BACKWARD INTEGRATION OF FOREIGN SALES ACTIVITIES INTO PRODUCTION: A RESOURCE FLOW PERSPECTIVE

ABSTRACT

This study focuses on the decision of expanding foreign sales activities towards production. Complementing traditional theories on foreign direct investment and the internationalization process of the firm, we suggest that multinational enterprises pursue backward integration of foreign subsidiaries also in order to improve resource flows within their network of foreign operations. We predict that differences in corporate income tax regimes, investment incentives granted by host governments, and external knowledge at other foreign locations cause backward integration of foreign sales activities into production once its improves financial, product, and information flows within the multinational network of operations. We test the hypotheses using event history analysis on a dataset of 2326 manufacturing firms showing 408 cases of backward integration between 1999 and 2012.

BACKWARD INTEGRATION OF FOREIGN SALES ACTIVITIES INTO PRODUCTION: A RESOURCE FLOW PERSPECTIVE

INTRODUCTION

The decision to establish local production activities at foreign sales locations has been subject to extensive analysis in the field of international business. However, approaches that build on local factor conditions (Dunning, 1988) or market knowledge guiding the incremental expansion of foreign operations to production (Johanson & Vahlne, 1977) fall short in capturing the advantages tied to maintaining a multinational network of operations (Bartlett & Ghoshal, 1999). In a global network of operations, MNEs can transfer resources between different host countries in order gain global competitive advantage (Gupta & Govindarajan, 1991, 2001; Kogut, 1985b).

This study takes an integrative perspective on MNEs' subsidiary networks and applies a transactional network approach (Fombrun, 1982) to explain the decision to backward integrate foreign sales activities into production. It links the relative advantages of a foreign sales location for production with improvements of intra-firm transactions in terms of financial, product, and information flows that backward integration of sales activities into production would bring along. Against this background, the research question addressed in this paper centers on whether the decision to start production activities at a foreign sales location is, besides the known factors, also motivated by the intention to improve the MNE's network of foreign operations as a whole.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

International management theories conceptualize the MNE as a network consisting of nodes represented by subsidiaries in different host countries and linkages between nodes in form of cross-border transactions between subsidiaries of various kinds (Bartlett & Ghoshal, 1989; Gupta

& Govindarajan, 1991). The network model of the MNE proposed by Gupta and Govindarajan (1991) conceives cross-border transactions between foreign subsidiaries as occurring along three key dimensions: financial flows, product flows, and information flows. For each type of transaction, the subsidiaries can differ by the extent to which they are receivers or providers of what is being transacted. According to Gupta and Govindarajan (1991), the magnitude and directionality of financial, product, information flows form the strategic context of a foreign subsidiary and the contribution it provides to the overall competitive success of the MNE as a whole. Maximizing or improving the flows of resources is the main mechanisms of converting the firm's global presence into global competitive advantage (e.g. Gupta & Govindarajan, 2001; Bartlett & Ghoshal, 1987). The root premise of this paper is that MNEs start production at those sales locations which provide the opportunity to improve the resource flows in the network of subsidiaries through their relative locational advantage over existing production sites. The concept of operational flexibility (Kogut, 1985b) includes three locational advantages that have this potential.

Financial flows and global exploitation of local tax advantages

A dispersed network of foreign operations allows the MNE to exploit differences in corporate income tax rates in order to decrease the overall tax burden. According to Kogut (1985b), multinationality allows for shifting profits from high-tax countries to low-tax countries through mark-ups on intra-company sales of goods in transfer pricing schemes. The improvement of financial flows (Gupta & Govindarajan, 1991) through which local tax advantages can be exploited by other units within the network represents a critical challenge in converting an MNE's global presence into global competitive advantage (Gupta & Govindarajan, 2001). When tax rates in countries where products are sold differ from tax rates in countries where they are produced, transfer pricing offers an effective mechanism to reallocate production costs and sales revenues to locations where the tax regimes are most favorable for taxing either of the two profit components (Carvens, 1997; Eden et al., 2005). A low corporate income tax rate motivates the

MNE to shift profits towards that location (e.g. Hines & Rice, 1994). Empirical studies on transfer pricing as a mechanism to shift profits from high to low tax jurisdictions document a wide-spread application among MNEs of all size and origin (e.g. Grupert & Mutti, 1991; Hines, 1999) as well as "negative" effects on their global tax bills (e.g. Bartelsman &Beetsma, 2003; Mooij & Ederveen, 2003).

Conceptually, the effectiveness of transfer pricing is dependent on the tax differentials between the MNE's international network of production facilities on the one hand and sales-generating subsidiaries on the other. However, the practical use of transfer pricing to direct revenues to low-tax countries is subject to legislations (e.g. Choe & Hyde, 2007). These legislations in the form of national or supranational agreements (OECD, 2001) limit the extent to which internal transfer prices set by the MNE can differ from the price at which the respective good would (presumably) be traded on the market (Halperin & Srinidhi, 1996). From the perspective of an MNE's subsidiary network, backward integration is worthwhile when the location has lower taxes than other production sites and when there are sales locations to source the products at high transfer prices. This leads us to predict:

H1: The propensity to start production at a foreign sales location is the higher, the greater the location's tax rate advantage over extant production locations and the greater the demand for international production by other sales locations.

Product flows and global exploitation of local investment incentives

Operating a dispersed network of foreign operations enables the MNE to access different investment incentive programs from host country governments (Kogut, 1985b). FDI incentives take several forms, like low-interest loans or grants and subsidies. Firms' responsiveness to different kinds of incentives depends on their specific investment situation, e.g. the type (start-up or expansion of existing investment) and the size of the investment (Rolfe et al. 1993). Host government incentives seek to gain from a number of positive side-effects associated with FDI,

like resource-transfer effects, employment effects, and balance-of-payments effects. Governments commonly justify FDI incentive programs by arguing that the social returns induced by these effects exceed the private returns of the subsidized MNE. Positive externalities of knowledge spillovers from inward FDI to domestic firms are confirmed by several studies (e.g. Kugler, 2001; Liu et al., 2000). Amongst others, Haskel et al. (2007) find a positive relationship between inward FDI and increases in total factor productivity of the domestic manufacturing industry.

Haaparanta (1996) shows that countries trying to attract FDI from foreign MNEs can compensate for disadvantages in local factor costs by subsidies. In general, it is argued that policy intervention in form of FDI incentives is particularly effective in situations where countries suffer from comparative disadvantage in other, non-policy variables that have traditionally been regarded as crucial FDI locations determinants, such as market size or availability of cheap or skilled labor. Supposing that governments will try to maximize the net wage income generated by the MNE's current and potential future local investments, governments in host countries within the MNE's network of operations will define country-specific levels of investment incentives that are to maximize local welfare (Haaparanta, 1996). In situations where government incentives are more and more motivated by a desire to capture FDI away from other potential host countries, competition among countries for FDI emerges which transfers much of the rents to the MNE (Haaland & Wooton, 1999). Such 'subsidy games' between governments aiming to attract FDI have been subject to thorough formal analysis. One conclusion from these studies is that differences in country size, labor costs, and expected gains from FDI inflows affect each country's optimal incentive scheme. Moreover, the distribution of FDI between countries with subsidies may well be significantly different from that without subsidies (e.g. Bjorvatn & Eckel 2006; Haaparanta, 1996; Barros & Cabral, 2000).

Studies present empirical evidence that competition among countries for FDI facilitating MNE location decisions that would not be made in the absence of subsidies granted by host country

governments and might have a positive effect on the net welfare of the participating countries (Fumagalli, 2003; Haaparanta, 1996). In particular, the model of Fumagalli (2003) shows that even under the assumption that exports represent an alternative to FDI for the MNE, governmental subsidies are able to attract FDI which otherwise would not have taken place. Hence, the decision to expand foreign sales activities into production can be expected to be positively affected by local levels of investment incentives offered to the MNE at sales locations.

Starting production at a foreign sales location reduces the need for imported products. The evaluation of investment incentives offered at sales locations requires considering the consequences for the product flow within the MNE's network. In order to improve product flows, Williamson's (1980) comparative institutional assessment on alternative modes for organizing work suggests transportation costs and buffer inventories as critical efficiency criteria for product flows optimization across successive value-adding activities. Both minimizing transportation costs and buffer inventory can be reached by substituting imports with local production, whereas the significance of the effects depend on the volume of avoided imports from foreign production facilities. From the perspective of an MNE's subsidiary network, backward integration is worthwhile when the location offers higher investment incentives than other production sites and when there are significant volumes of final products that are imported from these sites. This leads us to predict:

H 2: The propensity to start production at a foreign sales location is the higher, the greater the location's governmental support advantage over extant production locations and the greater the potential of avoiding imports from those locations.

Information flows and global exploitation of local knowledge

A dispersed network of foreign operations allows the MNE to tap into pockets of valuable knowledge at different locations. According to Kogut (1985b), the opportunity to monitor multiple national markets in order to scan valuable technological knowledge at foreign location

which can be transferred to and exploit at other locations within the MNE's network represents another unique source of global competitive advantages reserved to the MNE. The improvement of information flows (Gupta & Govindarajan, 1991) through which knowledge can be provided to other units within the network represents a critical challenge in converting an MNE's global presence into global competitive advantage (Gupta & Govindarajan, 2001).

Research on the competitive advantage of MNEs has long emphasized the importance of foreign subsidiaries in assimilating knowledge from external environments (e.g. Foss & Pedersen, 2002; Gupta & Govindarajan, 1991; Schlegelmilch & Chini, 2003). The assimilation of new knowledge by subsidiaries strengthens the competitiveness of the MNE in a twofold manner as it (1) positively affects the performance of the subsidiary in its own marketplace and (2) upgrades the competences of the MNE as a whole once the externally acquired, new knowledge is transferred to others units (Andersson et al., 2001). The ability of an organization to recognize the value of and assimilate new external information has been labelled absorptive capacity (Cohen & Levinthal, 1990). The generation of absorptive capacity is usually considered to be linked to R&D investments (Cantwell & Mudambi, 2005; Cohen & Levinthal, 1990), however there is evidence that absorptive capacity may also develop as a by-product of a firm's manufacturing operations. Abernathy (1978) and Rosenberg (1982) note that direct involvement in manufacturing activities increase firms' ability to recognize and exploit new information relevant to their product markets. They suggest that production experience provides the firm with the background necessary both to recognize and assimilate valuable, locally-bound information which can be used to upgrade local production techniques and processes. In the same vein, Andersson et al. (2001) identifies a foreign subsidiary's external technical embeddedness as being positively related to its ability to assimilate new knowledge and to the transfer of this knowledge to other units within the MNE's network. This allows for the conclusion that expanding an existing foreign sales subsidiary towards production contributes to absorptive capacity, i.e. its ability to identify, acquire, and assimilate external information that can be

exploited within the entire network of the MNE and potentially contribute to sustainable competitive advantage (Zahra & George, 2002).

Obviously, the benefits for the MNE stemming from this opportunity to transferring information to other countries within the international network of operations are positively related to the value and quality of the information locally available to the sending subsidiary (Tsai, 2001). However, in order to provide a beneficial contribution to an MNE's stock of information, it is not the local level of technological development in absolute terms that matters, but rather the relative consideration in relation to other locations within the MNE's international production network. Hence, it can be expected that a high local level of technological development compared to other host countries of the international production network increases the propensity to backward integrate local sales activities into production.

In order to be useful for other locations within the MNE, the locally absorbed technological knowledge must be transferred to other units in the network that value the knowledge and may exploit it in their value creation processes (e.g. Kogut & Zander, 1992, 1993; Schulz, 2001). Hence, it is the information flow between locations of the MNE's network of transactions (Gupta & Govindarajan, 1991) through which the advantage of accessing valuable technological local knowledge at foreign sales locations becomes effective for the MNE as a whole (Gupta & Govindarajan, 2001). The information flow represents the means through which valuable technological knowledge absorbed at a sales location is transferred to locations in the existing production network where it can be exploited in local production processes. Information transfer involves costs (Arrow, 1969), and among other things that hamper information transfer within MNEs (see van Wijk et al., 2008 for an overview) the distance that has to be bridged between globally dispersed subsidiaries by the information flow negatively affects knowledge transfer between sender (i.e. sales location) and receivers (other locations in the production network) of knowledge (e.g. Ambos & Ambos, 2009; Hough, 1972). Thus, we argue that geographical proximity of a sales location to neighboring production locations has a positive influence on the

transfer of technological knowledge because it encourages information flows between sender and receivers which positively affects the global exploitation of locally available, valuable technological knowledge (Gupta & Govondarajan, 2000; Harzing &Noorderhaven, 2006). Hence, from the perspective of an MNE's subsidiary network backward integration is worthwhile when the location offers a high level of technological development compared to other production sites and when there exist neighboring production sites in close proximity. This leads us to predict:

H 3: The propensity to start production at a foreign sales location is the higher, the greater the location's technology advantage over extant production locations and the greater the proximity to neighboring production locations.

EMPIRICAL METHOD

Data and sample

In order to test the hypotheses, we make use of the Microdatabase Direct Investment (MiDi) of the Central Bank of Germany comprising annual statistics on the scope and structure of German firms' FDI stocks in foreign countries (Lipponer, 2009). In accordance with the provisions of the German Foreign Trade and Payments Regulations, German firms have to report international FDI stocks if a foreign investment's balance sheet total exceeds the threshold of €3 million. The yearly reports include balance sheets and the stock of foreign direct investment, and other characteristics of the foreign subsidiary such as industry sector, sales volume, and the number of employees. From 1996 on, investing firms and their foreign subsidiaries can be traced over time using company codes, which provides us with a panel dataset that is suited to investigate backward integration decisions of German investors over time in the course of internationalization.

Based on a timespan of fourteen consecutive years (1999 to 2012), we performed several steps to obtain a sample limited to those German investors who are at risk of showing cases of backward

integration into production in one or more of their existing foreign sales locations. First, based on their classification by industry codes, for each investing firm included in the MiDi we identified all foreign sales and production subsidiaries with non-zero turnover and aggregated subsidiary characteristics on the country level per year. For each investor we then detected cases of backward integration by identifying those foreign locations that were (1) initially served via sales subsidiary as market entry mode and later (2a) turned into or (2b) supplemented by production subsidiaries. We excluded those cases of backward integration where the establishment of production activities took place in the year of initial market entry via sales subsidiary. We finally arrived with a sample consisting out of panel data on the international sales and production networks of German MNEs that maintain sales subsidiaries as candidates for backward integration in the observation period 1999-2012. In subsequent steps we aggregated the subsidiary-level data at the country level and, on this basis, created event history records. Altogether, the sample comprises 5556 sales subsidiaries belonging to 2326 German MNEs showing 408 cases of backward integration. Beside the micro data of the German Central Bank, we included macro data from the World Bank, the Economic Intelligence Unit, the OECD, the UNCTAD, and the Worldwide Corporate Tax Guide published by Ernst&Young.

Methodology and dependent variable

In order to analyze the backward integration events, we apply event history analysis (Allison, 1984). Backward integration is coded by a binary variable which takes the value one in the year in which an investor backward integrates an existing foreign sales subsidiary into production, and zero else. We start analysis with a semiparametric proportional hazard rate model (Cox, 1972) in which the probability of a backward integration at a certain point in time depends on a set of time-varying explanatory variables, complemented by a set of control variables in order to account for causes of backward integration- other than explained by the model variables. In our model, the total risk set, i.e. the set of foreign sales activities that are at risk of event occurrence comprises 26187 host country years. The hazard rate, i.e. the probability that backward

integration will occur in a particular year at a particular foreign sales activity, represents the dependent variable controlling for both the occurrence and timing of the backward integration event. As the baseline hazard in the semiparametric model has a consistently positive slope, we estimate more efficient, parametric Weibull models. All regressions feature a significant Weibull parameter $p > 1$ indicating a monotone increasing baseline hazard (Cleves et al., 2010), which indicates a rising probability of local backward integrations in the course of time. We clustered the standard errors at the investor level in order to account for firm effects.

Independent variables

We expect the start of production activities at those sales locations which allow for improving the flows of resources within the MNE beyond the potential of extant production locations. To represent this condition, the model uses three pairs of predictors in interaction. One predictor captures the relative advantage of the sales location for production, while the other predictor captures the impact on related resource flows. The following section outlines the sources and constructions of each pair of independent variables that enter the analysis in more detail.

Hypothesis 1 interprets backward integration of foreign sales activities into production as a means for improving financial flows within the MNE's network of foreign subsidiaries. Financial flows between locations with differing corporate income tax rates can be used by the MNE to shift profits to sales locations with lower corporate income tax rates relative to those prevailing in locations of the existing production network in order to minimize its global tax burden. To calculate the tax advantage of a sales location relative the production locations, we drew local corporate income tax data from the Worldwide Corporate Tax Guide published by Ernst&Young. These annual reports summarize corporate tax regimes of a great number of countries and, besides many other information on local tax regulations and procedures, release the local statutory corporate income tax rate that applies for foreign companies operating a branch in that country. The single reports were retrieved from internet sources or, especially reports prior to

2004, directly requested from Ernst&Young. The set of countries included in the individual reports changes from one year to the other which caused missing information for a few countries in particular years. Under the assumption that corporate income tax regimes do not change frequently, we replace these missing values by taking the last reported value and carrying it forward until an updated corporate income tax rate is reported for the respective country. On that basis we construct the variable *CorpTaxDiff* as the difference between the local tax rate at a focal sales location and the mean value of corporate income tax rates in the countries of the existing production network. In order to capture the improvement in financial flows through which the local tax advantage at a sales location becomes effective for the MNE as a whole, we construct the variable *SalesSurplus* as the number of other foreign sales locations representing transaction partners for transfer pricing through which foreign profits can be shifted to the focal sales location. For Hypothesis 1, both variables are tested as interaction term (*CorpTaxDiff x SalesSurplus*) to account for the mutual presupposition of bot, a local tax advantage and potential improvement of financial flows as conditions for global tax minimization at the level of the MNE's network as a whole.

Hypothesis 2 assumes backward integration of foreign sales activities into production to be a means for improving product flows within the MNE's network of foreign subsidiaries. Host country governments commonly offer investment incentives to foreign MNEs for the establishment of local production activities, from which they expect to benefit from a number of positive externalities such as local employment or trade-balance effects. We argue that MNEs evaluate FDI incentives locally granted for such investment against the background of the effect on the product flow that such expansion of foreign sales activities into local production has for the MNE as a whole. However, incentives are subject to individual bargaining. The results of these negotiations are rarely published and not recorded in databases. Therefore, we approximate the level of local investment incentives by the country's trade balance deficit, as it indicates its predisposition for granting investment incentives to attract FDI in productive assets that substitute

for the import of goods produced in foreign countries. Information on trade balance deficits was obtained from UNCTAD. On that basis, we construct the independent variable *InvIncentiveDiff* as the difference between the local Trade Balance deficit per GDP at a focal sales location and the mean value of the countries in the international production network. In order to capture the improvement in product flows through which the investment incentive received at a sales location becomes effective for the MNE as a whole, we construct the variable *InventoryTurnover*, calculated as local sales divided by current assets at the focal sales location as an indicator of the avoided imports to the focal sales location due to the launching production activities locally. For Hypothesis 2, both variables are tested as interaction term (*InvIncentiveDiff x InventoryTurnover*) to account for the mutual presupposition of both high investment incentives and potential improvement of product flows as conditions for benefitting from locally granted investment incentives at the level of the MNE's network as a whole.

Hypothesis 3 views backward integration of foreign sales activities into production to be a means for improving information flows within the MNE's network of foreign subsidiaries. Information flows between locations with differing levels of technological development can be used by the MNE to transfer valuable technological knowledge available at one location to other locations in an MNE's network. We operationalize a country's level of technological development by the number of scientific and technical journal publications as published by the World Bank. The independent variable *TechDevelopmentDiff* represents the difference between the local number of scientific and technical journal publications allotted to a sales location and the mean number of such publications allotted to locations of the international production network. In order to capture the improvement in information flows through which the valuable, technological knowledge available at a sales location becomes effective for the MNE as a whole, we constructed the variable *nearest3Production* as the distance (in km) from the focal location as the sender to the three closest production locations as potential receivers of the transferred technological knowledge. The lower the distance between sender and receiver, the better the information flow

transferring the knowledge is expected to be. For Hypothesis 3, both variables were tested as interaction term (*TechDevelopmentDiff x InventoryTurnover*) to account for the mutual presupposition of both, high level of technological development and potential improvement of information flows at a sales location, as conditions for benefitting from locally available technological knowledge on the level of the MNE's network as a whole.

Control variables

The set of control variables covers the effects proposed by earlier studies on the expansion of foreign subsidiary networks (e.g. Chung et al. 2010; Delios & Henisz, 2003; Fisch & Zschoche 2012). Among them, we include host country GDP growth rates (*GDPgrowth*) as a control, since an investing firm's willingness to commit further resources to a foreign market may depend on the growth of the respective market (e.g. Agarwal, 1980). Furthermore, we control for cultural distance as this construct has been negatively associated with FDI location choices and subsequent investments in existing host country subsidiaries in previous studies (Flores & Aguilera, 2007). We designed the cultural distance measure (*Culture*) as reflecting the distance between Germany as the country of origin of the investor and the host country by calculating the composite index proposed by Kogut and Singh (1988) on the basis of the cultural indices of Hofstede (1980). To control for the investing firm's international production experience (e.g. Davidson, 1980), we include the number of countries in which the investor upholds production activities (*NOCP*). We further control for the average growth rate of the investor's international production network (*ProductionGrowth*) by employment growth rates in production activities in order to separate backward integration-induced expansions of production networks from general network growth tendencies. Recent studies suggest that the expansion of international subsidiary networks follows production shifting considerations in the sense that the establishment of new sites is positively related to the diversity of as well as the uncertainty potential locations contribute to the network of international operations (e.g. Chung et al. 2010; Fisch & Zschoche, 2012). To account for production shifting motives for backward integration decisions, we control

for an increase in the diversity of exchange rate fluctuations in an investor's network of international operations following a backward integration (*ExRateDiversity*) as well as exchange rate uncertainty (*ExRateUncertainty*) (e.g. Campa, 1994; Kogut & Chang, 1996) and exchange rate depreciation (*ExRateDepreciation*) (e.g. Song 2015; Song et al., 2014) against the Euro as currency of reference.

RESULTS

Tables 1 and 2 provide descriptive statistics of the sample and a correlation matrix. Due to the confidentiality of the Central Bank data and the institution's security policies, minimum and maximum values of firm-level variables refer to the average of the highest or lowest three observations. The correlation matrix reveals that the variables are mostly independent of each other. There is a correlation between *SalesSurplus* and *NOCP* indicating that the number of foreign sales locations without local production decreases with the number of countries with international production activities, which is obvious. The positive correlations among the set of control variables capturing production shifting considerations (*ExRateDiversity*, *ExRateUncertainty*) seem plausible as well. Overall, the variance inflation factors (VIF) still indicate an acceptable level of multicollinearity; the mean VIF is 1.23.

Table 1 & 2 go about here

The results of the Weibull hazard rate models for the propensity to expand foreign sales activities into production are presented in Table 3. We report regression coefficients in the place of hazard rates. Model 1 is the base model comprising the control variables. It features a log likelihood of -1481.70. The control variables confirm the findings of existing studies on influencing factors of international production location decisions as they show the expected signs and are consistently

significant, with the exception of *ExRateDepreciation* which is insignificant in some of the models.

Model 2 incorporates the interaction of *CorpTaxDiff x SalesSurplus* to test the prediction of Hypothesis 1 that local backward integration improves the financial flows to minimize the global tax burden. The log likelihood rises significantly to -1383.80 compared to Model 1. The coefficient of the interaction term *CorpTaxDiff x SalesSurplus* shows a positive sign and is significant at the level of $p < 0.05$. Hypotheses 1 is supported: Local backward integration of sales activities into production seems to serve an MNE's network of foreign operations as a whole, since it improves financial flows between high and low-tax locations within the MNE's network of locations which allows for a minimization of global tax burden.

Model 3 incorporates the interaction *InvIncentiveDiff x InventoryTurnover* to test Hypothesis 2 that local backward integration of sales activities towards production optimizes the MNE's network of foreign operations in terms of enhancing product flows while exploiting investment incentives granted by host governments. The log likelihood rises significantly to -1258.98 compared to Model 1. The coefficient of *InvIncentiveDiff x InventoryTurnover* shows a positive sign and is significant at the level of $p < 0.01$. Hypotheses 2 is supported: Local backward integration of sales activities into production serves an MNE's network of foreign operations as a whole, since it improves product flows within the MNE's network of locations while exploiting investment incentives granted by the host government.

Model 4 incorporates the interaction term *TechDevelopmentDiff x nearest3Production* to test Hypothesis 3 that local backward integration of sales activities towards production optimizes the MNE's network of foreign operations in terms of enhancing information flows. The log likelihood rises significantly to -1352.21 compared to Model 1. The coefficient of the interaction term *TechDevelopmentDiff x nearest3Production* shows a negative sign and is significant at the level of $p < 0.01$. Hypotheses 3 receives support: Local backward integration of sales activities

into production serves an MNE's network of foreign operations as a whole, since it improves information flows between locations with different levels of technological development which allows for a knowledge transfer within the MNE's network of locations.

Table 3 goes about here

DISCUSSION

The empirical results of our analysis of German manufacturing MNEs suggest that starting production activities at foreign sales locations is determined by the simultaneous presence of (1) relative location advantages compared to countries in the existing production network as and (2) prospects for an improvement of resource flows within the MNE's network of foreign subsidiaries. In particular, MNEs seem to start production at sales locations that offer corporate income tax advantage and potential for financial flow improvement enabling the shifting of profits in a way that minimizes the global corporate income tax burden. Moreover, MNEs seem to be responsive to investment incentives granted by host governments at sales locations that offer high FDI incentives when there is a potential for product flow improvement as a result of substitution of imports with local production. Finally, the establishment of local production activities seems to take place at foreign sales locations that offer high levels of technological development and high potential for information flow improvement to empower knowledge transfer to other units in the MNE's network.

Theoretical contributions

The study makes contributions to two broad areas. First, it adds to the literature on firm internationalization (Johanson & Vahlne, 1977). In the language of internationalization process theory (Johanson & Vahlne, 1977), backward integration of a foreign sales subsidiary into

production demarcates the final step in the incremental process of firm internationalization. The establishment of local production activities in a host country is regarded as the highest degree of foreign market commitment that is reached by gradual acquisition, integration, and use of knowledge about the foreign market gained through local sales activities (Johanson & Wiedersheim-Paul, 1975). Our study gives support to the model as we find a positive relationship between the time elapsed since market entry and the backward integration of sales activities into foreign production (as indicated by increasing, monotone baseline hazard for the backward integration event). As a contribution beyond that model, the study considers the connection to other subsidiaries of the MNE through resource (financial, product, information) flows between locations. Thereby, the study acknowledges that commitments in other foreign markets count for commitment decisions in the focal host country and that resource allocations across locations within an MNE's international network of operations are dependent on one another. The study emphasizes the benefits of multinationality linked to arbitraging and substituting financial, product, and information resources between countries. Second, we contribute to literature on multinational strategy (Kogut, 1985 a, b) and the fundamental sources of an MNE's global competitive advantage (Gupta & Govindarajan, 1991, 2001). Kogut (1985b) pinpoints the essence of multinational strategy versus domestic strategy as lying in the construction of flexibility to exploit the uncertainty over future changes in macroeconomic variables in international environments. By creating operational flexibility, the MNE can benefit from a set of distinct advantages as opposed to a purely domestically operating firm, such as global tax minimization, exploitation of investment incentives granted by host governments, and knowledge transfer between countries the MNE operates in (Kogut, 1985b). These advantages of "being global" basically rest on a flexible reaction to and exploitation of environmental uncertainty and volatility through arbitraging and substituting factors within the MNE's multinational network of operations. As a contribution to this literature, by taking the perspective of the MNE as a network of transaction comprising financial, product, and information flows (Gupta & Govindarajan,

1991) the study conceptually links the Kogut's (1985b) concept of operational flexibility to the resources flows between subsidiaries through which the advantages of multinationality become effective.

Practical implications

For practitioners, the study stresses the advantages offered by an international network of operations and inspires managerial discretion regarding the configuration of such networks. Although research has long emphasized that leveraging the global production network is a potent source of competitive advantage for manufacturing firms, some managers underestimate the potentials of globally dispersed production systems (Vereecke & Van Dierdonck, 2002). The mastery of world class manufacturers is that they use factories strategically as parts of a global network. In such a network, production locations reinforce each other and are more than a sequence of opportunistic moves in chase for cheap labor, tax benefits, or capital subsidies ending up with a collection of disjoint factories in different countries (Ferdows, 1997). Our study advocates this view in highlighting financial, product, and information flows between locations as means through which such mutual reinforcement becomes effective and local advantage (such as low corporate income tax rates, investment incentives granted host governments, and valuable technological knowledge) can be exploited at a network level - once the MNEs' international production networks is properly configured. In particular, the study raises the awareness of how the decision to start local production in a host country relates to the set of existing locations within the international sales and production network. This may contribute to managers' ability to understand and evaluate the interplay between different locations when considering production network expansions (or contractions). The study's result finally offer a fresh perspective on the fact that decisions for international production should not be viewed in isolation but rather in light of their effect and contribution to the overall organization and strategy of the MNE as a whole.

LIMITATIONS AND FUTURE RESEARCH

The study has a number of limitations. Due to data restrictions and the low level of detail for subsidiary-level information in the anonymous dataset, we are not able to control for the specific kinds of inputs and outputs entering or leaving sales and production activities in different host countries. Furthermore, we cannot account for the case of outsourced production activities that may represent favorable alternatives for (captive) backward integrations.

Future research may build on our study by using more fine-grained data in order to advance our understanding of the configuration and organizational design aspects of an MNE's international network of operations. Beyond that, studies that use management surveys may shed light on the coordination aspect of backward integrations and the organizational and strategic consequences for the MNE as a whole. Currently, in our empirical study we view the practical decision to backward integrate foreign sales activities into production against a theoretical background linking potential advantages of firm multinationality with the respective flows of resources through which they become effective for the MNE as whole. To further increase the managerial relevance of the study's results, future research should investigate whether those decisions which were made according to theory are more successful than those which contradict theory and how performance effects of such decisions interrelate at different levels of analysis (e.g. subsidiary vs. network level). Finally, the analysis of the empirical and conceptual link between backward integrations and reverse backward integrations (i.e., local production divestments at a foreign sales location) fueling into a general model that allows for distinguishing growth/shrinking processes from production relocations would represent another fruitful avenue for further research.

REFERENCES

Abernathy, W.J. 1978. *The productivity dilemma: Roadblock to innovation in the automobile industry* (Vol. 35). Baltimore: Johns Hopkins University Press.

Agarwal, J. P. 1980. Determinants of foreign direct investment: A survey. *Weltwirtschaftliches Archiv*, 116(4), 739-773.

Allison, P. D. 1984. *Event history analysis: Regression for longitudinal event data (No. 46)*. Newbury Park, CA: Sage.

Ambos, T. C., & Ambos, B. 2009. The impact of distance on knowledge transfer effectiveness in multinational corporations. *Journal of International Management*, 15(1), 1-14.

Andersson, U., Forsgren, M., & Holm, U. 2001. Subsidiary embeddedness and competence development in MNCs a multi-level analysis. *Organization Studies*, 22(6): 1013-1034.

Arrow, K. J. 1969. Classificatory notes on the production and transmission of technological knowledge. *The American Economic Review*, 29-35.

Barros, P. P., & Cabral, L. (2000). Competing for foreign direct investment. *Review of International Economics*, 8(2), 360-371.

Bartelsman, E. J., & Beetsma, R. M. 2003. Why pay more? Corporate tax avoidance through transfer pricing in OECD countries. *Journal of Public Economics*, 87(9), 2225-2252.

Bartlett, C. A., & Ghoshal, S. 1987. Managing across borders: New organizational responses. *Sloan Management Review*, 29(1), 43-53.

Bartlett, C.A., & Ghoshal, S. 1999. Managing across borders: The transnational solution (Vol. 2). Boston: Harvard Business School Press.

Bjorvatn, K., & Eckel, C. 2006. Policy competition for foreign direct investment between asymmetric countries. *European Economic Review*, 50(7), 1891-1907.

Campa, J. M. 1994. Multinational investment under uncertainty in the chemical processing industries. *Journal of International Business Studies*, 25(3): 557-578.

Cantwell, J., & Mudambi, R. 2005. MNE competence-creating subsidiary mandates. *Strategic Management Journal*, 26(12): 1109-1128.

Choe, C., & Hyde, C.E. 2007. Multinational Transfer Pricing, Tax Arbitrage and the Arm's Length Principle. *Economic Record*, 83(263): 398-404.

Chung, C.C., Lee, S.H., Beamish, P. W., & Isobe, T. 2010. Subsidiary expansion/contraction during times of economic crisis. *Journal of International Business Studies*, 41(3): 500-516.

Cleves, M., Gould, W.W., Gutierrez, R.G., & Marchenko, Y. 2010. *An Introduction to Survival Analysis Using Stata*. Stata Press Books: College Station, Texas.

Cohen, W.M., & Levinthal, D.A. 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1): 128-152.

Cox, D.R. 1972. Regression analysis and life tables. *Journal of the Royal Statistical Society*, Series B 34: 187-202.

Cravens, K. S. 1997. Examining the role of transfer pricing as a strategy for multinational firms. *International Business Review*, 6(2), 127-145.

Cyert, R.M., & March, J.G. 1963. *A behavioral theory of the firm*. Englewood Cliffs, NJ.

Davidson, W. H. 1980. The location of foreign direct investment activity: Country characteristics and experience effects. *Journal of International Business Studies*, 11(2), 9-22.

De Mooij, R. A., & Ederveen, S. 2003. Taxation and foreign direct investment: a synthesis of empirical research. *International Tax and Public Finance*, 10(6), 673-693.

Delios, A., & Henisz, W.J. 2003. Political hazards, experience, and sequential entry strategies: The international expansion of Japanese firms, 1980–1998. *Strategic Management Journal*, 24(11): 1153-1164.

Dunning, J.H. 1988. The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies*, 19(1): 1-31

Dunning, J.H. 2001. The eclectic (OLI) paradigm of international production: past, present and future. *International Journal of the Economics of Business*, 8(2): 173-190

Eden, L., Valdez, L. F. J., & Li, D. 2005. Talk softly but carry a big stick: Transfer pricing penalties and the market valuation of Japanese multinationals in the United States. J*ournal of International Business Studies*, 36(4), 398-414.

Ferdows, K. 1997. Made in the world: the global spread of production. *Production and Operations Management*, 6(2): 102-109.

Fisch, J.H., & Zschoche, M. 2012. The role of operational flexibility in the expansion of international production networks. *Strategic Management Journal*, 33(13): 1540-1556.

Flores, R.G., & Aguilera, R.V. 2007. Globalization and location choice: an analysis of US multinational firms in 1980 and 2000. *Journal of International Business Studies*, 38(7): 1187-1210.

Fombrun, C. J. 1982. Strategies for network research in organizations. *Academy of Management Review*, 7(2), 280-291.

Forsgren, M. 1989. *Managing the internationalization process*. London: Routledge.
Foss, N.J., & Pedersen, T. 2002. Transferring knowledge in MNCs: The role of sources of subsidiary knowledge and organizational context. *Journal of International Management*, 8(1): 49-67.
Fumagalli, C. 2003. On the welfare effects of competition for foreign direct investments. *European Economic Review*, 47(6): 963-983.
Grubert, H., & Mutti, J. 1991. Taxes, tariffs and transfer pricing in multinational corporate decision making. *The Review of Economics and Statistics*, 285-293.
Gupta, A. K., & Govindarajan, V. 2000. Knowledge flows within multinational corporations. *Strategic Management Journal*, 21(4), 473-496.
Gupta, A. K., & Govindarajan, V. 2001. Converting global presence into global competitive advantage. *The Academy of Management Executive*, 15(2), 45-56.
Gupta, A.K., & Govindarajan, V. 1991. Knowledge flows and the structure of control within multinational corporations. *Academy of Management Review*, 16(4): 768-792.
Haaland, J. I., & Wooton, I. 1999. International competition for multinational investment. The *Scandinavian Journal of Economics*, 101(4), 631-649.
Haaparanta, P. 1996. Competition for foreign direct investments. *Journal of Public Economics*, 63(1): 141-153.
Halperin, R., & Srinidhi, B. 1996. US income tax transfer pricing rules for intangibles as approximations of arm's length pricing. *Accounting Review*, 61-80.
Harzing, A. W., & Noorderhaven, N. 2006. Knowledge flows in MNCs: An empirical test and extension of Gupta and Govindarajan's typology of subsidiary roles. International Business Review, 15(3), 195-214
Haskel, J.E., Pereira, S.C., & Slaughter, M. J. 2007. Does inward foreign direct investment boost the productivity of domestic firms? *The Review of Economics and Statistics*, 89(3): 482-496.
Hines Jr, J. R. 1999. Lessons from behavioral responses to international taxation. *National Tax Journal*, 305-322.
Hines, J. R., & Rice, E. M. 1994. Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics*, 109(1), 149-182.
Hofstede, G. 1980. *Culture's consequences: International differences in work-related values*. Newbury Park, CA: Sage.
Hough, E. A. 1972. Communication of technical information between overseas markets and head office laboratories. *R&D Management*, 3(1), 1-5.
Johanson, J., & Mattsson, L. 1986. International Marketing and Internationalization Processes - A Network Approach. *Research in International Marketing*, 234-265.
Johanson, J., & Vahlne, J.E. 1977. The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1): 23-32.
Johanson, J., & Wiedersheim-Paul, F. 1975. The internationalization of the firm—four Swedish cases. *Journal of Management Studies*, 12(3): 305-323.
Kogut, B. 1985a. Designing global strategies: Comparative and competitive value added chains. *Sloan Management Review*, 26(4): 15-28
Kogut, B. 1985b. Designing global strategies: Profiting from Operational Flexibility. *Sloan Management Review*, 26(4): 27-38.
Kogut, B., & Chang, S.J. 1996. Platform investments and volatile exchange rates: Direct investment in the US by Japanese electronic companies. *Review of Economics and Statistics*, 78(2): 221-231.
Kogut, B., & Singh, H. 1988. The effect of national culture on the choice of entry mode. *Journal of International Business Studies*, 19(3): 411-432.
Kogut, B., & Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3(3), 383-397.
Kogut, B., & Zander, U. 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies*, 625-645.
Kugler, M. 2001. *The sectoral diffusion of spillovers from foreign direct investment*. Mimeo, Universitv of Southampton.
Lipponer, A. 2009. *Microdatabase direct investment-MiDi. A brief guide*. Economic Research Centre, Deutsche Bundesbank, Frankfurt am Main.
Liu, X., Siler, P., Wang, C., & Wei, Y. 2000. Productivity spillovers from foreign direct investment: evidence from UK industry level panel data. *Journal of International Business Studies*, 31(3): 407-425.
Mintzberg, H. 1978. Patterns in strategy formation. *Management Science*, 24(9), 934-948.
OECD 2001. Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations.
Rolfe, R.J., Ricks, D.A., Pointer, M.M., & McCarthy, M. 1993. Determinants of FDI incentive preferences of MNEs. *Journal of International Business Studies*, 24(2): 335-355.
Rosenberg, N. 1982. *Inside the black box: Technology and economics*. Cambridge University Press.
Schlegelmilch, B.B., & Chini, T.C. 2003. Knowledge transfer between marketing functions in multinational companies: a conceptual model. *International Business Review*, 12(2): 215-232.
Schulz, M. 2001. The uncertain relevance of newness: Organizational learning and knowledge flows. *Academy of Management Journal*, 44(4), 661-681.

Song, S. 2015. Exchange rate challenges, flexible intra-firm adjustments, and subsidiary longevity. *Journal of World Business*, 50(1), 36-45.
Song, S., Lee, S. H., & Makhija, M. 2014. Operational hedging in foreign direct investments under volatile and divergent exchange rates across countries. *Journal of World Business*.
Tsai, W. 2001. Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal*, 44(5): 996-1004.
Van Wijk, R., Jansen, J. J., & Lyles, M. A. 2008. Inter-and intra-organizational knowledge transfer: a meta-analytic review and assessment of its antecedents and consequences. Journal of Management Studies, 45(4), 830-853.
Vereecke, A., & Van Dierdonck, R. 2002. The strategic role of the plant: testing Ferdows's model. *International Journal of Operations & Production Management*, 22(5): 492-514.
Williamson, O. E. 1980. The organization of work a comparative institutional assessment. *Journal of Economic Behavior & Organization*, 1(1), 5-38.
Zahra, S.A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2): 185-203.

TABLE 1: DESCRIPTIVE STATISTICS

Variable	Mean	S.d.	Min	Max
GDPgrowth	1.720	2.934	-15.832	15.086
Culture	1.369	1.109	.001	4.680
NOCP	2.496	5.228	.000	62.000
ProductionGrowth	.005	.115	-.254	3.763
ExRateDiversity	.034	.050	.000	1.228
ExRateDepreciation	.055	.072	.000	1.380
ExRateUncertainty	.001	0.046	-.229	.932
CorpTaxDiff	-.051	.086	-.269	.299
SalesSurplus	5.045	7.960	-55.000	45.667
InvIncentiveDiff	5960.270	39786.900	-699070.740	877728.080
InventoryTurnover	3.826	40.720	.000	1132.764
TechDevelopmentDiff	-15068.950	51107.740	-131380.850	203479.290
nearest3Production	7.510	1.159	.344	9.787

Note: Min. and max. values refer to the average of the highest and lowest three observations.

TABLE 2: CORRELATION MATRIX (* p < .05)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	VIF
GDPgrowth	1.00													1.17
Culture	0.247*	1.00												1.22
NOCP	0.035	0.161*	1.00											1.33
ProductionGrowth	0.025	0.011	0.072*	1.00										1.01
ExRateDiversity	0.017	0.081*	0.198*	0.012	1.00									1.62
ExRateDepreciation	-0.038*	0.082*	-0.034	-0.001	0.396*	1.00								1.33
ExRateUncertainty	0.074*	0.032	0.076*	0.037*	0.532*	0.413*	1.00							1.56
CorpTaxDiff	0.248*	0.139*	0.191*	0.009	0.045*	-0.051*	0.001	1.00						1.22
SalesSurplus	0.043*	0.136*	-0.343*	-0.024	0.005	-0.005	0.000	0.023	1.00					1.26
InvIncentiveDiff	-0.002	-0.028	-0.067*	-0.010	-0.072*	-0.006	-0.029	-0.000	-0.065*	1.00				1.02
InventoryTurnover	-0.006	-0.005	-0.037*	-0.011	-0.029	0.000	-0.036*	0.037*	0.018	0.040*	1.00			1.01
TechDevelopmentDiff	-0.073*	-0.242*	0.014	0.028	0.093*	0.107*	0.123*	-0.274*	-0.220*	-0.030	-0.027	1.00		1.31
nearest3Production	0.141*	0.068*	-0.021	0.029	0.290*	0.109*	0.283*	-0.141*	0.075*	-0.078*	-0.040*	0.282*	1.00	1.30

TABLE 3: RESULTS OF WEIBULL HAZARD RATE REGRESSION

Backward Integration	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
TechDevelopmentDiff x nearest3Production				**-.00002*** ** (2.07e-06)	**-.00002*** ** (1.88e-06)
TechDevelopmentDiff				.00015*** (.00001)	.00014*** (.00001)
nearest3Production				-.3607*** (.0659)	-.1692*** (.0565)
InvIncentiveDiff x InventoryTurnover			**1.09e-06*** ** (1.80e-07)		**7.49e-07*** ** (1.60e-07)
InvIncentiveDiff			5.35e-07 (1.05e-06)		2.15e-06 (1.48e-06)
InventoryTurnover			-.8558*** (.1533)		-.6016*** (.1360)
CorpTaxDiff x SalesSurplus		**.2291** ** (.0904)			**.3200*** ** (.0789)
CorpTaxDiff		5.5853*** (.5688)			7.1368*** (.7782)
SalesSurplus		-.0881*** (.0189)			-.0707*** (.0182)
GDPgrowth	.2406*** (.0220)	.2106*** (.0219)	.1513*** (.0236)	.2234*** (.0257)	.1281*** (.0220)
Culture	-.3024*** (.0590)	-.2448*** (.0531)	-.1520** (.0616)	-.2763*** (.0715)	-.1659*** (.0570)
NOCP	.03980*** (.0084)	-.0332* (.0171)	.0323*** (.0086)	.0227*** (.0084)	-.0252 (.0159)
ProductionGrowth	.8592*** (.1089)	.8633*** (.1215)	.9948*** (.1405)	.8802*** (.0944)	1.0167*** (.1754)
ExRateDiversity	8.0680*** (1.6007)	7.5423*** (1.8063)	7.4176*** (1.2132)	7.8438*** (1.5971)	6.6918*** (.3304)
ExRateDepreciation	.4678 (1.4706)	1.6824*** (1.5637)	.6854 (1.3129)	.9554 (1.6081)	3.1033** (1.5105)
ExRateUncertainty	-5.3764*** (1.7348)	-5.4245*** (1.9572)	-3.7245*** (1.4225)	-5.6432 (1.8892)	-4.6150*** (1.5980)
Constant	-5.0480*** (.1327)	-4.6035*** (.1313)	-6.8292*** (.4507)	-2.7587 (.3206)	-4.6910*** (.5522)
p (Weibull)	1.3323*** (.04951)	1.3928*** (.0495)	1.4179*** (.0482)	1.358*** (.0534)	1.4807*** (.0501)
Log likelihood	-1481.70	-1383.80***	-1258.98***	-1352.21***	-1103.39***
n	5556	5556	5556	5556	5556

Standard errors in parentheses; † p < .10; * p < .05; ** p < .01, *** p < 0.001