

# **COUNTRY RISK AND NETWORK LINKAGES WITHIN MULTINATIONALS**

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## **INTRODUCTION**

Research on the structure and dynamics of networks has a long history. Within this arena, scholars have devoted perhaps the greatest attention to understanding the nature of ties that bind nodes together within a network. In this paper, we extend this line of research by addressing the following question: Within an existing network, how does the level of risk specific to an existing node affect linkages between that node and the rest of the network? We conceptualize the multinational corporation (MNC) as a network of interdependent subsidiaries and examine the impact of *country risk* to which a subsidiary is exposed on *the intensity of intra-firm trade between the subsidiary and the rest of the MNC's global network*.

This study extends existing research on country risk and MNC entry decisions by focusing on MNCs that have already established subsidiaries in a host country. Specifically, we examine how country risk is likely to affect the nature of intra-firm trade linkages between a subsidiary and the rest of the MNC's global network. Exchange networks are often characterized by multiple types of transactional content: expressive (affect), cognitive (information), instrumental (power), and objective (goods). In the case of networks with an explicitly economic agenda, an analysis of objective exchanges among the nodes should be highly salient. In this study, the objective exchanges that we focus on are intra-firm trade.

It is well-accepted that intra-firm trade serves as an integrating mechanism for the MNC's global network (Kobrin, 1991). In this study, we argue that this type of integrating mechanism can be a valid strategy for dealing with country risk faced by established subsidiaries. In testing our hypotheses on the impact of country risk, we control for a variety of other factors that might influence MNCs' intra-firm trade.

In the next section, we review the relevant theoretical literature and advance two hypotheses regarding the main and moderated effects of nodal risk on node-network linkages. This is followed by a description of our data and variables. We next present the results and discuss the implications of our findings.

## **THEORY AND HYPOTHESES**

Consistent with decision theory, we define risk as being present when a possible action is associated with uncertainty regarding potential outcomes. Country risk refers to the country-specific risk which an MNC is exposed to when it conducts any operations in the particular country. Country risk is widely regarded as a multidimensional construct encompassing many types of country-specific political, institutional, and economic risks. Although the content of the various types of country risks may appear somewhat distinct, many scholars have argued that the different types of country risk share common drivers (e.g., La Porta, 1997). Indeed, empirical studies have consistently demonstrated extremely high

correlations among the various risk types (see La Porta, 1997).

We argue that intra-firm trade can mitigate the negative consequences of country risk through several mechanisms: socialization, monitoring, and rent appropriation. We examine each of these in turn. Moran (2001) and others have noted that managers within subsidiaries that are more tightly integrated into the internal global trading network of the MNC tend to exhibit greater similarities in their value systems and business practices with the rest of the MNC. Accordingly, they can be trusted to a greater degree to protect the MNC's welfare when dealing with local stakeholders. While such trust is not likely to eliminate the MNC's exposure to country risk, it can be expected to reduce it.

Intra-firm trade can also enhance the monitoring capabilities of the MNC. While these gains in monitoring will not eliminate the MNC's exposure to country risk, they can also be expected to mitigate it. Clearly, the greater the intensity of economic transactions between a subsidiary and other units within the MNC's global network, the greater must be the intensity of information and knowledge exchange between the subsidiary and these other units including corporate headquarters (Kobrin, 1991).

Finally, the greater the country risk, the greater is the uncertainty that the MNC faces about its ability to appropriate profits from sales of the focal subsidiary. To the extent that there exists greater intra-firm trade between the subsidiary and the rest of the global network, the MNC creates an assured intra-firm demand for the subsidiary's products and services thereby minimizing risks associated with rent appropriation.

Our arguments are consistent with Delios and Henisz' (D&H) (2000: 319) observation that MNCs may deploy a variety of hazard mitigation strategies, including exporting from the subsidiary. Considering the combined effects of socialization, monitoring, and rent appropriation, we argue that, when dealing with a subsidiary to which it must remain strategically committed, the global network of the MNC would find it advantageous to use intra-firm trade as a way to mitigate risk or the negative consequences of such risk. Stated more formally:

*Hypothesis 1: Ceteris paribus, the greater the level of country risk facing a subsidiary, the greater would be the intensity of intra-firm trade linkages between the particular subsidiary and the rest of the MNC.*

We now examine the implications of variations in MNCs' experience at operating in high risk countries. The effect of prior experience plays a central role in research on the evolution of MNCs' global expansion strategies. In a theoretical analysis of the impact of prior experience on how MNCs might deal with legitimacy concerns, Kostova and Zaheer (1999: 71) argue that operating in a larger and wider variety of countries gives the firm "extensive organizational experience in.. identifying important legitimating actors, making sense of their legitimacy requirements, and negotiating with them. [Greater experience also] suggests that the firm may have significant bargaining power with respect to the states and governments it deals with."

Consistent with prior research, we anticipate that when an MNC operates in a larger number of high risk countries, corporate managers develop a greater ability to anticipate the types and sources of country risks that a specific subsidiary may face. Corporate managers can use this experience to deploy a broader array of strategic choices for dealing with country risk. Organizing an MNC network to conduct intra-firm trade is not cost-free and may involve scheduling, tariff, and transport costs. As an alternative strategy, MNCs may choose to engage in direct negotiation, lobbying, and cooptation efforts with host country stakeholders (Moran, 2001). The well-known case of IBM's breakthrough negotiations with the Mexican government

to establish a wholly owned subsidiary in the early 1980s illustrates such a strategy (Weiss, 1990). We expect that MNCs with greater experience at dealing with high risk countries would be more likely to deploy such direct strategies. This should reduce at least partially the need to use intra-firm trade as a mechanism for dealing with country risk. Thus:

*Hypothesis 2: The positive association between country risk and a subsidiary's intensity of intra-firm trade predicted in H1 will be moderated by MNCs' experience at dealing with subsidiaries in high risk countries.*

## DATA AND VARIABLES

In this study, we use confidential panel data from the Benchmark and Annual Surveys of US Direct Investment Abroad, administered by the Bureau of Economic Analysis (BEA), United States Department of Commerce. The BEA data is the most comprehensive data available on MNCs. In this study, we use BEA data disaggregated at the individual foreign affiliate level for each MNC from 1983 through 1996.

To test our hypotheses on nodal risk and network linkages, we use a subset of the BEA data constructed in several steps. First, we limited our analysis to foreign subsidiaries in thirteen countries in the "Americas." This region includes all of North and South America, Central America and the island nations of the Caribbean and Bahamas. Our second data screen involved removing estimated data from the sample (see Feinberg and Keane, 2001 for a detailed discussion). Third, we restricted our sample to majority-owned (i.e., >50% owned) subsidiaries, because minority-owned subsidiaries typically provide much less comprehensive data to the BEA. We removed from our sample subsidiaries in countries with no available data on country risk and/or other missing data and subsidiaries without at least the two consecutive observations, since we use lagged variables. These screens left us with a sample of 16,686 subsidiary-year observations on 3289 subsidiaries of 1042 U.S. based MNC parents.

All MNC variables are expressed in U.S. dollars and deflated to 1992 dollars using the U.S. GDP deflator. We next discuss the measurement of our hypothesized and control variables.

***Subsidiary intensity of intra-firm trade.*** This variable is measured as the ratio of a specific subsidiary's sales to the rest of the MNC in a particular year to the total sales of the subsidiary in the same year. This variable ranges from 0 (implying no intra-firm trade by the subsidiary) to 1 (implying exclusively intra-firm trade by the subsidiary).

***Country risk.*** We operationalize country risk as the "risk of contract repudiation by the host government." Data on this variable were obtained from the International Country Risk Guide (the IRIS dataset published by countrydata.com). These data have been used widely in empirical research (e.g., La Porta, 1997). Although previous research has shown that different measures of country risk are highly correlated, for robustness we report our results using risk of expropriation. In the IRIS dataset, higher values imply lower risk. In order to eliminate potential confusion in interpreting the results, we multiplied the IRIS data by -1 before conducting our analyses.

***MNC's experience at dealing with high risk subsidiaries.*** To capture an MNC's ability to manage risk, we use the lagged number of "high risk" subsidiaries in each MNC network (by year). "High risk" subsidiaries are defined as those falling in the 25<sup>th</sup> percentile of Country Risk calculated from the population of subsidiaries (i.e., a risk level of below 8).

***Subsidiary and MNC control variables.*** To control for MNC strategy, we use two variables to capture the extent of the MNC's globalization and integration, specifically, a

measure of the MNC's foreign-to-U.S. assets and a measure of the MNC's total cross-border intra-firm trade. The MNC's cross-border intra-firm trade is measured as the sum of exports and imports between an MNC's U.S. operations and its foreign subsidiaries divided by the total sales of the U.S. operations. We control for subsidiary role using a measure of the MNC's ownership stake in the subsidiary and a measure of the subsidiary's value-added/sales. We use a dummy variable to control for manufacturing subsidiaries, and we control for subsidiary size and MNC size, both measured as the log of sales revenues. All MNC and subsidiary variables are lagged.

**Country, industry, and time effects.** We use country fixed effects to control for unobserved country characteristics that could potentially bias our results. We also estimate our model without country dummies, but including country variables widely used in empirical studies of international trade - the log of per-capita GDP and the log of the distance from each country to the U.S.. We control for industry effects using a variable that measures the average intra-MNC trade in each subsidiary's specific industry (every year) for all subsidiaries in our sample excluding the focal subsidiary. We use a similar variable to control for country-industry effects. We also include year dummies to pick up the effects of changes in demand, growth, public policy, and other unobserved time-related variation. Finally, our panel data estimator also controls for subsidiary effects.

We estimate our model using a random effects tobit regression, since many of the observations on the dependent variable are zero (See Feinberg and Keane, 2001).

## RESULTS AND DISCUSSION

\*\*\*\*\*Insert Table 1 here\*\*\*\*\*

Table 1 presents our regression results. We present our regression results in two steps. First, in column 1, we show the regression results with only the main effects included. Second, in column 2, we show the full set of results including the main effects as well as the interaction between country risk and the MNC's experience at managing high risk subsidiaries.

As can be seen in column 1, our results support Hypothesis 1. A subsidiary's intra-firm trade with the rest of the MNC's global network is positively associated ( $p < .001$ ) with risk of contract repudiation by the subsidiary's host country government. In Hypothesis 2, we predicted that an MNC's experience at managing high risk subsidiaries would dampen the positive relationship between country risk and subsidiary intensity of intra-firm trade. As can be seen in column 2, the interaction between risk of contract repudiation and MNC experience is significant at  $p < .001$  and in the expected negative direction.

Turning to the control variables, MNC and subsidiary size are positive, and generally significant. A subsidiary's intra-firm trade is also generally higher when its U.S. parent engages in more trade with all of its subsidiaries. Subsidiaries in which MNCs have a higher ownership stake also have greater trade linkages with the rest of the MNC. Subsidiaries in manufacturing industries are more likely to have intra-firm trade linkages with the rest of the MNC, and controls for trade in the subsidiary's industry and country-industry are highly significant.

To check the robustness of our results, we estimate the base model using country variables standard in "gravity" models of international trade, rather than country dummies. The variables we include are the average intra-firm-trade in the subsidiary's country (in each year), the log of per-capita GDP in the subsidiary's country, and the distance between the subsidiary's country and the U.S.. As can be seen in columns 3-4, the magnitude and significance of the coefficients on country risk and the risk-experience interaction are virtually unaffected by this estimation. In

columns 5-6, we estimate the same model as in columns 3-4, but we use the ICRG variable “expropriation risk,” rather than “risk of contract repudiation by the host country government.” Again, the results are nearly identical to our base specification.

Focusing on how country risk affects an MNC subsidiary’s intra-firm trading activities within the global network, we advanced two hypotheses: first, country risk would have a positive impact on the subsidiary’s intra-firm trade; second, this positive association would be moderated by the MNC’s experience at managing high risk subsidiaries. Our study provides some interesting insights into the question of how MNCs deal with country risk. Focusing on entry strategies, D&H (2000) found that MNCs were less likely to enter a risky country, particularly if they had less prior experience in other high risk countries. Of course, despite risks, MNCs often do enter risky countries. We look at what happens after such entry. Our findings are consistent with D&H’s (2000) observation that exports from the subsidiary may be a valid strategy for dealing with country risk on an ongoing basis. While MNCs may prefer to stay away from higher risk countries, if entry must occur, then integration may be preferable to isolation.

### ENDNOTES

The statistical analysis of firm-level data on US MNCs reported in this study was conducted at the International Investment Division, Bureau of Economic Analysis, US Department of Commerce, under arrangements that maintained legal confidentiality requirements. Views expressed are those of the authors.

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**Table 1: Random Effects Tobit Results for Subsidiary's Intensity of Intra-Firm Trade**

Dependent Variable = Subsidiary's Intensity of Intra-Firm Trade (IFT)	Base Model (Country Risk = Risk of Contract Repudiation)		Base Model But Country Variables Instead of Country Dummies		Country Risk = Risk of Expropriation	
	Main Effects (1)	Full Model (2)	Main Effects (3)	Full Model (4)	Main Effects (5)	Full Model (6)
<b>Hypothesized Variables</b>						
Country Risk (H1: +)	0.86***	1.49***	0.89***	1.88***	0.78***	2.20***
MNC's Experience at Dealing with high risk subs.	0.02	-0.11**	0.03	-0.14***	0.04*	-0.19***
MNC's Experience at Dealing with high risk subsidiaries*Country Risk (H2: -)		-0.02***		-0.03***		-0.03***
<b>Control Variables</b>						
MNC's total Cross Border Intra-Firm Trade	15.58***	16.70***	19.76***	20.46***	19.73***	20.71***
MNC's Foreign-to-U.S. Assets	-0.12	-0.47	-1.25	-0.17	-1.38	-0.19
MNC's ownership stake in Subsidiary	0.01**	0.01***	0.01***	0.01***	0.01***	0.01***
Subsidiary Value-Added-to-Sales	0.88	1.22	1.21	1.91*	1.22	1.86*
Subsidiary Manufacturing Dummy	3.96***	3.85***	3.70***	4.65***	3.78***	4.40***
Subsidiary Size	0.43*	0.52*	0.15	0.58*	0.06	0.69*
MNC Size	0.48*	0.24	1.21***	0.94***	1.09***	0.64*
Average IFT in Subsidiary's Industry	36.48***	38.40***	34.41***	34.55***	34.39***	35.75***
Average IFT in Subsidiary's Country-Industry	68.45***	68.51***	73.25***	73.00***	73.20***	73.11***
Average IFT in Subsidiary's Country			-11.02***	-12.37***	-9.59***	-13.32***
Log( Per capita GDP)			-3.39***	-3.00***	-3.20***	-3.07***
Log( Distance)			-8.58***	-10.71***	-7.78***	-10.24***
Constant	-31.17***	-26.63***	56.32***	72.89***	48.58***	75.90***
Firm-Specific Error ( $\sigma_u$ )	25.06***	25.0***	24.68***	24.28***	24.72***	24.37***
Idiosyncratic Error ( $\sigma_e$ )	15.29***	15.3***	15.42***	15.43***	15.43***	15.41***
Firm Variance Component ( $\rho$ )	72.9	72.7	71.92	71.23	71.97	71.43
<b>Model Statistics</b>						
Model includes country dummy variables	YES	YES	NO	NO	NO	NO
Model includes year dummy variables	YES	YES	YES	YES	YES	YES
Wald Chi <sup>2</sup> Model	7127.06***	6416.14***	6562.73***	7123.23***	6985.86***	6862.04***
Log-Likelihood	-635.67	-644.24	-643.13	-630.9	-647.46	-626.59

Note: Regression coefficients are multiplied by 100. The N for each model is 16686 subsidiary-year observations on 3289 subsidiaries. There are 9987 non-zero observations on the dependent variable. \*\*\* p<.001, \*\* p<.01, \* p<.05. All z tests are two-tailed.