Master Thesis

The influence of parent firm and subsidiary-specific characteristics on innovation outcomes.

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Date	**: 1 August 2021**
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Preface

My curiosity for the subject of this thesis came from my own experience. The company I was working for had started years ago as a privately owned company. The company had started its production when the founder noticed the need for specific products in the area where he lived. The company grew and expanded to other areas and countries. Many years later I joined this company and not much later the company was bought by a listed Belgium Multinational. Being part of an MNE things changed. On one hand being part of an MNE does offer advantages like sharing knowledge and for instance being able to make use of MNEs professional IT and legal departments. On the other hand, we were no longer fully in control of our own destiny as we needed to align with MNEs strategic decisions. This made me wonder what the future would bring. Why did this MNE buy us and how could it benefit from our local knowledge while integrating us in their ways of working. It made me curious what existing literature could say about lessons learned. This is when I noticed the gap for my thesis and that was the beginning of this journey.

When writing this thesis, I more than once drifted from my subject. Without my Mentor Elko Klijn, I would probably have been lost in this ocean of literature. He really helped me to focus on my subject and leave out all other interesting, but not relevant information.

Therefore, a big thank you to Elko Klijn for guiding me through this thesis and of course a very special thanks to the support of my wife Lia and my children Emma and Gijs. They kept me going.

Reynout Walkate

Executive summary

Introduction and theoretical background

This study focuses on firm characteristics of multinational enterprises (MNEs) that influence innovation. The reasons for companies to pursue innovation is studied by many scholars. We support the following reasons for innovation. First, innovation is needed to meet markets changing or emerging demands (Benner & Tushman, 2001; Jansen & Van Den Bosch, 2006). In addition, innovation can obtain a competitive advantage (Govindarajan & Trimble, 2005). While organizations can have different reasons for innovating, some companies seem to be more successful than others in pursuing and in achieving innovation (Venkatraman & Prescott, 1990). MNEs operate on a global scale and canhave several foreign subsidiaries operating in different market situations. How can MNEs succesfully respond to changing environments and how can they obtain and sustain a competative advantage from innovation? Parent firm characteristics, like global strategy and research and development (R&D) investments can influence innovational succes. Next to that the subsidiaries need to align with the parent firm although local foreign subsidiaries market conditions may require adaption to be competative on these local markets. The external factors coming from subsidiaries local market as well as the subsidiaries governance are two subsidiary characteristics we therefore expect to have an influence on MNEs innovational succes. In this study we therefore not only focus on the influence of MNEs parent firm characteristics (PFC) on innovation, but we also explore the influence of foreign subsidiary characteristics (SSC) on innovation.

The research questions therefore are as follows:

RQ 1: What is the effect of parent firm characteristics on the levels of innovation?

RQ 2: How do the responsibilities of local subsidiary TMTs affect these relationships?

Content

Introduction

A significant number of organizations cross their domestic boarders to expand their business. In search for a sustainable competitive advantage over their rivals, Multi National Enterprises (MNEs) strive for innovational success (Birkinshaw et al., 1998;Teece, 2010). These MNEs expand their businesses via foreign subsidiaries. In this study, we take a closer look at the innovative strategy of MNEs and at firm characteristics that influence the results of their strategy. Much research has been done about the influence of parent firm characteristics on innovation Yet, despite significant research efforts, less is known about the role of the foreign subsidiary in MNEs pursuit of innovation (Delany, 2000)

Innovation can be divided in two types of innovation; exploitative and explorative innovation. When pursuing exploitational innovation, companies strive for operational excellence of the current situation, they try to improve and optimize their current business in order to achieve competitive advantage. Explorative innovation is different and is used to the search for new products, markets or alternative ways to obtain a competitive advantage. Often the innovative strategy is a combination of both exploitative and explorative innovation (March, 1991; Govindarajan & Trimble, 2005; Jansen & Van Den Bosch, 2006).

As these foreign subsidiaries are part of the MNEs innovative strategy, how can they contribute to the innovation the parent firm is aiming at? What parent firm characteristics, as well as foreign subsidiary characteristics are important factors for innovative success? In this study we examine parent firm characteristics that directly influence innovation and we examine which foreign subsidiary characteristics have a moderating role on this mechanism. This study contributes to existing knowledge as it focusses on the moderating influence of the foreign subsidiary characteristics. This focus adds to existing knowledge through a better understanding of this mechanism. This study therefore also has practical use for MNEs who are pursuing innovation through foreign subsidiaries.

Parent firm characteristics can influence innovation. Research and development for instance can be a very important characteristic for inventing new products and services and for improving existing ones (Teece,1996) and R&D development also helps firms to take in external knowledge (Phene & Almeida, 2008). The global strategy is another important character (Ghoshal, 1987). The global strategy can define where and how to expand (Roth et al., 1991). Depending on the strategic choices, MNEs foreign subsidiaries may be located far away from the parent firm. Although connected to the parent firm, the local subsidiaries

environment can be operating in different markets and under different conditions than the parent firm does. These conditions come with their own challenges (Goshal & Bartlett, 1990). Depending on the dynamics of the local foreign subsidiary market, this may require adaption to the global strategy to fit local habits or tastes (Hill et al., 1990). The alignment to the global innovation strategy is therefore an important role for local management (Goshal & Bartlett, 1990; Hill et al., 1990). This brings us to the effects from subsidiary characteristics on innovation. The local market conditions of foreign subsidiaries as well as the way these subsidiaries are monitored and controlled, can influence MNEs innovational success,

Background theory and Hypotheses

Innovation

Interestingly, organizations are able to pursue different types of innovation and the combination between these two types can help them achieve growth. Innovation can come in many shapes and forms. Scholars have no consensus on the definition. It depends on the way you interpret innovation. From a narrow view innovation is limited to small changes up to a wider view where innovations are about radical steps. (Damanpour & Aravind, 2012; van der Kooij, 1998). A more scientific approach defines that a definition for innovation should describe innovation as being related to change, inside a system, from a certain point of view, within a timeframe, and has a jump wise development. (van der Kooij, 1998). A real simple definition of innovation is that innovation basically comes down to two questions a company can ask itself; “Where to play and how to win” (Nagji & Tuff, 2012).

This still leaves much room for interpretation, but the answer to those questions will help to define a company’s innovative strategy. Depending on the outcome a small modification of a product or service can be part of the innovative strategy, where in other situations it is necessary to reinvent the current business model (Johnson et al., 2008). Researcher commonly agree that innovation can be divided in two segments, exploitation and exploration. Although it is also understood that both segments exist simultaneously and that excluding one of them will not fully cover innovation. As example, when exploitative innovation is the strategy, companies need to weigh alternative possibilities. Some of these alternatives may be more uncertain, but possibly more rewarding. Deciding between these options requires an amount of explorative innovation even if the strategy is exploitative (March, 1991).

Exploitation

Exploitation is a means of innovation by which companies strive to meet current customers and markets demands (Jansen & Van Den Bosch, 2006) and incrementally improve themselves by refining and extending existing competences, technologies and processes. Incremental improvement are small improvements. Every adjustment is a small step to get predictable results (March, 1991). Exploitation is done by using existing knowledge, products and services for existing customers (Benner & Tushman, 2001; Levinthal & March, 1993; Jansen & Van Den Bosch, 2006). It is all about improving the existing situation and to meet the current customer’s demand. Choices are made using convergent thinking (Smith & Tushman, 2005). That means that solutions to problems are found by using existing rules and

using logical thinking. Exploitative innovation is not about thinking out of the box, but about holding on to the current situation. As the current situation is profitable, companies do not want to disturb this balance. Improvements are sought in adjustment to existing products and services rather than in completely new products. Other forms of improvements can be lowering costs by optimizing internal processes or making use of economies of scale. Smaller adjustments will not scare off existing customers and even small steps can provide a competitive advantage. The need and the pace for improvement is dictated by the industries velocity. Some industries demand improvements more often than other industries.

EXPLORATION

Another way of innovating is exploration or explorative innovation, which is quite different from exploitative innovation. Exploration is about looking for new opportunities and forgetting the old situation (Govindarajan & Trimble, 2005). Companies want to create and test new ideas, which can be new products or services, but also entering new markets and trying new business models. The success rate of exploration is much lower that of exploitation. As companies explore new possibilities, results are uncertain (March, 1991), but through exploration companies can gain long term competitive advantages, especially in a changing environment (Barney, 1991).

As results are uncertain explorative innovation requires flexibility. Choices cannot be made by using known possibilities, because the innovation is about searching and testing for the unknown (Smith & Tushman, 2005). Exploration requires more radical steps. This form of innovations is aiming to meet the demands of emerging customers and markets. Small adjustments to the existing products and services will not answer these demands, therefore new capabilities and competences are needed (Benner & Tushman, 2001; Jansen & Van Den Bosch, 2006). This does require different skills than those needed for exploitative innovation (Govindarajan & Trimble, 2005).

In this thesis we examine the influence from parent firm characteristics and from subsidiary characteristics on innovation. It is important to know that innovation can be divided into different types, but for the results of this study we look at innovation as a whole.

Parent firm Characteristics

A prominent theme in the innovation literature as well as international business literature focuses on the importance of parent-firm specific characteristics. These characteristics affect the extent to which firms engage in innovative activities (Birkinshaw et al., 1998; Harzing, Sorge, & Paauwe, 2002; Clark & Ramachandran, 2019).

GLOBAL STRATEGY

Global strategy can generally be defined as the way MNEs have globally organized and structured its value adding objectives (Ghoshal, 1987). These value adding objectives, are improvements in for instance competences, technologies and processes (Hill et al., 1990; Goshal & Bartlett, 1990).

There are several reasons why global strategy has an effect on innovation. The first reason is control. MNEs who have full control over their foreign subsidiaries, will increase efficiency, standardisation, implementation of shared values, formalization of rules and procedures, which all have a positive effect on exploitative innovation (Jansen & Van Den Bosch, 2006). The second reason is why global strategy has an effect on innovation comes from using MNEs position in national markets and therefore developing new opportunities (Ghoshal, 1987; Roth et al., 1991). In this way the global strategy has a positive effect on explorational innovation.

As defined above, global strategy can positively effect exploitation as well as explorational innovation. We therefore expect the global strategy to be positively related to MNEs innovation.

Hypothesis 1: Global strategy positively influences MNEs innovation

RESEARCH AND DEVELOPMENT (R&D)

Scholars agree that R&D generally generates new information, but it also helps companies to use and exploit existing information (Cohen & Levinthal, 1989). R&D is more than just generating new or improved products (Cohen & Levinthal, 1989). When MNEs spend heavily on R&D they can achieve and sustain competitive advantage and they can protect their intellectual property (Teece, 2007). R&D improves the capability of companies to absorb and use external information for their own benefit. It will help them to recognise opportunities to

innovate and improve their products and services (Teece, 2006; Cohen & Levinthal, 1989). Investing in R&D is therefore not only useful to improve existing products and services, but it is an important factor to recognise new opportunities (Teece, 2006).

A challenge for MNEs is also to combine and integrate existing knowledge within the company, available at the subsidiaries and how to distribute this knowledge. Centralization means that knowledge is generally available, but local foreign circumstances might require more learning capacity at the foreign subsidiary (Cohen & Levinthal, 1990). Larger investments in R&D at the parent firm could therefore positively contribute to improve innovation.

Hypothesis 2: R&D investment at parent firm level will positively contribute to innovation.

Subsidiary Characteristics

While a significant amount of research has focused on the characteristics of the parent firm, less is know how subsidiary characteristics affect innovation as well. Existing research has primarily focussed on the characteristics of MNEs, but given that foreign subsidiaries are entities that can pursue innovation too there is a need to study subsidiary's characteristics as well. Two important determinants exist at the level of the subsidiary. First, the role of TMTs in foreign subsidiaries can influence the level (and type) of innovation. For instance, by delegating more responsibilities to the local management team, firms can be in a better position to respond to local market conditions (Harzing, 2002). Second, local market conditions can be different to the host country for instance in terms of cultural differences and business practices, political stability, technical knowhow and competitive conditions.

SUBSIDIARY GOVERNANCE

Subsidiary governance defines the delegation of responsibilities. Local market knowledge and experience from foreign subsidiaries are an important asset for MNEs to be able to innovate. This is especially important when these local environments are very different from the host country (Delany, 2000; Rugman & Verbeke, 2001; Birkinshaw et al., 1998). High control over the foreign subsidiaries will make alignment with the host country easier (Harzing, 2002) and will make it possible for MNEs to structure the relationship between parent and subsidiary. This will stimulate the exchange of local knowledge and experience (Hill et al., 1990).

Interestingly, research to date has largely ignored the importance of delegating responsibilities to local management teams. Monitoring by subsidiary boards will help parent firms to make use of subsidiaries local knowledge and it will positively stimulate innovation as subsidiaries get the space and mandate to sense and develop new opportunities (Clark & Ramachandran, 2019). This requires less control by the parent firm (Clark & Ramachandran, 2019; Harzing, 2002). Monitoring will lead to better decision making, as MNEs can use subsidiaries local knowledge to stimulate MNEs search for explorative and or exploitative innovational success (Subramaniam & Vencatraman, 2001; Harzing, 2002; Birkinshaw et al., 1998). Monitoring will provide MNEs necessary information about foreign subsidiaries and their local environment. This will improve judgment and decision making by MNEs when comparing subsidiaries (Clark & Ramachandran, 2019).

Hence, we expect a positive influence on innovation when subsidiaries are monitored by the subsidiary boards.

Hypothesis 3: Monitoring by subsidiary boards will positively contribute to innovation.

MARKET CONDITIONS

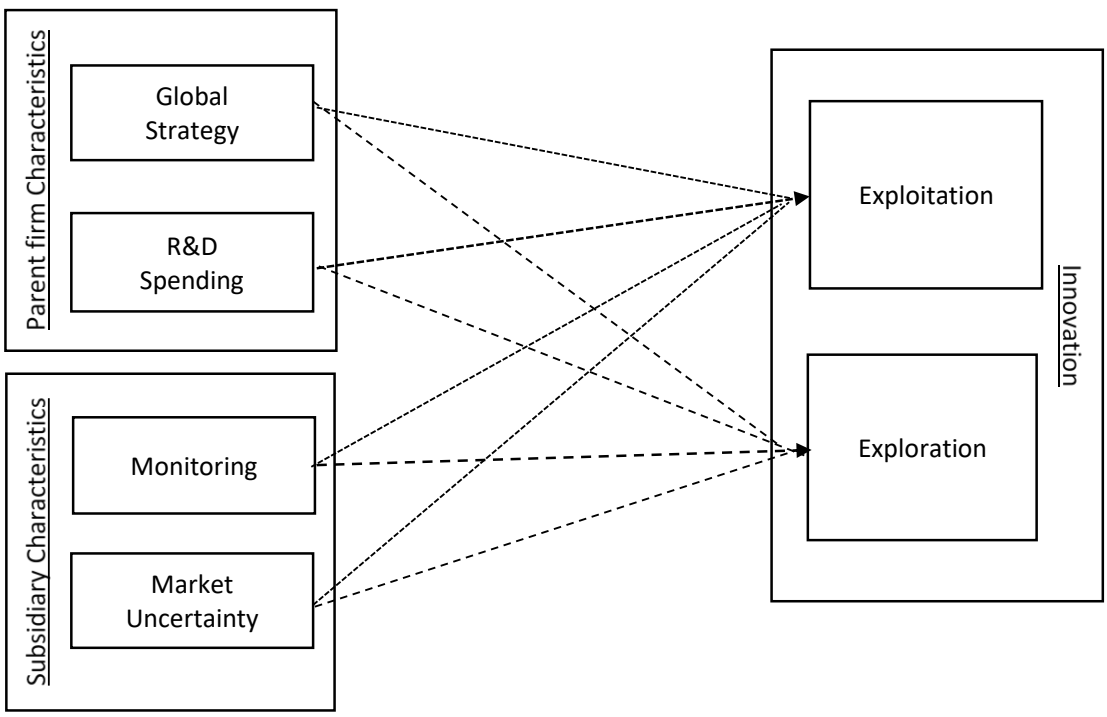
As stated above, local market conditions can differ from the host country. When market circumstances are changing, companies need to have dynamic capabilities to adapt and keep their competitive advantage (Jansen et al., 2009; Teece, 2007; March, 1991). Adapting to these market conditions also encourage more risky decisions (Calantone et al., 2003). The success rate and financial benefits might therefore be lower than expected, but dynamic market conditions at the foreign subsidiaries market can stimulate innovation. Such an environment will stimulate subsidiaries knowledge and learning capabilities in order to respond to the changing conditions (Horbach, 2008; Birkinshaw et al., 1998; Clark & Ramachandran, 2019). These conditions will positively stimulate subsidiaries explorative innovation as subsidiaries need to invent new products or services and it can also stimulate exploitative innovation when market demands improvement of existing products and services (Jansen & Van Den Bosch, 2006; Delany, 2000; Rugman & Verbeke, 2001; Birkinshaw et al., 1998).

Hypothesis 4: Uncertain market conditions in which foreign subsidiaries operate will positively contribute to innovation.

Conceptual Framework

The conceptional framework of our hypotheses are shown in figure 1. Innovation is stimulated by parent firm characteristics global strategy and R&D spending and we expect influence form foreign subsidiaries characteristics market uncertainty and monitoring.

Figure 1 Conceptual Framework



Research approach

In this study we are investigating the role of subsidiary characteristics on this relationship. A quantitative investigation is therefore a logical approach. A deductive approach is used. First hypotheses are defined from theory. These hypotheses are defined in such a way that expresses the relationship between variables. Next the hypotheses are tested. The fourth stage is calibrating the results against a reference standard, we used standard reference distributions. The fifth and final step is to draw conclusions to either support or reject the proposed hypotheses (Easterby-Smith et al., 2018).

Building upon the theory from desk research, our hypotheses were defined and tested. Hypotheses testing allows the researcher to draw conclusions about populations, based on data, retrieved from samples (Easterby-Smith et al., 2018). A positivist approach was used, as we expect that we are able to measure properties through objective methods (Easterby-Smith et al., 2018). Statistical data analyse was performed on a collection of quantitative date coming from a secondary data set. The data was retrieved from a self-administered survey. The self-administered survey was performed by the Brabant Development Agency (BOM) in 2011 via a questionnaire called: “Foreign-owned companies in the Netherlands 2011”.

To secure a population with the required knowledge, the key informant approach is used. Therefore, the representatives of the survey are board members and general managers of foreign subsidiaries situated in Noord-Brabant These respondents are expected to have the specialist knowledge needed for this survey.

The sample size consists of 199 respondents, which was deducted to 185 after deleting the data due to 14 incomplete questionnaires. The total number of foreign direct investments in Noord Brabant in 2011 was 1082 generating a response rate of 17.1%

To assure the quality of the findings, specific emphasis has been placed on internal and external validity. Internal validity is the extent to which you can be confident that a cause-and-effect relationship established in a study cannot be explained by other factors. Plausible alternative explanations should be eliminated (Easterby-Smith et al., 2018; Saunders et al., 2009). By using existing scales that are frequently used in the literature as well as various reliability test statistics, the study addresses these concerns. External validity or transferability involves the extent to which the results of a study can be generalized (applied) beyond the sample external validity, and specifically generalizability of the findings to other settings or

context, we made sure the sample represents an accurate reflection of the general population (Easterby-Smith et al., 2018; Yin, 2014). In addition, validity tests for common method bias (Podsakoff et al., 2003), early-late respondents and sampling proportion will be undertaken in order to test for the accuracy of the survey instrument (Dillman, 1991; Levin et al. , 1983).

Research measurements

The aim of this study is to understand the influence of parent firm characteristics on innovation as well as the effects from foreign subsidiary characteristics. We studied the affect from parent firm characteristics and foreign subsidiary characteristics as independent variables on Innovation. Table 1 is an overview of the validation of constructs which are further described below.

Table 1 Validation of constructs

Variables	α	Items	N	Mean	S.D.	Skew	Kurt
Innovation							
Exploration	,822	7	185	31,49	8,12	-0,551	0,655
Exploitation	,857	7	185	34,61	7,52	-0,966	1,449
Parentfirm Characteristics							
Global strategy	,719	3	185	14,96	3,87	-0,647	0,313
R&D spending			169	1,72	1,28	0,696	2,228
Subsidiary characteristics							
Uncertainty	,690	5	169	407,89	116,62	-0,757	1,143
Monitoring	,992	8	182	18,70	20,50	0,434	-1,515
Control							
Parent firm age			185	3,42	1,20	0,878	3,735
Parent firm size			185	7,15	2,81	-0,316	0,051
Geografical focus			185	2,99	1,77	0,459	-1,211
Choice of Country			185	3,09	1,20	-0,290	-0,263
Size of management board			182	3,63	3,10	1,490	2,556

INNOVATION

The dependent variable in this survey is innovation as innovation is caused by the predictor or independent variables. Innovation is divided in two categories, explorative and exploitative innovation. Both categories are measured by 7 questions on a 7-point Likert scale from 'fully disagree' to 'fully agree'. Appendix 1 shows the questions used in the BOM 2011 survey for both exploration and exploitation. Reliability of the scales for exploration and exploitation are evaluated by the use of Cronbach α. With an outcome of exploration (α = .822) and exploitation (α = .857), both scales were found to be reliable. Both scales were also tested for normality using the Skewness and Kurtosis test. Exploration scores -.551 on skewness, and .655 on Kurtosis. Exploitation scores -.966 on skewness, and 1.449 on kurtosis. Both scales are well within the limits of -1.96<skewness<, 1.96 and -2<kurtosis<2 and therefore behave like a normal distribution.

PARENT FIRM CHARACTERISTICS

To test our first hypothesis *H1: Global strategy positively influences MNEs innovation, we* the influence of Global strategy as independent variable on Innovation as dependent variable is measured. This is done by asking the survey respondents to evaluate the presence of

global strategy through answering 3 questions on a 7-point Likert scale from 'fully disagree' to 'fully agree'. Appendix 2 shows the questions used in the BOM 2011 survey for global strategy. The reliability and validity of the scale is evaluated by the use of Cronbach α. With an outcome of (α = .719) the scale was found reliable. The global strategy scale was tested for normality using the Skewness and Kurtosis test. With an outcome for skewness -.551 and for kurtosis .655, the scales are also well within the limits of skewness and kurtosis and therefore is normally distributed. To test our second hypothesis *H2: R&D investment at parent firm level will positively contribute to innovation,* The annual R&D spending's of the parent firm was measured by taking the percentage of annual sales spent on R&D activities. The respondents were asked to present this data over the last two years. The scale was tested for normality using the Skewness and Kurtosis test. The skewness 0.969 is well within its limits of normal distribution. The kurtosis value of 2.228 is relatively high.

SUBSIDIARY CHARACTERISTICS.

As explained the subsidiaries governance, the way the subsidiary is monitored by the board, is expected to have a positive effect on innovation. To test for our third hypothesis *H3: Monitoring by subsidiary boards will positively contribute to innovation,* we used 8 questions from the BOM 2011 survey to measure monitoring (Kriger, 1988). These questions from the survey are shown in appendix 3, using a 7-point Likert scale from 'fully disagree' to 'fully agree' to measure for monitoring.

Reliability of the scale is evaluated by the use of Cronbach α. With an outcome of (α = .992) the scale was found reliable. The scale is also tested for normality using the Skewness and Kurtosis test. With an outcome for skewness .434 and for kurtosis -1.515 both scales are within the limits of skewness and therefore are normally distributed.

The second subsidiary characteristic we tested is hypothesis *H4: Uncertain market conditions in which foreign subsidiaries operate will positively contribute to innovation.*

Market uncertainty is also measured on a 7-point Likert scale from 'fully disagree' to 'fully agree'. We used the five questions from the BOM 2011 survey about market uncertainty (Kumar & Seth, 1998). Reliability of the scales is evaluated by the use of Cronbach α. With an outcome of (α = .690), the scale was found reliable. The market uncertainty scale was also tested for normality using the Skewness and Kurtosis test. With an outcome for skewness -.757 and for kurtosis 1.143 the scale is within the limits of skewness and kurtosis and is normally distributed.

CONTROL VARIABLES

Several variables are included as control variables, to rule out alternative explanations of our study. Given the positive skewness of the measure, we used the natural logarithm of Firm age. Firm age can influence innovation, as more experienced companies tend to have a preference towards exploitation (Jansen et al., 2009). In the BOM 2011 survey the respondents were asked to add the year of establishment of the firm. Firm age is measured by deducting the year of establishment from the date the survey was held (year 2011 minus year of establishment).

The natural logarithm of the number of full-time employees (FTE) that are working at the parent firm is included to account for firm size. Larger firms might miss the flexibility needed for exploration (Jansen & Van Den Bosch, 2006). The number of FTE was retrieved from the data of the BOM 2011 survey. The respondents answered the question:" How many full-time employees…… are working for your subsidiary? Last year (2010) This year (2011)".

Geographical Focus. The geographical focus is measured by dividing the world in focus zones and checking the geographical focus of the respondents by asking: What is the geographic focus of your subsidiary's activities? Netherlands; Benelux; Western Europe; Europe; EMEA; World. Research has shown that specific geographical locations where clusters of firms are located, tend to have an impact on innovation (Pouder & St. John, 1996).

Choice of country

The choice of country is the number of countries the MNE is operative in. This can have an influence on innovation as geographical diversity can stimulate innovation (Beers & Zand, 2014). The Choice of country was checked by asking the respondents: "Approximately, in how many countries does the parent corporation operate?".

Size of management board

Finally, we added "size of management board", to exclude potential impact from the size of the board on innovation. The size of the management board is retrieved from the BOM 2011 survey as a direct question: "What is the total number of your board members?".

Results

The hypotheses we proposed are tested using hierarchical multiple regressions. The regression analysis will be explained of the five models that are related to the influence of parent firm characteristics as independent or predictor variables and the moderating effects of subsidiary characteristics on the dependent variable innovation. As stated previously, innovation can have an exploitative or an explorative nature. The dependent variable innovation in this study, is the sum of exploitative and explorative innovation. Before we show the regression analysis we shall start with the descriptive statistics and the correlations.

Descriptive statistics and correlations

The means, standard deviation and correlations are presented in table 2 “Correlation matrix”. As expected, there is a weak positive correlation between global strategy and exploitation ($r = 0.372$, $p < 0.01$), but there is no significant correlation between global strategy and exploration. Local subsidiary market uncertainty also shows a positive correlation with exploration ($r = 0.197$, $p < 0.05$) as well as with exploitation ($r = 0.225$, $p < 0.01$). We also see a positive correlation between R&D investments by the parent firm and exploration ($r = 0.196$, $p < 0.05$), but unexpectedly no correlation with exploitation. Finally monitoring shows an unexpected negative but not significant correlation with exploration and a positive also nonsignificant correlation with exploitation.

From the control variables we see a positive correlation between number of countries and exploration ($r = 0.245$, $p < 0.05$) and between number of countries and exploitation ($r = 0.163$, $p < 0.01$) As previously stated MNEs which operate in a number of countries might benefit from diversity in relation to innovation (Beers & Zand, 2014).

Table 2 Descriptive statistics

Variables	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Exploration	31,124	8,060	1,000										
2. Exploitation	34,673	7,125	,416**	1,000									
3. Global Strategy	14,843	3,873	0,097	,372**	1,000								
4. Market Uncertainty	4,507	1,118	,197*	,225**	,271**	1,000							
5. Monitoring	18,961	20,233	-0,062	0,013	-0,047	,171*	1,000						
6. R&D spending Par. Firm	1,736	1,272	,196*	-0,079	-0,058	-0,093	0,031	1,000					
7. Size Exec Board Subsidiary	3,503	3,137	0,131	0,089	-0,062	0,139	0,121	,177*	1,000				
8. Geografical focus	2,954	1,756	-0,056	0,072	0,142	0,007	-0,070	-0,026	-0,090	1,000			
9. Number of Countries	3,114	1,225	,245**	,163*	0,112	0,016	0,050	0,066	0,123	-0,023	1,000		
10. Parent firn size (FTE)	7,160	2,819	0,074	,300**	,223**	0,145	0,011	-0,079	,169*	0,129	,556**	1,000	
11. Parent firm age (Years)	3,470	1,206	-0,015	0,063	0,128	-0,012	-0,040	-0,055	0,046	-0,046	,295**	,290**	1,000

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed); N=153

Regression analysis

The regression results for exploitative innovation are shown in table 3 “Regression analysis Exploitation”. And for exploration in table 4 ”Regression analysis Exploration”.

The first model (Model 1) captures the effects of all the control variables.

The second model (Model 2) shows the effect of both parent firm characteristics and the subsidiary characteristic, monitoring and all control variables. This model explains 14.3% of the total effect and shows a significant positive effect from global strategy on exploitative innovation (ß= 0.589, $p < 0.001$). The other predictive variables don’t show a significant effect, R&D spending are negative, and monitoring is slightly negative. These last results are unexpected, from direction, negative instead of positive, as well as not being significant.

The third model (Model 3) shows the effect both parent firm characteristics, the subsidiary characteristic market uncertainty and all control variables., This model explains 15.7% of the total effect. The results again show a significant positive effect, although somewhat lower, from global strategy on exploitative innovation (ß= .559, $p < 0.001$). The other variables don’t show a significant effect. R&D spending is again negative and subsidiary market uncertainty is slightly positive, but not significant.

The fourth (Model 4) model shows the effect of parent firm characteristic global strategy as well as both subsidiary characteristics and all control variables. This model explains 15.4% of the total effect. Again, we only see some difference in the relation between global strategy on exploitative innovation (ß= .618, $p < 0.001$).

The fifth model (Model 5) shows the effect of parent firm characteristic R&D both subsidiary characteristics and all control variables. Here we see a drop in explanatory percentage. This model explains only 7.6% of the total effect. to in this model, market uncertainty shows a small but significant positive correlation (ß = .011, $p <.05$) with exploitation.

The sixth and last model (Model 6) shows the effect of the predictive variable as well as all control variables. This model explains 15.2% of the total effect and again global strategy correlates positive and significant with explorative innovation. (ß = .556, $p <.001$)

For explorative innovation we can conclude that global strategy’ does positively contribute to innovation. This model therefore partially supports hypothesis 1, but it doesn’t support hypotheses 2, 3 and 4.

For explorative innovation we made similar correlation models, but then with exploitative innovation as independent variable. This resulted in model 2 explaining 5.6%, showing a positive correlation between global strategy (ß = .285, p <.10) and R&D spending (ß = .832, p <.10). Model 3 shows a positive and significant correlation between R&D spending (ß = 1.142, p <.05) and exploration and on a very small scale with market uncertainty (ß = .013, p <.05). Model 5 and 6 shows very similar results. Model 6 explains 10.1% with positive and significant correlations between exploitative innovation and R&D spending (ß = 1.143, p <.05) and market uncertainty (ß = .014, p <.10).

For explorative innovation we can conclude that only monitoring doesn't significantly contribute. The other variables, global strategy, subsidiary market uncertainty and R&D spending by the parent firm do contribute to innovation, although the model only explains 10.1%. This outcome does partially support hypothesis 1, 2, and 4, but it rejects hypothesis 3 as monitoring doesn't significantly contribute to innovation according to our research.

Table 3 Regression analysis Exploitation

Exploitation	Model 1 ß (t-value)	Model 2 ß (t-value)	Model 3 ß (t-value)	Model 4 ß (t-value)	Model 5 ß (t-value)	Model 6 ß (t-value)
Parent Firm Characteristics						
Global Strategy		0,589 ***	0,559 ***	0,618 ***		0,556 ***
		(4,278)	(3,747)	(4,021)		(-3,717)
R&D Spendings Parent firm		-0,142	-0,259		-0,296	-0,259
		(-0,351)	(-0,611)		(-0,668)	(-0,609)
Subsidiary Characteristics						
Monitoring		-0,004		-0,026	-0,017	-0,012
		(-0,121)		(-0,836)	(-0,507)	(-0,377)
Market Uncertainty			0,006	0,008	0,011 *	0,007
			(1,364)	(1,615)	(2,317)	(1,402)
Control						
Parent firm age	0,220	-0,175	-0,260	0,006	-0,086	-0,262
	(0,439)	(-0,382)	(-0,549)	(0,012)	(-0,174)	(-0,551)
Parent firm size	0,645 **	0,548 *	0,552 *	0,466 †	0,698 **	0,553 *
	(2,631)	(2,332)	(2,264)	(1,869)	(2,769)	(2,259)
Choice of Country	-0,051	0,100	0,155	0,262	0,126	0,170
	(-0,090)	(0,190)	(0,285)	(0,468)	(0,221)	(0,312)
Geografical focus	-0,152	0,011	-0,007	-0,419	0,140	-0,015
	(-0,479)	(0,037)	(-0,022)	(-1,339)	(0,433)	(-0,047)
Size of management board	0,941	0,790	0,494	0,950	0,587	0,670
	(1,129)	(0,900)	(0,621)	(0,995)	(0,608)	(0,725)
Entry Mode	1,104	0,202	-0,337	-0,386	0,106	-0,345
	(1,190)	(0,234)	(-0,379)	(-0,416)	(0,115)	(-0,389)
Adjusted R-squared	0,033	0,143	0,157	0,154	0,076	0,152
F-value	2,0430 †	4,051 ***	4,156 ***	4,336 ***	2,397 **	3,732 ***

†p<.10; *p <.05;**p <.01;***p <,001 N=153

Table 4 Regression analysis Exploration

Exploration	Model 1 ß (t-value)	Model 2 ß (t-value)	Model 3 ß (t-value)	Model 4 ß (t-value)	Model 5 ß (t-value)	Model 6 ß (t-value)
Parent Firm Characteristics						
Global Strategy		0,285 †	0,101	0,036		0,091
		(1,746)	(0,579)	(0,212)		(0,523)
R&D Spendings Parent firm		0,832 †	1,142 *		1,136 *	1,143 *
		(1,733)	(2,299)		(2,302)	(2,308)
Subsidiary Characteristics						
Monitoring		-0,015		-0,063	-0,053	-0,052
		(-0,416)		(-1,807) †	(-1,436)	(-1,409)
Market Uncertainty			0,013 *	0,014 *	0,015 *	0,014 **
			(2,328)	(2,459)	(2,752)	(2,524)
Control						
Parent firm age	-0,694	-0,764	-0,491	-0,508	-0,469	-0,498
	(-1,282)	(-1,403)	(-0,883)	(-0,926)	(-0,854)	(-0,899)
Parent firm size	-0,084	-0,131	-0,179	-0,155	-0,152	-0,176
	(-0,318)	(-0,471)	(-0,625)	(-0,559)	(-0,542)	(-0,617)
Choice of Country	1,562 *	1,646 **	1,826 **	1,979 **	1,888 **	1,895 **
	(2,544)	(2,629)	(2,868)	(3,162)	(2,975)	(2,978)
Geografical focus	-0,341	-0,349	-0,204	-0,371	-0,214	-0,239
	(-0,994)	(-0,968)	(-0,561)	(-1,063)	(-0,595)	(-0,658)
Size of management board	0,058	-0,035	-0,483	0,598	0,272	0,286
	(0,065)	(-0,033)	(-0,518)	(0,562)	(0,253)	(0,265)
Entry Mode	1,045	0,883	0,388	0,238	0,425	0,351
	1,044	(0,865)	(0,372)	(0,229)	(0,4139)	(0,338)
Adjusted R-squared	0,030	0,056	0,095	0,074	0,105	0,101
F-value	1,918	2,085	2,767	2,458	2,992 ***	2,706 **

†p<.10; *p <.05;**p <.01;***p <,001 N=153

Results conclusion

Table5 Overview of hypotheses and results

Hypotheses	*Innovation*	
	Exploitation	*Exploration*
H1: Global strategy positively influences MNEs innovation.	Supported	Supported
H2: R&D investment at parent firm level will positively contribute to innovation.	Rejected	Supported
H3: Monitoring by subsidiary boards will positively contribute to innovation	Rejected	Rejected
H4: Uncertain market conditions in which foreign subsidiaries operate will positively contribute to innovation.	Rejected	Supported

DISCUSSION

As some MNEs seem to be more successful than others in pursuing and in achieving innovation (Venkatraman & Prescott, 1990), it is interesting to understand what influences this innovational success. MNEs operate on a global scale and can have several foreign subsidiaries operating in different market situations. Therefore there are many possible influences on this innovational success. Many studies have focussed on parent firm characteristics in relation to innovation (Burns & Stalker, 1961; Campbell et al., 1995; Ciabuschi et al., 2011; Ghoshal, 1987). The influence from Subsidiary characteristics on innovation has also been studied (Rugman & Verbeke, 2001; Birkinshaw et al., 1998). This study contributes to existing knowledge as it examined not only the influence of parent firm characteristics on innovation, but in addition we combined the influence of foreign subsidiary characteristics on innovation as well.

The results show as expected a positive influence on innovation from parent firms' characteristics global strategy and R&D spending's. Global strategy is expected to have a positive influence on innovation when MNEs are able to benefit from economies of scale and are able to optimize production and services (Jansen & Van Den Bosch, 2006). Investing in R&D is supported as well as expected. Investing in R&D is not only useful to improve existing products and services, but it is an important factor to recognise new opportunities (Teece, 2006). The combination of parent firm and subsidiary firm characteristics in our research doesn't affect these expected effects.

Monitoring leads to better decision making, and MNEs can use subsidiaries local knowledge to stimulate MNEs search for explorative and or exploitative innovational success (Subramaniam & Vencatraman, 2001; Harzing, 2002; Birkinshaw et al., 1998). Our research did not support this hypotheses, but we did find a positive relation whith market uncertainty and innovation. Subsidiaries who are familiar with the local market are better capable to adapt to changing environment than the parent firm in the host country (Rugman & Verbeke, 2001; Birkinshaw et al., 1998; Hill et al., 1990). This study adds to existing knowledge as it shows that subsidiary characteristics add to parent firm characteristics in achieving innovational succes. Theses insights are of practical use to MNEs who are trying to achieve innovational success abroad, but it is also a new angle for scholars to further investigate.

Limitations and future research

Besides the contribution to existing literature, this study has some limitations as well. These limitations can however be a very useful source for future research.

The first limitation in our research is a methodological limitation, concerning a possible selection bias. The survey is set out in a selected area in the Netherlands. The local government in this area is trying to stimulate foreign MNEs to invest in this area. Therefore, the selected population might not be representative for other parts in the Netherlands or other (European) countries. For instance, it is known from previous studies, that there are large differences between European countries (Harzing & Sorge, 2003). This is important for future research, as performing this research in other areas and countries might reveal new insights.

The second limitation is the research design. The data was assembled by means of a survey. A survey does not get the rich information that for instance semi structured interviews would. Monitoring for instance, did not show the expected positive relationship with innovation (Bianchini et al, 2015). Future research using interviews could enhance existing knowledge about monitoring. This is important, because more detailed information coming from interviews, could improve the understanding of nuances in monitoring.

The third limitation is again the research design. The data was retrieved from a cross sectional survey, which only covers a short period of time. This is important because cross sectional surveys do not have the ability to explain processes over time (Easterby-Smith et al., 2018). Future longitudinal research might explain long term influences on innovation.

CONCLUSION

This study focusses on the questions: What is the effect of parent firm characteristics on the levels of innovation and how do the responsibilities of local subsidiary TMTs affect these relationships? We have tested and found that global strategy as well as R&D spending's by the parent firm are important characteristics for innovational success. We added subsidiary characteristics monitoring and market uncertainty as expected contributors to MNEs innovational success. This study shows that the combination of parent firm characteristics as well as subsidiary characteristics contribute, which is interesting for practical use as well as for future research. The TMTs have an effect on the innovational relationship, which is interesting

for future research. The results of this study can also be interesting for MNEs who are expanding abroad as the right fit of subsidiary characteristics can stimulate MNEs innovational success.

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Appendix 1 - Innovation

Exploration: Fully disagree – Fully agree

1. Our subsidiary accepts demands that go beyond existing products and services
2. We invent new products and services
3. We experiment with new products and services in our market
4. We commercialise products and services that are completely new to our subsidiary
5. We frequently utilize new opportunities in new markets
6. Our subsidiary regularly uses new distribution channels
7. We regularly search for and approach new clients in new markets

Exploitation: Fully disagree – Fully agree

1. We frequently refine the provision of existing products and services
2. We regularly implement small adaptations to existing products and services
3. We introduce improved, but existing products and services for our local market
4. We improve the efficiency of how we provide our products and services
5. We increase economies of scale in existing markets
6. Our subsidiary expands services for existing clients
7. Lowering costs of internal processes is an important objective for our subsidiary

Appendix 2 – Parent Firm Characteristics

Global strategy

To what extent do you agree with the following statements? In our subsidiary's industry… Fully disagree Fully agree

1. …business activities are susceptible to scale economies
2. …competitors exist that have a presence in all key markets
3. …standardized product technology exists worldwide

R&D Spending

Research and Development: What percentage of annual sales	Last year (2010)	This year (2011)
1. …does the parent corporation spend on R&D activities?	%	%
2. …does the parent corporation spend on promotional and marketing activities?	%	%

Appendix 3 – Subsidiary Characteristics

If your subsidiary has a board of directors, to what extent does this board fulfil the following roles? Monitoring: Monitoring, controlling and approving Not at all - To a very large extent

1. Approving operating plans, capital expenditures, and budgets
2. Reviewing and approving significant actions of the subsidiary
3. Reviewing subsidiary management's plans for business resiliency (e.g., risk management, security, emergency communications)
4. Reviewing & monitoring the implementation of strategic plans
5. Monitoring overall subsidiary performance
6. Overseeing legal and ethical compliance of the subsidiary
7. Focusing on the integrity and clarity of financial reports
8. Participating in the development of strategic plans

Appendix 4 - Monitoring

Market Uncertainty: How predictable are the following trends in your subsidiary's industry?

	Not at all predictable	Fully predictable
Customer demand		
Competitive climate		
Technological trends		
Supply of raw materials and equipment		
Government policies and regulation		

Appendix 5 – Skewness and Kurtosis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
exploration	185	7	49	31,49	8,119	-0,551	0,179	0,655	0,355
exploitation	185	7	49	34,61	7,525	-0,966	0,179	1,449	0,355
globalstrat	185	3	21	14,96	3,867	-0,647	0,179	0,313	0,355
R&D_Spend_Par	169	0,00	8,01	1,7218	1,27561	0,696	0,187	2,228	0,371
geofoc1	185	1	6	2,99	1,766	0,459	0,179	-1,211	0,355
countries1_PFC_LN	185	0,00	5,71	3,0917	1,19753	-0,290	0,179	-0,263	0,355
parsize111_PFC_LN	185	0,00	13,82	7,1471	2,80840	-0,316	0,179	0,051	0,355
LNparentfirmage	185	0,00	7,61	3,4219	1,19955	0,878	0,179	3,735	0,355
unc	169	1,00	630,70	407,8880	116,62129	-0,757	0,187	1,143	0,371
Monitoring	182	0,00	56,00	18,6978	20,49880	0,434	0,180	-1,515	0,358
sizeexec_SSC	182	0	15	3,63	3,101	1,490	0,180	2,556	0,358
Valid N (listwise)	153								