Greenfield versus Acquisition – The Drivers for Entry and Expansion Modes of German-Based Multinational Enterprises in Portugal

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ABSTRACT

This paper examines the determinants for entry and expansion modes of German multinational enterprises in Portugal. Using a sample of Greenfield and acquisition transactions from 1996 until 2013, we investigate the impact of previously proven parent-level and industry-level drivers that derive from Transaction Cost/Internationalization Theory, Information Economics and Industrial Organization Perspective, and further factors that may have had an influence on the decision to invest in Portugal. We find evidence that the parent's size, its R&D intensity, the previous experience by another German firm, the target industry's growth and Portugal's membership in the Eurozone increase the probability of a Greenfield investment rather than an acquisition. In turn, the likelihood of an acquisition increases when the parent is publicly traded and productivity in the target industry grows. Our findings confirm that traditional theories can be applied to the particular combination of home and host country. Furthermore, specific policy recommendations can be given based on the results in order to promote German foreign direct investments in Portugal.

Keywords: International Expansion, Greenfield, Acquisition, Portugal

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Preface

I would like to express my special thanks to the support of Ricardo Reis (CLSBE), who kept me on the right track during the thesis and provided me with valuable recommendations. I also would like to acknowledge the support of Geraldo Cequeiro (CLSBE) and Pedro Raposo (CLSBE) for their advice on the empirical methodology. Furthermore, I want to thank Sara Silva (CLSBE), Pedro Figueiredo (AICEP) and Guido Radel (CCILA Portugal) for the support in accessing the data.

List of Abbreviations

AG	….	Aktiengesellschaft (German for publicly-traded firm)
CSA	….	Country-specific advantages
FSA	….	Firm-specific advantages
HHI	….	Hirschman-Herfindahl-Index
IE	….	Information Economics
IO	….	Industrial Organization Perspective
JV	….	Joint Venture
MEM	….	Marginal Effects at the Means
MNE	….	Multinational Enterprise
Pr	….	Probability
R&D	….	Research and Development
ROE	….	Return on Equity
TCI	….	Transaction Cost/Internationalization Theory
VIF	….	Variance Inflation Factor
WOS	….	Wholly-Owned Subsidiary

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1. Introduction

Internationalizing firms can enter a foreign country either via contractual modes, such as direct exports or licensing, or via equity modes, such as Greenfield investments or acquisitions. The dominant theories used for explaining the multinational enterprise's (MNE) choice between undertaking a Greenfield investment or acquisition in a foreign country are Transaction Cost/Internationalization Theory (Buckley and Casson, 1976; Hennart, 1982; Rugman, 1981), Information Economics (Akerlof, 1970; Stigler, 1961), and Industrial Organization Perspective (Oster, 1999). According to these theories, the MNE's choice on how to enter and expand in foreign countries is based on different MNE-level and target-industry-level factors, amongst others the parent's technological knowledge, international experience and host country experience, and the target industry's market concentration and availability of takeover targets.

The identification of drivers for entry and expansion of multinational enterprises (MNEs) into a foreign country has been a central subject of interest for international management research in the last decades. Traditionally, the decision of the MNE to enter a foreign market was described as a unilateral decision of the MNE based on the trade-off between control and tolerance of risk, where the latter is a function of the MNE's familiarity with the host country (Johanson and Vahlne, 1977; Anderson and Gatignon, 1986). A different perspective was first introduced by Dunning (1980, 1988), who claimed that the MNE would seek an optimal combination of firm-specific advantages (FSA) and country-specific advantages (CSA) in order to follow a global strategy.

Numerous research studies have been conducted in order to examine the drivers for entry and expansion of an MNE into a particular host country or region. However, most studies focused on large economies or economic areas, such as Western Europe, China, the United States, Asia, Canada, Japan and Great Britain as host regions, with investments originating in other major economies, such as the United States, Japan, Western Europe, or Great Britain (Canabal and White III, 2008). None of the studies that have been published to date focuses specifically on Portugal as a host country. Nevertheless, foreign direct investments (FDIs) are a crucial factor to promote growth (Balasubramanyam et al., 1999; Choe, 2003), even more in smaller-scale economies. Thus, especially for crisis-ridden Portugal, understanding the determinants for foreign entry and expansion is of importance for promoting FDIs in the mid- to long-term.

In order to examine whether traditional theories can be applied to the case of Portugal we investigate the following research question:

Research Question 1: Do drivers deriving from traditional literature hold for entry and expansion mode choices of German MNEs in Portugal?

We focus in our research on one home country (Germany) since the results may be more reliable and accurate instead of using multiple home countries. Furthermore, we pay our attention only on industries whose activities are related to innovation activities. In order to answer to this Research Question, eight hypotheses derived from Transaction Cost/Internationalization Theory, Information Economics, and Industrial Organization Perspective are built. We thereby focus on the *ex-ante* determinants of entry and expansion modes.

To complement the existent literature on entry and expansion modes (for an overview see Canabal and White III, 2008), we further investigate on the specific drivers for the entry and expansion mode choice between a Greenfield investment and an acquisition by trying to answer the following question:

Research Question 2: Which further parent- and host country-factors influence the choice between a Greenfield investment and an acquisition of a German MNE in Portugal?

In addition to the factors used in Research Question 1, we examine further German MNE (parent)-specific and Portugal (host country)-specific factors that may have influenced the choice between a Greenfield investment and an acquisition in order to propose a model that explains this decision as accurately as possible. We introduce factors that may have played a role in the particular case of German MNEs investing in Portugal, such as *Growth in Productivity*, *Change in Business Confidence* and the introduction of the Euro as a currency in 2002. Overall, we create three parent-level and three industry-level control variables.

Based on the answers to both of the Research Questions, we may be able to give recommendations on policies in order to attract more FDIs in Portugal.

The study is structured as follows. In part two, we present the dominant theories on the entry and expansion modes' determinants and derive our hypotheses. Section three deals with the applied methodology. First, the main variables are identified and described, including the ones built to

test the hypotheses and the control variables for the purpose of investigating on Research Question 2. Second, the empirical methods and model are described and explained. Third, the underlying data and sample are presented. In part four the results of the regression model are presented and analyzed. In part five and six, the results on the background of the dominant theories and their predictions are summarized, interpreted and discussed together with the limitations of our work and future research directions.

2. Literature Review

Foreign market entries involve a multinational parent that establishes a subsidiary in a specific sector in a host country. Hence, establishment mode choices are realized at the subsidiary-, parent-, industry- and country–level. Many studies examine the *ex-ante* determinants of foreign entry modes. There are two distinguishable entry mode types that involve equity participations: Greenfield investments and acquisitions. A Greenfield investment occurs when a new subsidiary is created from scratch, in an area where no previous facilities exist (Barkema and Vermeulen, 1998). Two types of subsidiaries can be identified: wholly-owned subsidiaries (WOS), which are 100% possessed by the MNE, and Joint Ventures (JV), that are held in part by a partner with equivalent assets (Barkema and Vermeulen, 1998). On the other hand, an acquisition implies the purchase of part or of the entire equity of a preexisting firm (Barkema and Vermeulen, 1998; Larimo, 2003), indicating that acquisitions can be wholly- or partially-owned as well.

We will hereafter present three of the most commonly used theories to explain the determinants of foreign establishment mode choice. These are Transaction Cost/Internationalization Theory (TCI), Information Economics (IE) and the Industrial Organization Perspective (IO).

2.1 Transaction Cost/Internationalization Theory

TCI is the leading theory to explain MNE's establishment mode choices (Canabal and White III, 2008) and was initially developed by Buckley and Casson (1976), Rugman (1981), and Hennart (1982). Similar to Williamson's (1975, 1985) version of Transaction Cost Theory, TCI focuses on the costs of exchanging intermediate inputs through transactions and on these inputs' market internalization. However, while TCI emphasizes how the limited rationality of actors lowers the efficiency of certain input markets, which urges MNEs to internalize these markets, Williamson affirms that the choice between market exchange and internalization is influenced by uncertainty

and asset specification. TCI has been extended to analyze the choice between Greenfield investments and acquisitions by explaining that the MNE's decision between them is determined by a comparison of the costs linked to obtaining or exploiting intermediate inputs abroad through these two establishment modes (Hennart and Park, 1993).

One critical input factor an MNE may pursue abroad is firm-embedded technological knowledge (Hennart, 1982). If an internationalizing MNE owns this kind of knowledge the transaction costs related to a Greenfield investment may be lower than those of undertaking an acquisition since Greenfield investments allow the MNE to build up its technologies from the start and pass on its critical skills to a wisely-chosen staff able and willing to incorporate them (Hennart and Park, 1993). In the case of non-existence of technological knowledge inside of the MNE, the internationalizing firm may want to obtain these skills by acquiring foreign firms and their skill-sets since such knowledge is difficult and expensive to develop internally (Wernerfelt, 1984), and also to acquire it separately on the market because of its firm-embeddedness nature (Hennart et al., 1996).

Two additional critical types of knowledge that are often silent are knowledge on how to operate internationally and knowledge on how to operate in a particular country (Hennart, 1982). To a large extent this knowledge can only be acquired through experience (Johanson and Vahlne, 1977). Hence, inexperienced MNEs are short of this knowledge and find it expensive to purchase it on the market distinctively from its owner. For this reason they are more likely to undertake acquisitions to access it, whereas MNEs that are internationally or host-country experienced prefer to undertake Greenfield investments, since they already possess it (Caves, 1996; Larimo, 2003).

2.2 Information Economics

IE describes how information affects economic decisions by focusing on existing information asymmetries (Stigler, 1961; Akerlof, 1970). Especially in acquisitions those asymmetries are present since the acquirer often has insufficient information on the culture and value of its targets. Hence, acquirers may have problems concerning the *ex-ante* evaluation of these targets and/or concerning the integration in their corporate network after the deal has been concluded (Ravenscraft and Scherer, 1987). Specifically this information asymmetry can be particularly

large for MNEs with little host-country experience since such MNEs are unfamiliar with existing local firms and will thus find it very difficult to evaluate and integrate them. These large asymmetries might force them to opt for Greenfield investments (Hennart et al., 1996, Hennart and Park, 1993). MNEs that have gained local experience are more familiar with host countries and its local firms and may find it easier to evaluate local firms, thus being more likely to undertake acquisitions (Hennart et al., 1996, Hennart and Park, 1993).

Furthermore, there is a possibility that information about conditions in a particular industry in the host country may partially become a public good that has become public by the first firm that entered the industry and consequently shared this information with other firms from the same sector in its home country. The first entrant faces greater informational asymmetries than its followers, who can learn from its mistakes (Caves and Mehra, 1986). Hence, if the entrant is the first one to enter the industry in a specific country the likelihood for an acquisition should increase, because an "entry by acquisition economizes on information costs and reduces uncertainty" (Caves and Mehra, 1986, p.462). As a complementary implication, the information stock should increase when either more firms have entered the target industry, or the more experience a firm has gained in the specific industry of the host country. This higher information stock should influence the establishment mode decision towards a Greenfield investment in a particular sector, since information costs and uncertainty have already been minimized by the experiences gained by (an) earlier entrant(s).

2.3 Industrial Organization Perspective

IO states that the MNE's establishment choice is influenced by the foreign industry's conditions (Caves and Mehra, 1986; Meyer and Estrin, 1997; Oster, 1999; Zejan, 1990). According to IO, the major difference between an acquisition and a Greenfield investment is that Greenfield investments increase local supply. The increase in local supply is particularly high in concentrated industries, since Greenfield entrants need to enter those industries at a large scale in order to be able to compete with the few large competitors. This will lead to a large decrease in prices and profits, and thus in a competitive response from the incumbents. Hence, MNEs prefer to enter concentrated industries through acquisitions (Caves and Mehra, 1986). In turn, the likelihood of a Greenfield investment in less-concentrated industries should increase.

Also, competitors are more likely to respond to Greenfield entries when their industry is not growing, since in this case they would lose market share. MNEs thus prefer to enter slow-growth industries via acquisitions. In turn, in case the industry is strongly growing, Greenfield investments would not make the incumbents lose market share and would make new entrants more tolerable, making Greenfield investments more likely (Zejan, 1990). However, Greenfield investments take some time to become operational and in case of high growth industries this would result in large foregone profits for the MNE, making an acquisition more likely (Caves and Mehra, 1986).

Another IO characteristic of the industry entered is the availability of takeover targets. In the case of lack of suitable firms that can potentially be acquired in a specific target industry, the MNE will be forced to enter the industry via a Greenfield investment instead of an acquisition (Caves and Mehra, 1986; Larimo, 2003; Zejan, 1990).

2.4 Summarized Predictions and Further Theories

Table 1 summarizes the predictions of the described theories.

Table 1: Predictions of Dominant Theories

Construct	TCI	IE	IO
Technological knowledge of parent	−		
International experience of parent	−		
Host-country experience of parent	−	+	
Parent is first entrant		+	
Parent is follower		−	
Concentration level of industry entered			+
Growth rate of industry entered			− / ∪
Availability of takeover targets			+

+ = increases likelihood of acquisition; − = increases likelihood of greenfield investment; ∪ = curvillinear effect on likelihood of acquisition

TCI = Transaction Cost/Internalization Theory
IE = Information Economics
IO = Industrial Organisation Perspective

Source: Own Contribution

Furthermore, larger firms have more resources in general. However, a concrete prediction cannot be made whether larger resources are a driver for Greenfield investments or acquisitions (Kogut and Singh, 1988).

In addition, managers of highly profitable firms may seek to undertake acquisitions in order to increase their reputation, power and salary, even though these acquisitions may not increase firm value (Finkelstein and Hambrick, 1989; Jensen, 1986).

2.5 Hypotheses

Overall, eight hypotheses will be tested relating to the choice between Greenfield investments and acquisitions. They are derived from the predictions of TCI, IE and IO, whose theories were outlined in the literature review.

Hypotheses deriving from Transaction Cost/Internationalization Theory

H1: MNEs prefer Greenfield investments over acquisitions when their technological knowledge is high.

H2: Internationally-experienced MNEs prefer Greenfield investments over acquisitions.

Hypotheses deriving from Information Economics

H3: Locally-experienced MNEs prefer acquisitions over Greenfield investments.

H4: If the MNE is the first to enter the industry in the host country, it will prefer to do so through an acquisition rather than a Greenfield investment.

H5: When a German firm has gained experience in the target industry of the host country, the MNE prefer to undertake a Greenfield investment over an acquisition.

Hypotheses deriving from Industrial Organization Perspective

H6: MNEs prefer acquisitions over Greenfield investments when the market is concentrated.

H7: MNEs prefer Greenfield investments over acquisitions when the target industry is growing.

H8: MNEs prefer acquisitions over Greenfield investments when the target industry has sufficient takeover targets available.

3. Methodology

In the following section, the methodology will be outlined. We apply a binary logit regression model with one dependent and 16 independent variables.

3.1 Variables

In order to examine the validity of the hypotheses, the following variables are tested. Since the focus of this study is solely the entry and expansion of one home country (Germany) in one target country (Portugal), it is not meaningful to investigate country-specific independent variables.[1] Therefore, the only independent variables tested are (parent-)firm-level and target-industry-level variables.

Dependent Variable

Greenfield. A Greenfield investment is defined as a newly established facility by the German MNE. A transaction is defined as an acquisition when it involves the complete or partial takeover of an existing Portuguese firm in which it previously did not have a stake. Note that these definitions entail both first-time entries and follow-up expansions, i.e. they still apply when the German MNE previously had a subsidiary in Portugal and subsequently undertook an additional investment. *Greenfield* is the only dependent variable used. It is a binary variable and assumes a value of 1 for a Greenfield investment and a value of 0 for an acquisition.

Variables to Test the Hypotheses

Independent Variables

R&D Intensity. In order to test hypothesis 1, *R&D Intensity* is used as a proxy for a firm's technological knowledge. TCI predicts that R&D-intensive multinationals prefer Greenfield investments over acquisitions, since they are able to exploit their own capabilities better by themselves (Anderson and Gatignon, 1986). This finding has been confirmed by several empirical studies (Andersson and Svensson, 1994; Brouthers and Brouthers, 2000; Chen and Zeng, 2004; Cho and Padmanabhan, 1995; Forsgren, 1990; Harzing, 2002; Hennart and Park, 1993; Hennart and Reddy, 1997; Padmanabhan and Cho, 1999). However, data availability for

[1] e.g. growth in Gross Domestic Product (GDP)

R&D expenditures is poor for our sample, since we also consider not-publicly traded firms. Thus, we use the firms' patent-employee ratio as a proxy. It is important to note, however, that this variable measures a firm's output of R&D efforts (patents) rather than its input (R&D expenditures). Furthermore, since the underlying data is highly skewed towards low levels of *R&D Intensity*, and we want to avoid possible issues with outliers, we split the continuous variable into two binary ones; *Low R&D Intensity*, with a value of 1 for R&D intensities below the 20th percentile and a value of 0 otherwise, and *High R&D Intensity*, with a value of 1 for R&D intensities above the 80th percentile and a value of 0 otherwise (see Appendix A).

International Experience. We test for the MNE's *International Experience* in order to test hypothesis 2. TCI predicts that internationally-experienced MNEs prefer Greenfield investments since they have already gained substantial knowledge on how to operate in international markets and are thus experienced in building subsidiaries from scratch (Hennart and Park, 1993). Empirical evidence has been mixed, with findings for both acquisitions (Andersson and Svensson, 1994; Caves and Mehra, 1986; Forsgren, 1990; Harzing, 2002) and Greenfield investments (Barkema and Vermeulen, 1998; Brouthers and Brouthers, 2000; Padmanabhan and Cho, 1999; Wilson, 1980). We use the number of years the firm has had operations abroad prior to its investment as a proxy for its international experience.

Local Experience. In order to validate hypothesis 3 we test for the MNE's *Local Experience.* TCI predicts that MNEs with more host-country experience prefer to undertake Greenfield investments, since they already know about local market characteristics. On the other hand, IE predicts that local-experienced firms may use their local expertise in order to evaluate local firms more appropriately which increases the likelihood of acquisitions (Hennart and Park, 1993). Empirical studies have confirmed the latter theory (Andersson and Svensson, 1994; Barkema and Vermeulen, 1998). We measure a firm's local experience as the number of years the firm has had operations in the country prior to the investment and do not expect any particular sign. A positive sign confirms TCI, while a negative one confirms IE and hypothesis 3.

First Entrant. According to IE, a firm that is the first one to enter a specific industry in a particular target country is more likely to acquire a foreign firm in order to decrease informational asymmetries (Caves and Mehra, 1986). The only empirical evidence found this variable to be not significant (Caves and Mehra, 1986). In order to test the validity hypothesis 4,

we test for this variable in binary form, assuming a value of 1 for a first entrant, and a value of 0 for a follower.

German Experience. On the other hand, when a German firm has already invested in a specific sector in Portugal, the likelihood that other German companies will follow into the same sector in Portugal should increase. IE predicts that in such a case a Greenfield investment will be more likely, since a follower will have to face less information asymmetries (Caves and Mehra, 1986). This prediction is confirmed by empirical findings (Hennart and Park, 1993). German experience is measured as the number of years since when there was a German first-mover in the specific sector in Portugal. We test this variable in order to prove the validity of hypothesis 5 and expect the coefficient's sign to be positive if the hypothesis holds.

Market Concentration. We use the independent variable *Market Concentration* in order to test hypothesis 6. According to IO, concentration should be a driver for acquisitions (Caves and Mehra, 1986). However, empirical evidence is mixed (acquisition: Caves and Mehra, 1986; Greenfield: Chen and Zeng, 2004; Hennart, Larimo and Chen, 1996). We test this variable by using the Hirschman-Herfindahl-Index (*HHI*) as a proxy for the concentration of the industry entered. In order for hypothesis 6 to hold, the sign should thus be negative.

Growth in Output. In order to capture the growth of an industry in the host country, a firm may undertake an acquisition since it makes rapid entries possible (Caves and Mehra, 1986, Andersson and Svensson, 1994). On the other hand, IO predicts that Greenfield investments are more tolerable for competitors when an industry is expanding rather than being stagnant (Zejan, 1990). Empirical evidence has proven that the latter explanation holds (Brouthers and Brouthers, 2000; Zejan, 1990; Meyer and Estrin, 1997). We test this variable in order to validate hypothesis 7 and expect the sign to be positive.

Takeover Targets. IO predicts that a higher number of takeover targets in a particular sector may increase the likelihood of undertaking an acquisition (Caves and Mehra, 1986; Larimo, 2003; Zejan, 1990). We measure the number of takeover targets as the natural logarithm of the number of firms in the target industry in the year preceding the entry in order to test hypothesis 8.

Control Variables

Parent-level

Firm Size. Generally, larger firms possess more resources (Kogut and Singh, 1988). Empirical evidence shows a tendency towards acquisitions (acquisition: Andersson and Svensson, 1994, Larimo, 2003; curvilinear effect towards acquisition: Meyer and Estrin, 1997). We control for the firm's size by using the natural logarithm of the firm's total assets as a proxy variable.

Profitability. Finkelstein and Hambrick (1989) outline that managers may undertake acquisitions in order to raise their influence and salaries, even if the acquisition does not increase firm value. Barkema and Vermeulen (1998) brought empirical support to Finkelstein and Hambrick (1989)'s theory. We control for this variable, using the firm's return on equity (*ROE*) as a proxy.

Publicly Traded. Publicly traded firms are expected to have more financing alternatives for acquisition-takeovers than not publicly traded ones (Pagano and Panetta, 1998). Empirical evidence for the influence of this variable on entry and expansion modes is not available. Nevertheless, we use the firm's legal form as a dummy variable, with a value of 1 for the German publicly-traded firm (*Aktiengesellschaft*, or *AG*), and a value of 0 for all other legal forms.

Industry-level

Growth in Productivity. Gains in productivity experienced by firms in a particular sector of the host country may draw the MNE's attention. The entrant may try to capture the increase in productivity via an acquisition since it is the faster mode of entry (Zejan, 1990). Productivity is measured as the Gross Value Added (GVA) of the target industry divided by the number of employees that are employed in the sector.

Change in Business Confidence. When local firms increase their confidence about the foreseen business environment, MNEs may be attracted by this confidence and attempt to capture possible future growth. We expect the firm to enter via an acquisition due to the increased speed of entry mentioned before.

Eurozone. We control for the time until/since the introduction of the Euro as a currency in 2002. It is expected that with increasing time since the introduction of the Euro the likelihood of an investment by an MNE increases, because both information asymmetries should decrease and firms are not exposed to possible preexisting exchange rate risks anymore, which in turn decreases the barriers for an investment. However, it is difficult to predict how this variable influences the choice between a Greenfield or acquisition transaction. We nevertheless control for this variable.

Interaction Variable

Market Concentration X *International Experience.* Hennart (2009) examines the optimal choice between Greenfield investments and acquisitions. Depending on the relative efficiency of the markets for assets, one or the other will be more favorable. As Hennart (2009) states, if the local firm's assets are strongly rooted within the firm so that the assets cannot be attained distinctly, but the firms' market is efficient, an acquisition will be the optimal choice. Furthermore, he claims that internationally-experienced MNEs will prefer acquisitions over Greenfield investments when the market is efficient (Hennart, 2009). In turn, internationally-experienced MNEs should prefer Greenfield investments when the market is inefficient. In order to evaluate the validity of his hypothesis, we use *Market Concentration* as a proxy for market efficiency[2] and test the interaction between *Market Concentration* and *International Experience*. The sign should be positive if his hypothesis holds.

3.2 Empirical Methods

In order to assess the factors that influence the decision between acquisitions and Greenfield investments a regression model is built. The model follows a stepwise logit regression procedure with binary outcome. Binomial choice models constitute the traditional methodology in the foreign entry mode literature (e.g. Caves and Mehra, 1986; Hennart and Park, 1993; Zejan, 1990). This model has been widely used in several entry and expansion modes' research studies, that use a dichotomous dependent variable (Brouthers and Brouthers, 2000; Ekeledo and Sivakumar, 2004; Erramilli et al., 2002; Erramilli and Rao, 1993). Its major advantage is the possibility to estimate the effects of increments in each independent variable on how likely the

[2] The higher the concentration in a certain industry, the less efficient is its market, and vice versa.

dependent variable (*Greenfield*) assumes the value 1 (for a Greenfield investment) in contrast to the value 0 (for an acquisition).

Furthermore, logistic regression models have as a key advantage that they have underlying assumptions that are different from linear models: neither linearity between the dependent variable and independent variable, nor normality regarding the residuals nor homoscedasticity of the independent variables needs to be present in order to receive appropriate results. However, the model is critical towards over- or under-fitting the data. In order to cope with this issue, a backward stepwise approach will be used where the least-significant variable is removed after each step until all independent variables are significant at the 10%-level. In addition, the error terms of the independent variables need to be independent and non-multicollinear.

3.3 Data and Sample

In general, it is rather difficult to retrieve data on intra-European Greenfield and acquisition transactions due to the lack of a centralized institutional body that collects this kind of data.[3] 161 Greenfield and acquisition transactions by German companies in Portugal from 1996 until 2013 could be captured. Excluding investments that constitute the creation of a sales office, financial investors, parents that lack data availability on independent variables, and industries that are not innovation-intensive according to Eurostat's (2014)'s TOT_INN sectors, the resulting sample consists of 73 Greenfield and acquisition transactions. Table 2 gives an overview on the sample, separated by primary and secondary NACE codes.

Most of the analyzed transactions occurred in the manufacturing sector, with a total of 44 transactions – or 60.3% of the whole sample. The second most frequent transactions were undertaken in the information and communication sector.

The data for the independent variables was compiled from a variety of sources. For a detailed overview on the origins of the used data, please see Appendix B.

[3] This may also be due to the circumstance that firms which are expanding internationally within the EU area are not obliged to report investments being made.

Table 2: Sample Overview on Investments by German Companies in Portugal from 1996 until 2013

NACE	Industry	Sample	%
C	*Manufacturing*	***44***	***60.3%***
17	Manufacture of paper and paper products	1	1.4%
20	Manufacture of chemicals and chemical products	5	6.8%
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3	4.1%
22	Manufacture of rubber and plastic products	1	1.4%
23	Manufacture of other non-metallic mineral products	3	4.1%
24	Manufacture of basic metals	2	2.7%
25	Manufacture of fabricated metal products, except machinery and equipment	1	1.4%
26	Manufacture of computer, electronic and optical products	9	12.3%
27	Manufacture of electrical equipment	4	5.5%
28	Manufacture of machinery and equipment n.e.c.	3	4.1%
29	Manufacture of motor vehicles, trailers and semi-trailers	11	15.1%
30	Manufacture of other transport equipment	1	1.4%
D	*Electricity, Gas, Steam and Air Conditioning Supply*	***7***	***9.6%***
35	Production of electricity	7	9.6%
G	*Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles*	***4***	***5.5%***
46	Agents (without the sale of motor vehicles)	4	5.5%
H	*Transportation and Storage*	***6***	***8.2%***
49	Land transportation and transport via pipeline	5	6.8%
53	Postal and courier activities	1	1.4%
J	*Information and Communication*	***10***	***13.7%***
58	Publishing	2	2.7%
62	Computer service activities	8	11.0%
M	*Professional, Scientific and Technical Activities*	***2***	***2.7%***
73	Advertising and market research	2	2.7%
	Total	**73**	**100.0%**

Source: ThomsonOne SDC (2014), Zephyr (2014), fDi Markets (2014)

Table 3 presents an overview on the chosen variables and depicts their means, standard deviations and correlation coefficients.

As mentioned above, multicollinearity is critical for logistic regression models, because it can lead to inappropriate results. One indicator for multicollinear independent variables are significant correlation coefficients, shown in Table 3. However, since multicollinearity usually involves more than two variables, pairwise correlations are usually a poor indicator for its presence (Long, 1997). Thus, we use multicollinearity measures, which can quantify multicollinearity by considering the entire model. Table 4 shows the Variance Inflation Factor (VIF), Tolerance and Condition Number for each of the independent variables.

Table 3: Means, Standard Deviations, and Correlations (N = 73)

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Greenfield	0.59	0.50																
2. Firm Size	8.18	2.95	.04															
3. Profitability	0.13	0.17	.12	-.36*														
4. Publicly Traded	0.78	0.42	-.31*	.55*	-.57*													
5. High R&D Intensity	0.21	0.41	.22	.05	-.17	.19												
6. Low R&D Intensity	0.21	0.41	.01	-.15	-.01	-.14	-.26											
7. International Experience	44.14	39.52	.14	.47*	-.15	.21	.08	-.09										
8. Local Experience	14.75	28.45	.21	.39*	-.08	.12	.06	.06	.87*									
9. German Experience	49.34	40.39	.29*	.15	.02	.05	.02	-.17	.14	.33*								
10. First Entrant	0.08	0.28	-.26	-.04	-.02	.04	-.15	.22	-.17	-.16	-.37*							
11. Market Concentration	0.07	0.10	.03	.15	-.04	.07	.04	-.19	-.03	.06	.36*	.14						
12. Growth in Output	0.05	0.06	.08	.16	.07	.00	-.04	-.11	.13	0.2	.19	-.08	.07					
13. Growth in Productivity	0.03	0.05	-.14	.09	.04	-.05	.00	-0.1	.13	.11	-.05	.03	.21	.48*				
14. Change in Business Confidence	0.31	3.17	.09	.00	.23	.06	-.02	.04	-.02	.12	.33*	-.06	.19	.08	-.06			
15. Takeover Targets	10.68	1.59	.24	-.22	-.01	-.06	.10	.14	-.13	-.07	-0.3*	.08	-.34*	-.20	-.26	.07		
16. Eurozone	0.84	0.37	.46*	.04	.04	-.15	.13	.23	.01	.17	-.05	.13	-.01	-.06	-.03	.02	.42*	
17. International Experience X Market Concentration	3.01	5.79	.10	.35*	-.06	.10	.01	-.04	.59*	.62*	.29*	.04	.55*	.24	.22	.24	-.40*	.02

* $p < 0.05$

Source: Own Contribution

Table 4: Variance Inflation Factors, Tolerance and Condition Number for Selected Models

Independent Variable	Full Model		Model A		Model B		Model C		Model D	
	VIF	Tol.	VIF	Tol.	VIF	Tol.	VIF	Tol.	VIF	Tol.
1. Firm Size	2.07	0.48	2.07	0.48	2.07	0.48	1.97	0.51	1.98	0.50
2. Profitability	1.79	0.56	1.76	0.57	1.76	0.57	1.76	0.57	1.73	0.58
3. Publicly Traded	2.21	0.45	2.17	0.46	2.17	0.46	2.17	0.46	2.17	0.46
4. High R&D Intensity	1.24	0.81	1.24	0.81	1.23	0.81	1.24	0.81	1.24	0.81
5. Low R&D Intensity	1.50	0.67	1.49	0.67	1.33	0.75	1.37	0.73	1.46	0.68
6. International Experience	7.38	0.14	6.58	0.15	1.38	0.73			6.52	0.15
7. Local Experience	7.11	0.14	6.90	0.14			1.45	0.69	6.83	0.15
8. German Experience	2.26	0.44	2.16	0.46	1.83	0.55	1.95	0.51	2.01	0.50
9. First Entrant	1.45	0.69	1.44	0.70	1.43	0.70	1.43	0.70	1.44	0.70
10. Market Concentration	2.66	0.38	1.63	0.61	1.62	0.62	1.59	0.63	1.52	0.66
11. Growth in Output	1.58	0.63	1.50	0.66	1.46	0.69	1.46	0.69	1.50	0.67
12. Growth in Productivity	1.59	0.63	1.56	0.64	1.56	0.64	1.55	0.65	1.51	0.66
13. Change in Business Confidence	1.59	0.63	1.39	0.72	1.39	0.72	1.39	0.72	1.32	0.76
14. Takeover Targets	2.10	0.48	1.79	0.56	1.77	0.56	1.78	0.56		
15. Eurozone	1.65	0.61	1.63	0.61	1.54	0.65	1.56	0.64	1.33	0.75
16. International Experience X Market Concentration	4.31	0.23								
Mean VIF	**2.66**	**0.50**	**2.35**	**0.55**	**1.61**	**0.64**	**1.62**	**0.63**	**2.33**	**0.57**
Condition Number	**44.37**		**40.84**		**38.60**		**37.14**		**18.30**	

Source: Own Contribution

Using the full model, three independent variables stand out to be collinear: *Local Experience*, *International Experience* and the interaction variable *International Experience* X *Market Concentration.* However, both VIF and Tolerance are within the thresholds proposed by Hair et al. (1998) of below 10 for the VIF and above 0.1 for the Tolerance. The third measure for collinearity, the Condition Number, is, with a value of 43.51, above Hair et al.'s (1998) threshold of 30. Instead of correcting the model for multicollinearity by excluding one of the more collinear variables or combining them with each other, we proceed with the full model since the explanatory power of each of the three variables is of crucial importance to understand the drivers of entry and expansion and the applied stepwise procedure should correct for possible collinearity issues.

However, in order to test for the robustness of our results, we run different modifications of our model, as depicted by the columns A to D. Here, we receive lower Condition Numbers that are partially still above the threshold of 30 (Model A, B and C) and below the threshold (Model D). In all models, we exclude the interaction variable *International Experience X Market Concentration* due to its high levels of correlation with the other variables. In Models B and C we exclude each of the variables *International Experience* and *Local Experience* due to their elevated VIFs. In Model D, we exclude *Takeover Targets*, since it has been filtered out as the main influence for the high Condition Numbers in the other models. In case the results are the same for all models, we can assume our results as being robust.

4. Results

Table 5 shows the estimation results from the stepwise regression. A positive coefficient means that the particular variable increases the likelihood of a Greenfield investment, a negative one indicates that the variable increases the probability of an acquisition. Overall, ten steps were performed, one for the exclusion of each of the most insignificant variable. Only six steps are shown here, the full model (1) and the last five steps (6-10). Even though the explanatory power decreases with the exclusion of variables, the final model (10) provides an overall good explanatory power of 47.73.

Note, however, that in logit regressions it is not (entirely) feasible to find statistical implications just by observing the coefficients and statistical significance (Ai and Norton, 2003). We thus

Table 5: Results for Binary Logit Regression: Greenfield (1) vs. Acquisition (0)

Greenfield = 1	1	6	7	8	9	10	MEM(10)
1. Intercept	-15.616 **	-12.595 **	-11.480 **	-9.266 **	-9.312 **	-4.020 **	
	(6.894)	(5.444)	(4.971)	(4.377)	(4.296)	(1.937)	
2. Firm Size[a]	0.387 *	0.361 *	0.364 *	0.362 **	0.395 **	0.340 **	**0.077**
	(0.203)	(0.195)	(0.194)	(0.180)	(0.173)	(0.166)	(0.038)
3. Profitability	0.218						
	(3.788)						
4. Publicly Traded[b]	-5.591 ***	-5.224 ***	-5.100 ***	-4.759 ***	-4.706 ***	-4.427 ***	**-0.563**
	(2.039)	(1.717)	(1.668)	(1.522)	(1.499)	(1.484)	(0.108)
5. High R&D Intensity[b]	2.680 **	2.369 **	2.255 **	2.329 **	2.478 **	2.657 **	**0.415**
	(1.301)	(1.147)	(1.113)	(1.101)	(1.094)	(1.109)	(0.119)
6. Low R&D Intensity[b]	1.403						
	(1.462)						
7. International Experience	0.027	0.035	0.036	0.010			
	(0.032)	(0.024)	(0.024)	(0.015)			
8. Local Experience	-0.077	-0.056	-0.052				
	(0.047)	(0.039)	(0.038)				
9. German Experience	0.052 *	0.040 ***	0.040 ***	0.031 **	0.031 **	0.025 **	**0.006**
	(0.028)	(0.015)	(0.015)	(0.012)	(0.012)	(0.010)	(0.002)
10. First Entrant[b]	-1.935						
	(2.057)						
11. Market Concentration	-7.951						
	(13.114)						
12. Growth in Output	13.910	18.131 *	17.426 *	15.973 *	15.739 *	16.050 *	**3.617**
	(10.852)	(10.001)	(9.604)	(9.089)	(9.220)	(8.820)	(1.955)
13. Growth in Productivity	-14.420	-18.550 *	-18.199 *	-17.714 *	-18.060 *	-20.853 **	**-4.700**
	(10.650)	(9.609)	(9.411)	(9.183)	(9.515)	(9.233)	(2.114)
14. Change in Business Confidence	-0.072						
	(0.173)						
15. Takeover Targets[a]	1.014 *	0.722 *	0.616	0.505	0.522		
	(0.554)	(0.433)	(0.386)	(0.362)	(0.359)		
16. Eurozone[b]	3.611 **	3.739 **	3.804 **	3.326 **	3.306 **	4.192 ***	**0.738**
	(1.538)	(1.513)	(1.501)	(1.384)	(1.388)	(1.379)	(0.105)
17. International Experience X Market Concentration	0.383	0.073					
	(0.351)	(0.106)					
Log-Likelihood	-21.4105	-22.7750	-23.0349	-24.0116	-24.2658	-25.5704	
R^2	0.5669	0.5393	0.5340	0.5143	0.5091	0.4828	
$\chi 2$	56.05	53.32	52.80	50.85	50.34	47.73	
p -value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

Note: N = 73. The table does not show steps 2 to 5. A detailed table can be found in the Appendix. Values in parentheses are standard errors. Column MEM(10) shows the Marginal Effects at the Means for Model 10.

[a] Variable is a natural logarithm.

[b] Variable is dichotomous.

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

Source: Own Contribution

compute the Marginal Effects at the Means (*MEM*) that are shown for the final model of Table 5 (column MEM(10)). The *MEM* makes it possible to assess how marginal changes in a variable have an impact on the probability of the occurrence of an event, keeping all other variables at their means (Hoetker, 2007). For binary independent variables, the *MEM* measures discrete change, whereas for continuous independent variables it measures the instantaneous rate of change, meaning how strongly a small increment in the underlying continuous variable influences the propensity of a Greenfield investment. Furthermore, it is possible to determine conditional changes in the probability of a Greenfield investment by interacting a binary and a continuous variable with each other, which we investigate further in the "Conditional Marginal Effects and Robustness of the Results" section.

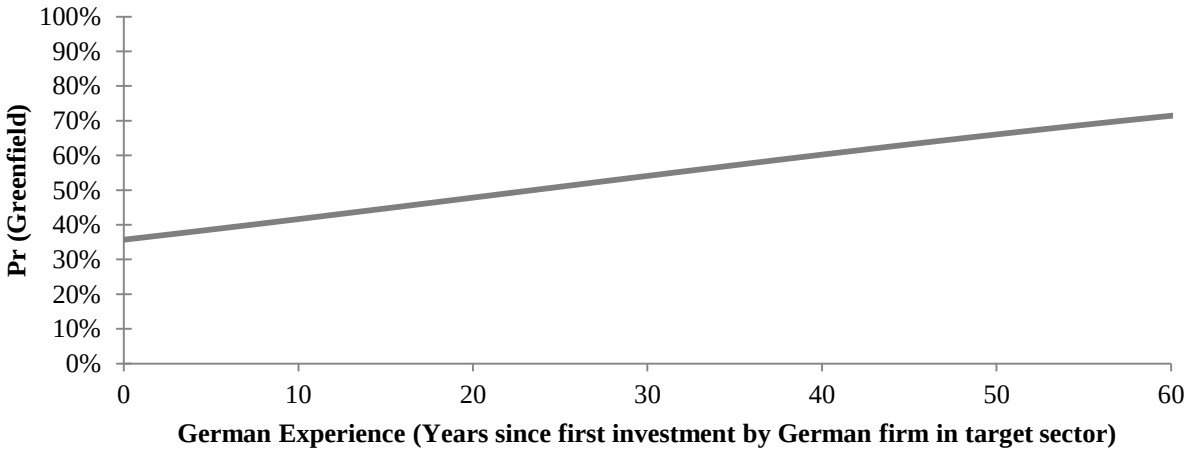
4.1 Results for Hypotheses

Hypothesis 1 predicts that R&D-intensive MNEs prefer to undertake Greenfield investments. The model estimate accepts the hypothesis at the 95% confidence level, indicating that firms with higher technological knowledge prefer to build subsidiaries from scratch. The *MEM* indicates that – for an average firm – having high R&D intensity makes a Greenfield investment by 41.5% more likely than being non-R&D intensive. We can thus confirm the findings of Forsgren (1989), Hennart and Park (1993), Andersson and Svensson (1994), Cho and Padmanabhan (1995), Hennart, Larimo, and Chen (1996), Meyer and Estrin (1997), Padmanabhan and Cho (1999), Brouthers and Brouthers (2000), Harzing (2002), and Chen and Zeng (2004).

Hypotheses 2 to 4 are rejected. Neither the international experience of an MNE, nor the MNE's host market experience, nor being the first one to enter the target industry, is a significant determinant for Greenfield investments or acquisitions. The result for the MNE's international experience goes in line with the not-significant findings of Zejan (1990), Cho and Padmanabhan (1995), Meyer and Estrin (1997) and Larimo (2003), who have also proven that international experience is not a significant driver for the choice between Greenfield investments and acquisitions. The result that host market experience does not have an influence on the establishment mode choice confirms the findings by Hennart and Park (1993), Cho and Padmanabhan (1995), Padmanabhan and Cho (1999), and Larimo (2003). The result for the variable *First Entrant* confirms the finding by Caves and Mehra (1986).

The number of years a German company has been operational in the target sector, *German Experience*, is significant at the 95% confidence level. We can thus confirm hypothesis 5. The variable has – as expected – a positive impact on the decision towards a Greenfield investment. The *MEM* suggests that a 1% increase of a German firm's experience in a particular target industry increases the chances of an average German MNE to undertake a Greenfield investment by 0.42%. For an additional year a German firm has been operational in the target sector, the likelihood increases by 0.85%. We can therefore confirm the results found by Hennart and Park (1993). Figure 1 shows the effect of an increase in *German Experience* on the propensity of a Greenfield investment. Interestingly, as long as the experience of a German firm in the target sector is below 23 years and 7 months, it is more likely for the German MNE to enter via an acquisition.

Figure 1: Adjusted Predictions for the Likelihood of a Greenfield Investment for an Average Firm with Variable German Experience in the Target Sector



Source: Own Contribution

Hypothesis 6 states that MNEs prefer to undertake acquisitions when the market for firms is efficient. The parameter estimate for *Market Concentration* is not significant, giving strong support for the rejection of the hypothesis. Hennart and Park (1993) also find this driver to be insignificant.

The variable *Growth in Output* proves to be significant. We can therefore confirm hypothesis 7. The variable is significant at the 90% confidence level and shows a positive sign. For an average firm, a 1 percentage point increase in output of the target industry makes a Greenfield investment

by 0.55% more likely. We can thus confirm the findings by Zejan (1990), Meyer and Estrin (1997) and Brouthers and Brouthers (2000).

Hypothesis 8 cannot be confirmed using our model. Hence, the availability of takeover targets no statistical significance which confirms the findings by Caves and Mehra (1986).

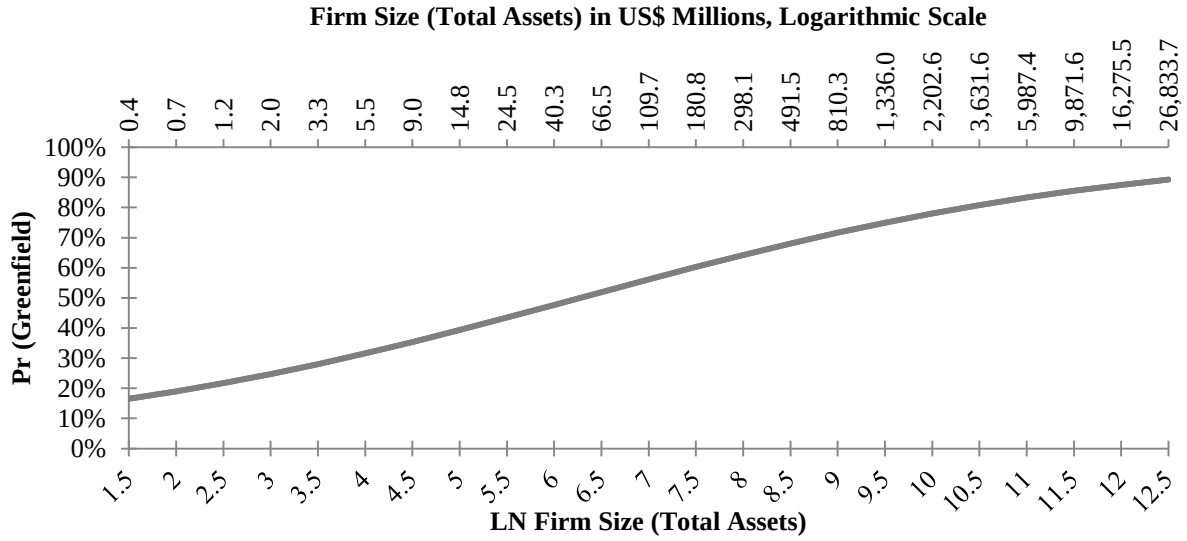
4.2 Results for Control Variables

Among the control variables, six additional variables prove to be significant. The variable *Firm Size*, for which no clear sign could be theoretically predicted, has a positive sign and is significant at the 95% confidence level. Since the variable is a logarithm, the estimated coefficient indicates that a 1% increase in the assets of a firm increases the odds of a Greenfield transaction by 34.0%. In case other empirical literature found this variable to be a significant determinant for the choice between Greenfield investments and acquisitions, it was found that it is a positive driver for acquisitions (Andersson and Svensson, 1994) or that it has a curvilinear effect towards Greenfield investments (Larimo, 2003). Therefore, our result is one that has not been proven clearly by previous empirical research. Furthermore, for an average firm, the *MEM* suggests that a 1% increase in the natural logarithm of total assets makes a Greenfield investment by 0.95% more likely. At a logarithmic value of 6.28 (or Total Asset value of US$53.4 million), the model predicts that the average firm is indifferent concerning the choice between a Greenfield investment or an acquisition. Values below this threshold make an acquisition more likely, values above it make a Greenfield investment more likely. Figure 2 illustrates the marginal effect of the increase in an average firm's size on the probability of a Greenfield investment.

The variable *Publicly Traded* shows significant parameter estimates at the 99% confidence level. As expected, the sign of the estimate is negative, indicating that publicly traded firms prefer to undertake acquisitions. In addition, the *MEM* indicates that being an average publicly-traded firm decreases the propensity of a Greenfield investment by 56.3%.

Furthermore, *Growth in Productivity* is significant at the 95% level and carries – as expected – a negative sign. In other words, an MNE is more likely to undertake a Greenfield investment when the industry productivity decreases since it may build and run newly started facilities better on its

Figure 2: Adjusted Predictions for the Likelihood of a Greenfield Investment for an Average Firm with Variable Size



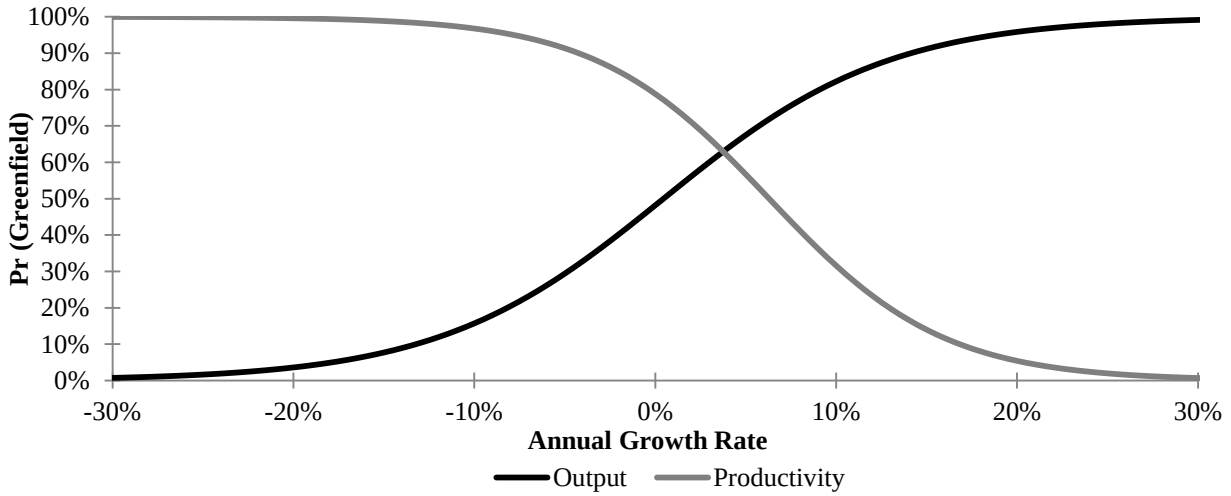
Source: Own Contribution

own. A 1 percentage-point increase in productivity makes a Greenfield investment for an average MNE by 0.72% less likely.

The impact of *Growth in Productivity* and *Growth in Output* on the odds of undertaking a Greenfield investment is illustrated in Figure 3. As can be seen, the two curves are approximately inverted to each other. However, they are not perfectly inverted and differ in certain aspects. At a zero-growth rate, the *Growth in Output* shows an estimated probability of a Greenfield investment of 48.18%, indicating that an acquisition would still be more likely, and a growth rate of 0.5% at which the average MNE is indifferent towards the choice between a Greenfield investment and an acquisition. In turn, for an average firm the *Growth in Productivity* appears to have a likelihood of 78.79% for a Greenfield investment at stagnant growth and a growth rate of 6.25% at which it is indifferent towards the choice between a Greenfield investment and an acquisition.

Lastly, the binary variable *Eurozone* is significant at the 99% confidence level. The sign is positive, and it can be inferred that the introduction of the Euro as a currency in 2002 has had a significant impact on the chances of undertaking Greenfield investments. Indeed, the *MEM*

Figure 3: Adjusted Predictions for the Likelihood of a Greenfield Investment for an Average Firm with Variable Growth in Output and Growth in Productivity



Source: Own Contribution

suggests that the probability of undertaking a Greenfield investment increased by 73.8% due to the introduction of the Euro.

The remaining variables have proven not to be significant drivers for the choice between Greenfield investments and acquisitions.

4.3 Conditional Marginal Effects and Robustness of the Results

The analysis beforehand assumed average values for the binary variables which has no real applications (e.g. a firm cannot be 78% publicly traded; or, at least, the nature of binary variables cannot capture this). It is, therefore, meaningful to estimate the before mentioned marginal effects for the continuous variables in dependence on each of the significant dichotomous variables, which makes it possible to estimate interaction effects and to analyze our results more deeply. Table 6 gives an overview on the conditional marginal effects at the means for the significant continuous variables, dependent on the occurrence or non-occurrence of the dichotomous variables. In other words, the depicted values show the elasticity of small changes in the continuous variables based on the means of the other significant variables, conditional to the value of the binary variable.

Table 6: Conditional Marginal Effects at the Means for Significant Continuous and Dichotomous Variables

Continuous Variable	Mean	1% increase (0.1 pp increase for ratios)	Delta Probability of GF w/o conditions	Delta Probability of GF conditional on					
				Publicly Traded		High R&D Intensity		Eurozone	
				No	Yes	No	Yes	No	Yes
Firm Size[a]	8.18	8.27	0.95%	0.04%	1.62%	1.32%	0.16%	2.66%	0.57%
German Experience	49.34	49.84	0.42%	0.04%	1.62%	0.59%	0.07%	1.18%	0.26%
Growth in Output	4.50%	4.60%	0.55%	0.03%	0.93%	0.76%	0.09%	1.53%	0.33%
Growth in Productivity	3.18%	3.28%	-0.72%	-0.03%	-1.21%	-0.99%	-0.13%	-1.95%	-0.44%

Note: The full table including the predicted probabilities for each case can be found in the Appendix.

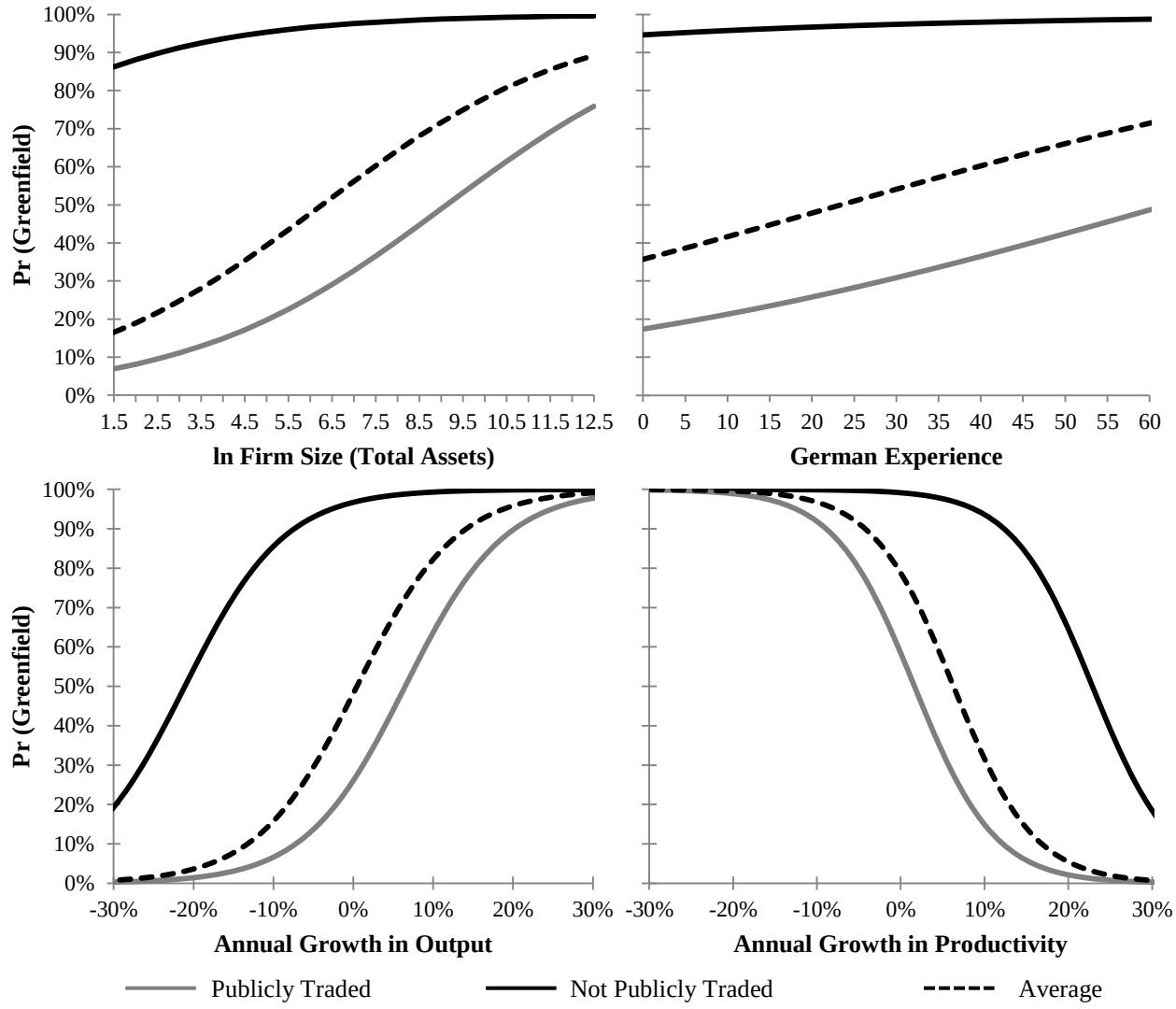
[a] Variable is a natural logarithm

Source: Own Contribution

The change in probability for a Greenfield investment differs substantially depending on the value of the binary variable. The biggest divergence in a small change of a continuous variable is estimated for a small increase in *Firm Size* and the membership of the *Eurozone*. Also, the largest impact is estimated for an average company that undertook an investment while Portugal was not yet part of the Eurozone and differs from the other average companies by being 1% larger based on the average LN value, or by US$ 305.55 million in absolute terms. The least significant change can be estimated for a 1 percentage point increase from the mean for the *Growth in Output* and a not-publicly traded company (0.026%). However, the indicated elasticities are rather difficult to understand (they constitute the slope of the marginal probability curve, or "a ratio of a ratio"). Figures 4 to 6 should therefore help to understand the impact of the dichotomous variables better. The figures are grouped into four sub-figures, each for the changes in one underlying continuous variable. Each sub-figure shows three curves, one for the occurrence of the binary variable, one for non-occurrence, and one for the average value.

Figure 4 shows the estimations conditional to the firm being publicly traded and not being publicly traded. As can be seen, for an average firm, the predictions for a non-publicly traded firm are that it is more likely for all observed firm sizes to undertake a Greenfield investment than being publicly traded. Additionally, the curve approximates asymptotically a probability of 100% with growing firm size. A publicly traded firm on the other hand prefers to undertake an acquisition until a logarithmic value of 9.13 (or Total Assets of US$ 922.8 million in absolute terms) and should opt for a Greenfield investment with increasing firm size. The effect of being a publicly traded firm on the experience of another German firm in the target sector is very similar.

Figure 4: Publicly Traded-Conditional Marginal Effects at the Means for Firm Size, German Experience, Growth in Output and Growth in Productivity



Source: Own Contribution

Being not-publicly traded, the probability of a Greenfield investment is always above 95% from 4 years of German experience onwards. For what concerns an average publicly traded firm, until a prior experience of another German firm in the target sector of approximately 62 years and 2.5 months it is more likely to undertake an acquisition. Beyond this threshold, a Greenfield investment is more likely.

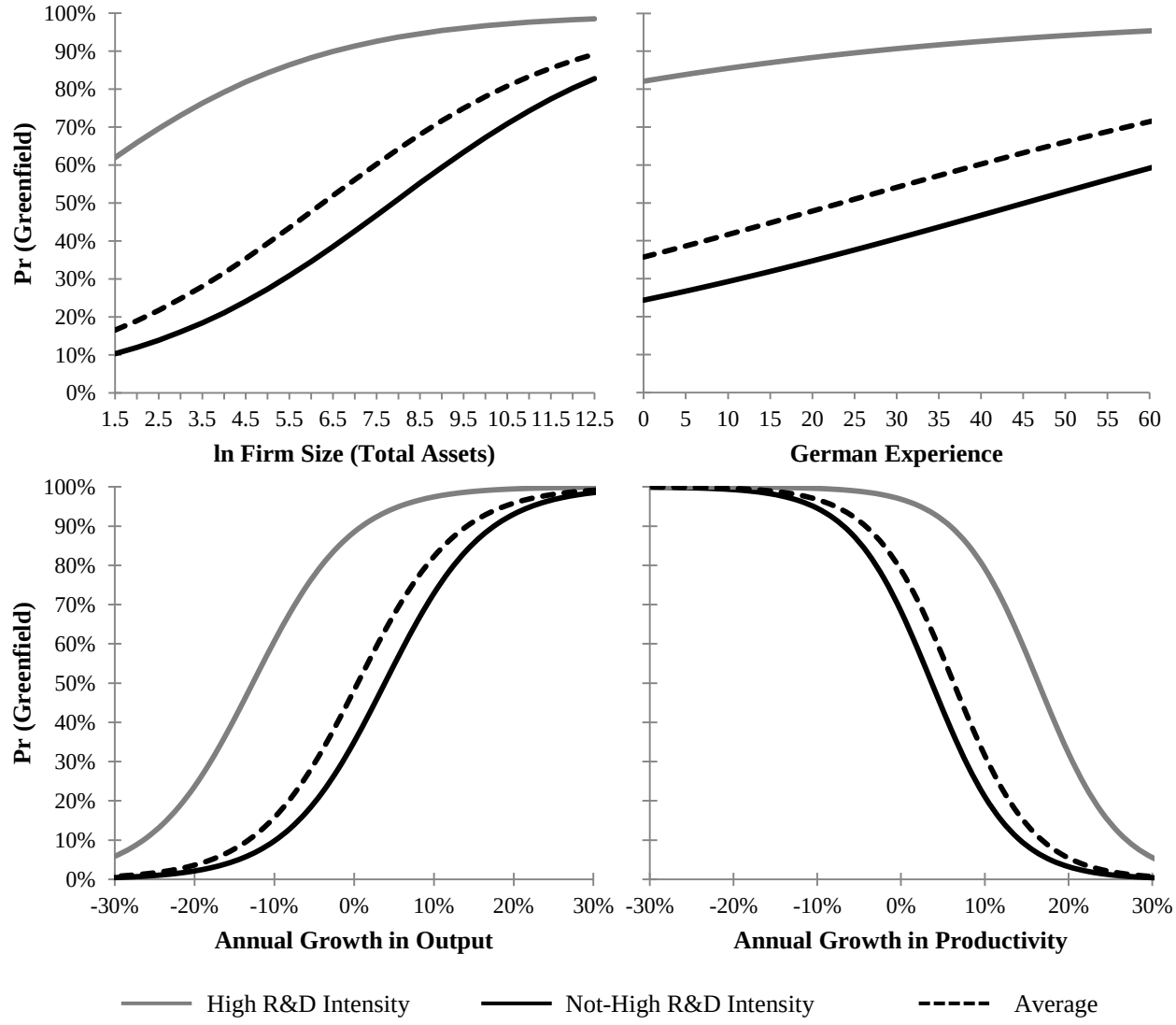
For the annual growth of the target industry, the curve of being a non-publicly traded firm is shifted by about minus 28% in growth when compared to the curve of a publicly traded one, making a non-publicly traded firm reaching the indifference threshold at a negative growth rate of the target sector (-21.05%) and thus substantially earlier than a publicly traded firm (6.57%).

Also, the propensity of a Greenfield investment at stagnant (0%-growth) is substantially different: At this point, a non-publicly traded firm is as likely as 96.72% to undertake a Greenfield investment, whereas for the publicly traded one the probability is only 26.05%, making an acquisition more likely. The opposite effect can be observed for the annual growth in productivity, where the curve of a non-publicly traded firm is shifted by about plus 21% in growth over the curve of a publicly traded firm. A publicly traded firm should opt for a Greenfield investment until efficiency gains are 1.65% or lower, whereas for a non-publicly traded firm this threshold is at an annual productivity increase of 22.85%.

Figure 5 shows the effects of an average firm being highly R&D intensive versus not being highly R&D intensive on the continuous variables. Even though the sub-figures may look similar to the ones from Figure 4, the effect of *High R&D Intensity* is inverted to *Publicly Traded*, meaning that firms that show to be highly R&D intensive have a higher likelihood of undertaking a Greenfield investment. The probability of a Greenfield investment is always above 60% for firms of all size classes and is approximating asymptotically 100%, as long as they are highly R&D intensive. Not highly R&D intensive firms are predicted to enter via an acquisition until a logarithmic value of the assets of 7.88, or US$ 264.3 million in absolute terms. After a firm passes this threshold, a Greenfield investment becomes more likely with growing firm size. Independently from the experience previously gained by another German firm in the target sector, a highly R&D intensive firm undertakes a Greenfield investment with a probability of over 80%. Not highly R&D intensive firms are estimated to prefer acquisitions until a threshold of 45 years and 3 months of experience gained by another German firm in the target sector.

The curve of the growth in output for highly R&D intensive firms is shifted by approximately minus 16% when compared to the curve for not-highly R&D intensive firms. Ergo, a Greenfield investment is earlier likely to be undertaken by firms that are highly R&D intensive. Until an annual decrease of the target industry of 12.70%, an acquisition is more likely for these firms, whereas for not-highly R&D intensive firms a threshold of 3.87% can be predicted. The curve for highly R&D intensive firms is shifted by approximately plus 10% in the case for the growth in productivity when compared to not-highly R&D intensive firms. The threshold until a Greenfield investment is more probable is 3.57% for not-highly R&D intensive firms and 16.42% for highly R&D intensive firms.

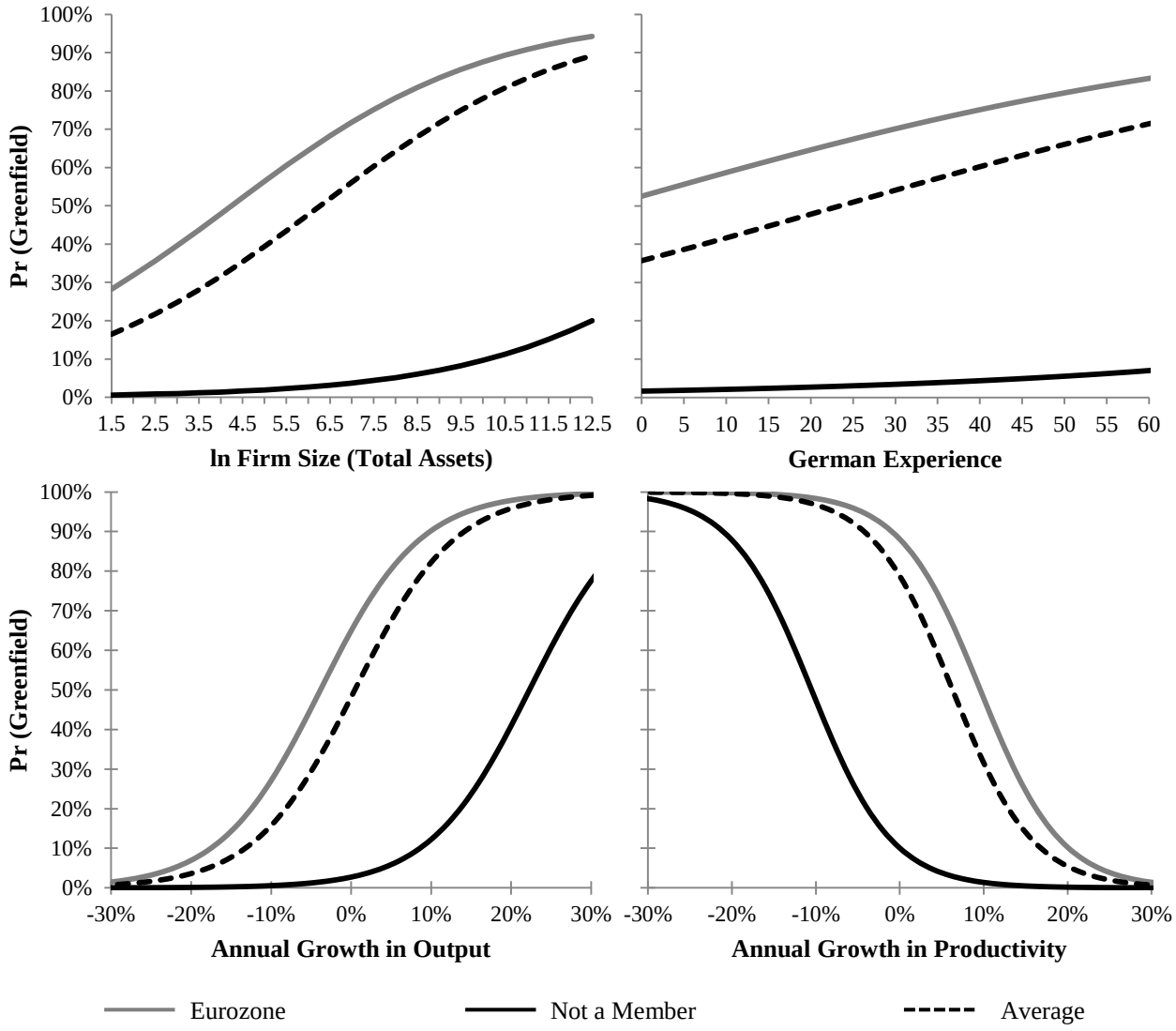
Figure 5: High R&D Intensity-Conditional Marginal Effects at the Means for Firm Size, German Experience, Growth in Output and Growth in Productivity



Source: Own Contribution

Figure 6 shows the estimations for the continuous variables conditional to the membership of the Eurozone. Portugal being part of the Eurozone increased the chances of Greenfield investments substantially. The Total Assets' value from which a Greenfield investment becomes more likely than an acquisition decreased substantially from a logarithmic value of 16.58 to 4.25, or from US$ 158.71 billion to US$ 70.11 million. Furthermore, even though the previous experience of other German firms in the target sector does have an impact on the likelihood of a Greenfield investment, it is above 50%, independently from the previous experience gained by them.

Figure 6: Eurozone-Conditional Marginal Effects at the Means for Firm Size, German Experience, Growth in Output and Growth in Productivity



Source: Own Contribution

Furthermore, for the *Growth in Output* of the target industry, before the introduction of the Euro an acquisition was the more likely establishment mode choice until a growth rate until 22.30%. After the Eurozone admittance, this threshold decreased to -3.85%, making a Greenfield investment more likely afterwards. For the *Growth in Productivity*, a Greenfield investment is more likely until 9.57% in growth, since the introduction of the Euro. This threshold was at -10.56% before the Eurozone.

Table 7 gives a summary of the thresholds at which an average firm is indifferent towards the decision between an acquisition and a Greenfield investment.

Table 7: Indifference Points for Conditional Marginal Effects at the Means for Significant Continuous and Dichotomous Variables

Continuous Variable	Pr(Greenfield) = 50%					
	Publicly Traded		High R&D Intensity		Eurozone	
	No	Yes	No	Yes	No	Yes
Firm Size[a]	-	9.13	7.88	-	16.58	4.25
German Experience	-	62y2.5m	45y3m	-	163y3m	-
Growth in Output	-21.05%	6.57%	-12.70%	3.87%	22.30%	-3.85%
Growth in Productivity	22.85%	1.65%	3.57%	16.42%	-10.56%	9.57%

Note: Shown values indicate the point at which an average firm is indifferent towards the decision between a greenfield investment and an acquisition. The shown graphs are miniature versions of Figures 4 to 6. The intersection of the horizontal line and the curve indicates the position of the indifference threshold for each case.

[a] Variable is a natural logarithm

Source: Own Contribution

Appendix E shows the results for the performed robustness checks. The model modifications A to D yield exactly the same result due to the applied stepwise procedure. Hence, our results can be seen as robust.

5. Discussion and Conclusion

The study at hand constitutes the first attempt to investigate the determinants of the mode for entry and expansion by German MNEs in Portugal. Primarily, we tried to answer the following research question:

Research Question 1: Do drivers deriving from traditional literature hold for entry and expansion mode choices of German MNEs in Portugal?

We found evidence that factors deriving from all three considered theories (Transaction Cost/Internationalization Theory, Information Economics and Industrial Organization Perspective) have an impact on the choice between acquisitions and Greenfield investments of German MNEs in Portugal.

Among the factors that derive from Transaction Cost/Internationalization Theory, we can conclude that a crucial element for the choice between a Greenfield investment and an acquisition is the factor of technological knowledge, this meaning that highly-skilled German MNEs prefer to undertake Greenfield investments. This result indicates that for highly-skilled MNEs transaction costs are lower for a Greenfield investment when compared to an acquisition, since a Greenfield investment makes it possible for the MNE to build its own facilities from scratch and transfer its critical skills to its own selection of employees. Hence, they are able to exploit their own capabilities better on their own.

Interestingly, neither the international experience of the German MNE nor its experience in Portugal has an impact on the choice between a Greenfield investment and an acquisition. This may be related to the period of our sample (1996 to 2013) which is majorly located in the time when Portugal was already part of the Eurozone. Both inexperienced and experienced German firms may have seen Portugal's admission to the Eurozone as a pre-selection of countries to expand into and concluded that their aggregated experiences gained abroad or in Portugal itself have no influence on how to enter the country.

Concerning the factors that derive from Information Economics, we could only find evidence for the previous experience gained by German firms in the target sector. Our results indicate that the longer a German firm has had operations in the sector of interest, the more likely another German company will follow by investing in a Greenfield project. However, we estimated a threshold of 23 years and 7 months until a German firm is more likely to acquire an existing Portuguese firm. Hence, only long-term aggregated experiences by other German firms make a German MNE opt for a Greenfield investment. The probability of a Greenfield investment is increased when dealing with a not publicly traded firm or a R&D intensive firm. Also, the Euro as a currency favored this trend. As an explanation, Information Economics suggests that the information asymmetry and uncertainty towards the target industry have decreased due to the increased information stock which has been accumulated by a previous German entry. This study

suggests that this information stock is sufficiently large enough when 23 years and 7 months passed from the entry, in order for a German MNE to undertake a Greenfield investment. The finding may also be seen as proof that Organizational Learning is determined by the culture in which the MNE is rooted (Hickson, 1996; Hofstede, 1983). Using this argumentation lets us conclude that the information efficiency among German MNEs is good, which may also be due to the rather strict (when compared to other countries) disclosure requirements established by the German government (Grundei and Talaulicar, 2002).

For what concerns the variables derived from the Industrial Organization Perspective, the growth rate of the industry entered proved to be the only influential driver. As long as growth is above 0.5%, the MNE will prefer to undertake a Greenfield investment. Below this growth rate, the German MNE will prefer to acquire an existing Portuguese firm. The result indicates that Greenfield investments are more tolerable for competitors when the industry is growing. Also, in stagnant or shrinking industries, acquisitions are more likely due to possible profitability losses or bankruptcies of existing firms that MNEs might be able to acquire at a smaller or even at a negative premium. Both for not publicly traded and highly R&D intensive firms this trend is shifted towards negative growth rates at which a Greenfield investment is being undertaken, indicating in turn that publicly traded and not-highly R&D intensive firms prefer to enter growing industries via a Greenfield investment at positive growth rates.

Remarkable is the finding that local market concentration does not play a role in the decision between a Greenfield investment and an acquisition of German MNEs in Portugal, even though several research studies have proven this factor to have an impact.

The second Research Question was:

Research Question 2: Which further parent- and host country-factors influence the choice between a Greenfield investment and an acquisition of a German MNE in Portugal?

Out of the six additionally examined factors we found two parent-level and two host-country factors to have an impact on the decision of the establishment mode.

Among the parent-level factors, we could confirm that the German MNE's size is a determinant for establishment mode choice. The fact that this variable is significant is already interesting.

Larger firms have more resources than smaller ones. Even though it could not be predicted whether larger resources are used for outright acquisitions or Greenfield investments, our results indicate that until a total asset's value of US$ 53.8 million an acquisition is more likely. For sizes above this value, a Greenfield investment is more probable. Hence, larger firms opt for Greenfield investments which may be because larger firms' cultures are more distinctive, and it may be easier to transfer a firm's culture through Greenfield projects since the new employees are selected according to the standards of the parent and are not taken over from the acquired firm. Even though acquisitions may be the faster mode of entry, larger resources may enable larger firms to build Greenfield facilities at a greater speed. The probability of a Greenfield investment further increases when the firm is not publicly traded and highly R&D intensive. In addition, the introduction of the Euro had an additional positive impact on the likelihood of a Greenfield investment, making firms already opt for Greenfield investments from a total assets' value of approximately US$ 7 million upwards.

A second parent-level factor that proved to be a significant driver for establishment mode choice is the corporate form of the entrant. We found that German publicly traded firms (*Aktiengesellschaft,* or *AG*) are more likely to undertake acquisitions in Portugal. Although the share price of a publicly traded firm usually falls upon the announcement of an acquisition, managers may seek to increase their power, salaries and prestige in the long-term by undertaking acquisitions. Especially the reputation is of importance in the case for publicly traded companies since this corporate form involves higher publication duties.

Among the industry-level factors that affect establishment mode choice, we found three further drivers to be significant. Our evidence suggests that an increase in productivity is a determinant for acquisitions. By contrary, the growth rate of the entered industry is a driver for Greenfield investments. When the target industry's productivity is growing above a rate of 6.25%, an acquisition is more likely. Below this threshold, a Greenfield investment is the most probable establishment mode. A reason German MNEs are more likely to undertake acquisitions when productivity increases at a substantial rate could be that German MNEs try to capture related gains in efficiency and are not able to build facilities that are as productive as existing ones in the target industry. On the contrary, managers of German MNEs do not consider productivity gains below 6.25% strong enough to justify an acquisition in the target country and may assume that

they could better leverage productivity by setting up their own facilities. Furthermore, the probability of a Greenfield investment is shifted towards higher growth rates when the firm is not publicly traded and highly R&D intensive.

The last influential factor on the choice between Greenfield investments and acquisitions is Portugal's membership in the Eurozone. We could find proof that the introduction of the Euro was a significant driver for Greenfield investments by German companies. A reason for this could be that the risk exposure due to currency fluctuations of the German D-Mark and the Portuguese Escudo was bigger in the case of Greenfield investments due to larger investment volumes.

The results allow us to give specific recommendations to attract more German FDIs in Portugal. Note, however, that these recommendations may only be applicable for FDI inflows from Germany – the transfer to other origins is critical and not scientifically backed up. Also, the adaption to industries different from the ones considered may also be critical. We assume that Greenfield investments are the more favorable type of FDIs, since they are associated with creating jobs and leveraging local supply (Caves and Mehra, 1986). Thus, the variables that were found to be significant drivers for Greenfield investments can be used as a basis for policies that deal with attracting Greenfield investments.

In general, R&D-intensive German MNEs are more likely to undertake Greenfield investments. Furthermore, larger, non-public firms tend to prefer Greenfield projects. In order to attract more Greenfield projects by German firms, policies should therefore aim at the promotion for these types of companies. In addition, German firms that have already invested in Portugal should be supported in order to maintain their commitment since their experience is shared with other firms from their home country and may attract further FDIs in its sector of operation. Moreover, policies should be aimed at boosting output in the industries that may be of interest for German MNEs, since growth attracts Greenfield projects. Lastly, since the Eurozone has proven to be a success factor for leveraging Greenfield investments, free trade policies should be further promoted, and foreign investors stronger supported in their intentions to invest in Portugal.

6. Limitations and Directions for Further Research

Our sample may have been exposed to idiosyncratic characteristics. The sample size was relatively small, with 73 observed predictions. We only considered transactions from one home country (Germany) to one target country (Portugal). Applications to other countries may therefore be critical. Moreover, Portugal is a rather small market that may display different characteristics when compared to larger economies. Furthermore, we focused only on industries that are related to innovation activities in order to be able to test our hypotheses. Specifically in the case for Portugal, future research may hence consider other countries of origin or compare FDIs undertaken in Portugal to FDIs undertaken in similar target countries. Future research could also study a broader sample that is not narrowed down on specific sectors.

In addition, we only examined the drivers for the strategic choice between a Greenfield investment and an acquisition. The impact of the factors on other strategic choices, such as the one between a Joint Venture and a wholly-owned subsidiary may yield new insights. Also, strategic options that do not involve equity participations, such as licensing, franchising, and exports may be an object of future studies.

We only investigated entry and expansion modes and did not focus on the post-performance of Greenfield investments or acquisitions by foreign firms in Portugal. This topic could be explored as well.

Finally, even though we examined the impact of the introduction of the Euro, it would be interesting to analyze how particular policies have an impact on the choice between a Greenfield investment and an acquisition.

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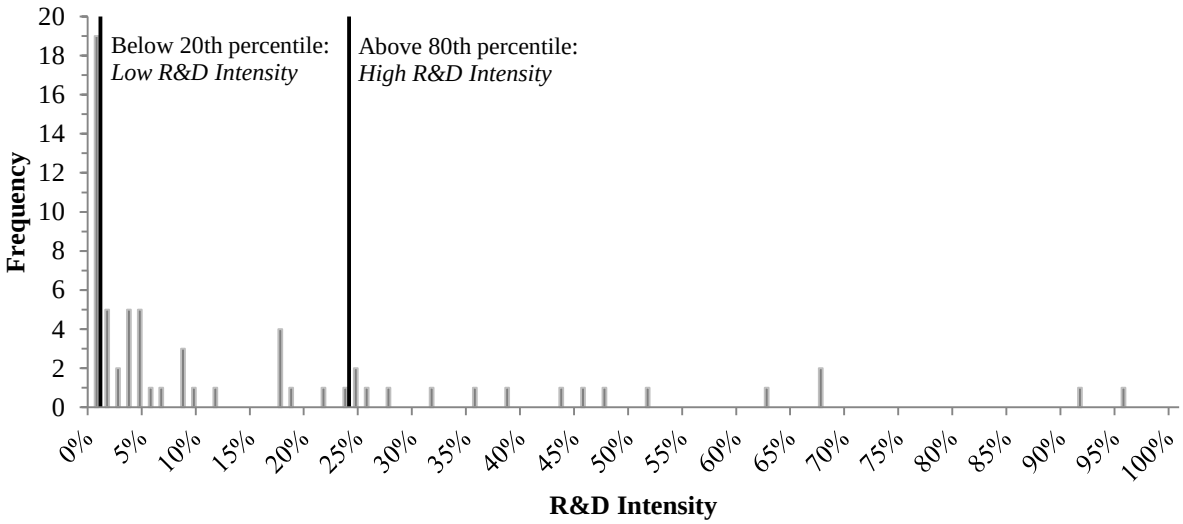
Appendix

Appendix A: Histogram for R&D Intensity and Chosen Cut-Off Barriers for Categories



Source: Own Contribution

Appendix B: Overview, Types, Predicted Sign, Measurement and Sources of Variables

Variable	B/C[a]	Measurement	Pred. Sign	Source(s)
1. Greenfield	B	Greenfield = 1; Acquisition = 0		Greenfield Investments: fDi Markets (2014), ThomsonOne SDC (2014); Acquisitions: ThomsonOne SDC (2014), Zephyr (2014)
2. Firm Size	C	LN *Total Assets*	-	ThomsonOne SDC (2014), Unternehmensregister (2014)
3. Profitability	C	*ROE = Net Income / Total Assets*	-	ThomsonOne SDC (2014), Unternehmensregister (2014)
4. Publicly Traded	B	Publicly Traded = 1; Non-Publicly Traded = 0	-	Bloomberg (2014)
5. High R&D Intensity	C/B[b]	*R&D Intensity* = Patents/N° of Employees; *High R&D Intensity* = *R&D Intensity* > 24.70% = 1; *R&D Intensity* < 24.70% = 0	+	Patents: European Patent Register (2014); N° of Employees: ThomsonOne SDC (2014), Unternehmensregister (2014), firm Websites
6. Low R&D Intensity	C/B[c]	*R&D Intensity* = Patents/N° of Employees; *Low R&D Intensity* = *R&D Intensity* < 0.19% = 1; *R&D Intensity* > 0.19% = 0	-	Patents: European Patent Register (2014); N° of Employees: ThomsonOne SDC (2014), Unternehmensregister (2014), firm Websites
7. International Experience	C	N° of years since first international experience	+/-	ThomsonOne SDC (2014), firm Websites
8. Local Experience	C	N° of years since first experience in Portugal	+/-	ThomsonOne SDC (2014), German Chamber of Commerce (2014), firm Websites
9. German Experience	C	N° of years since first German entry in sector in Portugal	+	ThomsonOne SDC (2014), AICEP (2014), German Chamber of Commerce (2014), firm Websites
10. First Entrant	B	First Entrant = 1; Follower = 0	-	ThomsonOne SDC (2014), AICEP (2014), firm Websites
11. Market Concentration	C	$HHI = \frac{\sum_{i=1}^{n} \frac{100 * x_i}{\sum x_j}}{10{,}000}$, with x = volume of sales	+	2004-2012: Instituto Nacional de Estatística (2014); 1995-2003: Sarmento/Nunes (2011)
12. Growth in Output	C	YoY% of Output by Industry	+	Instituto Nacional de Estatística (2014)
13. Growth in Productivity	C	YoY% of GVA by Industry/N° of Total Jobs by Industry	-	Instituto Nacional de Estatística (2014)
14. Change in Business Confidence	C	YoY% of Business Confidence by Industry	-	European Commission (2014)
15. Takeover Targets	C	LN N° of firms in Target Industry	-	Instituto Nacional de Estatística (2014)
16. Eurozone	B	Member of Eurozone = 1; Not a Member of Eurozone = 0	+/-	Publicly Available Information

[a] Binary (B) / Continuous variable (C)

[b] Continuous variable transformed into binary variable.

Source: Own Contribution

Appendix C: Complete Results for Binary Logit Regression: Greenfield (1) vs. Acquisition (0)

Greenfield = 1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**MEM(10)**
1. Intercept	-15.616 **	-15.516 **	-15.209 **	-14.009 **	-12.452 **	-12.595 **	-11.480 **	-9.266 **	-9.312 **	-4.020 **	
	(6.894)	(6.674)	(6.594)	(5.836)	(5.573)	(5.444)	(4.971)	(4.377)	(4.296)	(1.937)	
2. Firm Size[a]	0.387 *	0.387 *	0.374 *	0.366 *	0.351 *	0.361 *	0.364 *	0.362 **	0.395 **	0.340 **	**0.077**
	(0.203)	(0.203)	(0.198)	(0.196)	(0.192)	(0.195)	(0.194)	(0.180)	(0.173)	(0.166)	(0.038)
3. Profitability	0.218										
	(3.788)										
4. Publicly Traded[b]	-5.591 ***	-5.615 ***	-5.523 ***	-5.425 ***	-5.277 ***	-5.224 ***	-5.100 ***	-4.759 ***	-4.706 ***	-4.427 ***	**-0.563**
	(2.039)	(1.993)	(1.957)	(1.907)	(1.788)	(1.717)	(1.668)	(1.522)	(1.499)	(1.484)	(0.108)
5. High R&D Intensity[b]	2.680 **	2.676 **	2.545 **	2.477 **	2.116 *	2.369 **	2.255 **	2.329 **	2.478 **	2.657 **	**0.415**
	(1.301)	(1.298)	(1.233)	(1.215)	(1.158)	(1.147)	(1.113)	(1.101)	(1.094)	(1.109)	(0.119)
6. Low R&D Intensity[b]	1.403	1.380	1.489	1.412							
	(1.462)	(1.403)	(1.393)	(1.385)							
7. International Experience	0.027	0.027	0.033	0.039	0.030	0.035	0.036	0.010			
	(0.032)	(0.032)	(0.029)	(0.027)	(0.024)	(0.024)	(0.024)	(0.015)			
8. Local Experience	-0.077	-0.077	-0.080 *	-0.074 *	-0.054	-0.056	-0.052				
	(0.047)	(0.047)	(0.047)	(0.044)	(0.037)	(0.039)	(0.038)				
9. German Experience	0.052 *	0.052 *	0.049 *	0.039 **	0.034 **	0.040 ***	0.040 ***	0.031 **	0.031 **	0.025 **	**0.006**
	(0.028)	(0.028)	(0.027)	(0.017)	(0.015)	(0.015)	(0.015)	(0.012)	(0.012)	(0.010)	(0.002)
10. First Entrant[b]	-1.935	-1.918	-2.067	-2.360	-1.693						
	(2.057)	(2.034)	(2.016)	(2.008)	(1.752)						
11. Market Concentration	-7.951	-8.018	-6.715								
	(13.114)	(13.044)	(12.362)								
12. Growth in Output	13.910	13.911	13.929	16.913 *	16.153	18.131 *	17.426 *	15.973 *	15.739 *	16.050 *	**3.617**
	(10.852)	(10.873)	(10.760)	(10.034)	(9.971)	(10.001)	(9.604)	(9.089)	(9.220)	(8.820)	(1.955)
13. Growth in Productivity	-14.420	-14.409	-14.684	-17.660 *	-17.859 *	-18.550 *	-18.199 *	-17.714 *	-18.060 *	-20.853 **	**-4.700**
	(10.650)	(10.662)	(10.570)	(9.527)	(9.385)	(9.609)	(9.411)	(9.183)	(9.515)	(9.233)	(2.114)
14. Change in Business Confidence	-0.072	-0.070									
	(0.173)	(0.168)									
15. Takeover Targets[a]	1.014 *	1.010 *	0.977 *	0.857 *	0.779 *	0.722 *	0.616	0.505	0.522		
	(0.554)	(0.549)	(0.539)	(0.464)	(0.454)	(0.433)	(0.386)	(0.362)	(0.359)		
16. Eurozone[b]	3.611 **	3.601 **	3.613 **	3.596 **	3.668 **	3.739 **	3.804 **	3.326 **	3.306 **	4.192 ***	**0.738**
	(1.538)	(1.526)	(1.520)	(1.476)	(1.431)	(1.513)	(1.501)	(1.384)	(1.388)	(1.379)	(0.105)
17. International Experience X Market Concentration	0.383	0.383	0.358	0.199	0.138	0.073					
	(0.351)	(0.350)	(0.338)	(0.153)	(0.132)	(0.106)					
Log-Likelihood	-21.4105	-21.4121	-21.4976	-21.6521	-22.2289	-22.7750	-23.0349	-24.0116	-24.2658	-25.5704	
R^2	0.5669	0.5669	0.5651	0.5620	0.5504	0.5393	0.5340	0.5143	0.5091	0.4828	
χ^2	56.05	56.05	55.88	55.57	54.41	53.32	52.80	50.85	50.34	47.73	
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

Note: N = 73. Values in parentheses are standard errors. Column MEM(10) shows the Marginal Effects at the Means for Model 10.

[a] Variable is a natural logarithm.

[b] Variable is dichotomous.

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

Source: Own Contribution

Appendix D: Conditional Marginal Effects at the Means for Significant Continuous and Dichotomous Variables

Continuous Variable	Mean	1% increase (0.1pp increase for ratios)	Mean Probability of GF w/o conditions	Mean Probability of GF conditional on					
				Publicly Traded		High R&D Intensity		Eurozone	
				No	Yes	No	Yes	No	Yes
Firm Size[a]	8.18	8.27	65.69%	98.38%	42.05%	52.58%	94.05%	5.45%	79.22%
German Experience	49.34	49.84	65.69%	98.38%	42.05%	52.58%	94.05%	5.45%	79.22%
Growth in Output	4.50%	4.60%	65.69%	98.38%	42.04%	52.58%	94.05%	5.45%	79.22%
Growth in Productivity	3.18%	3.28%	65.69%	98.38%	42.05%	52.58%	94.05%	5.45%	79.22%
Continuous Variable	**Mean**	**1% increase (0.1pp increase for ratios)**	**Increased Probability of GF w/o conditions**	**Increased Probability of GF conditional on**					
				Publicly Traded		High R&D Intensity		Eurozone	
				No	Yes	No	Yes	No	Yes
Firm Size[a]	8.18	8.27	66.31%	98.42%	42.72%	53.28%	94.21%	5.60%	79.68%
German Experience	49.34	49.84	65.97%	98.42%	42.72%	52.89%	94.12%	5.52%	79.43%
Growth in Output	4.50%	4.60%	66.05%	98.41%	42.43%	52.98%	94.14%	5.53%	79.49%
Growth in Productivity	3.18%	3.28%	65.22%	98.35%	41.54%	52.06%	93.93%	5.34%	78.88%
Continuous Variable	**Mean**	**1% increase (0.1pp increase for ratios)**	**Delta Probability of GF w/o conditions**	**Delta Probability of GF conditional on**					
				Publicly Traded		High R&D Intensity		Eurozone	
				No	Yes	No	Yes	No	Yes
Firm Size[a]	8.18	8.27	0.95%	0.04%	1.62%	1.32%	0.16%	2.66%	0.57%
German Experience	49.34	49.84	0.42%	0.04%	1.62%	0.59%	0.07%	1.18%	0.26%
Growth in Output	4.50%	4.60%	0.55%	0.03%	0.93%	0.76%	0.09%	1.53%	0.33%
Growth in Productivity	3.18%	3.28%	-0.72%	-0.03%	-1.21%	-0.99%	-0.13%	-1.95%	-0.44%

Source: Own Contribution

Appendix E: Results for Robustness Checks

Greenfield = 1	A		B		C		D	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1. Intercept	-12.625 **	-4.020 **	-9.687 **	-4.020 **	-10.002 **	-4.020 **	-4.616 *	-4.020 **
	(5.493)	(1.937)	(4.878)	(1.937)	(4.960)	(1.937)	(2.707)	(1.937)
2. Firm Size[a]	0.371 *	0.340 **	0.362 **	0.340 **	0.407 **	0.340 **	0.289	0.340 **
	(0.199)	(0.166)	(0.181)	(0.166)	(0.183)	(0.166)	(0.186)	(0.166)
3. Profitability	0.339		-0.332		-0.631		-0.904	
	(3.680)		(3.537)		(3.585)		(3.396)	
4. Publicly Traded[b]	-5.277 ***	-4.427 ***	-4.860 ***	-4.427 ***	-4.901 ***	-4.427 ***	-4.842 ***	-4.427 ***
	(1.880)	(1.484)	(1.659)	(1.484)	(1.664)	(1.484)	(1.797)	(1.484)
5. High R&D Intensity[b]	2.441	2.657 **	2.323 **	2.657 **	2.442 **	2.657 **	2.398 **	2.657 **
	(1.229)	(1.109)	(1.167)	(1.109)	(1.176)	(1.109)	(1.197)	(1.109)
6. Low R&D Intensity[b]	1.127 **		0.298		0.273		0.818	
	(1.358)		(1.125)		(1.106)		(1.257)	
7. International Experience	0.045		0.009				0.038	
	(0.028)		(0.016)				(0.027)	
8. Local Experience	-0.065				-0.007		-0.049	
	(0.043)				(0.020)		(0.041)	
9. German Experience	0.033 *	0.025 **	0.024	0.025 **	0.027	0.025 **	0.026 *	0.025 **
	(0.018)	(0.010)	(0.016)	(0.010)	(0.016)	(0.010)	(0.016)	(0.010)
10. First Entrant[b]	-1.937		-1.584		-1.655		-1.585	
	(1.979)		(1.845)		(1.813)		(1.844)	
11. Market Concentration	5.260		3.698		3.067		2.453	
	(5.705)		(5.358)		(5.355)		(5.084)	
12. Growth in Output	19.867	16.050 *	17.591 *	16.050 *	16.922	16.050 *	17.402 *	16.050 *
	(10.881)	(8.820)	(10.312)	(8.820)	(10.292)	(8.820)	(9.734)	(8.820)
13. Growth in Productivity	-20.272	-20.853 **	-19.120 *	-20.853 **	-18.745 *	-20.853 **	-21.124 **	-20.853 **
	(10.204)	(9.233)	(9.874)	(9.233)	(10.165)	(9.233)	(9.635)	(9.233)
14. Change in Business Confidence	-0.027		-0.060		-0.071		0.028	
	(0.154)		(0.156)		(0.149)		(0.151)	
15. Takeover Targets[a]	0.692 *		0.568		0.606			
	(0.409)		(0.389)		(0.396)			
16. Eurozone[b]	3.736 **	4.192 ***	3.273 **	4.192 ***	3.289 **	4.192 ***	4.453 ***	4.192 ***
	(1.469)	(1.379)	(1.377)	(1.379)	(1.381)	(1.379)	(1.455)	(1.379)
Log-Likelihood	-22.155	-25.570	-23.408	-25.570	-23.538	-25.570	-23.979	-25.570
R^2	0.5518	0.4828	0.5265	0.4828	0.5239	0.483	0.5150	0.4828
$\chi 2$	54.560	47.73	52.06	47.73	51.8	47.730	50.91	47.73
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Note: $N = 73$. For each model, the first (Initial) and final steps are shown.

[a] Variable is a natural logarithm.

[b] Variable is binary.

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

Source: Own Contribution