Subsidiary withdrawal and network of multinational corporations

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In contrast to previous studies that have viewed foreign direct investments (FDIs) as dyadic relations between countries, the present study offers a contemporary and sophisticated view of FDIs by considering third-party country effects. We apply the ideas of export-platform and networked FDIs in order to provide this alternative perspective. This study also proposes that the withdrawal of manufacturing subsidiaries from a focal country has positive effects on subsidiaries' sales, purchasing, and the amount of imports/exports in third-party countries of the same region. Using data from Japanese foreign affiliates, including transaction information among subsidiaries, we found that such significant and positive effects exist. Furthermore, this study offers significant contributions to the literature on traditional FDIs and the survival of foreign subsidiaries.

Keywords：FDI, export-platform, foreign subsidiaries, withdrawal

1. INTRODUCTION

The motives of foreign direct investments (FDIs) have been explained through market- and efficiency-seeking in prior literature (e.g., Johanson and Vahlne, 1977). However, the foreign operations of multinational corporations (MNCs) have been complicated. Ekholm, Forslid, and Markusen (2007) argued the importance of export-platform FDIs by illustrating that some subsidiaries function as platforms to export products to third-party countries. Meanwhile, many affiliates are part of international production networks, known as "networked FDIs" (Baldwin and Okubo, 2014). This viewpoint sheds light on third-party country effects instead of characteristics of individual-affiliate and parent-affiliate pairs.

Moreover, prior studies have identified determinant factors on the survival of foreign subsidiaries. However, the literature premises that profitable subsidiaries are less likely to withdraw from host countries (Bradley, Aldrich, Shepherd, and Wiklund, 2011). The export-platform FDIs literature implies that the premise is not necessarily true since MNCs withdraw foreign subsidiaries for the purpose of restructuring subsidiary networks in the same region or throughout the world. Such withdrawals in a focal country would have certain influences on subsidiary operations in third-party countries.

This study intends to extend the FDI and subsidiary survival literature by considering third-party country effects. This study argues that the withdrawal of production subsidiaries from a focal country influences their operations in third-party countries of the same region. FDIs by MNCs have been more complicated over the past several decades; therefore, networked FDIs are critical considerations for understanding contemporary subsidiary operations of MNCs. According to The Survey on Overseas Business Activities by the Research and Statistics Department of the Japanese Ministry of Economy, Trade and Industry (METI), which is the present study's empirical touchstone, more than 40

percent of subsidiaries' sales are obtained from exports to third-party countries.

Finally, this study answers the following question: How do subsidiaries' withdrawals from a focal country influence their operations in third-party countries? Using data from Japanese affiliates from 1995 to 2013, this study conceptualizes networked FDIs and posits that such withdrawals from a focal country have positive influences on subsidiaries' sales, purchasing, and imports/exports in third-party countries of the same region. Furthermore, it presents four hypotheses that indicate the importance of viewing foreign subsidiaries as a subsidiary network.

2. THEORY AND HYPOTHESES

2.1 Foreign Direct Investment

Traditional theories of internationalization have shown that the primary motives of expanding production to foreign countries include market accessibility and reductions in transaction and transportation costs (Dunning and Lundan, 2008). In the field of international eco-

nomics, scholars have argued that it is no longer relevant to explain the motives of FDIs according to two dimensions. For instance, Ekholm, Forslid, and Markusen (2007: 793) found that export platforms refer to situation outputs of foreign affiliates, which are largely exported rather than sold in host countries. Blonigen, Davies, Waddell, and Naughton (2007) theorized that subsidiaries in neighboring or surrounding countries have significant influences on FDIs in a host country. Most affiliates purchase some (but not all) of their intermediates from abroad, while selling some of their output abroad. Baldwin and Okubo (2014) referred to these FDIs as "networked FDIs" since these affiliates operate as nodes in regional production networks. Tables 1 and 2 illustrate the amount of imports and exports to third-party countries (in 3-year increments) from 1995 to 2013. Using data from Japanese foreign affiliates, the findings show that approximately 40 percent of sales consist of exports to third-party countries, while roughly 50 percent of purchases include imports

Table 1 Sales in Manufacturing Subsidiaries (in percentage (%) terms)

	1995	1998	2001	2004	2007	2010	2013
Local sales	60.76	60.03	44.13	55.91	61.38	59.84	60.19
Exports to Japan	13.65	14.79	17.85	17.76	21.56	18.96	18.63
Exports to Asia	8.89	9.77	16.89	12.93	9.05	10.24	10.51
Exports to North America	4.06	4.91	7.42	4.22	2.72	3.46	3.29
Exports to Europe	10.07	7.48	10.01	7.04	4.15	5.71	5.45
Exports to other regions	2.57	3.02	3.71	2.14	1.14	1.79	1.94

Table 2 Purchasing by Manufacturing Subsidiaries (in percentage (%) terms)

	1995	1998	2001	2004	2007	2010	2013
Local procurement	44.62	42.08	50.38	47.99	54.98	55.29	57.82
Imports from Japan	33.64	39.00	31.89	31.90	31.36	30.16	24.83
Imports from Asia	10.70	9.13	10.33	12.85	9.33	9.72	10.54
Imports from North America	3.16	3.00	3.07	2.22	1.33	1.56	2.69
Imports from Europe	6.27	5.44	3.00	4.23	2.24	2.40	2.96
Imports from other regions	1.63	1.36	1.33	0.81	0.76	0.87	1.15

from third-party countries. This evidence clearly indicates that considering third-country effects is inevitable for a deeper understanding of contemporary MNCs' foreign operations.

2.2 Survival of Subsidiary Organizations

Prior studies on international management have found several determinant factors that explain the performance of foreign subsidiaries (e.g., Chang, Gong, and Peng, 2012), of which two primary factors are headquarters and subsidiary factors. For instance, Tran, Mahnke, and Ambos (2010) found that knowledge transfer from headquarters to subsidiaries has positive effects on the subsidiaries' performance. Regarding subsidiary factors, Andersson, Forsgren, and Holm (2002) found that a subsidiary's network and its embeddedness in host countries have a positive effect on their performance. In addition, Gao, Pan, Lu, and Tao (2008) showed that specific entry mode experiences have a positive impact on subsidiary performance.

Scholars have extended the literature by focusing on subsidiaries' survival (e. g., Berry, 2010, 2013). The phenomenon of survival has been explored from three levels: subsidiary, firm, and host country. For instance, Mata and Portugal (2002) showed that a subsidiary's survival is determined by its size in the context of Portuguese firms. In addition, using data from Japanese non-financial firms listed on the Tokyo Stock Exchange, Delios and Beamish (2001) found that the survival rates of MNCs' manufacturing subsidiaries in host countries generally increase with their local operating experience. With regard to firm-level factors and using data from 7,166 Swedish firms in the manufacturing and technology sectors, Bradley, Aldrich Shepherd, and Wiklund (2011) showed that subsidiaries have low mortality rates when compared with independent organizations. However, their mortality rates increase during severe economic downturns since independent organizations are more capable of using their resources to reduce mortality rates during environmental jolts when compared with subsidiary organizations. Regarding country-level factors and using data from 12,992 Japanese foreign affiliates, Delios, Xu, and Beamish (2008) showed that the relation between diversification levels and subsidiaries' survival rates can differ depending on the institutional environment in the host country. Subsequently, Song (2014b) found that when host market conditions are unfavorable, a small investment (instead of a large one) in a foreign subsidiary can cause the subsidiary to withdraw. Although the aforementioned studies investigated the survival or withdrawal of foreign subsidiaries, they did not consider the potential of MNCs' restructuring effects among subsidiary networks (Song, 2015). In fact, Lee and Song (2012) conceptualized intra-MNC effects and found that an increase (decrease) in production in a focal MNC subsidiary can lead to a decrease (increase) in production in other subsidiaries of the same MNC.

Prior studies on subsidiary performance have premised that higher subsidiary failure rates are the result of subsidiaries' lower performance, which is a conventional argument in this literature (Hamilton and Chow, 1993; Montgomery and Thomas, 1988). However, the export-platform and networked-FDI literature indicates that this assumption might not be true. Therefore, the present paper argues that FDIs should be viewed as networked FDIs (Baldwin and Okubo, 2014). Subsidiary operations in a focal country can influence subsidiary operations in third-party countries and vice versa. In particular, the withdrawal of a manufacturing subsidiary from a

focal country can influence subsidiaries' operations in third-party countries.

2.3 Hypotheses

Since the patterns of FDIs made by MNCs have been complicated, MNCs no longer establish subsidiaries for the sole purpose of market- and efficiency-seeking. As shown in Tables 1 and 2, manufacturing subsidiaries export to other subsidiaries in third-party countries rather than selling the products in the countries. In addition, manufacturing subsidiaries import goods from third-party countries. Song (2015), in fact, found that environmental uncertainty in a foreign subsidiary's host country has positive effects on an increase in intra-firm sales to subsidiaries in countries where the uncertainty is lower. Furthermore, the decrease of production in a focal MNC subsidiary positively influences the amount of production in other subsidiaries of the same MNC (Lee and Song, 2012). Thus, if a manufacturing subsidiary withdraws from a focal country, then the import/export functions of the country are partially transferred to third-party countries. Consequently, the sales and purchases by subsidiaries in the third-party countries increase. It suggests that subsidiary relationships should be established as subsidiary networks instead of individual subsidiaries. Moreover, third-party country effects are stronger in the same region since the restructuring of production networks in the same region is more effective than it is in other regions (Eden and Miller, 2004; Ghemawat, 2001). Hence, the following hypotheses are posited:

Hypothesis 1: The withdrawal of a manufacturing subsidiary from a focal country has a positive influence on subsidiaries' total sales in third-party countries of the same region.

Hypothesis 2: The withdrawal of a manufacturing subsidiary from a focal country has a positive influence on subsidiaries' exports in third-party countries of the same region.

Hypothesis 3: The withdrawal of a manufacturing subsidiary from a focal country has a positive influence on subsidiaries' total purchasing in third-party countries of the same region.

Hypothesis 4: The withdrawal of a manufacturing subsidiary from a focal country has a positive influence on subsidiaries' imports in third-party countries of the same region.

3. METHODS

3.1 Research Setting

In order to test the proposed hypotheses, firm-level data consisting of subsidiary-level sales, imports, and exports is necessary. Thus, this study utilizes firm-level data from Japanese foreign affiliates included in The Survey on Overseas Business Activities by METI, which is an annual survey that covers all Japanese affiliates in countries around the world. The quality of this survey-based data has been justified by existing studies (e.g., Makino, Chan, Isobe, and Beamish, 2007).

3.2 Data and Sample

As stated above, data was obtained from The Survey on Overseas Business Activities by METI, which covers the period from 1995 to 2013. In order to reveal the longitudinal dynamics, this study sets the observation period in the same time frame and focuses on manufacturing MNCs to test the hypotheses. In addition, it excluded firms with no foreign subsidiaries and those that lacked certain data. Consequently, the final sample covered 8,278 subsidiaries of

2,817 MNCs in 99 countries, and it consisted of 41,042 data points (with the unit of analysis as firm-country-year).

3.3 Measurement
(1) *Dependent Variables*

This study views subsidiaries' regional sales and operations, measured in ten thousand dollars, as dependent variables. The Survey on Overseas Business Activities includes subsidiary-level total sales, purchasing, export amounts (exports to Japan, North America, Asia, Europe, and other regions), and import amounts (imports from Japan, North America, Asia, Europe, and other regions). In order to construct the dependent variables and test the hypotheses, we first aggregated the total sales, purchasing, and the import/export amounts of each MNC subsidiary in a host country. Then, we aggregated the country-level variables to construct region-level variables. Five regions in particular were set (Japan, Asia, North America, Europe, and other regions) since these variables were readily and empirically available. Finally, the country-level data was subtracted from the region-level data to create aggregated variables in the third-party countries of the same region.

(2) *Independent Variables*

The independent variables conceptualize the withdrawal of manufacturing subsidiaries from a focal country. We used the time t-1 data for all of the independent and control variables. In addition, to measure the withdrawal from a focal country, 1 was used if a firm withdrew manufacturing subsidiaries from a focal country and 0 otherwise.

(3) *Control Variables*

We included two groups of control variables:

firm and country. We incorporated the *number of subsidiaries* to control the internationalization level of firms, while the *firms' total sales* were employed to control the size of the MNCs as a firm-level variable. In addition, the *focal country's total sales* were used to control the position of the country, while the *export amounts to Japan, North America, Asia, Europe, and other regions* were applied to control the operation in the focal country. These country-level variables were incorporated to test Hypotheses 1 and 2. In order to test Hypotheses 3 and 4, the *focal country's total purchasing* was used along with the *import amounts from Japan, North America, Asia, Europe, and other regions* into the focal country. These variables were measured in ten thousand dollars excluding the *number of subsidiaries.*

3.4 Statistical Analysis

The dataset in this study consists of unbalanced panel data. Hence, unobserved heterogeneity might arise since the data contains multiple observations for each firm. In order to deal with unobserved heterogeneity, which causes endogeneity problems for estimations, we used fixed-effects estimation for all of the models (Greene, 1993). In addition, the *STATA14* program estimated the regression by using the "xtreg" command with the "fe" option. Finally, we lessened the effects of any unobserved heterogeneity by incorporating year-dummy variables since it has been shown that using such variables in fixed-effects models can be an efficient means of dealing with heteroscedasticity (Sayrs, 1989).

4. RESULTS

Table 3 presents the descriptive statistics and correlations of variables that we applied in this study. Although some correlation coefficients

Table 3 Descriptive Statistics and Correlations

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1	Total sales in third-party countries of the same region	559824	4442813	1.000									
2	Withdrawal from the focal country	0.01	0.11	0.070	1.000								
3	Number of subsidiaries	5.06	13.2	0.241	0.044	1.000							
4	Total sales in the focal country	15178	106393	0.355	0.050	0.078	1.000						
5	Exports from the focal country to Japan	1170	12410	0.139	0.032	0.045	0.209	1.000					
6	Exports from the focal country to North America	960	53744	0.238	0.006	0.003	0.616	0.039	1.000				
7	Exports from the focal country to Asia	926	10833	0.281	0.060	0.041	0.208	0.175	0.028	1.000			
8	Exports from the focal country to Europe	898	13471	0.070	0.004	0.056	0.198	0.049	0.023	0.051	1.000		
9	Exports from the focal country to other regions	317	8083	0.090	0.006	0.042	0.168	0.034	0.054	0.107	0.079	1.000	
10	Total purchasing in the focal country	10060	70203	0.359	0.054	0.075	0.938	0.275	0.546	0.233	0.229	0.168	1.000
11	Imports from Japan into the focal country	2331	17586	0.177	0.035	0.066	0.350	0.165	0.014	0.131	0.164	0.104	0.406
12	Imports from North America into the focal country	87	1190	0.044	0.004	0.043	0.060	0.014	0.009	0.026	0.025	0.009	0.071
13	Imports from Asia into the focal country	773	7719	0.278	0.050	0.075	0.210	0.350	0.020	0.299	0.118	0.086	0.269
14	Imports from Europe into the focal country	344	5273	0.026	0.005	0.041	0.122	0.016	0.001	0.005	0.375	0.011	0.149
15	Imports from other regions into the focal country	1613	31065	0.297	0.020	0.091	0.085	0.408	0.004	0.085	0.016	0.074	0.119
16	Firm sales	275881	759646	0.439	0.037	0.223	0.272	0.141	0.053	0.154	0.145	0.098	0.282

	11	12	13	14	15	16
11	1.000					
12	0.081	1.000				
13	0.293	0.062	1.000			
14	0.174	0.055	0.071	1.000		
15	0.061	0.010	0.157	0.001	1.000	
16	0.198	0.111	0.202	0.162	0.196	1.000

were relatively high, the highest variance inflation indicator (VIF) was less than 10. Hence, we took no remedial action for multicollinearity. Using the aggregated amount of operations in third-party countries of the same region, Tables 4 and 5 provide the estimates of the fixed-effects regression models.

While Model 1 indicates the estimations of the total sales, Models 2 to 6 report the effects of the export amounts in third-party countries of the same region. Moreover, Models 7–12 in Table 5 show the effects of withdrawal on the total purchasing and the import amounts in third-party countries of the same region.

In Model 1, withdrawal from the focal country positively influences subsidiaries' total sales in third-party countries of the same region ($p < 001$), thus suggesting that withdrawal has a significant impact on operations in third-party countries of the same region. Hence, Hypothesis 1 is supported. In addition, in Models 2–6,

the independent variable has a positive effect on subsidiaries' exports to Japan, North America, Asia, and other regions from third-party countries of the same region ($p < .001$; $p < .05$). Hence, Hypothesis 2 is partially supported.

Model 7 tests Hypothesis 3. Withdrawal from the focal country has a positive effect on subsidiaries' total purchasing in third-party countries of the same region ($p < .001$). Hence, Hypothesis 3 is supported. Moreover, in Models 8–12, the independent variable also has a positive impact on subsidiaries' imports from Japan and other regions into third-party countries of the same region ($p < .001$; $p < .05$). Therefore, Hypothesis 4 is partially supported. However, withdrawal has a negative effect on import amounts from Europe ($p < .01$), which suggests that future research on the patterns of subsidiary networks and their effects can be fruitful.

In order to deal with any heteroscedasticity and autocorrelation problems in the estima-

Table 4 Results of Hypotheses Testing

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Subsidiaries in the Third-party Countries of the Same Region in Aggregate					
	Total Sales	Exports to Japan	Exports to North America	Exports to Asia	Exports to Europe	Exports to other regions
Withdrawal from the focal country	1136857.7***	277236.9***	70645.9*	118685.2***	17552.4	15252.8*
	(152140.8)	(26854.1)	(27992.7)	(23788.4)	(12370.5)	(7032.8)
Number of subsidiaries	47108.4***	11839.3***	893.2**	4400.8***	588.3***	-60.61
	(1696.5)	(299.4)	(312.1)	(265.3)	(137.9)	(78.42)
Aggregated total sales in the focal country	6.320***	-0.0195	0.860***	0.0986**	-0.197***	-0.0243*
	(0.224)	(0.0396)	(0.0413)	(0.0351)	(0.0182)	(0.0104)
Aggregated exports from the focal country to Japan	14.24***	4.975***	-0.593*	2.551***	1.059***	0.598***
	(1.429)	(0.252)	(0.263)	(0.223)	(0.116)	(0.0660)
Aggregated exports from the focal country to North America	7.716***	0.205**	6.693***	-0.623***	-0.157***	-0.0577**
	(0.401)	(0.0708)	(0.0738)	(0.0627)	(0.0326)	(0.0185)
Aggregated exports from the focal country to Asia	53.76***	6.805***	-0.943**	12.60***	-1.760***	0.293***
	(1.610)	(0.284)	(0.296)	(0.252)	(0.131)	(0.0744)
Aggregated exports from the focal country to Europe	-19.39***	-0.800***	-2.166***	-3.217***	4.393***	-0.704***
	(1.262)	(0.223)	(0.232)	(0.197)	(0.103)	(0.0583)
Aggregated exports from the focal country to other regions	-14.53***	1.757***	-2.215***	-2.558***	-2.398***	3.374***
	(2.069)	(0.365)	(0.381)	(0.324)	(0.168)	(0.0957)
Firm sales	-0.594***	-0.212***	-0.0977***	-0.153***	0.0146	-0.0456***
	(0.104)	(0.0183)	(0.0191)	(0.0162)	(0.00844)	(0.00480)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	230265.8	19679.0	24408.2	52218.8*	22757.1	15276.2*
	(161698.0)	(28541.0)	(29751.2)	(25282.7)	(13147.6)	(7474.6)
N	41042	41042	41042	41042	41042	41042

Standard errors in parentheses
$^\dagger p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5 Results of Hypotheses Testing

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Subsidiaries in the Third-party Countries of the Same Region in Aggregate					
	Total purchasing	Imports from Japan	Imports from North America	Imports from Asia	Imports from Europe	Imports from other regions
Withdrawal from the focal country	810136.7***	316094.0***	5.651	539.4	-16161.2**	2803.5*
	(116387.1)	(35257.3)	(840.6)	(15270.4)	(5353.4)	(1192.7)
Number of subsidiaries	35988.8***	14407.4***	-62.14***	-713.7***	-899.8***	-27.75*
	(1299.3)	(393.6)	(9.384)	(170.5)	(59.76)	(13.32)
Aggregated total purchasing in the focal country	10.66***	0.374***	0.00480**	0.126***	-0.0215*	0.00893***
	(0.209)	(0.0634)	(0.00151)	(0.0275)	(0.00962)	(0.00214)
Aggregated imports from Japan into the focal country	-7.740***	3.637***	0.0813***	0.415***	-0.213***	0.0329***
	(0.835)	(0.253)	(0.00603)	(0.110)	(0.0384)	(0.00856)
Aggregated imports from North America into the focal country	-83.01***	-1.275	2.978***	-14.38***	-4.309***	-0.571***
	(10.85)	(3.285)	(0.0783)	(1.423)	(0.499)	(0.111)
Aggregated imports from Asia into the focal country	54.33***	20.64***	0.105***	12.49***	-1.167***	0.343***
	(1.847)	(0.559)	(0.0133)	(0.242)	(0.0849)	(0.0189)
Aggregated imports from Europe into the focal country	-52.80***	-14.10***	-0.0940***	-7.056***	4.576***	-0.307***
	(2.525)	(0.765)	(0.0182)	(0.331)	(0.116)	(0.0259)
Aggregated imports from other regions into the focal country	-15.77***	-2.207***	-0.0147	-1.061***	0.132	0.238***
	(1.471)	(0.446)	(0.0106)	(0.193)	(0.0677)	(0.0151)
Firm sales	-0.567***	-0.196***	-0.00000356	-0.0119	0.0471***	-0.0233***
	(0.0793)	(0.0240)	(0.000573)	(0.0104)	(0.00365)	(0.000813)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	154863.6	20977.8	1627.6	19387.7	4071.9	6231.6***
	(123794.7)	(37501.4)	(894.1)	(16242.3)	(5694.1)	(1268.6)
N	41042	41042	41042	41042	41042	41042

Standard errors in parentheses
$^\dagger p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

tions (Wooldridge, 2010), we used feasible generalized least squares estimation to verify the robustness of the results (Song, 2015). Here, we employed the *STATA14* to estimate the regression using the "xtgls" command with the "corr" option. Although the details are not reported here due to space limitations, the results are consistent with those in Tables 4 and 5.

5. DISCUSSION AND CONCLUSION

This study extended the literature on FDI and subsidiary survival by developing an advanced mechanism that illustrates networked FDIs and analyzing the data of Japanese affiliates in manufacturing industries from 1995 to 2013. The results show that the withdrawal of production subsidiaries from a focal country has a positive effect on various subsidiaries' operations in third-party countries of the same region. The findings imply that the roles of production subsidiaries are transferred to third-party countries of the same region, especially when withdrawal occurs in a focal country.

This study advances the understanding of the existing literature in several ways. First, it contributes to the literature on FDI theory by providing evidence regarding the significant influences of export-platform and networked FDIs on operations in third-party countries. Furthermore, this study extends the literature on subsidiary survival. Prior studies have premised that subsidiaries survive when they achieve higher performance. However, export-platform and network FDIs suggest that the withdrawal of a subsidiary is consequent to the restructuring of MNCs' global subsidiary networks.

Besides the findings, this study identifies several important areas for future research. First, since the samples in this study consist of companies in the manufacturing sector, the effects of

withdrawal on operations in third-party countries might differ depending on types of industries in manufacturing. For instance, Tables 6 and 7 present the results of the automotive industry, thus suggesting stronger effects of a withdrawal on subsidiaries' aggregated operations in third-party countries of the same region when compared with Tables 4 and 5, thereby stressing on the need for future research to identify the differences among industries.

Second, this study focused on the withdrawal from a focal country. However, entry into or the establishment of manufacturing subsidiaries in a focal country should have a negative effect on sales and operations in third-party countries of the same region. The literature on operational flexibility has implicitly considered MNCs shifting production because of environmental uncertainty and the effects of such production shifts (Kogut and Kulatilaka, 1994; Song, 2014a). For instance, Fisch and Zschoche (2012) found that labor cost growth in host countries has a positive effect on the new establishment of production subsidiaries. Thus, it is important for future research to identify the differences regarding the effects of new establishments and withdrawals on operations in third-party countries. Moreover, some events, such as natural disasters, in host countries would have a strong impact on production networks; thus, comparing such subsidiary networks before and after the events can offer meaningful insights into the existing literature.

Third, this study employs regional operations as dependent variables. However, the detailed mechanism regarding the proximity of countries should be examined in future research. For instance, a withdrawal from Korea should have a significant positive effect on subsidiaries' operations in adjacent countries (e.g., China). More-

Table 6 Results of Hypotheses Testing (automotive industry)

	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
	Subsidiaries in the Third-party Countries of the Same Region in Aggregate					
	Total Sales	Exports to Japan	Exports to North America	Exports to Asia	Exports to Europe	Exports to other regions
Withdrawal from the focal country	5907411.3***	1300652.3***	212071.6***	797438.0***	179392.5*	105438.2***
	(1126034.8)	(227943.1)	(39437.4)	(135523.6)	(74614.1)	(20427.0)
Number of subsidiaries	126676.4***	20031.4***	4009.0***	2829.6	2110.2*	-3506.6***
	(14367.5)	(2908.4)	(503.2)	(1729.2)	(952.0)	(260.6)
Aggregated total sales in the focal country	5.950***	-0.465*	-0.0130	-0.413***	-0.350***	-0.0645***
	(0.905)	(0.183)	(0.0317)	(0.109)	(0.0600)	(0.0164)
Aggregated exports from the focal country to Japan	163.0***	40.51***	6.794***	22.20***	10.06***	3.171***
	(14.67)	(2.969)	(0.514)	(1.765)	(0.972)	(0.266)
Aggregated exports from the focal country to North America	55.55***	1.885	-0.117	-0.925	-2.397***	0.0606
	(6.960)	(1.409)	(0.244)	(0.838)	(0.461)	(0.126)
Aggregated exports from the focal country to Asia	102.2***	20.03***	2.656***	20.51***	-4.010***	0.555*
	(14.45)	(2.926)	(0.506)	(1.740)	(0.958)	(0.262)
Aggregated exports from the focal country to Europe	-29.33***	-3.125*	0.0715	-4.105***	6.528***	-0.866***
	(7.120)	(1.441)	(0.249)	(0.857)	(0.472)	(0.129)
Aggregated exports from the focal country to other regions	-11.93	6.195	-0.145	-3.939	-9.282***	3.900***
	(26.72)	(5.409)	(0.936)	(3.216)	(1.771)	(0.485)
Firm sales	-0.860	-0.154	-0.0227	-0.0549	-0.0157	0.0116
	(0.668)	(0.135)	(0.0234)	(0.0804)	(0.0443)	(0.0121)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	893575.9	118997.2	22499.9	133622.9	77816.6	37274.9**
	(796965.7)	(161329.7)	(27912.3)	(95918.6)	(52809.1)	(14457.5)
N	3464	3464	3464	3464	3464	3464

Standard errors in parentheses
†$p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7 Results of Hypotheses Testing (automotive industry)

	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
	Subsidiaries in the Third-party Countries of the Same Region in Aggregate					
	Total purchasing	Imports from Japan	Imports from North America	Imports from Asia	Imports from Europe	Imports from other regions
Withdrawal from the focal country	5291532.1***	1818482.1***	6856.9*	321746.2***	-1404.3	22332.0***
	(865865.2)	(292366.8)	(3073.0)	(50040.4)	(2513.3)	(3463.0)
Number of subsidiaries	88696.5***	40276.6***	-300.5***	2997.0***	590.6***	-1073.5***
	(11127.2)	(3757.2)	(39.49)	(643.1)	(32.30)	(44.50)
Aggregated total purchasing in the focal country	10.21***	0.518	0.00480	0.0962	0.00291	0.00897*
	(0.951)	(0.321)	(0.00338)	(0.0550)	(0.00276)	(0.00380)
Aggregated imports from Japan into the focal country	-17.79*	1.765	-0.0518*	0.722	-0.0149	-0.0829**
	(7.051)	(2.381)	(0.0250)	(0.407)	(0.0205)	(0.0282)
Aggregated imports from North America into the focal country	-330.0***	-107.1***	5.413***	-17.81***	-0.868***	-1.079***
	(69.85)	(23.59)	(0.248)	(4.037)	(0.203)	(0.279)
Aggregated imports from Asia into the focal country	209.6***	74.74***	0.469***	10.65***	-0.150***	0.729***
	(15.05)	(5.083)	(0.0534)	(0.870)	(0.0437)	(0.0602)
Aggregated imports from Europe into the focal country	-105.4***	-29.72***	-0.291***	-6.340***	0.765***	-0.880***
	(19.68)	(6.646)	(0.0699)	(1.138)	(0.0571)	(0.0787)
Aggregated imports from other regions into the focal country	-1980.1***	-689.0***	-0.723	-121.4***	-8.381***	-2.169*
	(258.3)	(87.22)	(0.917)	(14.93)	(0.750)	(1.033)
Firm sales	-0.665	-0.237	-0.000915	-0.00801	-0.00223	0.00183
	(0.515)	(0.174)	(0.00183)	(0.0297)	(0.00149)	(0.00206)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	879996.5	155981.3	2754.9	48543.9	1432.3	7228.2**
	(613454.1)	(207138.0)	(2177.2)	(35453.0)	(1780.6)	(2453.5)
N	3464	3464	3464	3464	3464	3464

Standard errors in parentheses
†$p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

over, by analyzing these networked FDIs effects, it is possible to answer the following question: What are the optimal production networks of MNCs? Tang and Tikko (1999), for instance, explored how operational flexibility, operationalized by the number of foreign countries and foreign subsidiaries per foreign country, influences value creation of MNCs. However, we do not have any answers to the question (Lee and Makhija, 2009).

This study has several limitations. First, the consequences of investments on performance are still relatively unknown. Second, this study did not consider the organizational interactions with competitors and other industry players. Prior studies, for instance, have found that organizations imitate larger and profitable organizations when considering new market entry (e.g., Haveman, 1993). Hence, inadequate consideration of inter-firm relationships is another limitation.

Regardless of the fact that this study is a work in progress, it still provides new insights into the current literature besides offering new avenues for future research.

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