate values for the factor prices and similarity determinants.

Almost all of the incorporated data are coming from databases listed in Section 2.6. Notwithstanding, some measurements are specific to the investigated firm's situation and business, or they have to be taken from other databases as the necessary information could not be found within the already listed ones. Each measurement's comment (in Column B) includes the corresponding source.

Due to the fact that we indicate each included determinant to have a similar importance as another one, the most suitable destination country can simply be found by summing up each country's standardised performance on all of these determinants and, then, by indicating which country has the highest (best) score. The total score for each of the included countries can be found in Cells G27, H27 and I27, respectively. The most suitable country's score is automatically marked dark green, while the second best country's score is automatically marked lighter green and the least suitable country's score is automatically marked white. On the basis of our results in the upper table of Sheet *"Country Decision"* of file *HFDI_Blueprint.xlsm*, this – thus – leads us to conclude that the USA is the most suitable

destination country for the proposed horizontal FDI with regard to the relevant theoretical determinants.

5.2. Specific location decision for our blueprint

From the analysis in Section 5.1, it is clear that the USA should be selected as the proposed horizontal FDI's destination country. Consequently, it is necessary to determine which specific location within the USA could serve as a realistic example in our blueprint. Due to time restrictions on the execution of our research and our decision to concentrate on the implementation and operationalisation of the specified financial evaluation, this is determined in close cooperation with Royal F&D.

Primarily, Royal F&D has selected several extremely important factors in order to make a better decision on a specific location for our blueprint within the USA. Based on these factors, the initial location decision is narrowed down as much as possible. The following factors have been selected by the company to guide us in this decision[1]:

- Distance to own clients, distributors, and possible suppliers.
- (Corporate) tax rates.
- Construction prices.
- Availability of natural gas.
- Wage rate.
- Tax benefits and/or subsidies.
- Availability of well-trained staff.

While taking these factors into account, we have come to the conclusion that a location in the city of – or area around – Akron, in the state Ohio, would be a nice and realistic starting point for our blueprint. This conclusion was drawn with help of the following online web tools:

- http://www.clustermapping.us/region
- http://www.gmaonline.org/resources/contributions-to-the-us-economy/
- http://selectusa.stateincentives.org/?referrer=selectusa
- http://rsmus.com/what-we-do/services/tax/credits-and-incentives/investment-incentives.html
- https://energy.gov/savings/search?f%5B0%5D=im_field_rebate_state%3A860116
- https://www.eia.gov/state/maps.php?v=Natural%20Gas

[1] These factors have been selected from a list of both theoretical and practical (by Royal F&D proposed) important location factors (Table 4, Appendix B).

6. Necessary Specifications for our Financial Evaluation Method

In the previous chapter (Chapter 5), we have come to the conclusion that the city of and/or area around Akron, in the state of Ohio (USA), is a realistic choice of location for the proposed horizontal FDI in our blueprint. Therefore, we are now able to investigate the required specifications that make it possible for us to further implement the alternative evaluation method at Royal F&D (our case study). This is done on the basis of the last two knowledge issues of the third sub-question (p. 3): *"What information is further required from Royal F&D for the implementation?"* and *"How should the alternative evaluation method be altered to be of greater use to Royal F&D?"*.

In Section 6.1, we establish all practical and firm-specific information that needs to be tracked down within the company that proposes the horizontal FDI. On the other hand, in Section 6.2, we list all information that needs to be tracked down externally or that is based on certain assumptions. By determining all of this information and filling it in on sheet "*Fill-in sheet*" in the additional file *HFDI_Blueprint.xlsm*, all necessary specifications are gathered together. Based on this, it should be possible to implement and operationalise our financial evaluation method.

6.1. Required internal information from Royal F&D

6.1.1. Regardless of the inclusion or exclusion of uncertainties and/or risks

- The moment of the company's first capital investment (i.e. the end of the year that precedes the project horizon and, thus, the starting point of the project horizon).
- The starting sales volume in units (x 1,000,000) (i.e. the company's most recent annual sales volume in units immediately preceding the project horizon) and, subsequently, the annual growth rate(s) until the final project year (i.e. the end of the project horizon).
- The company's most recently used year standard exchange rate (i.e. the exchange rate that is used for calculations throughout the whole year that precedes the project horizon).
- The foreign currency symbol.
- The specific product components per unit.
- The necessary quantity of these product components per unit.
- The Dutch price for each product component per quantity of 1000, as an indication for its American price.
- The Dutch unit costs to apply each packaging technique.
- The (average) nominal Dutch sales price per unit.
- The average interference time on total operating time (%).
- The average changeover time on total operating time (%).
- The average cleaning time on total operating time (%).
- The necessary fixed and variable (i.e. per production line) number of employees per working day.
- The standard working hours per employee per day.
- The number of working days per week.
- The annual paid working weeks.
- The average Dutch gross hourly wage for equivalent direct and indirect labour (i.e. respectively for the variable and fixed type of employees).

- The company's real discount rate (i.e. its real after-tax MARR) as our blueprint excludes inflation:
    - If necessary, calculated on the basis of the company's WACC and corresponding beta.
- The total available operating time per week.
- The total available weeks of operation on a yearly basis.
- The number of producible units per hour.
- The average Dutch rent as an annual fixed fee, based on the costs of an equivalent type and size of production plant (during the last four years).
- As a percentage of total production volume, the indirect production costs for:
    - Maintenance.
    - Utilities.
    - Cleaning.
    - Remaining (incl. environmental costs, pest control and other manufacturing costs).
- The remaining miscellaneous costs of the production location, excluding assembly costs for production lines, but including costs for:
    - Quality research.
    - Audit and accountancy.
    - Licenses.
    - Hardware.
    - Phones.
    - Postage.
    - Communication.
    - Office supplies.
    - Banking and financing.
    - Subscriptions.
- The investment costs for:
    - Initial equipment (i.e. information technology, office and other smaller equipment), which is necessary for the initial set-up of the production plant.
    - Subsequent equipment (i.e. information technology, office and other smaller equipment), which is necessary for every new production line after the first year (as a percentage of the initial equipment investment).
    - Initial production machinery, regardless of the number of production lines (i.e. for the entire production location).
    - Other production machinery:
        - Per two production lines.
        - Per production line.
    - Packaging machinery per production line:
        - Installed individually.
        - Installed together (combined).
- The assembly costs per production line.
- The necessary additional operating time and capacity (in number of equivalent fulltime (operating) production weeks) to properly test and install all production parts per assembled production line within the first year. This is necessary to ensure that production runs smoothly before meeting the customers' demand.
- The company's current premium for general liability insurance (as a percentage of net sales).
- The company's current premium for a business owner policy (as a percentage of locally insured matters).

- The company's estimated locally insured matters (i.e. its machines and installations, inventory, possible clearance costs etc.), expressed in monetary value.
- The payment term for accounts receivable (as a percentage of one year).
- The payment term for accounts payable (as a percentage of one year).
- The average available inventory of supplied goods (as a percentage of one year).

6.1.2. In case that specific uncertainties and/or risks are built-in

- The company's standard deviation for its (average) nominal Dutch sales price per unit.
- The expected standard deviation for each packaging technique's Dutch unit costs.

6.2. Required external information and assumptions

6.2.1. Regardless of the inclusion or exclusion of uncertainties and/or risks

- The project's terminal value and the subsequent enterprise value are calculated with help of the Gordon growth model.[1] If the annual growth rate of the total sales volume is between (or equal to) 4% to 10% in the last year of the project horizon, we assume that the perpetuity growth rate is half of this percentage. If this annual growth rate is above 10% in the last year, we assume that the perpetuity growth rate is 5%. When this annual growth rate is below 4% in the last year, we assume that the perpetuity growth rate is 2%. These assumptions are necessary to make sure that the firm's perpetuity growth rate does not outpace the growth rate of the overall economy at some point in time.[2]
- On the basis of our observation of the exact historical and expected annual usage percentages of both packaging techniques, we believe that linear functions provide a very good reflection of reality (on the short term). Consequently, we assume that the usage percentages of the two required packaging techniques on total sales volume complement each other linearly during the project horizon (up to 100%). As a result, the usage percentage of one packaging technique decreases linearly according to the function $y = -ax + b$, while the usage percentage of the other packaging technique increases linearly according to the function $y = ax - c$; where a represents the necessary identical (positive and negative) slope and b and c represent the correct intercepts.
- The slope and intercepts of the expected linear usage of both packaging techniques can be identified by determining the linear trend line of the graph that shows the officially expected annual usage percentages of both packaging techniques.
- We assume that the needed amount of and price for each packaging component are not able to cause any clear uncertainties or risks for their corresponding individual component. As a result of that, unit prices for the two packaging techniques do not need further specifications.
- We assume that (only) product components are thrown away and turned into scrap during 50% of the total interference time and changeover time.
- The project includes local average gross hourly wages on metropolitan area level (in our case of Akron, Ohio), which are based on the company's Dutch equivalent average gross hourly wages and two average wage indices (annually & hourly) that should be created by using the most recent relevant data from two different databases (2016; the STAN database and the Occupational Employment Statistics).
- Employees' gross hourly salary is split in two different average Dutch gross hourly wages: one for all labour that depends on the number of operating lines and another one for all labour

[1] https://www.investopedia.com/university/dcf/dcf4.asp
[2] https://www.divestopedia.com/definition/6598/terminal-growth-rate

that does not depend on the number of operating lines. The former wage is assumed to be representative for direct labour costs and the latter wage is assumed to be representative for indirect labour costs.

- The annual direct labour costs depend on the necessary production capacity for the annual total production volume.
- The destination country's (federal) tax rate (which is based on operating profit) should be identified externally.
    - In the USA (i.e. our blueprint's destination country), the federal tax rate is indicated to be at a flat rate of 21% from the first of January in 2018.[3]
- We assume that this federal tax rate can be used in all years of our evaluation.
- The destination country's state tax rate, which can be based on operating profit or gross receipts, should be identified externally.
    - The state of Ohio (i.e. our blueprint's specific destination location) does not levy a corporate income tax rate, but imposes a gross receipts tax rate.[4] For a company with net sales above $4,000,000.-, for example, this would result in an obligatory annual minimum tax (of $2,600.-) plus an additional variable tax on total annual taxable gross receipts minus the first gross receipts of $1,000,000.- at a tax rate of 0.26%.[5]
- When the destination country's state tax rate is based on gross receipts, the following four components have to be identified:
    - The state tax rate on gross receipts.
    - The (state) tax-free gross receipts.
    - The threshold value for each gross receipts tax bracket (starting with the highest tax bracket in order to only need the lower limit of each gross receipts tax bracket).
    - The obligatory annual minimum state tax per gross receipts tax bracket.
- Federal and state tax rates are both incorporated directly (i.e. in the same year).
- The local city tax rate (for Akron, Ohio) is not included in our analysis as this tax is officially paid by the employees themselves.[6]
- When federal tax is based on operating profit and state tax is based on gross receipts, total provision for income taxes should be calculated by the sum of both individual taxes. When both federal and state tax are based on a company's operating profit, provision for income taxes can be calculated by using the effective income tax rate, as was described in Section 3.3.
- The sales taxes are irrelevant for our DCF analysis as these are imposed at the retail level.
- The excise taxes are irrelevant as well as its only relevant cost component – taxation on highway usage of trucks[7] – applies to logistics, which is assumed to be outsourced. Consequently, excise taxes do not change compared to the investigated company's current situation and, thus, do not have to be included in our DCF analysis.
- The property tax rate is not relevant in our evaluation method as the property is rented.
- The additional operating time and capacity to test and install the production line(s) properly within the first year has an increasing effect on the corresponding DCF's total production volume and, as a result of that, an effect on the initial necessary capacity of the production

[3] KPMG; *TaxNewsFlash United States*; December 15, 2017
[4] https://taxfoundation.org/ohio-commercial-activity-tax-2017/
[5] https://www.tax.ohio.gov/Portals/0/communications/publications/annual_reports/2015_annual_report/2015_AR_Section_2_Commercial_Activity_Tax.pdf
[6] https://taxfoundation.org/local-income-taxes-city-and-county-level-income-and-wage-taxes-continue-wane/
[7] https://www.irs.gov/businesses/small-businesses-self-employed/excise-tax

machines and total costs of product components and direct labour costs. In this way, we try to account for additional start-up costs.

- The Dutch average annual fixed rent is translated into an equivalent American average annual rent by creating and using a country-level rent index (in which the Dutch rent index serves as the denominator).[8] As each individual country's rent index is in comparison to rent in New York City, it is also necessary to translate the American average annual rent to a more suitable local annual rent.
- The average annual local rent is found by creating and using a local construction price index.
    - For Akron (in Ohio), this leads to the following: A one-story office building in Cleveland, which is close to Akron, has an average construction price of $ 162.19 per square foot compared to an average construction price of $ 215.01 per square foot in New York City.[9] As these costs vary widely with each location, these prices can be used to create a local construction price index in order to determine the local average annual rent.
- The local average annual rent is assumed to be a fixed expense (i.e. its annual costs do not vary within our project horizon).
- The remaining miscellaneous costs of the production location (excluding assembly costs for the installation of production lines) are assumed to be fixed annual expenses.
- We assume that all machines, installations and other production components, which are necessary for the company's production, can be depreciated over 12 years. This is in line with the Alternative Depreciation System of the IRS Publication 946.
- Information technology, office and other smaller equipment investments are grouped together as one (equipment) investment category in order to simplify its depreciation. The investments for this category are depreciated over 7 years, which is the average period of depreciation for the different asset classes that are included. This is also in line with the Alternative Depreciation System of the IRS Publication 946.
- The assembly costs for each production line are not depreciable and, therefore, should be subtracted directly.
- The correct foreign insurance and policy premiums are assumed to be equivalent to the company's current home premiums.
- The business owner policy includes insurance for damage, fire, accidents etc. of bought and rented property.[10]
- Directors and officers liability insurance does not have to be included as this should already be arranged in the Netherlands.
- Shipping and transportation costs are assumed to be 0 as all logistics are outsourced.
- Finished goods are always distributed directly (per full truckload) and, therefore, do not need storage space. Consequently, inventory costs only include costs for supplied goods and its handling.
- Salvage value at the end of a component's useful life is assumed to be 0.
- Each (additional) investment will only be made in the year before it is needed. This is done to account for a construction period, but also in order to minimise the company's risk of investing in unnecessary additional capacity.
- Sales & Marketing (costs) are not influenced by the proposed horizontal FDI and, thus, do not have to be included.
- No efficiency or stock differences are taken into account.

[8] https://www.numbeo.com/cost-of-living/rankings_by_country.jsp?title=2017
[9] http://evstudio.com/cost-per-square-foot-of-commercial-construction-by-region/
[10] http://www.businessinsuranceusa.com/business-owners-insurance

- All unsold and obsolete inventory is removed at no costs.

6.2.2. In case that specific uncertainties and/or risks are built-in

- The expected mean and standard deviation of the year standard exchange rate over the project horizon should be identified externally. This is possible on the basis of historical data over the last few years.[11] In the end, these values will replace the company's most recently used year standard exchange rate during the project horizon, in order to account for uncertainty in the precise exchange rate between the home country and the destination country.
- We assume that all (four) factors for which a standard deviation is determined, can be included in the Monte Carlo simulation according to normal distributions. Thereby, we are able to test for these factors' extent of influence on the NPV's expected outcome when their precise values are fluctuating randomly over time instead of being fixed.

[11] https://www.xe.com/currencycharts/?from=EUR&to=USD&view=5Y

7. Implementation and Operationalisation of our Financial Evaluation Method

In this chapter, we describe which financial evaluation techniques are implemented and how this is done. Thereby, we operationalise our financial evaluation method and make it possible, for those who are interested, to understand how it is built.

Primarily, by the implementation of a nondimensional scaling compensatory MCDA (Section 5.1), we have been able to ensure that the most suitable country shall be selected for each company's proposed horizontal FDI when different countries are being compared.

Next, our financial evaluation method is implemented. This includes a DCF analysis, break-even analysis and Monte Carlo simulation (MCS). Although described and suggested in Section 3.1, we are excluding the DTA and the final noncompensatory MCDA additive weighting technique. This decision was made because of the following findings and/or restrictions:

- In our opinion, it is impossible to implement the DTA technique as a general and automated analysis that will improve our blueprint's results, since its input and decision moments are always very case specific.
- Moreover, the imposed restrictions (Section 4.1) on and required assumptions (Section 6.2) for our financial evaluation method make it impossible for us to identify crucial decisions that are affected by uncertain changes during the project horizon and, thus, are the foundation for a DTA. Two examples of these restrictions and/or assumptions are the company's decision to rent the real estate initially and our assumption to only start investing in (a) new production line(s) as soon as it is clear that it/they will be needed in the subsequent year.
- The noncompensatory MCDA additive weighting technique, which we intended to use for a more qualitative analysis of the remaining factors in Table 1 (mentioned in its last column), will be excluded from our research due to time limitations and the fact that this evaluation technique does not necessarily improve our financial (i.e. quantitative) evaluation. As a result of that, we will list it as a suggestion for future research.

In Section 7.1, we start off by explaining how (and why) each determinant of Table 1 – that was categorised under the heading "*DCF analysis*" – is or is not included in our DCF analysis. Next, Sections 7.2, 7.3 and 7.4, respectively, describe the structure of the Excel sheets that contain the DCF analysis (without uncertainties and/or risks), our break-even analysis and our MCS in order to provide a detailed and clear picture of the operation of our blueprint. Lastly, Section 7.5 describes the additionally incorporated tools that further increase the ease of use of our blueprint.

7.1. Inclusion of the general, horizontal and location decision FDI determinants in the DCF analysis

This section contains a short description about how (and why) each determinant (and its measurement(s)) of Table 1 in Column "*DCF analysis*" is or is not included in our DCF analysis. In order to explain this as simply as possible, we make use of Table 2.

(Horizontal) FDI determinants and/or corresponding location decision determinants	Measurement(s)	Relationship to (horizontal) FDI in case of the DCF analysis	Explanation about the manner of inclusion
Factor prices	(Absolute) average annual wage difference	-	On the basis of the home and destination countries' average annual wages, an index is created that automatically translates the Dutch hourly wages to equivalent American hourly wages (in Cells B45 and B46 at sheet "*Fill-in Sheet*" of file *HFDI_Blueprint.xlsm*). The larger the difference between the average annual wages, the larger the impact of the resulting index on the equivalent American hourly wages.
Fixed investment costs	Cash outflow	-	This determinant is included in our DCF analysis as the necessary capital expenditures (e.g. for packaging machinery or equipment) and the corresponding (in)direct fixed costs to produce at the new production plant. The greater these costs, the less attractive the horizontal FDI may turn out to be.
Experience (to invest) abroad	Dummy variable	+	This determinant has an indirect positive effect on our DCF analysis because of the following: If the company already has some experience in the destination country, our blueprint will require it to continue outsourcing its logistics. As a consequence of that, no extra costs for logistics should be added and no (new) problems should arise. Moreover, costs for logistics should always decrease when engaging in a horizontal FDI (instead of exporting), due to the company's closer proximity to its foreign market.
Retained profit at the foreign production plant	Log cash flow of parent firm	+	This determinant is not included in our DCF analysis as the specific amount of retained profit, that the parent firm might be willing to reinvest in the proposed FDI, is not necessary in order to calculate the corresponding NPV. However, on the basis of the resulting free cash flows, the company is able to assess how many cash can be retained – and when – but also how much extra debt should (and can) be taken on to meet all of its prospective investments during the project horizon.
Destination country's currency	Foreign exchange rate as destination country currency	+	This determinant is included directly as the company's year standard exchange rate in Cell F3 at sheet "*Fill-in sheet*" of file *HFDI_Blueprint.xlsm*. It represents the company's expected average foreign exchange rate for the destination country in question during the year that precedes our project horizon.
Governments' incentives	Tax rates	-	This determinant is included directly in the DCF analysis by using the destination country's federal and state tax rates to calculate provision for

			income taxes. The higher these rates, the larger the disadvantage for the company in case of a positive operating profit.
	Subsidies	+	Despite our attempt to identify advantageous and generally applicable (FDI) subsidies, we have not been able to do so. Most of them only appear to be available in less prosperous regions, are related to the usage of green energy or are only obtained under the condition that the company does something in return for the (local) society.[1 and 2] To prevent that our blueprint is being limited in its application (due to location specific subsidies), we have decided to ignore subsidies completely.
Economic growth	Interest rates	-	Interest rates and, thus, interest payments and debt are excluded from the DCF analysis as the obtainable amount of debt financing for the proposed horizontal FDI is yet unknown. This is something that depends on the company's decision on its total amount of retained profit (as was already explained above (p. 46)) and its ability to deploy collateral, which are still unknown as well.

Table 2 Description of inclusion of general, horizontal and location decision FDI determinants

7.2. Structure of the DCF analysis (without uncertainties and/or risks)

The following subsections explain how each row of the "*DCF analysis*" sheet in the additional file *HFDI_Blueprint.xlsm* reacts to input on sheet "*Fill-in sheet*". Only those rows that contain numerical values will be discussed here.

Generally, it should be noted that in most rows the calculations are split on a yearly basis over the project horizon. Moreover, expenses are always transformed into negative values in order to make a clear distinction between the investigated alternative's income and expenses. Besides, our DCF analysis is limited to processing investments with a maximum number of two new production lines per investment period (i.e. per year). Lastly, the DCF analysis does not include any uncertainties and/or risks and, thus, provides us with a static result.

Time (end of the year): Row 1

This row includes all periods (i.e. years) of our project horizon for which the financial results are examined in more details. Its starting point is the ending of the year that precedes the project horizon. The first investment(s) for the investigated alternative are done at this starting point.

PV factor: Row 2

Each period's present value (PV) factor is depending on the company's real discount rate and the elapsed number of periods in the project horizon. The PV factor is necessary in order to compute discounted free cash flows (FCFs), which are necessary to find the alternative's NPV, and is calculated by using the following formula:

$$(1 + the\ company's\ real\ discount\ rate)^{-(the\ period\ in\ question\ -\ the\ period\ preceding\ the\ project\ horizon)}$$

[1] http://selectusa.stateincentives.org/?referrer=selectusa

[2] https://energy.gov/savings/search?f%5B0%5D=im_field_rebate_state%3A860116

Total production volume: Row 4

Row 4 shows the annual total production volume, which comprises of the corresponding annual sales volume and a calculated extra loss in producible units (as a percentage) due to interferences and changeovers during the total operating time.

Besides, in the first period of our project horizon, an additional amount of producible units is added to this total production volume to account for the total operating time and capacity that is needed to test and install the initial production line(s) thoroughly and correctly. This addition depends on the necessary number of fulltime operating production weeks to achieve this; the annually available number of operating weeks; the producible units per hour; the total available operating time per week; the total downtime of the production process; the necessary number of production lines during this year in order to meet all demand; and, likewise, on the calculated extra loss in product components (as a percentage).

Sales volume: Row 5

The annual sales volume equals the expected total annual demand for the company's product. It is depending on the company's (expected) sales volume at the start of our project horizon (i.e. the company's total annual sales volume during the year that precedes the project horizon) and its subsequent (expected) annual growth rate.

Nominal sales price: Row 6

The incorporated nominal sales price only depends on the product of the indicated year standard exchange rate and the nominal Dutch sales price as this price is linked directly to the firm's current sales abroad. As a result of that, the nominal foreign sales price is an equivalent of the nominal Dutch sales price.

Sales, net: Row 7

The annual net sales, which equals total annual revenue, is calculated by the product of the sales volume and the nominal sales price.

Product components: Row 11

This cost item includes the annual costs for all necessary product components during the project horizon, except for the product's necessary packaging materials. As the total product costs (per unit) are fixed and automatically calculated on the basis of the required input values for each product component on the sheet "*Fill-in sheet*", the blueprint can simply calculate the corresponding annual total costs for the product components by the multiplication of each year's total production volume with these total product costs (per unit).

Packaging materials: Row 12

This cost item includes the annual costs for all necessary packaging materials during the project horizon. As two different packaging techniques are used and both of them have their own costs and annual usage percentages, the annual total direct costs under this cost item is calculated by using the following formula:

$$-(period's\ sales\ volume * (unit\ costs\ for\ using\ the\ first\ packaging\ technique * the\ period's\ usage\ percentage\ of\ the\ first\ packaging\ technique + unit\ costs\ for\ using\ the\ second\ packaging\ technique * the\ period's\ usage\ percentage\ of\ the\ second\ packaging\ technique)$$

Labour: Row 13

The annual cost for direct labour (i.e. all labour that is necessary to process the calculated production volume) is calculated by the product of the following items:

- The required number of employees per working day that operate one production line;

- These employees' standard daily working hours;
- Their working days per week;
- Their annually paid working weeks;
- Their average gross hourly metropolitan area level wage, which is computed automatically on the basis of the required input values for this direct labour wage;
- The following formula, which calculates the total production capacity needed (expressed in the exactly required number of production lines) in order to produce each period's total production volume:

$$\frac{the\ period's\ total\ production\ volume}{weeks\ of\ operation\ per\ period * producible\ units\ per\ hour * (total\ available\ operating\ time\ per\ week * (1 - total\ downtime\ of\ the\ production\ process))}$$

Total direct costs: Row 14

Each period's total direct costs are calculated by adding the costs for packaging materials and direct labour to the costs for product components of the period in question.

Labour: Row 17

The annual costs for indirect labour (i.e. the production location's annual overhead costs for its more senior staff's labour) are a fixed annual expense. This is because the number of employees, that fall into this category, is not influenced by an increasing sales and/or production volume throughout the project horizon.

Its annual value can be calculated by the product of the following items:

- The fixed number of employees per day;
- These employees' standard daily working hours;
- Their working days per week;
- Their annually paid working weeks;
- Their average gross hourly metropolitan area level wage, which is computed automatically on the basis of the required input values for this indirect labour wage.

Maintenance: Row 18

The (indirect) annual maintenance costs are a fixed percentage of total production volume. Consequently, it is calculated by the product of this maintenance costs percentage and the annual total production volume.

Rent: Row 19

This cost item includes the annual costs for renting the required building at our blueprint's location. As its annual costs do not vary within our project horizon, its value is just copied and pasted from Cell B64 of sheet "*Fill-in sheet*" into this row. This is possible as the annual rent, Cell B64's value, is automatically calculated on the basis of the necessary input values.

Depreciation of machines & installations: Row 21

In this row, straight-line depreciation is used for all machines & installations according to the indicated number of year to depreciate them, which is given in Cell B70 of sheet "*Fill-in sheet*". In each period, the incorporated formula checks for the amount of periods that precede the period in question. Subsequently, it adds up all capital investments for machines & installations in these preceding periods up to and including a preceding amount of periods that is equal to the value in Cell B70 of sheet "*Fill-in sheet*". Finally, this summed amount is divided by the value in Cell B70 of sheet "*Fill-in sheet*".

Depreciation of equipment: Row 22

In this row, straight-line depreciation is used in the same way as in row 21. However, here it is used for depreciation of equipment. The number of year to depreciate equipment is given in Cell B71 of sheet "*Fill-in sheet*". In each period, the incorporated formula checks for the amount of periods that precede

the period in question. Subsequently, it adds up all capital investments for equipment in these preceding periods up to and including a preceding amount of periods that is equal to the value in Cell B71 of sheet "*Fill-in sheet*". Finally, this summed amount is divided by the value in Cell B71 of sheet "*Fill-in sheet*".

Total depreciation: Row 23

Total depreciation is calculated by adding the depreciation of equipment to the depreciation of machines & installations.

Utilities: Row 24

The (indirect) annual utility costs are a fixed percentage of total production volume. Consequently, it is calculated by the product of this utility costs percentage and the annual total production volume.

Cleaning: Row 25

The (indirect) annual cleaning costs are likewise a fixed percentage of total production volume. Consequently, it is calculated by the product of this cleaning costs percentage and the annual total production volume.

Remaining: Row 26

The (indirect) annual remaining costs are also a fixed percentage of total production volume. Consequently, it is calculated by the product of this remaining costs percentage and the annual total production volume.

Total indirect costs: Row 27

The total indirect costs are calculated by adding up all indirect cost items (i.e. indirect costs for labour, maintenance, rent, total depreciation, utilities, cleaning and remaining).

Total cost of goods sold: Row 29

The total cost of goods sold is calculated by adding total indirect costs to total direct costs.

Gross profit: Row 31

The alternative's gross profit is calculated by adding total cost of goods sold to net sales.

Insurance: Row 34

Insurance summates all costs for general liability insurance and a business owner policy. The annual general liability insurance costs are computed by the multiplication of its premium with the net sales of the period in question. In the meantime, total annual costs for a business owner policy are calculated by the product of its premium, the locally insured matters and the year standard exchange rate.

Remaining miscellaneous: Row 35

At the start of the project horizon, the remaining miscellaneous cost item only includes the assembly costs for each production line that should be invested in (i.e. one or two production lines) to meet all demand in the first period of the project horizon. The assembly costs per production line are multiplied by the amount of production lines to be installed and are converted into the right currency in order to compute the correct starting point's total remaining miscellaneous costs.

The assembly costs are included in the same way during the following periods, whenever one or more production lines are necessary in a subsequent period.

In addition to that, each period of our project horizon includes the identified fixed remaining miscellaneous cost items as incorporated in Cell B69 on sheet "*Fill-in sheet*" (however, here in its converted currency) and enumerated in Section 6.1.1.

Total operating expenses: Row 36

Total operating expenses are calculated by adding all cost items of operating expenditures (i.e. insurances and remaining miscellaneous).

Operating profit (EBIT): Row 38

The total operating profit (EBIT) is calculated by adding total operating expenses to gross profit.

Provision for income taxes: Row 40

In case that both federal and state tax rate are based on operating profit, the corresponding effective income tax rate is computed and included in our DCF. In case that federal tax rate is based on operating profit and state tax rate is based on gross receipts, total provision for income taxes is calculated by the sum of both individual taxes. In the latter situation, the right gross receipts tax bracket is selected and used automatically on the basis of each period's net sales.

Tax-adjusted operating profit (ATCF): Row 41

The tax-adjusted operating profit (ATCF) is calculated by adding provision for income taxes to operating profit (EBIT).

Total depreciation: Row 43

This row copies the total depreciation for each period in the project horizon from Row 23. However, here all negative values are reversed to positive values as this will be needed for this row's subsequent processing.

Change in operating working capital: Row 45

Each period's change in operating working capital is simply the difference between the investigated alternative's operating working capital of the period in question and the period that precedes it. The total operating working capital of each period is calculated by using the following formula on the basis of the necessary corresponding input values of sheet "*Fill-in sheet*":

$$(payment\ term\ for\ accounts\ receivable, as\ a\ percentage\ of\ the\ period * the\ period's\ net\ sales) - \big((the\ period's\ direct\ costs\ for\ product\ components + the\ period's\ direct\ costs\ for\ packaging\ materials) * average\ available\ inventory, as\ a\ percentage\ of the\ period\big) + \big((the\ period's\ direct\ costs\ for\ product\ components + the\ period's\ direct\ costs\ for\ packaging\ materials) * payment\ term\ for\ accounts\ payable, as\ a\ percentage\ of\ the\ period\big)$$

Total (production capacity needed): Row 49

This row shows the total production capacity needed during each time period (expressed in the exactly required total number of production lines) in order to produce each period's total production volume. Each period's value is calculated by using the following formula:

$$\frac{the\ period's\ total\ production\ volume}{weeks\ of\ operation\ per\ period * producible\ units\ per\ hour * (total\ available\ operating\ time\ per\ week * (1 - total\ downtime\ of\ the\ production\ process))}$$

*W*henever a next integer is passed by during a period, this means that a new production line should be purchased and installed during the preceding period.

#1 (production capacity needed): Row 50

#1 represents the name of the first packaging technique that is stated in the first column of this row. All subsequent cells in this row calculate the annual part of total production capacity needed to produce each period's sales volume that makes use of the first packaging technique; unless the total production volume is equal to zero for the period in question. Thereafter, the resulting values are rounded down in order to determine in which period the required capacity for this (first) packaging technique will be occupying a (next) full production line.

*W*henever a next integer is reached during a period, a new production line with this packaging technique should be purchased and installed at the latest during its preceding period.

This row's values are depending on each period's total production volume, the linear annual usage percentage of the first packaging technique, the number of weeks of operation per period, the number of producible units per hour and the multiplication of the total available operating time per week with $(1 - the\ total\ downtime\ of\ the\ production\ process)$.

#2 (production capacity needed): Row 51

#2 represents the name of the second packaging technique that is stated in the first column of this row. All subsequent cells in this row calculate the annual part of total production capacity needed to produce each period's sales volume that makes use of the second packaging technique; unless the total production volume is equal to zero for the period in question. Thereafter, the resulting values are rounded down in order to determine in which period the required capacity for this (second) packaging technique will be occupying a (next) full production line.

*W*henever a next integer is reached during a period, a new production line with this packaging technique should be purchased and installed at the latest during its preceding period.

This row's values are depending on each period's total production volume, the linear annual usage percentage of the second packaging technique, the number of weeks of operation per period, the number of producible units per hour and the multiplication of the total available operating time per week with $(1 - the\ total\ downtime\ of\ the\ production\ process)$.

#1('s number of years up to and including its next operating (packaging) machine): Row 53

On the basis of the results in row 50, the formula in this row counts how many periods are yet to come until the next production line with the first packaging technique should be in use. The number that is stated in each period represents the number of periods up to and including the next operating production line with the first packaging technique. As the maximum number of periods that can be identified is ten (at the project horizon's starting point), we use the number eleven in case that no new operating production line is necessary anymore with this packaging technique before the end of the project horizon.

#2's (number of years up to and including its next operating (packaging) machine: Row 54

On the basis of the results in row 51, the formula in this row counts how many periods are yet to come until the next production line with the second packaging technique should be in use. The number that is stated in each period represents the number of periods up to and including the next operating production line with the second packaging technique. As the maximum number of periods that can be identified is ten (at the project horizon's starting point), we use the number eleven in case that no new operating production line is necessary anymore with this packaging technique before the end of the project horizon.

Standard production machinery investments: Row 55

The formula in this row is able to add up the following standard production machinery investments, that each have their own restrictions of when to be included and which are independent of the used packaging technique:

- The initial production machinery investment; which is only necessary – and, thus, included – at the starting point of the project horizon as this investment relates to the initial set-up of the production plant. Its value (as listed in Cell B74 on sheet "*Fill-in sheet*") is independent of the number of operating production lines and is automatically converted into the right currency.
- The standard production machinery investment per production line; which should only be added to the total investment whenever one or more new production lines are necessary in a subsequent period. As soon as it appears that this investment is necessary, its value (as listed

in Cell B76 on sheet "*Fill-in sheet*") is multiplied by the number of production lines to be purchased and installed and is converted into the right currency as well.

- The standard production machinery investment per two production lines; which should only be added to the total investment whenever the next odd number of operating production lines is reached or passed by in a subsequent period. As soon as it appears that this investment is necessary, its value (as listed in Cell B75 on sheet "*Fill-in sheet*") is included after being converted into the right currency.

Apart from that, this row will only return the correct total standard production machinery investment for each period as long as the increase in the number of necessary operating production lines per period does not rise above two.

Packaging machinery investments: Row 56

According to our blueprint, the first production line that will be installed always includes packaging machinery that is able to switch between both packaging techniques. Hereby, total unused capacity of the production lines with only one packaging technique can be decreased as much as possible. This is simply true because a production line that combines these two techniques is able to ensure more flexibility in the production capacity for both techniques. Moreover, it prevents the company from investing in two separate production lines (i.e. one for each packaging technique) as long as the necessary total production capacity is smaller than the capacity of one production line. Consequently, the first investment for packaging machinery always includes the costs for a production line that combines the two packaging techniques (i.e. the value of Cell E15 on sheet "*Fill-in sheet*" in its converted currency).

Subsequently, when additional capacity is required in the following period(s), our blueprint automatically selects and converts the investment costs for the packaging technique that will be the first to occupy a full production line because of its prospective sales volume. However, in case that two extra production lines are necessary in a subsequent period (except for the first period of our project horizon), the blueprint is restricted to a situation in which both packaging techniques cause this increase in necessary production capacity: Each of their prospective sales volume leads to the necessity of its own new production line. In other words, our blueprint is not able to process the investment costs for two production lines with identical packaging technique during the same period. Nevertheless, we believe that this restriction is reasonable as production (with the concerned packaging technique) would otherwise have to increase excessively.

Equipment investments: Row 57

This row contains two kind of equipment investments: (1) the initial equipment investment, which includes information technology, office and other smaller equipment and is only included at the starting point of the project horizon; and (2) a subsequent equipment investment (as a fixed percentage of the initial equipment investment), which is necessary whenever one or more new production lines are necessary in a subsequent period. Whenever one of these two equipment investments is incorporated in a period, its value is automatically converted into the right currency. In case of a subsequent equipment investment, the investment is even multiplied by the number of production lines to be purchased and installed during the period in question.

Total capital expenditures: Row 58

The company's total capital expenditure in each period is calculated by adding up all of the necessary yearly capital expenditures (i.e. the standard production machinery investments, the packaging machinery investments and the equipment investments), which are necessary in order to continue to meet the prospective demand.

Free cash flow (FCF): Row 60

Each period's FCF is calculated by adding its total depreciation (of Row 43), its change in operating working capital and its total capital expenditures to the tax-adjusted operating profit (ATCF) for the period in question.

Discounted FCF: Row 61

Each annual discounted FCF is the PV equivalent of its corresponding FCF in Row 60. Its value is computed by the multiplication of the period's PV factor with the corresponding FCF.

Net present value of FCFs: Row 62

In this row, all discounted FCFs of Row 61 are summated. Thereby, the alternative's NPV is found. As long as this value is greater than or equal to zero, the proposed horizontal FDI is profitable and worth the investment under the included input values. However, if the NPV has a negative value, the proposed horizontal FDI is not profitable. Whenever the required input values on sheet "*Fill-in sheet*" are adjusted, the NPV will change accordingly and, thereby, may lead to different recommendations.

Enterprise value (NPV of FCFs and Terminal Value): Row 63

The investigated alternative's enterprise value includes (1) the NPV and (2) the discounted terminal value (i.e. the discounted cash flows of the investigated alternative after the evaluated project horizon). It equals the total market value of the proposed alternative.

While the alternative's NPV is taken from Row 62 directly, its discounted terminal value is calculated by using the following formula[3]:

$$\left(\frac{the\ final\ period's\ FCF * (1 + the\ perpetuity\ growth\ rate)}{(the\ company's\ real\ discount\ rate - the\ perpetuity\ growth\ rate)}\right) * the\ final\ period's\ PV\ factor,$$

where the perpetuity growth rate equals the annual growth rate beyond the project horizon, which is automatically computed in Cell B14 on sheet "*Fill-in sheet*" on the basis of the input in Cell B13 of the same sheet.

When using this formula, there is only one restriction: the company's real discount rate cannot be lower than or equal to the perpetuity growth rate in order to achieve a positive (and finite) enterprise value.

7.3. Structure of the break-even analysis

Whenever the DCF analysis, whose structure was explained in the previous section, is able to compute a result for the NPV (and enterprise value), the break-even analysis can be performed automatically in our blueprint by pressing the following button on the "*Fill-in sheet*" sheet:

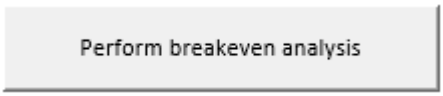

Figure 2 Activation button for the breakeven analysis

By pressing this button, the underlying macro is activated and ran directly and, as soon as the macro is completed, its results are given on sheet "*BEA*" in the additional file *HFDI_Blueprint.xlsm*.

The macro that runs the break-even analysis is incorporated in our blueprint by the use of Excel's programming language (i.e. Visual Basic for Applications (VBA)) and can be found in Table 5, Appendix C. It tries to find the NPV's break-even point by separately adjusting the following input factors' values, as we suspect these factors to carry a potentially decisive influence on the NPV's outcome:

[3] https://www.investopedia.com/university/dcf/dcf4.asp

- The nominal Dutch sales price.
- The starting sales volume.
- The federal tax rate.
- The year standard exchange rate.
- The real discount rate (after-tax MARR).

These factors have been selected to be included in the break-even analysis on the basis of our literature review in Section 2.4 and the input from Royal F&D.

When rows 62 and 63 of the "*DCF analysis*" sheet in the additional file *HFDI_Blueprint.xlsm* yield positive results under the corresponding input on sheet "*Fill-in sheet*", the proposed horizontal FDI is showing its first signs of a potentially successful investment. As a result of that, it should be possible now to determine and evaluate the NPV's corresponding break-even points for the five included factors. After activating the macro, an upper or lower limit is identified for each of them, dependent on their influence on the NPV's value. Subsequently, by comparing each factor's initial input value with its break-even point for the NPV, its current distance to this margin can be identified. As long as the input factor's value does not cross this break-even point under the current circumstances, its NPV will remain acceptable. Nevertheless, the closer a factor's initial input value is to its break-even point, the greater the risk that the proposed horizontal FDI may be an unwise investment. Consequently, when the proposed horizontal FDI's NPV is positive, the break-even analysis and its results – as given on sheet "*BEA*" in the additional file *HFDI_Blueprint.xlsm* – assist the user of our blueprint in evaluating the degree of risk for each of the five input factors individually. Based on this, the initial positive results for the proposed horizontal FDI are strengthened or weakened.

In case that row 62 of the "*DCF analysis*" sheet in the additional file *HFDI_Blueprint.xlsm* returns a negative NPV, the break-even analysis is only able to assist in determining the required input values which may lead to a DCF analysis that does break-even. Although the analysis might recommend break-even points which are beyond the possible ranges of the relevant input values (i.e. negative or excessively high) and, thereby, impossible break-even points, one could start by implementing the break-even point for the first input value that does suggest a realistic break-even point (i.e. a factor that is described to have an upper or lower limit instead an 'impossible solution') and that can be influenced by the company itself. After changing the value for this factor on the sheet "*Fill-in sheet*" and checking for its effect on the results of the "*DCF analysis*" sheet, the break-even analysis should be performed again to determine the (realistic) break-even points for the other input values under these new circumstances. If necessary and possible, this process can be repeated in a similar way until all input factors compute realistic break-even points.

Whenever the break-even analysis is performed, the columns on sheet "*BEA*" in the additional file *HFDI_Blueprint.xlsm* are filled in as follows:

- Column A states the name of each input factor evaluated.
- Column B includes the initial input value for each of the analysed input factors in the corresponding row.
- Column C renders the break-even point of each input factor in order to let the NPV break-even under the current circumstances;
- Column D defines whether the identified break-even point is an upper limit, lower limit, impossible solution for the NPV to break-even or the NPV's precise break-even point;
- Column E reproduces the NPV's precise break-even value, which is achieved in the DCF analysis when including the break-even point for the input factor in question. By that means, we are able to verify the correctness and accuracy of our break-even analysis.

7.4. Structure of the Monte Carlo simulation

In order to operationalise and implement the MCS, the following was necessary as a preparation:
On sheet "*MCS*", the DCF analysis is included again. However, here it is hidden in a group as direct insights in its details have little contribution to the conclusion that should be draw on the basis of the MCS. Nevertheless, the way in which some of the required input factors are included, has been changed in this DCF analysis. Probability distributions replace these input factors' previously fixed values in order to include uncertainty. On this basis, a new 'random' result is computed for the NPV each time one of the cells in the document is refreshed.

In accordance with the specified requirements for a financial evaluation in which uncertainties and/or risks are built-in (as described in Sections 6.1.2 and 6.2.2), we make use of normal distributions for the nominal Dutch sales prices, the year standard exchange rates and the two individual packaging costs in the DCF analysis on sheet "*MCS*".

Besides, the (hidden) DCF analysis on sheet "*MCS*" underwent the following additional adjustments:

- An additional row was inserted after Row 2. In this row, the year standard exchange rate is computed for each period in the project horizon on the basis of its normal distribution. So, except for the project horizon's starting point – for which the initial year standard exchange rate is still used –, each period's exchange rate is now selected randomly according to the identified probability distribution.
- Due to the insertion of this new row, all subsequent rows are moved down one row. Moreover, all subsequent rows – that first depended on the fixed value of the year standard exchange rate – are now influenced by the corresponding period's randomly computed exchange rate. In other words, each function, that originally included a reference to the fixed year standard exchange rate on sheet "*Fill-in sheet*", now refers to the corresponding period's year standard exchange rate in row 3 on sheet "*MCS*".

Apart from that, we have created two extra tables on sheet "*MCS*". The first table (in Columns N and O) will include the selected number of trials and the NPV for each of them whenever the MCS is performed. The second table (in Columns Q, R and S) automatically divides all individual results of the MCS into the specified ranges for the NPV, which are determined on the basis of the MCS' NPVs' mean and standard deviation. Thereby, we are able to assess the spread in the obtained NPV results when uncertainty is included.

Subsequently, whenever it is possible to perform the break-even analysis due to effective results for the DCF analysis (on sheet "*DCF analysis*") and the correct standard deviations have been identified for the required input factors (on sheet "*Fill-in sheet*"), we are able to perform the MCS. By pressing the following button on the "*Fill-in sheet*" sheet, the MCS's underlying macro is activated automatically:

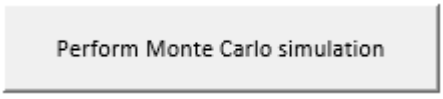

Figure 3 Activation button for the Monte Carlo simulation

After activating this macro, an input box first appears which prompts the user to enter the amount of trials desired during the MCS. Depending on the user's concerning input, one of the following two actions will occur:

- In case that an integer above zero is entered, the MCS is continued on the basis of this selected number of trials.
- In case that a negative value or zero is entered, the MCS is cancelled automatically.

Whenever an integer above zero is entered, this value is copy-pasted to cell O1 on sheet "*MCS*" in order to indicate the selected number of trials. Furthermore, previous results of the MCS are deleted, if necessary. Afterwards, this (first visible) table's subsequent rows are filled in according to the following method: First of all, each row will obtain a unique number in Column N to name the trial in question. Next, the corresponding NPV is copy-pasted from the hidden DCF analysis on sheet "*MCS*" to the adjacent cell in Column O and the correct number format is applied to it. This process is repeated in a similar way until all trials have been entered.

On the basis of the resulting list of NPVs, the second table (in Columns Q, R and S) automatically specifies the NPV for each – in Column Q determined – relative distance to the NPVs' mean, where the NPVs' standard deviation is the reference point for these relative distances. Subsequently, through the combination of each two – in Column R – consecutive resulting NPVs, relevant NPV-ranges are defined. Based on this, each trial is assigned to its appropriate NPV-range in Column S. Column S then calculates the total number of trials assigned to each of these ranges. Hereby, we are able to determine the distribution of the MCS' results over the relevant ranges.

Finally, the macro creates a histogram for the distribution of the MCS' results over the relevant ranges, where the most common value equals the NPVs' mean. In this way, the MCS' results are visualised and the subsequent evaluation of these results is facilitated. During the evaluation, the degree of risk of negative results is the most important aspect to study. The greater this degree of risk, the more likely that the proposed horizontal FDI is an unwise investment.

The macro that runs the MCS is incorporated in our blueprint by the use of VBA and can be found in Table 6, Appendix C.

7.5. Additional tools in our blueprint

In order to further increase the ease of use of our blueprint, we have added some extra tools to the additional file *HFDI_Blueprint.xlsm*. The following list explains each of them briefly:

- The following button is added on sheet "*Country Decision*":

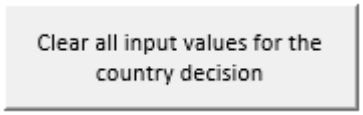

Figure 4 Delete button for the country decision's input values

  By pressing this button, it is possible to clear all of the required input values for a country decision at once. Thereby, the country decision can be restarted in a quick way.
  Before the button's underlying macro is fully activated, a message box pops-up which asks for another verification of this action as it cannot be undone after completion. Whenever the action is verified, all light grey cells on sheet "*Country Decision*" in the additional file *FHDI_Blueprint.xlsm* are emptied and change to a dark grey colour. Finally, another message box pops-up which explains that the macro was run successfully.
  The macro that runs this action is incorporated in our blueprint by the use of VBA and can be found in Table 7, Appendix C.
- The following button is added on sheet "*Fill-in sheet*":

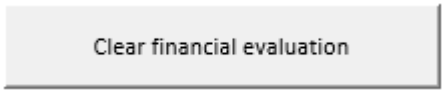

Figure 5 Delete button for the financial evaluation's input values and results

By pressing this button, it is possible to clear all of the required input values for and results of a financial evaluation at once. Thereby, the financial evaluation can be restarted in a quick way.

Before the button's underlying macro is fully activated, a message box pops-up which asks for another verification of this action as it cannot be undone after completion. Whenever the action is verified, all light grey cells on sheet "*Fill-in sheet*" in the additional file *FHDI_Blueprint.xlsm* are emptied and change to a dark grey colour. Besides, the corresponding results on all subsequent sheets are deleted. Finally, another message box pops-up which explains that the macro was run successfully.

The macro that runs this action is incorporated in our blueprint by the use of VBA and can be found in Table 8, Appendix C.

- The background colour of each empty input cell that still needs a value, changes from dark grey to lighter grey when filled in and vice versa. This helps the user of our blueprint to distinguish between cells that still need an input value and cells that already have one. Thereby, we made it possible to identify missing values more quickly when filling in the required input.
- A drop down list is added on sheet "*Fill-in sheet"* in Cell C51, from which the user has to choose whether state tax is imposed on: (1) gross receipts or (2) operating profit. Depending on the choice made, the corresponding cell(s) must be supplemented with the correct values so that the right provision for income taxes can be calculated in our blueprint.

8. Conclusion, Discussion and Recommendations

8.1. Conclusion

Now that we have implemented and operationalised our financial evaluation method for horizontal FDIs (i.e. our blueprint) and each sub-question has been addressed in one of the previous chapters, we are able to answer the main question of our research:

'To what extent is it possible to perform a thorough financial evaluation of a horizontal foreign direct investment of a Dutch multinational firm on the basis of literature, and what other aspects should be taken into account to let the evaluation be of practical relevance?'

On the basis of the literature review, we have been able to determine what is already known about (horizontal) FDIs and, consequently, which motives, determinants, risks, databases and theoretical models are readily available to support the financial evaluation of a horizontal FDI. During our literature review, it quickly became clear that no realistic theoretical model could be identified in the scientific articles studied. Therefore, we had to design our own FDI-specific financial evaluation method.

In order to design this financial evaluation method, we first determined and explained five (financial) evaluation techniques: the DCF analysis, the break-even analysis, the DTA, the MCS and the MCDA. Through our assessment and explanation of how these could be complemented with the results of our literature review and our research on further requirements for these evaluation techniques, we have laid the foundation for a practical financial evaluation method which we deemed to be capable of evaluating a horizontal FDI thoroughly.

Since it was not clear yet whether this financial evaluation method would work thoroughly, we had to test it. As a result of that, the proposed horizontal FDI of Royal F&D became a case study for our financial evaluation method, while we tried to find an answer for this company in the meantime whether it is financially feasible to expand its production abroad and, if so, where to do this preferably.

Based on Royal F&D's requirements, wishes and restrictions, we started off by comparing three countries in North-America using a nondimensional scaling compensatory MCDA. By that means, the USA was identified as the most suitable destination country for the proposed horizontal FDI with regard to its main performance for the relevant theoretical (horizontal) FDI determinants. Consequently, the nondimensional scaling compensatory MCDA – as included on Sheet *"Country Decision"* of the additional file *HFDI_Blueprint.xlsm* – is capable of selecting a destination country that has the most potential for a successful horizontal FDI.

Next, we have identified Akron, in the state of Ohio, as a realistic destination location within the USA and used it as the specific location by means of which we have implemented and operationalised our FDI-specific financial evaluation method.

On the basis of our comprehensive list of necessary specifications, which is related to the required input on sheet "*Fill-in sheet*" of the additional file *HFDI_Blueprint.xlsm*, the following three evaluation techniques have been implemented and operationalised one by one:

- The DCF analysis.
- The break-even analysis.
- The MCS.

Each of these evaluation techniques has been implemented and operationalised due to its relevance for our financial (i.e. quantitative) evaluation of the proposed horizontal FDI and due to the fact that

its analysis could be automated, by which the blueprint turns into a useful and practical financial evaluation tool.

Based on the subsequent results of our case study at Royal F&D, we have come to the conclusion that the implemented financial evaluation method is capable of performing a thorough financial evaluation of the proposed (kind of) horizontal FDI.

8.2. Discussion

8.2.1. Interpretation of the results

In our research, we have developed and tested a more practical financial evaluation method for the proposed kind of horizontal FDIs and looked into the financial feasibility of Royal F&D's proposed horizontal FDI. We have been able to do this through the combination of several (financial) evaluation techniques with the information of our literature review and the required practical information, specifications and assumptions. Based on our extensive explanation and discussion of each of these components, our description of how they are combined, the exclusion of theoretical determinants with an unclear or no relationship to (horizontal) FDI, and the comprehensive description of the resulting blueprint's structure, we ensure that our results are valid.

The final result of our research is (1) an initial recommendation to Royal F&D whether the proposed horizontal FDI seems financially feasible or not, and (2) a highly automated but practical financial evaluation method for similar kinds of horizontal FDIs, that can easily be altered if necessary or requested. As a result of the latter, we are convinced that the blueprint, as included in the additional file *HFDI_Blueprint.xlsm*, makes it possible to evaluate similar kinds of horizontal FDIs in a fast yet detailed quantitative way. Each incorporated analysis technique includes relevant theoretical components, while being adapted to practice in the meantime, in which user-friendliness, simplicity, the possibility for adjustments but also accuracy are important requirements.

8.2.2. Limitations of the results

It must be taken into account that our blueprint was implemented and operationalised on the basis of several – but yet as few as possible – restrictions in order to simplify the financial evaluation, partly because of the underlying information's confidentiality. Through an investigation of how these restrictions could be eliminated without a disproportionate increase in the required input, the blueprint's accuracy could be improved.

Furthermore, we did not have the possibility to implement and operationalise all of the (financial) evaluation techniques initially described. Consequently, it could be investigated whether it is of added value yet to implement and operationalise the remaining (financial) evaluation techniques.

8.2.3. Suggestions for future research

Aside from the indirect suggestions for future research in the previous subsection, we give the following additional suggestions:

- Look into the possibilities for incremental comparison of different horizontal FDI alternatives in order to enable a directly decisive comparison of these different alternatives.
- Assess the added value of modifying the country decision's nondimensional scaling compensatory MCDA method to a noncompensatory MCDA additive weighting technique and, subsequently, act on the concerned findings.
- Assess the added value of extending our blueprint with not described methods of analysis, such as a scenario analysis or sensitivity analysis, and, subsequently, act on the concerned findings.

- Look into the possibility of implementing almost fully-automated bootstrapping in the MCS, as a replacement for our current assumption of normal distributions. We believe that this will improve the accuracy of the MCS' results.
- Due to the fact that our financial evaluation method was only implemented and operationalised for Royal F&D's case study, we are convinced that it would be a right next step to further test the blueprint and to adjust it where necessary. This can be achieved through its implementing at/for different locations, firms and situations. Only by that means, we can validate whether and how our blueprint may be used for other horizontal FDIs.

8.3. Recommendations

Since we have achieved very positive and realistic results for the proposed case study by our financial evaluation method, we recommend Royal F&D to use the blueprint as a supporting tool in its final decision making process. With this, the company is (at least) assisted in whether the proposed horizontal FDI in the city of and/or area around Akron, in the state of Ohio (USA), is a feasible solution to its expected future capacity problem or not.

Nevertheless, in case that Royal F&D is not yet convinced of our specific location decision, we advise them to assess the results of a few more locations in the USA as a check-up and/or comparison of these different locations.

Next, we recommend Royal F&D to investigate its negotiating position with respect to its logistics and sales partner(s) in order to find out whether it can capture even more added value, independently of the obtained results in our blueprint.

Apart from that, we believe that it is wise to investigate the financial results when export is continued – under a similar prospective demand – in order to verify whether the proposed horizontal FDI actually represents the best solution for the expected future capacity problem or not.

A last, more independent, recommendation would be to investigate the local costs for all product components and both packaging techniques and, then, to implement these prices in our blueprint. Most of all, as this will lead to an even more accurate decision on the proposed horizontal FDI.

References

Agénor, P.-R. (2003). Benefits and Costs of International Financial Integration: Theory and Facts. *The World Economy, 26*(8), 1089-1118.

Alfaro, L., & Charlton, A. (2009). Intra-Industry Foreign Direct Investment. *American Economic Review, 99*(5), 2096-2119.

Bagchi, P., Lejeune, M., & Alam, A. (2014). How supply competency affects FDI decisions: Some insights. *International Journal Production Economics, 147*, 239-251.

Behrens, K., & Picard, P. (2005). Tax competition, location, and horizontal foreign direct investment. *CORE Discussion paper*(91).

Boubacar, I. (2016). Spatial determinants of U.S. FDI and exports in OECD countries. *Economic Systems, 40*, 135-144.

Brainard, S. (1997). An Empirical Assessment of the Proximity-Concentration Trade-off Between Multinational Sales and Trade. *American Economic Review, 87*(4), 520-544.

Buch, C., Kesternich, I., Lipponer, A., & Schnitzer, M. (2009). Financial constraints and the margins of FDI. *Economic Studies, 29*(1), 1-60.

Conconi, P., Sapir, A., & Zanardi, M. (2016). The internationalization process of firms: From exports to FDI. *Journal of International Economics, 99*, 16-30.

De Maeseneire, W., & Claeys, T. (2012). SMEs, foreign direct investment and financial constraints: The case of Belgium. *International Business Review, 21*, 408-424.

El-Sahli, Z., Gullstrand, J., & Olofsdotter, K. (2016, July). Exploring Outward FDI and the Choice of Destination: Evidence from Swedish Firm-Level Data. *Department of Economics Working Paper, 16*, 1-6.

Forte, R., & Silva, V. (2017). Outward FDI and Home Country Exports: THeoretical Approaches and Empirical Evidence. *The International Trade Journal, 31*(3), 245-271.

Garretsen, H., & Peeters, J. (2009). FDI and the Relevance of Spatial Linkages: Do Third-Country Effects Matter for Dutch FDI? *Review of World Economics, 2*, 319-338.

Goolsbee, A., Levitt, S., & Syverson, C. (2013). *Microeconomics.* Basingstoke: Macmillan Higher Education.

Helpman, E., & Krugman, P. (1985). *Market Structure and Foreign Trade.* Cambridge: MIT Press.

Helpman, E., Melitz, M., & Yeaple, S. (2003, January). Export versus FDI. *National Bureau of Economic Research Working Paper Series, 9439*, 1-46.

Hogenbirk, A., & Narula, R. (1999). Globalisation and the Small Economy: The Case of the Netherlands. In D. Van Den Bulcke, & A. Verbeke, *Globalization and the Small Economy (Forthcoming)* (pp. 1-29). Maastricht: MERIT.

Ito, T. (2013). Export-Platform Foreign Direct Investment: Theory and Evidence. *The World Economy*, 563-581.

Krautheim, S. (2013). Export-supporting FDI. *Canadian Journal of Economics, 46*(4), 1571-1605.

Kurmanalieva, E. (2006, October). Transport Costs in International Trade. Jon Haveman.

Lin, H.-L., Hsiao, Y.-C., & Lin, E. (2015). The choice between standard and non-standard FDI production strategies for Taiwanese multinationals. *Research Policy, 44*, 283-293.

Monarrez, S. (2011). Locational Determinants of FDI for Different Industries across States: the Case of Mexico. Retrieved from https://ssrn.com/abstract=1760252

Nayak, D., & Choudhury, R. (2014, March). A selective review of foreign direct investment theories. *ARTNeT Working Paper Series, 143*, 1-35.

Neary, J. (2009). Trade costs and foreign direct investment. *International Review of Economics and Finance, 18*, 207-218.

Pontes, J. (2004). A Theory of the Relationship between Foreign Direct Investment and Trade. *Economics Bulletin, 6*(2), 1-8.

Shank, J., & Peterson, D. (2005). Strategic cost analysis for capital spending decisions. *Cost Management, 19*(4), 14-20.

Sullivan, W., Wicks, E., & Koelling, C. (2015). *Engineering Economy* (16th ed.). Upper Saddle River: Pearson Higher Education, Inc.

Tao, F., Liu, X., Gao, L., & Xia, E. (2017). Do cross-border mergers and acquisitions increase short-term market performance? The case of Chinese firms. *International Business Review, 26*, 189-202.

Tintelnot, F. (2017). Global Production with Export Platforms. *The Quarterly Journal of Economics, 132*(1), 157-209.

Toulemonde, E. (2008). Multinationals: Too Many or Too Few? - The Proximity-concentration Trade-off. *Open Economies Review, 19*, 203-219.

Appendices

A. Literature Review

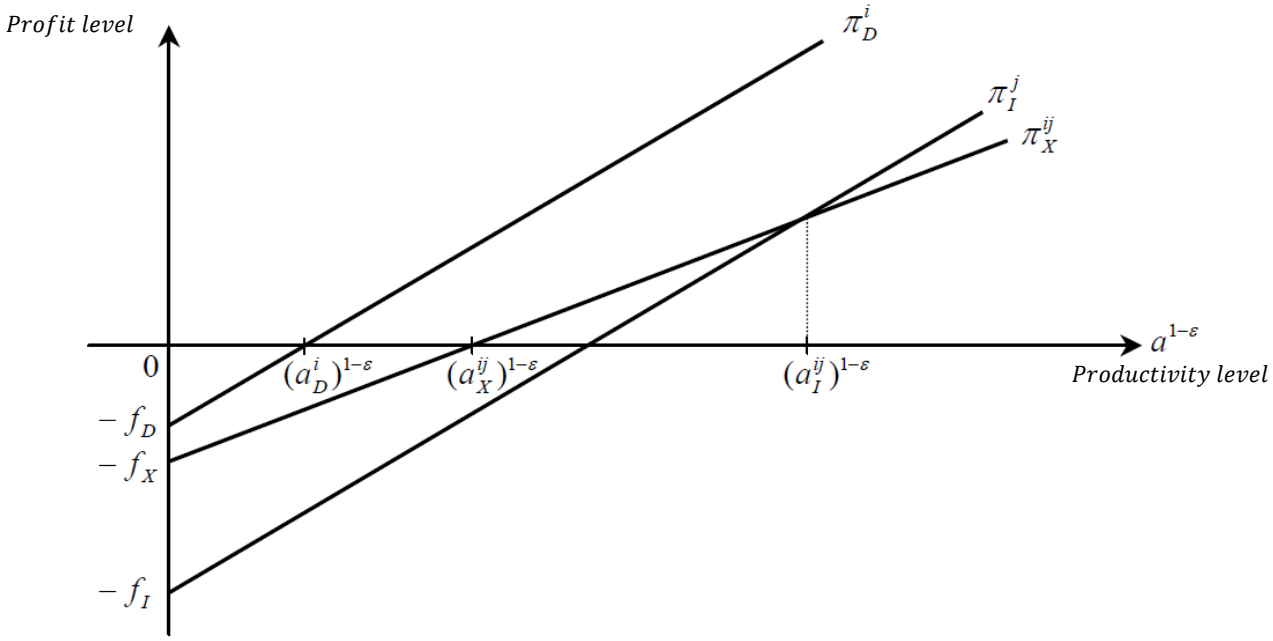

Figure 6 Profit margins according to productivity level (Helpman et al., 2003)

The authors of Figure 6 assume fixed costs for export to visualise this graph. Moreover (Helpman et al., 2003):

- $(a_D^i)^{i-\varepsilon}$ determines the productivity level at which firms start to make profit in their home country;
- $(a_X^{ij})^{i-\varepsilon}$ determines the productivity level at which firms start to make profit by exporting;
- $(a_I^{ij})^{i-\varepsilon}$ determines the productivity level at which it is more profitable for firms to engage in FDI than in export.

	FDI mode						FDI sales
Determinant	Overall	Horizontal	Vertical	Export-platform	Hybrid	Heterogeneous	
Third-country effects/export				+ [1, 2]	+ [1, 2]		
Trade costs		+ [3, 4, 5, 6, 7, 8, 9, 10, 11, 12]	- 3	- [13]			
Market size of the destination country		+ [3, 8, 14]					
Factor prices		- [3, 15]	+ [3, 15]				
Fixed investment costs	- [3, 5, 11, 14, 16]						
Productivity		+ [14]	+ [3]				
Firm size			+ [3]			+ [3]	
Being a hi-tech firm		+ [3]					
Experience (to invest) abroad		+ [3,17]					
Trade liberalisation	+ [1, 9, 11, 13, 15, 16] - [9, 11, 17]						
Market potential				+ [13]			
Economies of scale	- [5, 6, 7, 9, 10, 15, 16]	- [5, 6, 7, 9, 10, 15, 16]					
Spread in productivity of firms in an industry							+ [7]
Marketing intensity							+ [5]
Enforceability of financial agreement		+ [14]					+ [14]
Retained profit at the foreign production plant							+ [14]

Table 3 Specific impact of determinants

[1] (Boubacar, 2016)

[2] (Garretsen & Peeters, 2009)

[3] (Lin et al., 2015)

[4] (Behrens & Picard, 2005)

[5] (Brainard, 1997)

[6] (Forte & Silva, 2017)

[7] (Helpman et al., 2003)

[8] (Monarrez, 2011)

[9] (Nayak & Choudhury, 2014)

[10] (Pontes, 2004)

[11] (Toulemonde, 2008)

[12] (Krautheim, 2013)

[13] (Ito, 2013)

[14] (Buch et al., 2009)

[15] (Tintelnot, 2017)

[16] (Neary, 2009)

[17] (Conconi et al., 2016)

B. Location Decision

Factors for the initial specific location decision	**Selected by Royal F&D**
Quality of infrastructure	
Distance to own clients, distributors and possible suppliers	✓
Cultural differences between home country and destination country	
Presence of home country bank in the destination country	
Presence of similar type of firms	
Degree of economic stability/growth	
(Corporate) tax rates	✓
Ease of obtaining air permits	
Climatic conditions	
Construction prices	✓
Availability of natural gas	✓
Distance between home country and destination location (also in travel time)	
Wage rate	✓
Tax benefits and/or subsidies	✓
Availability of well-trained staff	✓
Local availability of raw materials and/or product components	
Possibility of expanding the location	
Close to highway	

Table 4 Specific location factors

C. Implementation and Operationalisation of our Financial Evaluation Method

Table 5, Table 6, Table 7 and Table 8 are included in this appendix in order to give direct insight in our VBA codes to those who are not familiar with the application VBA.

```
Sub goalseek()

' Auxiliary variable in order to keep the initial input value of the selected (risk) factors
Dim SPInit As Variant
Dim SVInit As Variant
Dim FTInit As Variant
Dim EXCHInit As Variant
Dim RDRInit As Variant
Dim NPVInit As Variant

' Auxiliary variable in order to allocate the results of our break-even analysis
Dim BEP As Range

' Assign reference to initial input value of the selected (risk) factor
SPInit = Sheets("Fill-in sheet").Range("Salesprice").Value
SVInit = Sheets("Fill-in sheet").Range("StartingSV").Value
FTInit = Sheets("Fill-in sheet").Range("FTax").Value
EXCHInit = Sheets("Fill-in sheet").Range("EXCH").Value
RDRInit = Sheets("Fill-in sheet").Range("ATMARR").Value
NPVInit = Sheets("DCF analysis").Range("NPV").Value

' Preset format of nominal Dutch sales price number
Sheets("Fill-in sheet").Range("Salesprice").NumberFormat = " [$€-809]* #,##0.0000_); [$€-809]* -#,##0.0000"

' Prevent the screen from updating while running the macro
Application.ScreenUpdating = False

' Additional pre-setup

Set BEP = Sheets("BEA").Range("A2")

Sheets("BEA").Activate

With Application
   .MaxIterations = 32767
   .MaxChange = 0.0001
End With

' Goal seek for nominal Dutch Sales price
Sheets("DCF analysis").Range("NPV").goalseek (0), ChangingCell:=Sheets("Fill-in sheet").Range("Salesprice")

   BEP.Offset(0, 0).Value = Sheets("Fill-in sheet").Range("SPFactor").Value
   BEP.Offset(0, 1).Value = SPInit
   BEP.Offset(0, 2).Value = Sheets("Fill-in sheet").Range("Salesprice").Value

   If NPVInit > 0 Then
      If BEP.Offset(0, 2).Value < BEP.Offset(0, 1).Value Then
         BEP.Offset(0, 3).Value = "Lower limit"
            Else
               BEP.Offset(0, 3).Value = "Upper limit"
      End If
      Else
         If BEP.Offset(0, 2).Value > BEP.Offset(0, 1).Value Then
            BEP.Offset(0, 3).Value = "Lower limit"
               Else
                  BEP.Offset(0, 3).Value = "Upper limit"
         End If
```

```
    End If

    BEP.Offset(0, 4).Value = Sheets("DCF analysis").Range("NPV").Value

    If BEP.Offset(0, 2).Value < 0 Or BEP.Offset(0, 4).Value > 0.0001 Or BEP.Offset(0, 4).Value < -0.0001 Then
       BEP.Offset(0, 3).Value = "Impossible solution"
          Else
             If BEP.Offset(0, 2).Value = BEP.Offset(0, 1).Value Then
                BEP.Offset(0, 3).Value = "Breakeven point"
                   Else
             End If
    End If

Sheets("Fill-in sheet").Range("Salesprice").Value = SPInit

' Goal seek for starting sales volume
Sheets("DCF analysis").Range("NPV").goalseek (0), ChangingCell:=Sheets("Fill-in sheet").Range("StartingSV")

    BEP.Offset(1, 0).Value = "Starting sales volume"
    BEP.Offset(1, 1).Value = SVInit * 1000000
    BEP.Offset(1, 2).Value = Sheets("Fill-in sheet").Range("StartingSV").Value * 1000000

    If NPVInit > 0 Then
       If BEP.Offset(1, 2).Value < BEP.Offset(1, 1).Value Then
          BEP.Offset(1, 3).Value = "Lower limit"
             Else
                BEP.Offset(1, 3).Value = "Upper limit"
       End If
       Else
          If BEP.Offset(1, 2).Value > BEP.Offset(1, 1).Value Then
             BEP.Offset(1, 3).Value = "Lower limit"
                Else
                   BEP.Offset(1, 3).Value = "Upper limit"
          End If
    End If

    BEP.Offset(1, 4).Value = Sheets("DCF analysis").Range("NPV").Value

    If BEP.Offset(1, 2).Value < 0 Or BEP.Offset(1, 4).Value > 0.0001 Or BEP.Offset(1, 4).Value < -0.0001 Then
          BEP.Offset(1, 3).Value = "Impossible solution"
          Else
             If BEP.Offset(1, 2).Value = BEP.Offset(1, 1).Value Then
                BEP.Offset(1, 3).Value = "Breakeven point"
                   Else
             End If
    End If

Sheets("Fill-in sheet").Range("StartingSV").Value = SVInit

' Goal seek for federal tax rate
Sheets("DCF analysis").Range("NPV").goalseek (0), ChangingCell:=Sheets("Fill-in sheet").Range("FTax")

    BEP.Offset(2, 0).Value = Sheets("Fill-in sheet").Range("FTRFactor").Value
    BEP.Offset(2, 1).Value = FTInit
    BEP.Offset(2, 2).Value = Sheets("Fill-in sheet").Range("FTax").Value

    If NPVInit > 0 Then
       If BEP.Offset(2, 2).Value < BEP.Offset(2, 1).Value Then
          BEP.Offset(2, 3).Value = "Lower limit"
             Else
                BEP.Offset(2, 3).Value = "Upper limit"
       End If
       Else
```

```
            If BEP.Offset(2, 2).Value > BEP.Offset(2, 1).Value Then
               BEP.Offset(2, 3).Value = "Lower limit"
                  Else
                     BEP.Offset(2, 3).Value = "Upper limit"
            End If
      End If

      BEP.Offset(2, 4).Value = Sheets("DCF analysis").Range("NPV").Value

      If BEP.Offset(2, 2).Value < 0 Or BEP.Offset(2, 2).Value > 1 Or BEP.Offset(2, 4).Value > 0.0001 Or BEP.Offset(2, 4).Value < -0.0001
   Then
         BEP.Offset(2, 3).Value = "Impossible solution"
            Else
               If BEP.Offset(2, 2).Value = BEP.Offset(2, 1).Value Then
                  BEP.Offset(2, 3).Value = "Breakeven point"
                     Else
               End If
      End If

   Sheets("Fill-in sheet").Range("FTax").Value = FTInit

   ' Goal seek for destination country's currency
   Sheets("DCF analysis").Range("NPV").goalseek (0), ChangingCell:=Sheets("Fill-in sheet").Range("EXCH")

      BEP.Offset(3, 0).Value = Sheets("Fill-in sheet").Range("EXCHFactor").Value
      BEP.Offset(3, 1).Value = EXCHInit
      BEP.Offset(3, 2).Value = Sheets("Fill-in sheet").Range("EXCH").Value

      If NPVInit > 0 Then
         If BEP.Offset(3, 2).Value < BEP.Offset(3, 1).Value Then
            BEP.Offset(3, 3).Value = "Lower limit"
               Else
                  BEP.Offset(3, 3).Value = "Upper limit"
         End If
         Else
            If BEP.Offset(3, 2).Value > BEP.Offset(3, 1).Value Then
               BEP.Offset(3, 3).Value = "Lower limit"
                  Else
                     BEP.Offset(3, 3).Value = "Upper limit"
            End If
      End If

      BEP.Offset(3, 4).Value = Sheets("DCF analysis").Range("NPV").Value

      If BEP.Offset(3, 2).Value < 0 Or BEP.Offset(3, 4).Value > 0.0001 Or BEP.Offset(3, 4).Value < -0.0001 Then
         BEP.Offset(3, 3).Value = "Impossible solution"
            Else
               If BEP.Offset(3, 2).Value = BEP.Offset(3, 1).Value Then
                  BEP.Offset(3, 3).Value = "Breakeven point"
                     Else
               End If
      End If

   Sheets("Fill-in sheet").Range("EXCH").Value = EXCHInit

   ' Goal seek for the real discount rate (after-tax MARR)
   Sheets("DCF analysis").Range("NPV").goalseek (0), ChangingCell:=Sheets("Fill-in sheet").Range("ATMARR")

      BEP.Offset(4, 0).Value = Sheets("Fill-in sheet").Range("ATMFactor").Value
      BEP.Offset(4, 1).Value = RDRInit
      BEP.Offset(4, 2).Value = Sheets("Fill-in sheet").Range("ATMARR").Value

      If NPVInit > 0 Then
```

```
        If BEP.Offset(4, 2).Value < BEP.Offset(4, 1).Value Then
          BEP.Offset(4, 3).Value = "Lower limit"
            Else
              BEP.Offset(4, 3).Value = "Upper limit"
        End If
        Else
          If BEP.Offset(4, 2).Value > BEP.Offset(4, 1).Value Then
            BEP.Offset(4, 3).Value = "Lower limit"
              Else
                BEP.Offset(4, 3).Value = "Upper limit"
          End If
    End If

    BEP.Offset(4, 4).Value = Sheets("DCF analysis").Range("NPV").Value

    If BEP.Offset(4, 2).Value < 0 Or BEP.Offset(4, 2).Value > 1 Or BEP.Offset(3, 4).Value > 0.0001 Or BEP.Offset(3, 4).Value < -0.0001
Then
        BEP.Offset(4, 3).Value = "Impossible solution"
          Else
            If BEP.Offset(4, 2).Value = BEP.Offset(4, 1).Value Then
              BEP.Offset(4, 3).Value = "Breakeven point"
                Else
            End If
    End If

Sheets("Fill-in sheet").Range("ATMARR").Value = RDRInit

' Format all cells that will include the results for our break-even analysis
BEP.Offset(0, 1).NumberFormat = " [$€-809]* #,##0.0000_); [$€-809]* -#,##0.0000"
BEP.Offset(0, 2).NumberFormat = " [$€-809]* #,##0.0000_); [$€-809]* -#,##0.0000"
BEP.Offset(0, 4).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"
BEP.Offset(1, 1).NumberFormat = "#,##0.00"
BEP.Offset(1, 2).NumberFormat = "#,##0.00"
BEP.Offset(1, 4).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"
BEP.Offset(2, 1).NumberFormat = "#0.00%"
BEP.Offset(2, 2).NumberFormat = "#0.00%"
BEP.Offset(2, 4).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"
BEP.Offset(3, 1).NumberFormat = "#0.00"
BEP.Offset(3, 2).NumberFormat = "#0.00"
BEP.Offset(3, 4).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"
BEP.Offset(4, 1).NumberFormat = "#0.00%"
BEP.Offset(4, 2).NumberFormat = "#0.00%"
BEP.Offset(4, 4).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"

' Turn screen updating on
Application.ScreenUpdating = True

Range("A1").Select

End Sub
```

Table 5 VBA Code for the macro of our break-even analysis

```
Sub MCS()

' Declaration of variables
Dim Nmbrtrials As Long
Dim Trial As Integer
Dim NPVMCS As Variant
Dim Min As Variant
Dim Max As Variant
Dim MCSResult As Range
Dim cell As Range
Dim histogram As Range

' Ask for the amount of trials as an input
Nmbrtrials = Application.InputBox("How many trials would you like to run?", , 1000)
If Nmbrtrials = 0 Or StrPtr(Nmbrtrials) = 0 Or Nmbrtrials < 0 Then
GoTo Quit:
Else
Sheets("MCS").Range("O1") = Nmbrtrials
MsgBox ("The selected amount of trials is set to " & Nmbrtrials & ".")
End If

' Prevent the screen from updating while running the macro
Application.ScreenUpdating = False

' Go to MCS sheet
Sheets("MCS").Activate

' Pre-setup
Set MCSResult = Sheets("MCS").Range("O1")
Set NPVMCS = Sheets("MCS").Range("B63")

' Clear previous trials
Sheets("MCS").Range("N3:O1048576").Select
Selection.ClearContents

' Clear chart if present
If Sheets("MCS").ChartObjects.Count > 0 Then
   Sheets("MCS").ChartObjects.Delete
End If

' Compute NPV results for chosen amount of trials
For Trial = 1 To MCSResult.Value
   MCSResult.Offset(Trial + 1, -1) = Trial
   MCSResult.Offset(Trial + 1, 0) = NPVMCS
   MCSResult.Offset(Trial + 1, 0).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"
Next Trial

MCSResult.Offset(MCSResult.Value + 1, 0) = "=B63"
MCSResult.Offset(MCSResult.Value + 1, 0).NumberFormat = " [$$-809]* #,##0.0000_); [$$-809]* -#,##0.0000"

' Determining the input for the histogram of the NPV results
' Find initial cell that contains a value (at or just below the minimum NPV of the Monte Carlo simulation)
Min = Application.Min(Sheets("MCS").Range("R2:R33"))

For Each cell In Sheets("MCS").Range("R2:R33")
   If cell.Value = Min Then
      Minaddress = cell.Address
      Exit For
   End If
Next cell

' Find last cell that contains a value (at or just above the maximum NPV of the Monte Carlo simulation)
Max = Application.Max(Sheets("MCS").Range("R2:R33"))
```

```
For Each cell In Sheets("MCS").Range("R2:R33")
   If cell.Value = "More" Then
      Maxaddress = cell.Address
      Exit For
   End If
Next cell

If Maxaddress = Empty Then
   For Each cell In Sheets("MCS").Range("R2:R33")
      If cell.Value = Max Then
         Maxaddress = cell.Address
         Exit For
      End If
   Next cell
   Else
End If

' Create histogram of the NPV values over the identified range
Set histogram = Application.Union(Sheets("MCS").Range("$R$1:$S$1"), Sheets("MCS").Range(Minaddress,
Maxaddress).Offset(0, 1), Sheets("MCS").Range(Minaddress, Maxaddress))

histogram.Select
histogram.Activate

ActiveSheet.Shapes.AddChart2(201, xlColumnClustered).Select
ActiveChart.SetSourceData Source:=histogram
ActiveChart.Parent.Name = "NPVFrequency"

With ActiveChart.SeriesCollection(1)
   .XValues = Sheets("MCS").Range(Minaddress, Maxaddress)
   .Values = Sheets("MCS").Range(Minaddress, Maxaddress).Offset(0, 1)
End With

' Delete all unnecessary information in chart
ActiveChart.FullSeriesCollection(2).Select
Selection.Delete

ActiveChart.Legend.Select
Selection.Delete

' Lay-out of chart
With ActiveChart
   .SetElement (msoElementPrimaryCategoryAxisTitleAdjacentToAxis)
   .Axes(xlCategory).HasTitle = True
   .Axes(xlCategory).AxisTitle.Select
   .Axes(xlCategory, xlPrimary).AxisTitle.Text = "NPV"

   .SetElement (msoElementPrimaryValueAxisTitleAdjacentToAxis)
   .Axes(xlValue).HasTitle = True
   .Axes(xlValue).AxisTitle.Select
   .Axes(xlValue, xlPrimary).AxisTitle.Text = "Frequency"

   .ChartTitle.Text = "Frequency histogram for unique NPV trials"
End With

' Rescale chart
Sheets("MCS").Shapes("NPVFrequency").ScaleWidth 1.3423597679, msoFalse, msoScaleFromTopLeft
Sheets("MCS").Shapes("NPVFrequency").ScaleHeight 1.1483516484, msoFalse, msoScaleFromTopLeft

' Add trendline to chart
ActiveChart.FullSeriesCollection(1).Trendlines.Add
ActiveChart.FullSeriesCollection(1).Trendlines(1).Select
```

X

```
    With Selection
        .Type = xlMovingAvg
        .Period = 2
    End With
    With Selection.Format.Line
        .Visible = msoTrue
        .ForeColor.ObjectThemeColor = msoThemeColorAccent2
    End With

' Position chart
With Sheets("MCS").Shapes("NPVFrequency")
    .Left = Range("U7").Left
    .Top = Range("U7").Top
End With

' Turn screen updating on
Application.ScreenUpdating = True

' If the Monte Carlo simulation was cancelled or the amount of trials was set to zero
Quit:
If Nmbrtrials = 0 Or StrPtr(Nmbrtrials) = 0 Or Nmbrtrials < 0 Then
    MsgBox "The Monte Carlo simulation was cancelled.", vbInformation + vbOKOnly
    Else
    Sheets("MCS").Range("N1").Select
End If

End Sub
```

Table 6 VBA Code for the macro of our Monte Carlo simulation

```
Sub ClearCD()

Dim Message As String
Dim Answer As Variant
Dim Rng As Range

Message = "Are you sure about clearing all existing input values?"
Answer = MsgBox(Message, vbExclamation + vbYesNo + vbDefaultButton2)

' Activate warning message whenever the button 'Clear all input values for the country decision' is pressed
Select Case Answer

    Case vbYes

    ' Prevent the screen from updating while running the macro
    Application.ScreenUpdating = False

      ' Clear all input values for the country decision
      Range("D2:F3,D6:F25,A30,B30:C33").Select
      Selection.ClearContents

    ' Turn screen updating on
    Application.ScreenUpdating = True

    Range("A1").Select

      ' Confirm completion of the selected action
      Select Case MsgBox("All input values have been cleared successfully.", vbOKOnly)
      End Select

    Case vbNo

      ' Cancel initiated action
      GoTo Quit:

  End Select

Quit:
End Sub
```

Table 7 VBA Code for the macro that clears the current country decision input

```
Sub Clearinput()

Dim Message As String
Dim Answer As Variant
Dim Rng As Range

Message = "Are you sure about clearing all existing input values and results?"
Answer = MsgBox(Message, vbExclamation + vbYesNo + vbDefaultButton2)

' Activate warning message whenever the button 'Clear financial evaluation' is pressed
Select Case Answer

    Case vbYes

    ' Prevent the screen from updating while running the macro
    Application.ScreenUpdating = False

      ' Clear all existing necessary input values on the Fill-in sheet

Range("A3,B3:B13,C2:D2,F3,F6,C15:E15,A18:C25,B28,C28:D29,B31,B33:B35,C38:C39,B40:B44,B47,B50,B51:C51,B52,B53:
E54,B56:B61,B63,B65:B84,C88,D87:D90").Select
      Selection.ClearContents

      ' Clear all results of the break-even analysis
      Sheets("BEA").Activate
      Range("A2:E6").Select
      Selection.ClearContents

      ' Clear all trials and the chart of the Monte Carlo simulation
      Sheets("MCS").Activate
      Range("O1,N3:O1048576").Select
      Selection.ClearContents

      If Sheets("MCS").ChartObjects.Count > 0 Then
            Sheets("MCS").ChartObjects.Delete
      End If

    ' Turn screen updating on
    Application.ScreenUpdating = True

      ' Return to Fill-in sheet
      Sheets("Fill-in sheet").Activate
      Range("A1").Select

      ' Confirm completion of the selected action
      Select Case MsgBox("All input values and results have been cleared successfully.", vbOKOnly)
      End Select

    Case vbNo

      ' Cancel initiated action
      GoTo Quit:

  End Select

Quit:
End Sub
```

Table 8 VBA Code for the macro that clears the current financial evaluation in full