

The effect of operational flexibility on decisions to withdraw from foreign production locations

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Abstract

Research on international divestment has identified a variety of factors that influence the survival of individual subsidiaries. Drawing on the concept of operational flexibility, this paper investigates the characteristics of an international production network as influencing factors on divestments of elements of this network. The analysis of German manufacturing firms reveals that labor cost developments and uncertainty of labor costs in the remaining countries influence the propensity to leave the focal country as production location. Further, the results suggest that under adverse local labor cost conditions, the ease of employee dismissal and the contribution of the focal location to the heterogeneity of labor cost developments in the network reduce the propensity to withdraw from this location.

Keywords: Operational flexibility, production networks, international divestment, Hazard rate analysis

1. INTRODUCTION

Changing macro- and microeconomic conditions urge firms to relocate their international activities. As international divestment strategies involve massive capacity decisions for multinational corporations, they attract rising attention in international business research (Dhanaraj & Beamish, 2009). Viewing foreign affiliates as gateways to foreign demand and supply markets, research on international divestment has mainly identified factors of survival that relate to the individual subsidiary. However, the decision to divest may also depend on the role played by the subsidiary for other subsidiaries or the multinational corporation (MNC) as a whole (Benito, 2005). If a candidate for closure is established as part of an integrated production network, the decision is subject to the characteristics of the remaining network as well (Belderbos & Zou, 2009). This study sheds light on the determinants of divestment decisions that refer to the configuration of international networks of production subsidiaries in different locations.

Many international ventures are divested for financial reasons (Jagersma & van Gorp, 2003). Accordingly, studies regard the closure of a foreign affiliate as a consequence of performing below expectations. Host country characteristics exert an influence on performance, hence, the survival chance of the subsidiary. While economic and industry growth decrease the propensity to divest (Benito, 1997; Mudambi & Zahra, 2007), competitor entry rates into the industry (Mata & Portugal, 2000; Mata & Portugal, 2002) and cultural distance to the home country (Barkema, Bell, & Pennings, 1996; Li & Guisinger, 1991) seem to increase it. On the subsidiary level, joint ventures are more often divested than wholly-owned subsidiaries (Delios & Makino, 2003; Ogasavara & Hoshino, 2008). Similarly, acquisitions vis-à-vis greenfield investments show lower survival rates (Li & Guisinger, 1991; Shaver, 1995).

Furthermore, subsidiaries that add to a firm's product diversification have a lower chance to survive (Hennart, Kim, & Zeng, 1998; Li, 1995). Regarding parent firm characteristics, empirical studies revealed lower divestment rates for firms that possess host country experience (Li, 1995; Shaver, Mitchell, & Yeung, 1997) and technological advantage (Belderbos, 2003; Delios & Beamish, 2001). Confirming the rationale that parent companies divest affiliates which decrease the overall success of the firm, Haynes, Thompson and Wright (2002) find (on a national level) that divestments improve a company's performance. Besides financial reasons, strategic motivations may drive international divestment decisions (Benito & Welch, 1997; Boddewyn, 1979). Makino et al. (2007) show that international joint ventures are terminated if their purposes have been achieved. In this case, the divestment is a strategic move of the corporate group rather than an outcome of the subsidiary's financial failure. Altogether, previous research has produced rich insights on the determinants of foreign subsidiary survival. However, interrelations with other foreign production subsidiaries of the firm as influencing factors of the divestment decision have been mostly unattended.

The concept of operational flexibility states that a primary advantage of multinational corporations is the flexibility to transfer resources, e. g. production capacity, between locations in different countries as a reaction to environmental changes (Kogut, 1985). Chung, Lu and Beamish (2008) highlight network characteristics that influence the survival of foreign subsidiaries. The study employs a composite figure that measures the network development incorporating the number of foreign subsidiaries and the number of host countries to express the importance of an individual subsidiary to the whole network. Several studies on international subsidiary closures account for properties of the international network in an implicit way as they include the number of foreign subsidiaries (Barkema, Bell, & Pennings, 1996; Benito, 1997) or the number of host countries (Yamawaki, 1997) as a measure of the

investor's international experience. The results, however, are not congruent. One explanation may be that not only the size but also the configuration of an international production network determines a subsidiary's importance to the network. Belderbos and Zou (2009) use the concept of operational flexibility to identify factors of foreign manufacturing affiliate divestments. Differing from Chung, Lu and Beamish (2008), they consider the characteristics of an international production network's set of host countries rather than the bare size of the network. The findings suggest that growing labor costs in a location and a correlation with the macroeconomic conditions in other locations increase the propensity to divest a foreign subsidiary. A differentiation between subsidiaries which are the sole investment in the target market and subsidiaries which are not the sole investment shows that, according to the logic of operational flexibility, location characteristics of the production network are only relevant to the decision of closure when the subsidiary exit involves a complete withdrawal from the location.

Our study seeks to extend this new stream of research based on the concept of operational flexibility by stressing the flexibility value of a location that is part of an international production network. Rising labor costs make a location less profitable and suggest shifting production elsewhere in the network. However, divesting this location would kill the opportunity to shift back production if cost conditions go into reverse. As long as the local labor market is flexible enough to allow for temporary capacity adjustments, investors are likely to hold the location even if labor costs are presently rising. Similarly, uncertain labor costs in a location complicate production planning and will generally induce investors to shift production to more stable locations. Nevertheless this location can be valuable for production shifting if its labor cost development is different from the remaining network. The aim of this paper is to show that divestments of individual production locations depend on labor cost

developments throughout the international production network and are less likely if they enhance the opportunity to shift production.

The next section of the paper develops a model that predicts international divestment decisions drawing on cost and flexibility characteristics of an international production network. In the third section, the empirical research design will be described. The results of the empirical analysis of a panel of German MNCs maintaining production networks abroad are presented in section four. The fifth section concludes the paper with a discussion of the findings, including their limitations, and gives implications for management and future research.

2. THEORY AND HYPOTHESES

Activities in several international markets endow firms with flexibility in strategic and operational decisions. Flexibility is valuable when external developments are uncertain. MNCs may use arbitrage opportunities provided by international tax differentials, governmental support through subsidies, and information on new products and technologies (Kogut, 1985). Establishing production facilities abroad enables firms to react to changing local production conditions such as labor market developments, institutional regulations, or exchange rate fluctuations by shifting production capacities between countries. Kogut (1983) states that operational flexibility is one of the primary advantages of multinational corporations over national firms.

The argument of operational flexibility has been quantified by models to determine the value of an international production network under uncertainty (Dasu & Li, 1997; Huchzermeier &

Cohen, 1996; Kogut & Kulatilaka, 1994). Empirical studies support that MNCs exercise operational flexibility by altering their production configuration according to exchange rate fluctuations (Rangan, 1998), labor cost changes (Belderbos & Zou, 2007), or at times of economic crisis (Chung et al., 2010). Other studies examine performance implications of maintaining operational flexibility through international activities (Allen & Pantzalis, 1996; Lee & Makhija, 2009; Tang & Tikoo, 1999). Arbitrage opportunities result from cost differences of locally sourced inputs that are not priced in world markets, above all labor (Kogut, 1985). A network of production locations will enable the MNC to exploit the potential of operational flexibility by shifting production from countries with rising labor costs to countries with falling labor costs (Tang & Tikoo, 1999). Labor cost changes in the whole network are therefore relevant to divestment decisions in the individual locations.

We build a model of the decision to withdraw from a country as a production location that is part of an international network. The value V of this location consists of two elements: its net present value NPV and its flexibility value F .

$$V=NPV+F$$

Both values are influenced by the actual cost development μ and its uncertainty σ in the production network. Growth and unpredictability of costs make a production location less efficient and, therefore, directly affect the NPV . The flexibility value F reflects an MNC's potential to adjust its production configuration according to μ and σ . Given an MNC's need N to react to changing conditions, F is determined by the opportunity O to do it by capacity adjustments in the focal production location.

$$V=NPV(\mu,\sigma) + N(\mu,\sigma) * O$$

Labor cost advantages of foreign countries are a major motivation to establish production sites outside the home market (e.g., Dunning & Lundan, 2008). Studies also show that higher wage rates prevent investors from entering a foreign market (Bellak & Leibrecht, 2009; Carstensen & Toubal, 2004). However, international investors do not expect favorable cost conditions to be permanent. Labor costs may rise dramatically when a large number of MNCs locate production facilities in a certain country as labor is relatively cheap. Since rising labor costs have a negative impact on foreign subsidiary performance (Chan, Isobe, & Makino, 2008), firms try to reduce the cost of production. They enhance productivity through technology and training, thus cost-efficient production is also possible in high-wage countries (Mucchielli & Saucier, 1997). However, if cost savings do not suffice to recover production efficiency, the MNC is prone to consider different locations as substitutes for former low cost countries that have become too expensive and relocate their production to countries that offer more favorable cost conditions. Rising labor costs will generally lower the net present value *NPV* of a production location and make it less attractive to the investor.

Hypothesis 1a: Rising labor costs increase the propensity to leave a country as a production location.

Since the divestment decision is made in a network perspective, the question of whether to leave or not to leave a host country is also contingent on labor cost developments in alternative locations. Belderbos and Zou (2007) confirm that MNCs adjust their workforce in one host country as a consequence of cost developments in the other locations of the production network. Rising labor costs in other locations make the focal production location relatively more valuable and influence the judgment of its *NPV*. We therefore assume that an MNC is less willing to eliminate a location from the network when labor cost developments in the other locations are unfavorable.

Hypothesis 1b: Rising labor costs in the residual network reduce the propensity to leave a country as a production location.

Rising labor costs influence the cost structure of an MNC and generate a need to react to those changes flexibly, i. e. to shift production from a location that becomes relatively more expensive to a location that becomes relatively less expensive. When labor cost developments are different across countries, a location that becomes more expensive today may become attractive as a production location again in the future. Therefore, MNCs do not react to rising labor costs immediately by a complete withdrawal from the foreign location but with a reduction of workforce (Belderbos & Zou, 2007). The opportunity to operate flexibly through dismissal of workers is contingent on the regulation of the local labor market. Countries exhibit different intensities of labor market regulation and thus impose different costs on firms who dismiss workers, e. g. in form of complex legal requirements, severance payments, or long notice periods (World Bank, 2009). Previous findings suggest that investors do not seem to anticipate the costs that are associated with rigid labor markets (Leibrecht & Scharler, 2009). An MNC that has built an international network of production locations will only consider leaving a foreign country with rising labor costs if labor market regulations impede the opportunity to exercise operational flexibility and thus diminish the flexibility value F of the location. We put this argument in a positive way and expect that

Hypothesis 1c: Ease of employee dismissal reduces the effect of labor cost growth on the propensity to leave a country as a production location.

The future developments of labor costs in a host country can be hard to predict. Wages may have volatile growth rates, especially in emerging economies that are often preferred as investment locations by firms who target low cost labor, e. g. in Eastern Europe (International

Labour Organization, 2009). The lack of predictability makes the choice of efficient manufacturing technologies and the design of cost-minimizing production processes difficult (de Meza & van der Ploeg, 1987). Labor cost volatility leads to an extra discount on the cash flows that are going to be generated by the production sites in a country and decreases the net present value *NPV* of the foreign production location.

Hypothesis 2a: Uncertainty of labor costs increases the propensity to leave a country as a production location.

However, investors do not only build their divestment decisions on the uncertainty of labor costs in a single country. They will also consider the cost predictability of other locations in the production network. Uncertain labor cost developments in the alternative locations will lead to a more positive judgment of the *NPV* of the focal production location and make it less a candidate of divestment.

Hypothesis 2b: Uncertainty of labor costs in the residual network reduces the propensity to leave a country as a production location.

Volatile labor costs require an ongoing adjustment the international production configuration by shifting capacities across countries. However, Chung et al. (2010) demonstrate that MNCs do not shift production internationally if macro-economic conditions among foreign locations are redundant, i. e. environments change in parallel. Belderbos and Zou (2009) show that multinational portfolio redundancy as the correlation of exchange rates between an affiliate's host country and the other countries of the production network lead to a higher propensity to divest. Conversely, a location in which wage rates fluctuate to different directions than in the remaining locations provides an opportunity to shift production when there is a need for production shifting through volatile labor costs. The contribution to the diversity of labor cost

movements within the production network increases the flexibility value F of the focal location. Consequently, the propensity to divestment will be lower.

Hypothesis 2c: The contribution of a location to the diversity of labor cost developments in the network reduces the effect of uncertainty of labor costs on the propensity to leave a country as a production location.

3. EMPIRICAL ANALYSIS

3.1 Data

We test our hypotheses on firm-level data of German manufacturing MNCs. The Central Bank of Germany maintains a database that comprises anonymous information about all foreign direct investment objects of German parent firms above a balance sheet total of €3 million. The reports include balance sheets, the stock of foreign direct investment, and other characteristics of the foreign subsidiaries. They are available as panel data on an annual basis and are assigned to investors by consistent identification numbers from 1996 on. For this study, we closed the data set with definite figures from 2006 and preliminary figures from 2007. Besides firm-level data, we included country-level data of the World Bank, the International Labour Organization (ILO), and the World Economic Forum.

The Central Bank FDI database allows us to filter out the production affiliates of the German parent firms. Because of transportation and coordination costs, a low physical distance facilitates earning the benefits from operational flexibility (Rugman & Verbeke, 2004). Similar to Belderbos and Zou's (2007) study that includes nine production locations of Japanese MNCs in the East Asian region, we limit the analysis of production subsidiaries to

one geographical region. Our study centers on European production locations, since Europe is the most relevant production region of German MNCs, accounting for 56 % of their foreign production. The second reason that makes Europe an appropriate empirical environment is that MNCs evaluate factor costs in the currency of their home country, whilst exchange rate fluctuations superimpose international factor cost movements. In European production networks, exchange rate fluctuations play a minor role due to the euro (European Central Bank, 2007). The levels and movements of labor costs among European countries, though, are very diverse (International Labour Organization, 2009), as are the levels of labor market regulation (World Bank, 2009).

In order to investigate complete withdrawals from foreign locations, we aggregated all the production subsidiaries an investor maintains in a country. Subsidiaries reporting negative equity and investors reporting no turnover of the corporate group were excluded from the analysis. We analyze withdrawals (if they occur) from production locations between 2002 and 2007 that had been entered after 1996. To exclude investment decisions that were rapidly retracted, the production location had to be at least two consecutive years in the investor's country portfolio. To avoid a bias from firms that left the databank during the observation period, we included only parent firms that were under observation for the full period until 2007. We consider a set of production locations as an international network if it embraces subsidiaries in more than two European countries before the withdrawal from one location. We finally obtain a panel of 596 production locations of 189 German MNCs. Table 1 displays the countries and their frequency as production locations. To ensure confidentiality, all numbers referring to less than four observations are concealed.

Insert Table 1 about here

3.2 Measures

3.2.1 Dependent variable

According to the majority of studies on international divestment decisions on the subsidiary level (e.g., Dhanaraj & Beamish, 2009; Pan & Chi, 1999) we use a binary coding for the dependent variable *country exit*. It takes the value one in the year in which an investor withdraws from a country as a production location, and zero otherwise. Within the period between 2002 and 2007, 143 country exits occurred among the 596 locations.

3.2.2 Independent variables

Labor cost developments in foreign locations were taken from the ILO's Key Indicators of the Labour Market (KILM) databank, 6th edition (2009). To calculate *labor cost development*, we use the real manufacturing wage index as a basis, which is the nominal wages index corrected for changes in purchasing power measured by the consumer price index ($100 * \text{nominal wage index} / \text{consumer price index}$). We subtract the wage index of the previous year from the wage index of the present year to obtain the annual growth rate. To measure the *residual network's labor cost development* we calculate the mean growth rates across all other production locations of the MNC.

We also draw on the ILO real manufacturing wage index to measure *uncertainty of labor*

costs. Similar to earlier studies that incorporate uncertainty by the volatility of a macroeconomic indicator (Campa, 2004; Folta & O'Brien, 2004), we use an autoregressive conditional heteroskedastic (ARCH) process (Engle, 1982) to estimate the degree to which the current wage index could not be expected by the investors looking at the past development. We compute the *residual network's uncertainty of labor costs* by the mean of labor cost uncertainties across all production locations of the MNC except the focal location.

The variable *contribution to network diversity* shall reflect the heterogeneity of labor cost developments added by the focal location to the whole production network. From the variance in real manufacturing wage growth indices across the full set of host countries in a year, we subtract the variance in the network without the focal location. A positive value indicates that the heterogeneity of labor cost developments is higher including the focal country, and a negative value means that the heterogeneity of the network is higher without that country.

The World Bank publishes the annual survey “Doing Business” that reports on business regulation and the protection of property rights as well as their effects on businesses in 183 economies (World Bank, 2009). The data are useful for foreign investors to evaluate countries as investment targets and are often employed as indicators in empirical studies (e.g., Atanassov & Kim, 2009; Botero et al., 2004). In particular, the reports include information on national labor market regulations, which are provided by local lawyers and public officials. We invert the “difficulty of firing” index in order to measure *ease of dismissal*. The index contains eight components that describe how easily workers can be laid off, e. g. whether redundancy is allowed as a basis for terminating workers or whether the employer needs to notify a third party to terminate a redundant worker.

3.2.3 Control variables

Previous research proposed a variety of factors on the host country, subsidiary, and parent firm level that influence international divestments. We control for these factors as far as data were available. Referring to host country characteristics, market growth proved to be an important location factor of international investment decisions (e.g., Buckley, Devinney, & Louviere, 2007) and divestment of foreign production subsidiaries (Benito, 1997). If production subsidiaries, among other markets, serve local demand, *GDP growth* (source: World Bank) should lower the propensity to withdraw from that country. Higher costs of imports make local production more attractive and will decrease the propensity to divest. In Europe, tariffs or import restrictions can be largely neglected. However, there are costs for documents, administrative fees for customs clearance and technical control, terminal handling charges and domestic transport. We measure those costs as *obstacles to imports*, which we also obtained from the “Doing Business” surveys of the World Bank. The figures refer to the costs per 20-foot container in U.S. dollars. The overall political climate of host country has a strong influence on the survival of foreign investment objects (Akhter & Choudhry, 1993; Hadjikhani & Johanson, 1996). In its annual executive opinion surveys (Schwab, 2009), the World Economic Forum raises the question whether the threat of terrorism imposes significant costs on business, which delivers a measure of the variable *political stability*. It ranges from one (high costs) to seven (low costs, i. e. highly stable). Cultural distance between the home and the host country may impede foreign business activities and has revealed a negative impact on subsidiary survival (Barkema, Bell, & Pennings, 1996; Li & Guisinger, 1991). We operationalize *cultural distance* using the extended list of cultural indices by Hofstede (1980). Following previous work (Chang & Rosenzweig, 2001), we calculate the square root of the sum of the squared differences between those four cultural dimensions of the respective host countries and Germany, divided by four. As higher

cultural distance is likely to cause costs of coordination when exercising production flexibility, we expect a positive influence on the probability to withdraw from a foreign production location.

On the subsidiary level, performance indicators seem to be driving forces on the decision to divest an affiliate or not (Benito & Welch, 1997; Jagersma & van Gorp, 2003). In order to separate financial reasons of withdrawal from the strategic motivations of operational flexibility, we measure *profitability* of a foreign location by the average return on sales generated by the production subsidiaries within a country. We expect that the more profitable a foreign location, the lower is the propensity to leave this location. Since previous studies found that joint ventures show a higher probability of termination (Delios & Makino, 2003; Ogasavara & Hoshino, 2008), we control for the average *equity share* of the investor's affiliates in a host country. Another factor that may impact on divestment is the importance of the production location, which we measure by the (logarithmized) *sales volume* of the subsidiaries in a location. As sales reflect the potential of within-country advantages of scale and scope we expect that the divestment propensity will be lower as sales are high in a foreign location.

Regarding influence factors on the corporate level, previous research employs the number of host countries to account for network or learning effects as determinants of subsidiary survival (Yamawaki, 1997). We include the number of countries in which an investor maintains production subsidiaries by the variable *network size* since the opportunity to operate flexibly tends to rise with the number of locations (Allen & Pantzalis, 1996; Lee & Makhija, 2009; Tang & Tikoo, 1999). The decision to withdraw from a country may be part of an overall restructuring process of the MNC. We therefore include the variable *number of previous country exits*, which captures the number of previous withdrawals from other foreign

locations. Finally, we control for ownership of the corporate group. MNCs owned by private individuals or families exhibit internationalization strategies that are different from other ownership types (George, Wiklund, & Zahra, 2005; Zahra, 2003). Ownership may therefore affect international divestment decisions. We include the dummy variable *private ownership of corporate group* which has the value one if the firm is held by a domestic private individual or family, and zero otherwise.

4. RESULTS

Descriptive statistics are displayed in Table 2. Due to confidentiality policies, minimum and maximum values of firm-level variables need to refer to the average of the highest and lowest three observations. The correlation matrix reveals that the variables are mostly independent of each other. There is a strong correlation between *uncertainty of labor costs* and *labor cost development* as well as *residual network's uncertainty of labor costs* and *residual network's labor cost development*, which indicates that locations that feature high wage growth rates are also more unpredictable in their wage developments. The positive correlation between *number of previous country exits* and *network size* (number of host countries) is evident; however, we decided to integrate both variables as controls since their impact on divestment decisions may be different. With a mean of 1.85, the variance inflation factors (VIF) indicate an acceptable level of multicollinearity.

 Insert Table 2 about here

Hazard rate models are an appropriate means to analyse the survival of investment objects (e.g., Chen & Wu, 1996; Dhanaraj & Beamish, 2009; Zaheer & Mosakowski, 1997). The hazard rate is defined as the probability that a certain event (e.g., termination of an international venture) occurs within a given time interval divided by the length of that interval. We employ a hazard model that is implemented in non-parametric regressions (Cox, 1972). It delivers an efficient estimation of the hypothesized influences on the decision to exit a foreign production location even though we have no assumption about the baseline hazard. The regression results are presented in Tables 3a and 3b.

Insert Table 3a about here

Model 1 is the base model. It includes the control and moderating variables with a log likelihood of -825.26. Looking at the country-level variables, the results correspond to existing studies. *GDP growth* exerts a stable negative influence on the propensity to withdraw from a foreign location. The impact of *obstacles to imports* and *political stability* is also negative and mostly stable. *Cultural distance* has a positive influence on the propensity to divest a foreign production location in the full model only. On the subsidiary level, *profitability* proves to prevent exit from a foreign country. Corresponding to previous findings on the divestment of joint ventures, a higher *equity share* of the affiliates in the host country is associated with a lower propensity to divestment. The flexibility perspective provides an additional argument that joint ventures are more likely to be shut down: Operating a production facility with a partner makes decisions on capacity adjustment more complex since a local partner might be reluctant to degrade the joint venture. The negative influence of *sales*

volume suggests that the more important a host country for an investor, the less likely its elimination from the portfolio. On the corporate level, the size of the production network seems to impede divestment, while preceding divestment decisions concerning other locations tend to have a negative influence on further divestment. However, *network size* and *number of previous country exits* are rather unstable throughout the models. Finally, *private ownership of corporate group* exerts a negative influence on divestment, which may be attributed to more cautious internationalization paths of private owners. The moderator variable *contribution to network diversity* is mostly insignificant whereas *ease of dismissal* seems to deter withdrawal from a foreign country.

In Model 2, the variable *labor cost development* is introduced in order to test *Hypothesis 1a*. The coefficient is not significant. Therefore, we reject our first Hypothesis. Model 3 incorporates the variable *residual network's labor cost development* to test *Hypothesis 1b*. It raises the log likelihood to -818.68 and has a significant negative coefficient, which supports the prediction that rising labor costs in the remaining countries of the production network lower the divestment propensity in the focal location. In Model 4, *labor cost development* is interacted with *ease of dismissal*. For interactions, variables were centered around zero. The log likelihood of Model 4 is significantly higher than in Model 2 (-820.85). The coefficient is negative, which supports *Hypothesis 1c*. The opportunity to react to deteriorating cost conditions by capacity reduction seems to prevent withdrawal from locations with rising labor costs.

 Insert Table 3b about here

The variable *uncertainty of labor costs* is added in Model 5 (Table 3b). The coefficient is not significant and does not support *Hypothesis 2a*. Model 6 tests *Hypothesis 2b* by introducing the variable *residual network's uncertainty of labor costs*. The coefficient is negative and significant (log likelihood -820.58). The unpredictability of labor costs of the remaining locations seems to prevent divestment of the focal location. However, due to its strong correlation with *residual network's labor cost development* it loses significance in the full model (Model 8). Model 7 includes the interaction term of *uncertainty of labor costs* and *contribution to network diversity*, which effectuates a significant improvement of the log likelihood to -822.36. The interaction term is negative and significant, providing support for *Hypothesis 2c*. The opportunity to shift production between the focal location and other countries with opposite labor cost developments lowers the propensity to leave a country with uncertain labor costs. Since *uncertainty of labor costs* becomes significantly positive in Model 7 as well as in the full model, *Hypothesis 2a*, which predicts that the unpredictability of labor costs enforces divestment decisions, is partly supported.

5. DISCUSSION

Besides the known factors of international divestment, benefits from operational flexibility appear to govern a firm's decision to withdraw from a location. This study complements the findings of prior work that network size (Chung, Lu, & Beamish, 2008), labor cost growth, and host-country redundancy (Belderbos & Zou, 2009) influence divestment decisions regarding operational flexibility. It shows that the effect of labor cost growth in the focal location is reduced by the ease of reducing its production capacity for the time being. Thus, the location will be available for reverse labor cost movements in the future. The study further

shows that labor cost uncertainty is acceptable if the focal location shows a labor cost development that is different from the developments in the residual network. Under these circumstances, the location provides the firm with operational flexibility.

Previous studies mostly identified factors that determine the survival of single international affiliates. However, this literature gives little attention to the flexibility value of these affiliates as part of an international production network. On the one hand, our study of European production networks of German MNCs confirms those findings concerning GDP growth and political conditions (Benito, 1997) and concerning the share of investment in the foreign affiliate (Li, 1995; Ogasavara & Hoshino, 2008). Besides including these factors as indicators of subsidiary performance, we explicitly control for financial performance and find that it exerts a strong negative influence on divestment propensity, while the influences of the other factors remains stable.

On the other hand, the concept of operational flexibility suggests viewing foreign affiliates not only as independent entities that serve local supply or demand markets but also as a set of interrelated units that enable the firm to react flexibly to changing cost conditions (Kogut, 1985). In this perspective, divestment decisions depend upon both cost developments in the focal location and in the remaining locations (Belderbos & Zou, 2007). This study reveals that investors build their decision to completely withdraw from a host country on cost developments in the whole network of production facilities. It further suggests that rising and uncertain wages decrease the net present value of a production location, whereas they increase the flexibility value of a location if firms can easily adjust their local workforce and if the location contributes to the heterogeneity of wage developments in the network.

Investors who have to decide on international divestments may base their decisions on diverse

information. Our analysis revealed that those decisions are not only driven by most evident reason – the foreign investment’s financial performance – but also by the production location strategy of a firm. We find that labor cost characteristics of the focal location and the other locations of the production network are strong predictors for a firm’s international divestment decisions. When evaluating a country as a candidate for divestment, managers ought to consider the flexibility value of a location: They should take into account the rigidity of the local labor market as well as the location’s fit into the existing network’s wage developments, i. e. the location’s contribution to the heterogeneity of labor cost developments. Long-term oriented investors should not hastily withdraw from a host country when labor cost developments temporarily turn adverse, if the foreign location provides the flexibility needed for an international production shifting strategy. Rather, they should keep the location in their portfolio since international cost conditions may change rapidly and the location might offer the potential for taking over production tasks from other countries.

Since host country governments have an interest to keep foreign investors in the country, the study also has political implications. First, labor markets should be flexible in order to benefit from the employment effect of foreign investors. Administrative and regulative obstacles to the dismissal of workers impose costs on investors that intend to adjust their workforce. If they cannot reduce capacity to the desired level, they are more likely to completely withdraw from the location. On the contrary, if the host country government allows for temporary workforce reductions, investors will stick to the location for later re-investments. Second, host country governments need to be aware that investors evaluate a country’s quality as a production location by its fit with other locations in the country portfolio, which is different for each investor. Efforts to influence labor cost developments, e. g. tax concessions or subsidization of wages, are ineffective if investors base the decision to exit a host country on

its ability to contribute to the operational flexibility of the network. In summary, we have to conclude that single local authorities are hardly able to influence divestment decisions that are based on the foreign investor's multinational configuration.

Future research may build on the findings of this study and overcome its limitations, some of which are due to missing information in our anonymous dataset. With more information on the subsidiary level, one could ensure that subsidiaries within a network produce interchangeable outputs; i. e. shifting production capacity between subsidiaries is feasible. Further, future studies should incorporate more factors that have been examined by extant research. In the present data, there is no distinction between greenfield investments and acquisitions and no information on competitive advantage, e. g. R&D or advertising intensity. Neither could we judge if strategic motivations other than production shifting triggered the divestment decision, e. g. a major customer left the focal market. Subsequent studies may also advance our knowledge on international divestment by choosing empirical settings that are different from the European. Exchange rate movements are an important determinant of a multinational production network's operational flexibility when there is no common or dominant currency. Beyond that, studies building on more fine-grained data such as management surveys may detect to what extent MNCs exploit operational flexibility by enlarging capacity in an existing location or entering a new location after a production facility has been abandoned. Finally, it needs to be clarified if international divestment decisions that are based on operational flexibility are beneficial to the MNC in terms of financial performance, competitiveness, and social responsibility.

REFERENCES

- Akhter, S. H., & Choudhry, Y. A. (1993). Forced withdrawal from a country market: Managing political risk. *Business Horizons*, 36(3), 47-54.
- Allen, L., & Pantzalis, C. (1996). Valuation of the operating flexibility of multinational operations. *Journal of International Business Studies*, 27(4), 633-653.
- Atanasov, J. V., & Kim, E. H. (2009). Labor and corporate governance: International evidence from restructuring decisions. *Journal of Finance*, 64(1), 341-374.
- Barkema, H. G., Bell, J. H. J., & Pennings, J. M. (1996). Foreign entry, cultural barriers, and learning. *Strategic Management Journal*, 17(2), 151-166.
- Belderbos, R. (2003). Antidumping and foreign divestment: Japanese electronics multinationals in the EU. *Review of World Economics*, 139(1), 131-160.
- Belderbos, R., & Zou, J. (2009). Real options and foreign affiliate divestments: A portfolio perspective. *Journal of International Business Studies*, 40(4), 600-620.
- Belderbos, R., & Zou, J. (2007). On the growth of foreign affiliates: Multinational plant networks, joint ventures, and flexibility. *Journal of International Business Studies*, 38(7), 1095-1112.
- Bellak, C., & Leibrecht, M. (2009). Do low corporate income tax rates attract FDI? – Evidence from Central- and East European countries. *Applied Economics*, 41, 2691-2703.
- Benito, G. R. G. (2005). Divestment and international business strategy. *Journal of Economic Geography*, 5, 235-251.
- Benito, G. R. G. (1997). Divestment of foreign production operations. *Applied Economics*, 29(10), 1365-1377.
- Benito, G. R. G., & Welch, L. S. (1997). De-internationalization. *Management International Review*, 37(Special Issue 2), 7-25.
- Boddewyn, J. J. (1979). Foreign divestment: Magnitude and factors. *Journal of International Business Studies*, 10(1), 21-27.
- Botero, J. C., Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2004). The regulation of labor. *Quarterly Journal of Economics*, 119(4), 1339-1382.
- Buckley, P. J., Devinney, T. M., & Louviere, J. J. (2007). Do managers behave the way theory suggests? A choice-theoretic examination of foreign direct investment location decision-making. *Journal of International Business Studies*, 38(7), 1069-1094.
- Campa, J. M. (2004). Exchange rates and trade: How important is hysteresis in trade?

European Economic Review, 48(3), 527-548.

Carstensen, K., & Toubal, F. (2004). Foreign direct investment in Central and Eastern European countries: A dynamic panel analysis. *Journal of Comparative Economics*, 32(1), 3-22.

Chan, C. M., Isobe, T., & Makino, S. (2008). Which country matters? Institutional development and foreign affiliate performance. *Strategic Management Journal*, 29(11), 1179-1205.

Chang, S. J., & Rosenzweig, P. M. (2001). The choice of entry mode in sequential foreign direct investment. *Strategic Management Journal*, 22(8), 747-776.

Chen, T.-J., & Wu, G. (1996). Determinants of divestment of FDI in Taiwan. *Review of World Economics*, 132(1), 172-184.

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.

Chung, C. C., Lu, J. W., & Beamish, P. W. (2008). Multinational networks during times of economic crisis versus stability. *Management International Review*, 48(3), 279-295.

Cox, D. R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society*, 34(2), 187-220.

Dasu, S., & Li, L. (1997). Optimal operating policies in the presence of exchange rate variability. *Management Science*, 43(5), 705-722.

de Meza, D., & van der Ploeg, F. (1987). Production flexibility as a motive for multinationality. *The Journal of Industrial Economics*, 35(3), 343-351.

Delios, A., & Beamish, P. W. (2001). Survival and profitability: The roles of experience and intangible assets in foreign subsidiary performance. *Academy of Management Journal*, 44(5), 1028-1038.

Delios, A., & Makino, S. (2003). Timing of entry and the foreign subsidiary performance of Japanese firms. *Journal of International Marketing*, 11(3), 83-105.

Dhanaraj, C., & Beamish, P. W. (2009). Institutional environment and subsidiary survival. *Management International Review*, 49(3), 291-312.

Dunning, J. H., & Lundan, S. M. (2008) *Multinational enterprises and the global economy*. Cheltenham, UK; Northampton, MA: Edward Elgar.

Engle, R. F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. *Econometrica*, 50(4), 987-1007.

- European Central Bank (2007). *Review of the international role of the Euro*. Frankfurt/Main.
- Folta, T. B., & O'Brien, J. P. (2004). Entry in the presence of dueling options. *Strategic Management Journal*, 25(2), 121-138.
- George, G., Wiklund, J., & Zahra, S. A. (2005). Ownership and the internationalization of small firms. *Journal of Management*, 31(2), 210-233.
- Hadjikhani, A., & Johanson, J. (1996). Facing foreign market turbulence: Three Swedish multinationals in Iran. *Journal of International Marketing*, 4(4), 53-74.
- Haynes, M., Thompson, S., & Wright, M. (2002). The impact of divestment on firm performance: Empirical evidence from a panel of UK companies. *Journal of Industrial Economics*, 50(2), 173-196.
- Hennart, J.-F., Kim, D.-J., & Zeng, M. (1998). The impact of joint venture status on the longevity of Japanese stakes in US manufacturing affiliates. *Organization Science*, 9(3), 382-395.
- Hofstede, G. H. (1980) *Culture's consequences: International differences in work-related values*. Newbury Park, CA: Sage Publications, Inc.
- Huchzermeier, A., & Cohen, M. A. (1996). Valuing operational flexibility under exchange rate risk. *Operations Research*, 44(1), 100-113.
- International Labour Organization (2009) *Key Indicators of the Labour Market (KILM) databank*. Geneva.
- Jagersma, P. K., & van Gorp, D. M. (2003). International divestments - An empirical perspective. *Business Horizons*, 46(6), 61-69.
- Kogut, B. (1983) Foreign direct investment as a sequential process. In C. P. Kindleberger, & D. Audretsch (Eds.), *The Multinational Corporation in the 1980s* (pp. 38-56). Cambridge, MA: MIT Press.
- Kogut, B., & Kulatilaka, N. (1994). Operating flexibility, global manufacturing, and the option value of a multinational network. *Management Science*, 40(1), 123-139.
- Kogut, B. (1985). Designing Global Strategies: Profiting from operational flexibility. *Sloan Management Review*, 27(1), 27-38.
- Lee, S. H., & Makhija, M. (2009). The effect of domestic uncertainty on the real options value of international investments. *Journal of International Business Studies*, 40(3), 405-420.
- Leibrecht, M., & Scharler, J. (2009). How important is employment protection legislation for foreign direct investment flows in Central and Eastern European countries? *Economics of Transition*, 17(2), 275-295.
- Li, J. (1995). Foreign entry and survival: Effects of strategic choices on performance in

- international markets. *Strategic Management Journal*, 16(5), 333-351.
- Li, J., & Guisinger, S. (1991). Comparative business failures of foreign-controlled firms in the United States. *Journal of International Business Studies*, 22(2), 209-224.
- Makino, S., Chan, C. M., Isobe, T., & Beamish, P. W. (2007). Intended and unintended termination of international joint ventures. *Strategic Management Journal*, 28(11), 1113-1132.
- Mata, J., & Portugal, P. (2002). The survival of new domestic and foreign-owned firms. *Strategic Management Journal*, 23(4), 323-343.
- Mata, J., & Portugal, P. (2000). Closure and divestiture by foreign entrants: The impact of entry and post-entry strategies. *Strategic Management Journal*, 21(5), 549-562.
- Mucchielli, J.-L., & Saucier, P. (1997) European industrial relocations in low-wage countries: policy and theory debates. In P. J. Buckley, & J.-L. Mucchielli (Eds.), *Multinational firms and international relocation* (pp. 5-33). Cheltenham, UK, Brookfield, US: Edward Elgar.
- Mudambi, R., & Zahra, S. A. (2007). The survival of international new ventures. *Journal of International Business Studies*, 38(2), 333-352.
- Ogasavara, M. H., & Hoshino, Y. (2008). The effects of entry strategy and inter-firm trust on the survival of Japanese manufacturing subsidiaries in Brazil. *Asian Business & Management*, 7(3), 353-380.
- Pan, Y., & Chi, P. S. K. (1999). Financial performance and survival of multinational corporations in China. *Strategic Management Journal*, 20(4), 359-374.
- Rangan, S. (1998). Do multinationals operate flexibly? Theory and evidence. *Journal of International Business Studies*, 29(2), 217-237.
- Rugman, A. M., & Verbeke, A. (2004). A perspective on regional and global strategies of multinational enterprises. *Journal of International Business Studies*, 35(1), 3-18.
- Schwab, K., (Ed.) (2009). *The Global Competitiveness Report 2009–2010*. Geneva: World Economic Forum.
- Shaver, J. M. (1995). The influence of industry growth and foreign entry rate on foreign direct investment survival. *Academy of Management Best Papers Proceedings*, 201-205.
- Shaver, J. M., Mitchell, W., & Yeung, B. (1997). The effect of own-firm and other-firm experience on foreign direct investment survival in the United States, 1987-92. *Strategic Management Journal*, 18(10), 811-824.
- Tang, C. Y., & Tikoo, S. (1999). Operational flexibility and market valuation of earnings. *Strategic Management Journal*, 20(8), 749-761.
- World Bank (2009) *Doing Business 2010*. Washington, DC: Palgrave MacMillan.

Yamawaki, H. (1997) Exit of Japanese multinationals in U.S. and European manufacturing industries. In P. Buckley, & J.-L. Mucchielli (Eds.), *Multinational firms and international relocation* (pp. 220-237). Cheltenham: Edward Elgar.

Zaheer, S., & Mosakowski, E. (1997). The dynamics of the liability of foreignness: A global study of survival in financial services. *Strategic Management Journal*, 18(6), 439-464.

Zahra, S. A. (2003). International expansion of US manufacturing family businesses: The effect of ownership and involvement. *Journal of Business Venturing*, 18(4), 495-512.

TABLES

Table 1: Countries and their frequency included in the analysis

Country	Frequency
Austria	40
Belgium	24
Bulgaria	< 4
Czech Republic	33
Croatia	4
Denmark	11
Estonia	< 4
Finland	8
France	80
Greece	10
Hungary	24
Ireland	8
Italy	55
Latvia	< 4
Lithuania	< 4
Moldova	< 4
Netherlands	25
Norway	6
Poland	42
Portugal	20
Romania	8
Russian Federation	5
Slovak Republic	14
Spain	76
Sweden	12
Switzerland	23
Turkey	19
Ukraine	< 4
United Kingdom	38
Total	596

Table 2: Descriptive statistics, correlation matrix, and variance inflation factors

	Variable	Mean	St.Dev	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VIF
1	<i>residual network's uncertainty of labor costs</i>	70.34	76.08	0.67	561.8	1.00																3.27
2	<i>uncertainty of labor costs</i>	53.79	128.01	0.54	1111	-0.02	1.00															3.22
3	<i>residual network's labor cost development</i>	4.82	11.05	-38.1	57.8	0.79	0.02	1.00														2.80
4	<i>labor cost development</i>	3.14	19.24	-59.3	97.7	0.04	0.68	0.03	1.00													2.38
5	<i>contribution to network diversity</i>	-23.64	275.66	-2681	2514	-0.40	0.38	-0.22	0.12	1.00												1.56
6	<i>ease of dismissal</i>	37.67	14.71	0	60	0.02	0.10	0.01	0.07	0.06	1.00											1.13
7	<i>GDP growth</i>	3.54	2.13	-0.81	10.42	0.12	0.37	0.14	0.37	0.05	0.06	1.00										1.66
8	<i>obstacles to imports</i>	1032.2	257.07	420	2050	-0.11	0.16	-0.09	0.15	0.09	0.16	-0.17	1.00									1.33
9	<i>political stability</i>	5.07	0.65	3.80	6.50	0.03	0.09	0.03	0.11	0.08	-0.11	0.02	-0.20	1.00								1.39
10	<i>cultural distance</i>	2777	1571	611	8746	0.07	-0.05	0.02	0.25	-0.01	0.19	0.32	0.07	0.32	1.00							1.84
11	<i>profitability</i>	0.04	0.12	-0.63	0.73	0.09	0.02	0.08	0.02	0.01	-0.02	0.03	-0.03	0.15	0.03	1.00						1.08
12	<i>equity share</i>	0.93	0.17	0.15	1	-0.04	-0.11	-0.06	-0.05	-0.03	0.06	-0.06	0.08	-0.02	0.07	-0.09	1.00					1.07
13	<i>sales volume</i>	11.04	1.53	7.60	15.78	0.07	-0.01	0.11	0.00	0.02	0.00	-0.01	0.00	-0.01	0.02	0.11	0.03	1.00				1.18
14	<i>network size</i>	7.18	5.59	3	29	0.16	0.13	0.09	0.08	0.05	0.00	0.13	-0.04	0.09	-0.03	0.14	0.06	0.26	1.00			2.05
15	<i>number of previous country exits</i>	3.28	3.00	1	20	0.07	0.36	0.03	0.29	0.12	0.09	0.38	-0.13	0.18	0.15	0.11	0.03	0.13	0.64	1.00		2.38
16	<i>private ownership of corporate group</i>	0.28	0.45	0	1	-0.08	-0.03	-0.03	-0.02	0.02	0.01	-0.03	-0.01	0.04	0.08	0.05	0.09	-0.29	-0.28	-0.21	1.00	1.07

Table 3a: Cox hazard rate regressions of the propensity to withdraw from a host country

<i>country exit</i>	Model 1	Model 2	Model 3	Model 4
<i>uncertainty of labor costs X contribution to network diversity</i>				
<i>residual network's uncertainty of labor costs</i>				
<i>uncertainty of labor costs</i>				
<i>labor cost development X ease of dismissal</i>				-0.0016*** (0.0005)
<i>residual network's labor cost development</i>			-0.0308*** (0.0086)	
<i>labor cost development</i>		-0.0009 (0.0058)		0.0022 (0.0057)
<i>contribution to network diversity</i>	0.0007 (0.0005)	0.0007 (0.0005)	0.0004 (0.0005)	0.0010** (0.0005)
<i>ease of dismissal</i>	-0.0166*** (0.0063)	-0.0164** (0.0064)	-0.0155** (0.0063)	-0.0160** (0.0064)
<i>GDP growth</i>	-0.4739*** (0.0700)	-0.4742*** (0.0703)	-0.4428*** (0.0694)	-0.5696*** (0.0775)
<i>obstacles to imports</i>	-0.0016*** (0.0004)	-0.0016*** (0.0004)	-0.0018*** (0.0004)	-0.0021*** (0.0004)
<i>political stability</i>	-0.3764** (0.1678)	-0.3729** (0.1694)	-0.2933* (0.1683)	-0.2137 (0.1761)
<i>cultural distance</i>	2.63E-5 (8.17E-5)	2.68E-5 (8.32E-5)	1.96E-5 (8.24E-5)	0.0001 (0.0001)
<i>profitability</i>	-1.5406*** (0.5626)	-1.5413*** (0.5629)	-1.5925*** (0.5789)	-1.612*** (0.5655)
<i>equity share</i>	-0.8843* (0.4646)	-0.8868* (0.4647)	-0.9011* (0.4624)	-0.7508 (0.4646)
<i>sales volume</i>	-0.1620** (0.0628)	-0.1616** (0.0629)	-0.1425** (0.0632)	-0.1427** (0.0632)
<i>network size</i>	-0.0496* (0.0271)	-0.0502* (0.0274)	-0.0419 (0.0275)	-0.0562** (0.0275)
<i>number of previous country exits</i>	0.0953* (0.0515)	0.0965* (0.0523)	0.0818 (0.0521)	0.1144** (0.0540)
<i>private ownership of corporate group</i>	-0.3777* (0.2058)	-0.3789* (0.2060)	-0.4366** (0.2069)	-0.3861* (0.2080)
Log likelihood	-825.26	-825.24	-818.68***	-820.85***
Reference	no (base model)	Model 1	Model 1	Model 2
Objects	596	596	596	596

Standard errors in parentheses; *** p < 0.01; ** p < 0.05; * p < 0.1

Table 3b: Cox hazard rate regressions of the propensity to withdraw from a host country

<i>country exit</i>	Model 5	Model 6	Model 7	Model 8
<i>uncertainty of labor costs X contribution to network diversity</i>			-1.59E-5* (8.65E-6)	-2.56E-5** (1.07E-5)
<i>residual network's uncertainty of labor costs</i>		-0.0048*** (0.0018)		-0.0012 (0.0023)
<i>uncertainty of labor costs</i>	0.0013 (0.0013)		0.0039** (0.0018)	0.0065*** (0.0019)
<i>labor cost development X ease of dismissal</i>				-0.0022*** (0.0006)
<i>residual network's labor cost development</i>				-0.0290** (0.0117)
<i>labor cost development</i>				0.0003 (0.0076)
<i>contribution to network diversity</i>	0.0006 (0.0004)	0.0002 (0.0005)	0.0006 (0.0005)	0.0004 (0.0006)
<i>ease of dismissal</i>	-0.0180*** (0.0065)	-0.0158** (0.0064)	-0.0203*** (0.0067)	-0.0197*** (0.0067)
<i>GDP growth</i>	-0.4918*** (0.0722)	-0.4609*** (0.0698)	-0.5051*** (0.0712)	-0.6032*** (0.0784)
<i>obstacles to imports</i>	-0.0017*** (0.0004)	-0.0018*** (0.0004)	-0.0016*** (0.0004)	-0.0025*** (0.0004)
<i>political stability</i>	-0.4270** (0.1764)	-0.3281* (0.1685)	-0.5127*** (0.1844)	-0.2243 (0.1874)
<i>cultural distance</i>	3.86E-5 (8.23E-5)	4.61E-5 (8.19E-5)	4.26E-5 (8.12E-5)	0.0002** (0.0001)
<i>profitability</i>	-1.5042*** (0.5625)	-1.3946** (0.5662)	-1.5353*** (0.5675)	-1.6571*** (0.5957)
<i>equity share</i>	-0.8627* (0.4659)	-0.9509** (0.4619)	-0.8263* (0.4672)	-0.6060 (0.4709)
<i>sales volume</i>	-0.1611** (0.0628)	-0.1663*** (0.06235)	-0.1647*** (0.0633)	-0.1226* (0.0646)
<i>network size</i>	-0.0478* (0.0271)	-0.0341 (0.0277)	-0.0468* (0.0273)	-0.0477* (0.0287)
<i>number of previous country exits</i>	0.0832 (0.0528)	0.0846 (0.0528)	0.0844 (0.0523)	0.0829 (0.0556)
<i>private ownership of corporate group</i>	-0.3758* (0.2057)	-0.4304** (0.2057)	-0.3746* (0.2075)	-0.4340** (0.2110)
Log likelihood	-824.87	-820.58***	-822.36**	-807.49***
Reference	Model 1	Model 1	Model 5	Model 1
Objects	596	596	596	596

Standard errors in parentheses; *** p < 0.01; ** p < 0.05; * p < 0.1