LOCATION OF DECISION-RIGHTS WITHIN MULTINATIONAL FIRMS

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May 1, 2012

Abstract

Using U.S-based multinational firm data gathered over more than two decades, we examine factors associated with the location of decision-rights within these firms, whether the inappropriate assignment of decision-rights is associated with poor performance, and whether these firms relocate decision-rights in response to their evolving environments. We find a mismatch between the location of decision-rights and a firm's environment is associated with weak firm performance. We also show that the likelihood a parent company will alter the assignment of decision-rights to a subsidiary is increasing in the extent of a mismatch although this likelihood is decreasing in the strength of the subsidiary's performance.

JEL classification: C72, M41

Key words: organizational structure, multinational, delegation, decentralization, decision-rights

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1. Introduction

The globalization of business has been explosive. The largest retailer in the world, Wal-Mart Stores, had just one percent of its stores located outside the U.S. in 1993, but that number had grown to over 51 percent in 2011. Multinational firms operate in various political, cultural, legal, and economic environments. The sheer size and scope of these firms heightens the need for their managers to obtain and process enormous quantities of information. As firm profit maximization depends on the collocation of decision-rights with the knowledge necessary for making those decisions (Hayek, 1945), understanding the allocation of decision-rights to foreign subsidiaries of multinational firms is becoming increasingly important. This study uses a large sample of U.S-based multinational firms to examine factors associated with the location of decision-rights, whether the inappropriate location of decision-rights is associated with firm performance, and whether firms reassign decision-rights as their environments evolve.

Multinational firms typically conduct their international activities through foreign affiliated companies often operating in different currency environments. When preparing its consolidated financial statements, a parent company must report its results and those of its foreign affiliates in a common reporting currency.[1] Generally Accepted Accounting Principles (GAAP) require a parent to use one of two procedures to transform foreign currency financial statements. The procedure depends on the currency in which the foreign affiliate primarily makes it operating, investing and financing decisions—termed its *functional currency*. To identify an affiliate's functional currency, the parent is required to distinguish between affiliates whose activities are

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[1] We define a *firm* as a U.S. parent and the set of legal entities in which the parent holds, directly or indirectly, at least a 20 percent equity interest. The term *parent* refers only to the domestic operation of the *firm*. We refer to a foreign *affiliate* as a legal entity in which the parent has, directly or indirectly, at least a 20 percent equity interest. We refer to a foreign *subsidiary* as a foreign affiliate in which the U.S. parent has, directly or indirectly, at least a 50 percent equity interest.

integrated with the parent's domestic activities (e.g., the affiliate serves as a sales outlet and remits funds to the parent) and those whose activities are self-contained within the foreign environment (e.g., the affiliate produces and sells locally and retains funds for reinvestment). Thus, the affiliate's functional currency serves as an indicator of the "real" location of decision-making for each affiliate.

Using data the U.S. Bureau of Economic Analysis gathers, we study the location of decision-rights within 2,902 U.S.-based multinational firms that own 28,386 foreign subsidiaries over the period 1982 to 2004. We use a firm's declared functional currency for each foreign subsidiary to measure the extent to which the firm has centralized or decentralized its decision-making.

It has been long argued that firms should choose their organizational structure to match their environments (e.g., Lawrence and Lorsch, 1967). We regard a firm's organizational structure as describing the centralization or decentralization of decision-rights with regard to each of its foreign subsidiaries. Thus, to understand the factors associated with firms' organizational structures, we model the assignment of decision-rights to foreign subsidiaries (Besanko et al., 2000). By comparing our prediction of the location of decision-rights with the actual location for each subsidiary, we measure the lack of fit between a firm's organizational structure and its environment, which we term organizational *mismatch*. With this measure of organizational mismatch in hand, we develop and test two primary hypotheses.

The first hypothesis posits and we find that an organizational structure that is mismatched to a firm's environment is associated with weaker firm performance. Further, firms with inappropriately decentralized decision-rights suffer significantly poorer performance than those with inappropriately centralized decision-rights. The second hypothesis predicts and we show that the likelihood a parent will reassign decision-rights is increasing in the extent of a mismatch

but this likelihood is decreasing in the strength of its subsidiary's performance. Moreover, to align the organizational structure with the environment, we find parents are less willing to reclaim decision-rights from subsidiaries when those rights were previously inappropriately decentralized than they are to delegate decision-rights that were previously inappropriately centralized. These observations, which partially validate our organizational mismatch measure, suggest circumstances prompting firms to alter the location of decision-rights.

Our study makes several contributions to the literature examining the location of decision-rights within multinational firms. First, using a large sample of multinational firms that spans more than two decades, we establish that organizational structure is associated with firm performance and that firms adjust their structure in response to their evolving environments. In contrast, there is little empirical research examining the organizational structure of multinational firms and firm performance (Caves, 1996); however, notable exceptions include Leksell, (1981) and Habib and Victor (1991). Leksell (1981) shows that organizational idiosyncrasy prevails in multinational firms without seeming to affect their relative performance. Habib and Victor (1991) find evidence that mismatched organizational structures impair profits in manufacturing but not service industries. A limitation of the antecedent work is that it uses relatively small samples, uses survey-based measures of organizational structure, is limited to a cross-section of data, or focuses on a small set of industries.

Second, we develop a novel procedure for identifying the real location of decision-rights by characterizing each subsidiary as being either centralized or decentralized. We recognize that decision-making within firms is more complex and multidimensional than our dichotomous measure suggests. Nevertheless, our parsimonious measure of organizational structure does have several desirable features: it allows us to examine the location of decision-rights over a long time

period, across a large number of firms, and is constructed using data gathered from independently audited financial statements. Our construct also can be used to measure and compare the location of decision-rights for multinational firms based in various countries.

Third, we offer support for a measure of a multinational firm's organizational structure constructed using publicly available data. In our study, the location of decision-rights is identified at the foreign subsidiary-level using proprietary data. Accordingly, we consider an alternative measure of a multinational firm's organizational structure that uses publicly available data. The correlation between the measures constructed using proprietary data at the subsidiary-level and public data at the consolidated-level is significantly positive, suggesting publicly available financial statements can help identify the location of decision-rights within multinational firms.

The paper proceeds as follows: Section 2 develops the testable hypotheses; Section 3 explains our method for determining the location of decision-rights within a multinational firm; Section 4 describes the sample; Section 5 details the research design; Section 6 documents empirical results; Section 7 includes robustness tests; and, Section 8 concludes.

2. Hypothesis development

A firm is viewed as a mechanism that facilitates efficient allocation of resources (Bolton and Dewatripont, 1994). A firm's *organizational structure* is the coordinating mechanism that assigns decision-rights within the firm to achieve its aims; it describes how a firm uses a division of labor to assign tasks and to facilitate information flows (Besanko et al., 2000).

The appropriate location of decision-rights within a firm has been widely debated (Friebel and Raith, 2010). The management and strategy literature focus on the way in which strategic

initiatives determine the appropriate organizational structure (e.g., Egelhoff, 1982; Habib and Victor, 1991; Wolf and Egelhoff, 2002; Csaszar, 2010). Using survey data, Bloom and Van Reenen (2007) examines multinational firms headquartered in different countries to explore the role of cultural, legal, and political factors in determining organizational structure. The industrial organization literature also studies the optimal decentralization of decision-rights (e.g., Grossman and Hart, 1986; Aghion and Tirole, 1997; Rajan and Wulf, 2006; Acemoglu et al., 2007; Alonso et al., 2008; Hart and Holmstrom, 2010). The role of a firm's organizational structure appears in the international trade literature as a factor explaining differences in firm performance (Marin and Verdier, 2008). The finance literature examines how organizational structure influences firm capital structure, dividend payout, and investment decisions (Stein, 2002; Graham et al., 2011). The accounting literature examines implications of organizational structure for performance evaluation, compensation, and budgeting (e.g., Baiman et al., 1995; Baldenius and Reichelstein, 2006).

In this study of multinational firms, we use the location of decision-rights in the parent-subsidiary relation as an indication of a firm's organizational structure. Some foreign subsidiaries, although *owned* by a U.S. parent, conduct their activities relatively autonomously—that is, formal ownership need not reflect real control over the activities within a firm (Berle and Means 1932; Aghion and Tirole, 1997; Bester 2009; Hart and Holmstrom, 2010). Accordingly, we identify the assignment of decision-rights to foreign subsidiaries. We characterize each subsidiary as being either centralized or decentralized. While the location of decision-rights in firms is more complex than this dichotomous construct captures (Milgrom and Roberts, 1992), our construct has the virtue that it allows us to parsimoniously characterize the assignment of decision-rights for a large sample of firms over a long period.

One of the most enduring ideas in organization theory is that a firm's organizational structure must "fit" its environment (Ghoshal and Nohria, 1993). A firm's view of its environment is dynamic. Not only do they learn about their environments but their environments also evolve. For instance, firms often deal with foreign demand uncertainty by testing the foreign markets with small export levels before moving production to a foreign market that they identify as being substantial (Akhmetova, 2010); or the desirability of sourcing production that uses proprietary technology evolves as patent laws and other property rights in a foreign country change (Bilir, 2011). Accordingly, as a firm's understanding of its environment improves or its environment evolves, it may find that its organizational structure is mismatched with its environment.

A firm's ability to efficiently allocate resources, and thereby earn a superior rate of return, depends in part on the congruence of its organizational structure to its environment. (e.g., Lawrence and Lorsch, 1967; Caves, 1996). However, there is a dearth of large sample empirical evidence supporting this claim. Accordingly, our first hypothesis examines whether the inappropriate assignment of decision-rights is associated with performance:[2]

> *H₁: An organizational structure that is mismatched to a firm's environment is associated with poor firm performance.*

A firm with an organizational structure poorly matched to its environment should alter it to align it more closely with its environment (Lawrence and Lorsch, 1967). That is, as the role of a firm's foreign subsidiaries in implementing the firm's strategy changes over time, matching the multinational firm's organizational structure to its environment may necessitate the reassignment of decision-rights (Chandler, 1962). It may be difficult to recognize when mismatches occur,

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[2] All hypotheses are stated in the alternative form.

particularly in rapidly changing environments. Even when mismatches are identified, influence costs may constrain the relocation of decision-rights in a parent-subsidiary relation (Hart and Holmstrom, 2010). For instance, this relocation may necessitate renegotiation of employment contracts, changing the location of institutional knowledge, adjustment to accounting and internal control systems, or resolving conflicts arising from organizational politics.

We expect a subsidiary's performance to impact the likelihood that a parent will reassign decision-rights. A subsidiary's poor performance may highlight the need for an organizational change. Further, this poor performance may encourage a firm to incur the costs to change the location of decision-rights. Alternatively, we expect good subsidiary performance to enable a firm to tolerate an organizational mismatch for longer. Thus, we offer the following hypotheses:[3]

> H_{2a}: *The likelihood that a parent will alter decision-rights in a subsidiary is increasing in the extent of a mismatch.*
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> H_{2b}: *The likelihood that a parent will alter decision-rights in a subsidiary in response to a mismatch is decreasing in the subsidiary's performance.*

3. Location of decision-rights in multinational firms

We use GAAP for U.S.-based multinational firms to identify the assignment of decision-rights to foreign subsidiaries. When preparing consolidated financial statements that include financial statements of foreign subsidiaries, FASB ASC 830 – *Foreign Currency Translation* (previously codified as FAS 52), requires that a parent determine a functional currency for each of its foreign affiliates. The functional currency is the currency in which an affiliate primarily

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[3] We examine performance effects in H_1 at the firm-level because we expect the effect of an individual subsidiary mismatch to have negative consequences for the entire firm rather than to affect only the subsidiary. For instance, the misallocation of decision-rights to a subsidiary can distract management of the parent company or create coordination problems within the firm's value chain, thereby affecting the performance of other subsidiaries. In contrast, we examine changes in decision-rights in H_{2a} and H_{2b} at the subsidiary-level because changes in the location of decision-rights occur at the subsidiary level.

makes its operating, investing, and financing decisions. For a foreign affiliate of a U.S. parent, the functional currency is either the U.S. dollar (the parent's reporting currency) or a foreign currency (typically the host country currency). Given the rationale underlying the functional currency choice (see Revsine, 1984), we use the functional currency designation for financial reporting purposes to identify the real location of decision making.[4] Specifically, when the affiliate's functional currency is the parent's reporting currency, we regard decision-rights as being *centralized*; alternatively, when the affiliate's functional currency is the host country currency, we regard decision-rights as being *decentralized*.

To illustrate, consider Quest Software's accounting policy disclosure suggesting the centralization of decision-rights:[5]

> In accordance with Statement of Financial Accounting Standards ("SFAS") No. 52, *"Foreign Currency Translation,"* the United States Dollar is considered to be the functional currency for our foreign subsidiaries as such subsidiaries act primarily as an extension of our parent company's operations. The functional currency determination is primarily based on the subsidiaries' relative financial and operational dependence on the parent company.

Alternatively, Bayer AG, a Germany-based firm, has accounting policies suggesting the decentralization of decision-rights:[6]

> The majority of consolidated companies outside the euro zone autonomously carry out their activities financially, economically and organizationally. Their functional currencies according to IAS 21 are thus the respective local currencies.

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[4] ASC 830 lists six factors (see http://www.fasb.org/pdf/aop_FAS52.pdf) to help firms identify foreign business activities that are carried out with a significant degree of autonomy (i.e., decision-rights are decentralized). Managers and auditors should consider these factors when determining the functional currency. In Section 7, we offer tests suggesting a firm's incentives to manage its earnings do not drive its functional currency choice.

[5] The illustrations we offer were found by searching annual reports for the term "functional currency" and do not necessarily imply that these firms are represented in our sample.

[6] Although our data restrict our focus to U.S. firms reporting under U.S. accounting standards, similar rules apply to non U.S. firms reporting under the nearly identical International Accounting Standard No. 21 – *The Effects of Changes in Foreign Exchange Rates* (IAS 21). Hence, our measure is useful for identifying the location of decision rights for multinational firms based in various countries.

Importantly, because the assignment of decision-rights may vary within a firm, many firms use not one but both of the two allowable methods under ASC 830 when transforming their foreign subsidiaries' financial statements. For example, Nacco Industries reports the following policy suggesting it has only retained the decision-rights pertaining to its Mexican operations:

> Assets and liabilities of foreign operations are translated into U.S. dollars at the fiscal year-end exchange rate. The related translation adjustments are recorded as a separate component of stockholders' equity, except for NMHG's Mexican operations. The U.S. dollar is considered the functional currency for NMHG's Mexican operations and, therefore, the effect of translating assets and liabilities from the Mexican peso to the U.S. dollar is recorded in results of operations.

Firms must also disclose any change in their accounting policy regarding the functional currency designation. Universal Biosensors Inc., a U.S.-based multinational firm operating through an Australian subsidiary discussed reasons for a change in the functional currency designation of that subsidiary in its annual report:

> In 2006, the Company significantly expanded its Australian based research activities. All of the Company's directors became and continue to be resident in Australia. All of the Company's expenditure on research and development is Australian dollar denominated. It also began planning for and successfully accomplished a capital-raising in Australian dollars and listed on the Australian Stock Exchange. The majority of cash and other monetary assets now held by the Company are denominated in Australian dollars. Due to these changes in circumstance, management are of the view that the functional currency of the Company changed in 2006 to Australian dollars.

To show how financial statements can be used to determine the location of decision-making, we outline the accounting requirements under ASC 830. This accounting standard requires firms to choose between two methods when transforming an affiliate's financial statements expressed in a foreign currency into the parent's reporting currency. The appropriate procedure depends on the affiliate's functional currency. When an affiliate's functional currency is the parent's reporting currency and its activities are highly interdependent with the parent, then *Foreign*

Currency Translation Adjustments (FCTAs) arising from changes in exchange rates are recognized on the *income statement*. On the other hand, when an affiliate's functional currency is the local currency and its activities are autonomous, then FCTAs are reported in accumulated other comprehensive income in the equity section of the *balance sheet*.

Thus, by using financial statement data for each foreign subsidiary of a multinational firm, we observe whether the translation adjustment is reported in its income statement or balance sheet and thereby identify the assignment of decision-rights to each subsidiary. The use of the translation adjustment in this way is novel. Moreover, this approach has the advantage that this identification is guided by GAAP and a firm's application of these reporting procedures is subject to external audit.[7] Appendix A further describes how we determine functional currencies using the financial statements of individual subsidiaries.[8]

This study emphasizes that subsidiaries play different roles within an organization and, therefore, it considers the functional currency choice at the subsidiary-level. In contrast, analyzing the FCTA reported in the consolidated financial statements at the firm-level, which is the level of focus in studies examining the value relevance of the FCTA, would be less powerful for our study (e.g., Soo and Soo, 1994; Bartov and Bodnar, 1996; Bartov, 1997; Louis, 2003; Şabac et al., 2005). A firm-level focus would fail to recognize that the accounting policy choice is determined subsidiary by subsidiary and is not a firm-level choice.

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[7] As an alternative measure, Li et al. (2010) use the extent to which a CEO speaks in conference calls as a proxy for the extent to which the CEO possesses real authority and examine the relation between the assignment of authority in an organization and CEO compensation.

[8] To ensure the functional currency is indeed a *choice* of the parent, we restrict our sample of affiliate observations in two ways: First, we exclude affiliates in which the parent holds a minority interest. Second, we exclude affiliates operating in highly inflationary environments, defined by ASC 830 as a 3-year inflation rate of approximately 100 percent or more. As the local currency is not considered stable enough to serve as a functional currency, the more stable currency of the reporting parent must be used instead.

To identify the location of decision-rights using publicly available data, we use the consolidated translation adjustment disclosed in a firm's 10-K filing (using changes in Compustat *RECTA*). We set a firm-level dichotomous variable equal to 1 if the consolidated balance sheet reports a non-zero translation adjustment in *accumulated other comprehensive income* and 0 otherwise. To compare these two approaches, we convert our dichotomous subsidiary-level measure to a continuous firm-level measure by weighting the subsidiary-level measure using the ratio of subsidiary sales to the firm's total foreign sales. The correlation between these two measures is significantly positive ($r = 0.42$), suggesting publicly available data can be used to identify a reasonable proxy for a firm's assignment of decision-rights.

4. Sample and descriptive statistics

The Bureau of Economic Analysis (BEA) maintains financial and operating data for foreign affiliates of U.S.-based multinational firms.[9] Appendix A provides a discussion of BEA data. From the entire population of foreign affiliates reporting to the BEA, we exclude those that are ultimately owned by a non-U.S. parent, minority-owned affiliates, and trusts, estates and partnerships. Our final sample consists of 2,902 firms that own 28,386 foreign subsidiaries over the period 1982 to 2004 (45,990 foreign subsidiary-years).

Table 1 presents information about the sample. Approximately two thirds of the subsidiary-years in the sample exhibit decentralized decision making. Moreover, the proportion of decentralized subsidiaries is increasing over time, suggesting an increasing trend towards decentralized decision-making in multinational firms (see Malone, 2004). In 1982, approximately 66 percent of the 4,889 subsidiaries in our sample were decentralized; whereas in

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[9] Also see http://www.bea.gov/surveys/diasurv.htm and Mataloni (2003) for information about BEA data.

2004, over 80 percent were decentralized. This trend is also confirmed across firms; untabulated firm-level statistics show in 1982 that 27, 40 and 33 percent of firms report that all, some, or none of their subsidiaries are centralized, respectively. In 2004, this statistic shifted to 17, 33 and 50 percent. Decentralized subsidiaries are larger in terms of sales, employees, and assets, as well as the number of countries and industries that are represented, supporting the notion that these subsidiaries operate with a higher level of autonomy.

The assignment of decision-rights to subsidiaries also varies across industries. For instance, the Petroleum industry exhibits a greater proportion of centralized subsidiaries, while other industries, such as Services, display a greater proportion of decentralized subsidiaries. This suggests that when firms sell products that are relatively standardized (e.g., petroleum), the parent company is more capable of retaining decision-rights, whereas the opposite holds when products are more likely to be tailored to local tastes (e.g., services).

5. Research design

To test our two hypotheses—organizational structure is associated with firm performance and firms adjust their organizational structure when poorly suited to their environments—we begin by describing the procedure to determine the appropriate location of decision-rights.

5.1   *Mismatch construct*

Firms face competitive forces that cause them to assign decision-rights to subsidiaries in a fashion that is profit maximizing. In a large subsidiary-level dataset that captures both cross-sectional and inter-temporal variation in the assignment of decision-rights, we believe that, on average, firms behave optimally. Individual firms, however, learn about their environments and dynamically converge to the optimal organizational structure. Therefore, a cross-sectional

sample is expected to consist of firm actual choices that are distributed around the optimal choice. If the systematic portion of the model of the assignment of decision-rights (fitted assignment of decision-rights as a function of subsidiary, firm, and country characteristics) is the appropriate choice for a firm, then the residual from the model should adversely affect the firm's future performance. Klaas et al. (2010) proposes an analogous approach for examining the performance implications arising from mismatches between the firm's actual organizational structure and the ideal organizational structure given the environment. Likewise, Ittner and Larcker (2001) and Ittner et al. (2003) use a similar approach to assess the effect on firm performance of suboptimal employee stock option grants.

5.1.1 Model of assignment of decision-rights

By examining subsidiary financial statements, we identify a parent's assignment of decision-rights to its subsidiaries. The indicator variable *Decentralized Sub* is set equal to 1 if the functional currency is the local currency, implying decision-rights have been decentralized, and to 0 if the functional currency is the U.S. dollar, implying the decision-rights have been centralized. Specifically, we fit the following model (where subscript *i* denotes a subsidiary and subscript *t* denotes the time period):

$$\Pr(\textit{Decentralized Sub}_{i,t} = 1) = G\big(\beta_0 + \sum\nolimits_{j=1}^{13} \beta_j \textit{ Subsidiary Characteristics}_{i,t}$$

$$+ \sum\nolimits_{j=14}^{17} \beta_j \textit{ Firm Characteristics}_{i,t} + \sum\nolimits_{j=18}^{22} \beta_j \textit{ Country Characteristics}_{i,t}\big), \quad (1)$$

where *G*(.) is the cumulative distribution function for a standard logistic random variable. We include year and industry fixed effects in all of our analyses.

As we use Equation (1) to estimate a lack of fit between the location of decision-rights and each subsidiary's environment, we require a comprehensive model explaining the allocation of

decision-rights within a multinational firm. The model includes subsidiary, firm, and country-level characteristics that capture activities in which an autonomous entity would be engaged as well as the reasons a parent would grant decision-rights to a subsidiary. Below we motivate each variable in the model; the detailed variable definitions appear in Table 2.

5.1.1.1 Subsidiary characteristics

The subsidiary characteristics are motivated in part by the factors GAAP recommends (see ASC 830) a firm consider when determining whether a subsidiary carries out its activities autonomously (see Revsine, 1984). Decentralized decision-rights facilitate the ability to respond to local, idiosyncratic demand factors (*LOCAL SALES*). Greater sourcing of goods and services from the U.S. should be less common in decentralized subsidiaries (*U.S. IMPORTS*). Local labor costs should be higher and financing activities in the local market should be more substantial for decentralized subsidiaries (*LOCAL COMPENSATION; INTEREST COVERAGE*; *LOCAL DEBT*). Further, decentralized subsidiaries are less likely to have inter-company transactions (*U.S. PAYABLES*; *U.S. RECEIVABLES*).

Other subsidiary characteristics are found in the literature examining organizational design and decision-making in multinational firms (Stopford and Wells, 1972; Goehle, 1978). Dividends from foreign subsidiaries address agency problems arising when information is asymmetrically distributed (Desai et al., 2007), typically more prevalent in decentralized subsidiaries (*DIVIDEND*). Heightened product diversity should favor the decentralization of decision-rights (Bolton and Farrell, 1990) (*SALES MIX*). Aylmer (1970) suggests larger subsidiaries are assigned more decision-rights (*RELATIVE SIZE*). Parent companies often maintain tighter control over new subsidiaries by centralizing decision-rights (Stopford and Wells, 1982) (*AGE*). Decentralized subsidiaries are less likely to employ expatriates when local

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knowledge and relationships are important and there is little need to coordinate its activities with those of the parent (Ahlstrom and Bruton, 2010), or they may be more likely if the expatriate serves a monitoring role (*EXPAT*). Finally, decentralizing decision-rights is more appropriate when information is "soft" and difficult to communicate (Stein, 2002; Mian and Liberti, 2009) or when managers must be motivated to be creative (Aghion and Tirole, 1994) (*R&D*).

5.1.1.2 Firm characteristics

The scale and scope of international business stresses managers' ability to coordinate their firms' activities favoring decentralization (*% FOREIGN SALES*; *COUNTRIES*).[10] Vertical integration increases the need for centralized decision-making to improve coordination within the firm (*INTERCOMPANY SALES*). Finally, we expect parents to be more confident delegating decision-rights to local subsidiary managers once these managers have demonstrated their administrative ability (*EXPERIENCE*).

5.1.1.3 Country characteristics

Heightened local market competition favors the decentralization of decision-rights (Aghion and Tirole, 1997) (*LOCAL COMPETITION*). A parent is more inclined to retain decision-rights when a subsidiary operates in a country whose populace is tolerant of authority (*AUTHORITY ACCEPTABLE*) or operates in an unstable business environment (*FINANCIAL RISK; POLITICAL RISK; ECONOMIC RISK*).

5.2 Research design for Hypothesis 1

A firm's organizational structure impacts its ability to efficiently allocate resources. *H₁* posits that a firm's organizational structure ill-suited to its environment will hinder its ability to allocate

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[10] When computing firm-level measures, we consider all affiliates (i.e., parent owns at least 20 percent) rather than restricting our attention to subsidiaries (i.e., parent owns at least 50 percent).

resources efficiently leading it to perform poorly. To examine H_1, we estimate the following firm-level pooled, cross-sectional OLS regression (where subscript k denotes a firm and subscript t denotes the time period):

$$Firm\ Performance_{k,t} = \alpha_0 + \alpha_1\ MISMATCH^{Firm}_{k,t} + \alpha_2\ \%\ FOREIGN\ SALES_{k,t}$$

$$+ \alpha_3\ MISMATCH^{Firm}_{k,t} \times \%\ FOREIGN\ SALES_{k,t} + Control\ variables_{k,t};\qquad(2)$$

Detailed variable definitions for this expression appear in Table 4.

We determine *Firm Performance* as Return on Assets (ROA) because it is one of the most commonly used measures of financial performance and is available for our sample of private and public firms. ROA^{Firm}_t is calculated as (Net income + interest expense × (1 − median industry accounting effective tax rate)) / Total assets and adjusted each year by the firm's industry median ROA. $MISMATCH^{Firm}_t$ aggregates $MISMATCH^{Sub}_t$ across all subsidiaries in an affiliated group, where $MISMATCH^{Sub}_t$ is the squared residual from Expression (1). Our measurement of $MISMATCH^{Firm}_t$ assumes that larger mismatches are more likely to be detrimental to a firm's performance than smaller mismatches and that the effect on firm performance of mismatches in different subsidiaries is independent of each other. Further, to recognize that mismatches in larger subsidiaries may be more damaging to firm performance than mismatches in smaller ones, we weight our subsidiary-level measure, $MISMATCH^{Sub}_t$ by the ratio of subsidiary sales to the firm's total foreign sales.[11] Accordingly, the firm-level measure, $MISMATCH^{Firm}_t$, used in Expression (2) can be interpreted as the proportion of a firm's foreign sales that are generated by subsidiaries with an inappropriate allocation of decision-rights.

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[11] Our results are unaffected if we weight by subsidiary assets or number of employees rather than sales.

Based on H_1, we predict that the coefficient on $MISMATCH_t^{Firm}$ will be negative; i.e., $\alpha_1 < 0$. Alternatively, if firm performance is not sensitive to the inappropriate assignment of decision-rights, then the sign should be non-negative. Furthermore, to the extent the model to estimate the mismatch measure (Expression (1)) excludes affiliate, firm, or country attributes that explain the location of decision-rights, $MISMATCH_t^{Firm}$ is a poor proxy for the inappropriate allocation of decision-rights. This omission, however, biases against finding that firm performance is negatively associated with the inappropriate assignment of decision-rights.

As the mismatch construct relates to foreign operations, the strength of the relation between mismatch and firm performance should increase in the relative size of a firm's foreign operations. Thus, we consider the interaction between the extent to which a firm's organizational structure is mismatched to its environment and the proportion of the firm's activities that are attributable to its foreign subsidiaries. We posit that the coefficient on $MISMATCH_t^{Firm} \times \%$ *FOREIGN SALES* will be negative; i.e., $\alpha_3 < 0$. On the other hand, if the negative externalities of inappropriately assigning decision-rights to foreign subsidiaries are substantial regardless of the size of the foreign operation, then the sign should be non-negative. Throughout this study, all continuous variables that are interacted are mean-centered.

We control for cross-sectional differences in firm size (*FIRM SIZE)* and firm experience (*INTL EXPERIENCE*). Nissim and Penman (2001) document the time series properties of various firm performance measures and find these measures revert to the mean fairly quickly.

5.3   Research design for Hypotheses 2a and 2b

From time to time, a firm may find its organizational structure is mismatched to its environment. H_2 posits that the likelihood a parent will alter the assignment of decision-rights to

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a subsidiary is increasing in the extent of the mismatch and that this likelihood is decreasing in the subsidiary's performance. We estimate the following pooled, cross-sectional logistic model (where subscript t denotes the time period and subsidiary subscripts are suppressed):

$$\Pr(\Delta \text{ Decision Rights}_t = 1) = G(\delta_0 + \delta_1 \text{ MISMATCH}_{t-1}^{Sub} + \delta_2 \text{ ROA}_{t-1}^{Sub}$$

$$+ \delta_3 \text{ MISMATCH}_{t-1}^{Sub} \times \text{ROA}_{t-1}^{Sub} + \text{Control variables}_t), \qquad (3)$$

where $G(.)$ is the cumulative distribution function for a standard logistic random variable. Detailed variable definitions for this expression appear in Table 5.

A change in the assignment of decision-rights to a subsidiary in time period t, denoted Δ *Decision Rights*, is measured using an indicator variable equal to 1 if the parent changed the assignment of decision-rights from that of the previous period for a particular subsidiary, and 0 otherwise. $MISMATCH_{t-1}^{Sub}$, is the squared residual from Expression (1) and is measured in the time period immediately prior to the current time period t.[12] Based on H_{2a}, the parent is predicted to change the assignment of decision-rights to a subsidiary in response to the extent of the mismatch. Accordingly, we predict the coefficient on $MISMATCH_{t-1}^{Sub}$ to be positive; i.e. $\delta_1 > 0$. On the other hand, if there is not a link between the extent of the organizational mismatch and the change in the assignment of decision-rights or the mismatch construct is a poor proxy, the coefficient on $MISMATCH_{t-1}^{Sub}$ should be non-positive.

The subsidiary's performance, denoted ROA_{t-1}^{Sub}, is defined as the difference between the return on assets of the subsidiary and the median return on assets for all foreign subsidiaries (of U.S.-based multinationals) in the subsidiary's 3-digit ISIC code in the time period $t-1$. When

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[12] Recall that our sample captures survey years 1982, 1989, 1994, 1999 and 2004, so the prior time period is either five or seven years prior to the current time period.

the assignment of decision-rights to a subsidiary poorly suits the environment and the subsidiary is performing badly, we anticipate that the firm will be more likely to change the organizational structure in an attempt to improve the firm's performance. Based on H_{2b}, we predict the sign on the coefficient of $MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$ to be negative; i.e. $\delta_3 < 0$. Alternatively, if the subsidiary's performance does not affect the firm's willingness to reassign decision-rights in response to a mismatch, or if $MISMATCH_{t-1}^{Sub}$ or ROA_{t-1}^{Sub} are inappropriate proxies, then the sign should be non-negative.[13]

Several variables control for cross-sectional differences in a firm's decision to change its organizational structure. First, changes in a subsidiary's environment are expected to prompt the parent to reconsider the appropriateness of the assignment of decision-rights (*ENVIRONMENT CHANGE*). Second, a firm might be less willing to relocate decision-rights if the presence of influence costs makes it difficult; this cost is anticipated to be directly proportional to the subsidiary's size (*RELATIVE SIZE*). Third, we expect a parent to be more likely to evaluate the assignment of decision-rights to a recently incorporated or acquired subsidiary (*AGE*).

6. Empirical results

6.1 Estimating the model of assignment of decision-rights

Table 2 provides descriptive data for the regression variables included in Expression (1) for our sample of 45,990 subsidiary-years. All continuous variables are winsorized at the 1 and 99 percent levels. A univariate comparison of sample means suggests that decentralized and

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[13] The presence of income-shifting within the firm (possibly for tax reasons) and the difficulty of allocating joint factors of production to each subsidiary reduce our ability to accurately determine a subsidiary's return on assets. Further, we do not have sufficiently detailed data to separate operating and financing activities when measuring performance at the subsidiary-level.

centralized subsidiaries exhibit different characteristics. Decentralized subsidiaries have greater financial and operating independence from their parent than centralized subsidiaries. Specifically, decentralized subsidiaries generate a larger portion of their total sales in their local markets (*LOCAL SALES* of 0.757 versus 0.666), have fewer imported goods from the U.S. (*U.S. IMPORTS* of 0.076 versus 0.081), have more significant local labor costs (*LOCAL COMPENSATION* OF 0.187 versus 0.149), raise a greater share of debt in their local markets (*LOCAL DEBT* of 0.592 versus 0.512), and have smaller intercompany payables (*U.S. PAYABLES* of 0.144 versus 0.186) and receivables (*U.S. RECEIVABLES* of 0.029 versus 0.051). With respect to firm characteristics, firms engaging in substantial intra-firm trade (*INTERCOMPANY SALES* of 0.107 versus 0.126) are less likely to decentralize decision-rights. Decentralized and centralized subsidiaries also exhibit different country characteristics. Decentralized subsidiaries are more common in countries where competition is more pronounced (*LOCAL COMPETITION* of 5.430 versus 5.232), where the centralization of authority is culturally less acceptable (*AUTHORITY ACCEPTABLE* of 47.536 versus 52.938), and that exhibit lower *FINANCIAL RISK* (8.455 versus 10.958), *POLITICAL RISK* (19.980 versus 23.740), and *ECONOMIC RISK* (11.100 versus 13.711).

Table 3 reports statistics from estimating Expression (1). Columns (1a), (2a), and (3a) summarize the results including only subsidiary, firm, and country characteristics, respectively, while column (4a) includes all three sets of variables. Firm-level variables provide lower explanatory power than either subsidiary or country-level variables (based on the pseudo-R-sq). This observation suggests that the unique characteristics of each subsidiary's activities and environment primarily influence the assignment of decision-rights. Overall, the pseudo R-sq from our estimation of Expression (1) is 0.212 and the results are substantially similar to the

univariate statistics discussed earlier with respect to differences between decentralized and centralized subsidiaries. In addition, we find subsidiaries that have fewer U.S. expatriates (*EXPAT*) and pay dividends more frequently (*DIVIDEND*) are more likely to be decentralized. Hence, firms are less likely to employ expatriates to monitor decentralized subsidiaries and they remit dividend payments to reduce the potential for agency conflicts in decentralized subsidiaries. As expected, subsidiaries with higher research and development expenditures (*R&D*) are also more likely to be decentralized. Interestingly, holding constant *FINANCIAL RISK* and *ECONOMIC RISK*, subsidiaries are *more* likely to be decentralized in countries with high *POLITICAL RISK*. We conjecture that managing political risk, unlike financial and economic risk, necessitates relationships with government officials in the host country—a task, perhaps, best assigned to a decentralized subsidiary whose employees have established relationships within the country.[14]

6.2 Performance consequences of a mismatch

Table 4 Panel A offers descriptive statistics for the variables in Expression (2) for our sample of 5,700 firm-years. The mean and median ROA_t^{Firm} is about 4 percent, the mean (median) $MISMATCH_t^{Firm}$ is 0.138 (0.060), and the mean (median) *% FOREIGN SALES* is 0.270 (0.208). A mean $MISMATCH_t^{Firm}$ of 0.138 implies that, on average, a firm conducts about 14 percent of its international business using an organizational structure incongruent with its environment.

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[14] *ECONOMIC RISK* and *POLITICAL RISK*, the two most highly correlated variables in Table 2, are significantly, positively correlated ($r = 0.61$). Consequently, we re-estimate Expression (1) after replacing *FINANCIAL RISK*, *ECONOMIC RISK*, and *POLITICAL RISK* with the composite risk index in *Political Risk Services' International Country Risk Guide*. This change does not affect the tenor of any of the reported results.

Table 4 Panel B reports the results of our firm-level estimation of Expression (2). The negative and significant coefficient on $MISMATCH_t^{Firm}$ in column (1b) suggests that ROA_t^{Firm} is decreasing in the extent to which the organizational structure supporting the firm's international business is poorly matched to its environment. Likewise, the negative and significant coefficient on the interaction between $MISMATCH_t^{Firm}$ and *% FOREIGN SALES* in column (2b) indicates that this negative performance consequence is more pronounced for firms with larger foreign operations—the mismatched organizational structure represents a greater proportion of the firm's global operations. These results are consistent with H_1. They provide large sample evidence that poorer firm performance is associated with having an organizational structure that is incongruent with the firm's environment.

Before turning to address *H2*, we explore two themes: First, we consider whether having subsidiaries that are inappropriately centralized or decentralized differentially affects firm performance. Second, we examine how an organizational mismatch influences a firm's market power and its ability to efficiently utilize its assets.

The performance consequence of an organizational mismatch might vary with whether the decision-rights have been inappropriately centralized or decentralized. Indeed, Klaas et al. (2010) challenge the notion that all organizational structure mismatches would be equally detrimental to a firm's performance. They highlight, however, that there is a "lack of conceptual development" (p. 157) in the literature. We test whether the detrimental effect on firm performance of having subsidiaries that are inappropriately decentralized differs from that associated with subsidiaries that are inappropriately centralized. We extend Expression (2) to include $DEC\text{-}MISMATCH_t^{Firm}$ and also interact it with *% FOREIGN SALES*. The variable $DEC\text{-}MISMATCH_t^{Firm}$ is computed in

the same fashion as $MISMATCH_t^{Firm}$, except that it aggregates $MISMATCH_t^{Sub}$ only for subsidiaries that are inappropriately decentralized (i.e., for which the predicted value of *Decentralized Sub* from Expression (1) is lower than the actual value). The mean and median value of $DEC\text{-}MISMATCH_t^{Firm}$ is 0.040 and 0.063, respectively.

In column (1c) of Table 4 Panel C, we find a marginally significant reduction in firm performance when the subsidiaries are inappropriately centralized and a significant incremental reduction when the firm's subsidiaries are inappropriately decentralized. This finding suggests the cost of inappropriately retaining decision-rights is lower than the cost of inappropriately assigning decision-rights. In addition, column (4c) shows that the incremental reduction in performance associated with the inappropriate delegation of decision-rights is not increasing in the relative size of the firm's foreign operations (i.e., the coefficient on $DEC\text{-}MISMATCH_t^{Firm} \times$ *% FOREIGN SALES* is not significant).

To understand these results, we consider the relation between a firm's strategy and its organizational structure. In his seminal work exploring how competitive forces in a firm's environment shape its strategy, Porter (1980) highlights two generic strategic approaches—a *cost leadership* strategy and *differentiation* strategy—that firms might use to outperform their rivals and argues that effective implementation of these strategies necessitates a suitable organizational structure. To evaluate whether a firm is efficiently implementing a *cost leadership* strategy or *differentiation* strategy, Hall (1980) separates a firm's return on assets into a profit margin factor and asset turnover factor.[15] We define *PROFIT MARGIN* as (firm net income + firm interest expense × (1 − median industry effective tax rate)) / total firm sales, and *ASSET TURNOVER* as

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[15] In a study of 64 companies, Hall (1980) found the most successful companies implement strategies aimed at achieving either the lowest cost position or most differentiated product or service position.

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total firm sales / total firm assets. We adjust these measures by the industry median in year t. The mean and median value of *PROFIT MARGIN* is 0.037 and 0.035, respectively; the mean and median value of *ASSET TURNOVER* is 1.243 and 1.159, respectively.

A *cost leadership* strategy emphasizes a firm achieving the lowest cost position through economies of scale and value chain efficiencies thereby allowing it to generate higher sales volume than its competitors (Porter, 1980). This strategy implies a firm should enjoy a favorable return on assets by trading off lower profit margins for higher asset usage efficiency (Stickney et al., 2007). An organizational structure in which decision-making is centralized is expected to help a firm better coordinate its production function and thereby attain a low cost position (Aghion and Tirole, 1997). We expect firms that are inappropriately decentralized to use their assets less efficiently.

Consistent with this argument, the significantly negative coefficient on $DEC\text{-}MISMATCH_t^{Firm}$ in columns (3c) and (6c) in Table 4 Panel C implies that inappropriately delegating decision-rights is associated with less efficient asset usage. Further, the fact a firm's poor performance is not exacerbated by the extent of the organizational mismatch suggests inappropriately delegating decision-rights weakens the firm's ability to coordinate its activities that harms the entire firm. Moreover, the insignificant coefficients on $DEC\text{-}MISMATCH_t^{Firm}$ and $DEC\text{-}MISMATCH_t^{Firm} \times \%$ *FOREIGN SALES* in columns (2c) and (5c) suggests that inappropriate decentralization does not enhance the firm's ability to offer a quality differentiated product or service and gain market power that offsets the decrease in its ability to efficiently use its assets.

A *differentiation strategy* focuses on a firm achieving better product capability or service quality than its competitors (Porter, 1980). A firm pursuing this strategy aims to generate a

favorable return on assets by sacrificing asset turnover for higher profit margins (Stickney et al., 2007). Decentralized decision-making should help a firm better provide a quality differentiated product or service because the managers of its subsidiaries are likely to better appreciate their customers' needs (Aghion and Tirole, 1997). Column (4c) shows that the inappropriate centralization of decision-rights weakens the firm's performance. Moreover, the significant negative coefficient on $MISMATCH_t^{Firm} \times \%\ FOREIGN\ SALES$ evidences that this weakness is exacerbated by the proportion of foreign sales. When these results are viewed within the context of a firm pursuing a differentiation strategy, they imply that centralization does not have a negative externality on the performance of the whole firm. To the contrary, the performance consequence of being inappropriately centralized is localized, and further, as columns (5c) and (6c) show, being inappropriately centralized does not seem to have a significantly negative effect on either a firm's profit margins or asset usage efficiency.

6.3 Change in decision-rights

Table 5 Panel A reports the subsidiary-level estimation of Expression (3) for the sample of 16,660 subsidiary-years in which an individual subsidiary appeared at least twice during the sample period. In column (1a), the positive and significant coefficient on $MISMATCH_{t-1}^{Sub}$ suggests a firm is more likely to alter the location of decision-rights when it is more poorly matched to a subsidiary's environment. This result is consistent with H_{2a}. In column (2a), the negative and significant coefficient on $MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$ implies a parent is less likely to alter a subsidiary's decision-rights in response to a mismatch when the subsidiary is performing well; further, when computing the cross-derivative consistent with Norton et al. (2004), the interaction term remains significant. This finding is consistent with H_{2b}.

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To understand the costs of reengineering a firm's organization structure, we extend Expression (3) to explore whether a firm's willingness to alter the assignment of decision-rights varies asymmetrically with whether they were previously inappropriately centralized or decentralized. Relocating decision-rights is costly because it may necessitate renegotiation of employment contracts, changing the location of institutional knowledge, and resolving conflicts arising from organizational politics (Milgrom and Roberts, 1992; Hart and Holmstrom, 2010).

In Table 5 Panel B, the variable $DEC\text{-}MISMATCH_{t-1}^{Sub}$ indicates whether decision-rights were inappropriately decentralized in the previous period. The negative and significant coefficient on this variable in column (1b) suggests that the parent is less likely to reclaim from a subsidiary decision-rights that were inappropriately assigned in the previous period. In column (2b), the interaction term $DEC\text{-}MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$ tests whether the firm's willingness to reassign decision-rights that were inappropriately delegated varies with a subsidiary's performance. The insignificant coefficient on this interaction term implies that a subsidiary's performance has no incremental effect on a parent's willingness to reclaim decision-rights from a subsidiary that were inappropriately assigned to it in the previous period.

The result in Table 5 Panel B (column 1b) that firms are less likely to fix the inappropriate delegation of decision-rights implies it is substantially more costly to retract decision-rights from subsidiaries than it is to grant decision-rights to them as their environments evolve (Hart and Holmstrom, 2010). Given this cost differential, it is economically rational for firms to tolerate weaker performance for longer when decision-rights are inappropriately decentralized. Indeed, consistent with this claim, Table 4 Panel C (column 1c) reports that inappropriate decentralization of decision-rights has a greater negative effect on firm performance than

inappropriate centralization. Together these observations suggest multinational firms should exercise caution before delegating decision-rights to their subsidiaries.

7. Robustness tests

Whether firms appropriately evaluate the circumstances underlying their functional currency choice and whether auditors attest to their assertions affects the construct validity of our measure. We perform several robustness tests to validate our measure of the assignment of decision-rights.

7.1 Proportion of managerial employees

A subsidiary with decision-rights is expected to have a higher proportion of managerial employees to non-managerial employees than a subsidiary without decision-rights. Thus, at the subsidiary level, we compare our measure of decentralization with the proportion of employees of the foreign subsidiary that are classified as managers. These data are available from the BEA but only for 2004. We observe a statistically significant correlation ($r = 0.13$, $p < 0.01$) between our measure *Decentralized Sub* and the proportion of managerial employees. This correlation is robust to including subsidiary size and industry as control variables. This finding supports using the functional currency choices as an indicator of the location of decision-rights.

7.2 Segmental reporting

FASB ASC 280 – *Disclosures about Segments of an Enterprise and Related Information* (previously codified as FAS 131) requires companies to report segment financial information in their financial reports consistent with the way they manage their businesses—termed the *management approach*. Galbraith (2000) notes multinational companies adopt geographical divisions when products, markets, and brands are heterogeneous, and when competitors,

suppliers, and customers are local. As many of these characteristics are expected to be associated with decentralized decision-making, we posit that a multinational firm with a greater number of geographic segments is more likely to delegate decision-rights to its foreign subsidiaries. We find a significantly positive correlation ($r = 0.11$, $p < 0.01$) between the number of geographic segments and a firm-level measure of decentralization (where *Decentralized Sub* is weighted by the ratio of subsidiary sales to the firm's total foreign sales). This correlation is robust to controls for firm size, percent foreign sales, and firm industry. It corroborates our measure of decentralization as a proxy for the assignment of decision-rights within multinational firms.

7.3   *Earnings management*

It is well recognized that firms strategically choose accounting policies and procedures to manipulate their results to attain some reporting objective. Because firms might choose policies to translate the results of their subsidiaries to manage their earnings, we test whether firms' accounting policy choices are associated with earnings management incentives.

It seems implausible that a firm would choose its functional currency to effectively manage earnings upward or downward each period. This manipulation would require the firm to predict the direction of the movement in foreign exchange rates, anticipate a subsidiary's net monetary position, and justify to the firm's independent auditors that the subsidiary's evolving environment necessitated the change in accounting policy.

In contrast, it seems plausible that a firm might choose the functional currencies of its subsidiaries to reduce earnings volatility (Doupnik and Evans, 1988). The foreign currency translation adjustment is only reflected in earnings when the subsidiary's local currency is the functional currency; further, the adjustment included in net earnings only arises from the translation of monetary items. Therefore, a firm's earnings volatility should be greater when it

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has subsidiaries with high net monetary exposure and substantial fluctuations in the exchange rates between the U.S dollar and the subsidiary's local currency.

To test for earnings management, we extend Expression (1) and estimate the following model (where subscript i denotes a subsidiary and subscript t denotes the time period):

$$\Pr(\textit{Decentralized Sub}_{i,t}=1) = G\big(\beta_0 + \sum_{j=1}^{22} \beta_j \textit{ Subsidiary, Firm, and Country Characteristics}$$

$$+ \beta_{23} \textit{ TRANSLATION EXPOSURE}_{i,t} + \beta_{24} \textit{ Variability}_{i,t} \qquad (4)$$

$$+ \beta_{25} \textit{ TRANSLATION EXPOSURE}_{i,t} \times \textit{Variability}_{i,t}\big),$$

where $G(.)$ is the cumulative distribution function for a standard logistic random variable. *TRANSLATION EXPOSURE* measures the net monetary exposure of a subsidiary to changes in foreign currency exchange rates; and *Variability* is either *FX RISK* or *FX VOLATILITY*, two alternative measures that capture expected exchange rate variability. A positive and significant coefficient on the interaction term (i.e., $\beta_{25} > 0$) would imply firms chose functional currencies to reduce earnings volatility.

Table 6 reports results of estimating Expression (4). The coefficient on the interaction between *TRANSLATION EXPOSURE* and a measure of the expected exchange rate variability, either *FX RISK* or *FX VOLATILITY*, in columns (1b) or (2b), respectively, is not significantly positive.[16] In addition, the main effects are insignificant with the exception of the coefficient on *FX VOLATILITY*, which is negative. Hence, we do not find evidence that firms choose a subsidiary's functional currency to exclude the functional currency translation adjustment from earnings and thereby reduce their earnings volatility.

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[16] When computing the cross-derivative consistent with Norton et al. (2004), the interaction term remains insignificant.

8. Conclusion

We examine the location of decision-rights within U.S.-based multinational firms. This setting provides a powerful environment within which to study the location of decision-rights. Not only are cultural, economic, and legal differences substantial in this setting, requiring that multinational firms exercise great care when assigning decision-rights, but the particular accounting procedures multinational firms use to translate their subsidiaries' foreign currency denominated financial statements allow for a parsimonious characterization of the extent to which decision-rights have been centralized or decentralized. We use this accounting choice to identify whether decision-rights are assigned to a subsidiary or retained by the parent of a multinational firm. By comparing a parent's actual assignment of decision-rights to a subsidiary with the predicted assignment based on subsidiary, firm, and country characteristics, we measure the extent to which the firm's assignment of decision-rights is mismatched to its environment. Using this measure of organizational mismatch, we explore two primary hypotheses.

The first hypothesis posits and we find that an organizational structure that is mismatched to a firm's environment is associated with poor firm performance. Further, firms that have inappropriately decentralized decision-rights experience significantly weaker performance than those that have inappropriately centralized decision-rights. Exploring this relation more deeply, we find inappropriate decentralization reduces a firm's ability to efficiently use its assets without allowing it to profit from being able to more acutely meet the needs of its customers.

The second hypothesis predicts and we find that the likelihood a parent will alter decision-rights in a subsidiary is increasing in the extent of a mismatch but this likelihood is decreasing in the strength of the subsidiary's performance. To fix the organizational mismatch, we find that

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firms are less inclined to reclaim decision-rights from subsidiaries when those rights where previously inappropriately decentralized than they are to delegate decision-rights that were previously inappropriately centralized. Thus, it appears that it is more costly for a firm to retract decision-rights from a subsidiary that it is to grant them. The presence of differential costs rationalizes our finding that firms experience significantly weaker performance when decision-rights are inappropriately decentralized than when centralized—it is more costly for these firms to reengineer their inapt organizational structures.

In conclusion, we establish that organizational structure affects firm performance and firms adjust their organizational structure as their environments change. We suggest that the costs of inappropriately centralizing decision-rights are lower than the costs of inappropriately decentralizing decision-rights. Accordingly, multinational firms should exercise caution before delegating decision-rights to its subsidiaries operating in environments that are likely to evolve.

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Table 1
Sample Composition of 45,990 Subsidiary-Years

	Decentralized Subsidiaries	Centralized Subsidiaries
Sample Period		
All years	34,686	11,304
1982	3,245	1,644
1989	7,016	2,652
1994	8,578	2,645
1999	9,150	2,794
2004	6,697	1,569
Geographic Region		
Canada	3,842	1,025
Latin America	2,366	2,925
Europe	21,449	5,324
Africa	428	69
Middle East	39	81
Asia Pacific	6,562	1,880
Primary Industry		
Petroleum	933	1,091
Food	1,323	444
Chemical	3,598	924
Primary & Fabricated Metal Manufacturing	1,251	289
Industrial Machinery and Equipment	1,916	495
Electronic Equipment Manufacturing	1,334	592
Transportation Equipment Manufacturing	1,319	263
Other Manufacturing	4,338	929
Wholesale Trade	8,419	2,468
Banking	48	34
Financial, Insurance, and Real Estate	4,346	2,113
Services	3,927	1,008
Other	1,934	654
Sample Characteristics		
Median Total Sales ($ thousands)	25,053	16,819
Median Total Assets ($ thousands)	26,097	23,254
Median Total Employees	110	66
Number of Countries Represented	62	60
Number of Industries Represented	339	294

Table 1 presents sample characteristics of the 45,990 subsidiary-years partitioned according to the location of decision-rights. Industry classifications are those used by the BEA when reporting statistics on U.S. international trade and investment (e.g., using 3-digit International Standard Industrial Classification (ISIC) codes). To maintain confidentiality, all medians reported are means of the five middle values.

Table 2
Descriptive Statistics for 45,990 Subsidiary-Years

	Decentralized Subsidiaries			Centralized Subsidiaries			Mean	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Difference	p-value
Subsidiary characteristics								
LOCAL SALES	0.757	0.988	0.360	0.666	0.984	0.430	0.091	0.000
U.S. IMPORTS	0.076	0.000	0.171	0.081	0.000	0.195	(0.005)	0.000
LOCAL COMPENSATION	0.187	0.151	0.166	0.149	0.098	0.172	0.039	0.000
INTEREST COVERAGE	15.722	1.667	40.137	10.701	0.390	30.061	5.021	0.000
LOCAL DEBT	0.592	0.729	0.339	0.512	0.638	0.377	0.080	0.000
U.S. PAYABLES	0.144	0.013	0.246	0.186	0.007	0.295	(0.042)	0.000
U.S. RECEIVABLES	0.029	0.000	0.097	0.051	0.000	0.148	(0.022)	0.000
DIVIDEND	0.196	0.000	0.397	0.169	0.000	0.374	0.027	0.000
SALES MIX	1.382	1.000	0.863	1.297	1.000	0.787	0.085	0.000
RELATIVE SIZE	0.105	0.021	0.210	0.105	0.014	0.225	(0.000)	0.998
AGE	1.299	1.609	1.094	1.131	1.099	1.080	0.168	0.108
EXPAT	0.105	0.000	0.307	0.132	0.000	0.339	(0.027)	0.000
R&D	0.005	0.000	0.016	0.003	0.000	0.013	0.002	0.000
Firm characteristics								
% FOREIGN SALES	0.379	0.384	0.165	0.380	0.392	0.174	(0.001)	0.000
COUNTRIES	2.906	3.135	1.021	2.926	3.219	1.102	(0.020)	0.000
INTERCOMPANY SALES	0.107	0.078	0.106	0.126	0.090	0.126	(0.019)	0.000
EXPERIENCE	1.659	2.079	1.207	1.512	2.079	1.227	0.147	0.000
Country characteristics								
LOCAL COMPETITION	5.430	5.500	0.389	5.232	5.220	0.454	0.198	0.000
AUTHORITY ACCEPTABLE	47.536	39.000	17.136	52.938	49.000	19.863	(5.402)	0.000
FINANCIAL RISK	8.455	7.500	5.497	10.958	10.000	7.705	(2.504)	0.000
POLITICAL RISK	19.980	19.000	8.277	23.740	20.000	11.800	(3.760)	0.000
ECONOMIC RISK	11.100	10.500	3.913	13.711	11.500	6.906	(2.611)	0.000
Other control variables								
TRANSLATION EXPOSURE	0.281	0.209	0.273	0.296	0.199	0.319	(0.016)	0.000
FX RISK	1.194	1.000	1.459	1.970	1.000	2.250	(0.776)	0.000
FX VOLATILITY	0.055	0.047	0.078	0.177	0.054	0.388	(0.121)	0.000

Subsidiary characteristics: *LOCAL SALES* is the subsidiary's local sales to its total sales. *U.S. IMPORTS* is the subsidiary's U.S. imports to its total operating expenses. *LOCAL COMPENSATION* is the subsidiary's compensation expense to its total operating expenses. *INTEREST COVERAGE* is the subsidiary's earnings before interest and taxes to its interest expense. *LOCAL DEBT* is the subsidiary's local debt to its total debt. *U.S. PAYABLES* is the subsidiary's ratio of payables to the parent (current liabilities and long-term debt) to its total liabilities. *U.S. RECEIVABLES* is the subsidiary's ratio of receivables from the parent (current and noncurrent) to its total assets. *DIVIDEND* equals 1 if the subsidiary paid a dividend to the parent in the current or in the two years prior to or subsequent to the current year (e.g., t-2 to t+2) and 0 otherwise. *SALES MIX* is the number of 3-digit ISIC codes in which the subsidiary generates revenue. *RELATIVE SIZE* is the ratio of the subsidiary's total assets to the firm's total foreign assets. *AGE* approximates the subsidiary's age as the natural log of the number of years since the subsidiary first began reporting to the BEA. *EXPAT* equals 1 if the subsidiary employs a U.S. expatriate and 0 otherwise. *R&D* equals the subsidiary's research and development expenditures to its total sales. **Firm characteristics:** *% FOREIGN SALES* is the ratio of the firm's foreign sales to worldwide sales. *COUNTRIES* is the natural log of the number of countries in which the parent company owns a foreign affiliate. *INTERCOMPANY*

SALES is the ratio of firm's affiliated sales to the sum of all affiliated and unaffiliated sales. *EXPERIENCE* is the natural log of the number of years that the parent has operated any foreign affiliate in the country of the affiliate's location. **Country characteristics:** *LOCAL COMPETITION* is taken from the *World Economic Forum Executive Opinion Survey*, and ranges in value from 1 to 7 where "Competition in the local market is 1=limited in most industries and price-cutting is rare, 7=intense in most industries as market leadership changes over time." *AUTHORITY ACCEPTABLE* is taken from www.geert-hofstede.com, and is a cultural index that ranks countries from 0 to 100 where higher values imply that culture accepts and expects that power is distributed unequally. *FINANCIAL RISK, POLITICAL RISK, ECONOMIC RISK,* and *FX RISK* are taken from *Political Risk Services' International Country Risk Guide*. *FINANCIAL RISK* is an index that ranks countries from 0 to 50 where higher values imply higher risk that a country will be unable to finance its commercial and trade debt obligations. *POLITICAL RISK* is an index that ranks countries from 0 to 100 where higher values imply higher political instability. *ECONOMIC RISK* is an index that ranks countries from 0 to 50 where higher values imply a weaker economy. **Other control variables:** *TRANSLATION EXPOSURE* equals the absolute value of the subsidiary's monetary assets (i.e., total assets minus inventory and property, plant and equipment) minus monetary liabilities (i.e., trade payables, short-term debt and long-term debt) scaled by the subsidiary's total assets. *FX RISK* is taken from *Political Risk Services' International Country Risk Guide* and is an index that ranks countries from 0 to 10 where higher values imply that the subsidiary's local currency is expected to have higher exchange rate instability against the U.S. dollar. *FX VOLATILITY* is the coefficient of variation of the subsidiary's local currency exchange rate against the U.S. dollar over the previous 12 months. All continuous variables are winsorized at the 1 and 99 percent levels.

Table 3

Subsidiary-Level Logistic Regressions of Decentralized Subsidiary on
Subsidiary, Firm, and Country Characteristics for 45,990 Subsidiary-Years

Dependent Variable =			Pr*(Decentralized Sub* = 1*)*					
	(1a)		(2a)		(3a)		(4a)	
Independent Variables	**coeff.**	**p-value**	**coeff.**	**p-value**	**coeff.**	**p-value**	**coeff.**	**p-value**
Subsidiary characteristics								
LOCAL SALES	0.475	0.000					0.582	0.000
U.S. IMPORTS	-0.398	0.012					-0.353	0.032
LOCAL COMPENSATION	0.964	0.000					0.824	0.000
INTEREST COVERAGE	0.003	0.000					0.002	0.000
LOCAL DEBT	0.398	0.000					0.289	0.001
U.S. PAYABLES	-0.090	0.271					-0.072	0.352
U.S. RECEIVABLES	-1.260	0.000					-1.359	0.000
DIVIDEND	0.206	0.002					0.253	0.000
SALES MIX	0.079	0.171					0.123	0.037
RELATIVE SIZE	0.112	0.373					-0.157	0.354
AGE	0.020	0.050					0.057	0.107
EXPAT	-0.222	0.002					-0.179	0.024
R&D	6.103	0.020					3.065	0.191
Firm characteristics								
% FOREIGN SALES			0.586	0.080			0.414	0.238
COUNTRIES			0.034	0.491			0.119	0.111
INTERCOMPANY SALES			-3.152	0.000			-2.942	0.000
EXPERIENCE			0.055	0.070			-0.076	0.044
Country characteristics								
LOCAL COMPETITION					0.852	0.000	0.912	0.000
AUTHORITY ACCEPTABLE					-0.006	0.000	-0.005	0.000
FINANCIAL RISK					-0.037	0.000	-0.038	0.000
POLITICAL RISK					0.024	0.000	0.021	0.000
ECONOMIC RISK					-0.076	0.000	-0.082	0.000
INTERCEPT	-1.461	0.000	-0.852	0.003	-3.847	0.000	-5.365	0.000
Pseudo R-sq	0.1009		0.0824		0.1560		0.2124	

See **Table 2** for variable definitions. Industry and year indicator variables are included in all specifications. Reported p-values are based on tests using standard errors clustered by firm.

Table 4 Panel A
Firm-Level Descriptive Statistics for 5,700 Firm-Years

	Mean	**Median**	**Std. Dev.**
ROA_t^{Firm}	0.039	0.038	0.067
$MISMATCH_t^{Firm}$	0.138	0.060	0.181
% FOREIGN SALES	0.270	0.208	0.169
FIRM SIZE	13.114	13.079	2.258
INTL EXPERIENCE	1.444	1.792	1.183

ROA_t^{Firm} is (firm net income + firm interest expense × (1−median industry effective tax rate)) / total firm assets, minus the industry median *ROA* in year *t* (using 3-digit ISIC codes). $MISMATCH_t^{Firm}$ aggregates $MISMATCH_t^{Sub}$ across all subsidiaries in an affiliated group, where $MISMATCH_t^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3. *% FOREIGN SALES* is the ratio of the firm's total foreign sales to the firm's total sales. *FIRM SIZE* is the natural log of the firm's total sales. *INTL EXPERIENCE* is the natural log of the number of years since the first year that the firm began reporting to the BEA.

Table 4 Panel B

Firm-Level Ordinary Least Square Regressions of Accounting Measures of Performance on Organizational Structure Mismatch and Control Variables for 5,700 Firm-Years

Dependent Variable =	ROA_t^{Firm}			
	(1b)		(2b)	
Independent Variables	**coefficient**	**p-value**	**coefficient**	**p-value**
$MISMATCH_t^{Firm}$	-0.012	0.049	-0.012	0.041
% FOREIGN SALES			-0.048	0.000
$MISMATCH_t^{Firm} \times$ *% FOREIGN SALES*			-0.083	0.044
FIRM SIZE	0.001	0.002	0.001	0.251
INTL EXPERIENCE	0.000	0.712	0.001	0.246
INTERCEPT	-0.020	0.009	-0.008	0.291
Adj. R-sq	0.0091		0.0236	

$MISMATCH_t^{Firm}$ aggregates $MISMATCH_t^{Sub}$ across all subsidiaries in an affiliated group, where $MISMATCH_t^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3. See **Table 4 Panel A** for all other variable definitions. Industry and year indicator variables are included in all specifications. All continuous variables that are interacted are mean-centered. Reported p-values are based on tests using standard errors clustered by firm.

Table 4 Panel C
Firm-Level Ordinary Least Square Regressions of Accounting Measures of Performance on
Organizational Structure Mismatch and Control Variables for 5,700 Firm-Years

Dependent Variable =	ROA_t^{Firm}		PROFIT MARGIN		ASSET TURNOVER	
	(1c)		(2c)		(3c)	
Independent Variables	**coefficient**	**p-value**	**coefficient**	**p-value**	**coefficient**	**p-value**
$MISMATCH_t^{Firm}$	-0.011	0.065	-0.002	0.750	-0.008	0.866
$DEC\text{-}MISMATCH_t^{Firm}$	-0.030	0.028	-0.006	0.762	-0.798	0.000
FIRM SIZE	0.001	0.003	0.004	0.000	-0.091	0.000
INTL EXPERIENCE	0.000	0.687	0.001	0.613	0.019	0.049
INTERCEPT	-0.019	0.015	-0.040	0.000	1.094	0.000
Adj.R-sq	0.0098		0.0202		0.1164	

Dependent Variable =	ROA_t^{Firm}		PROFIT MARGIN		ASSET TURNOVER	
	(4c)		(5c)		(6c)	
Independent Variables	**coefficient**	**p-value**	**coefficient**	**p-value**	**coefficient**	**p-value**
$MISMATCH_t^{Firm}$	-0.011	0.060	-0.002	0.754	-0.010	0.844
$DEC\text{-}MISMATCH_t^{Firm}$	-0.027	0.059	-0.003	0.881	-0.780	0.000
% FOREIGN SALES	-0.049	0.000	-0.028	0.000	-0.583	0.000
$MISMATCH_t^{Firm} \times$ *% FOREIGN SALES*	-0.078	0.061	-0.078	0.128	0.164	0.571
$DEC\text{-}MISMATCH_t^{Firm} \times$ % FOREIGN SALES	-0.088	0.279	-0.094	0.492	-0.100	0.904
FIRM SIZE	0.001	0.259	0.004	0.000	-0.100	0.000
INTL EXPERIENCE	0.001	0.264	0.002	0.201	0.037	0.000
INTERCEPT	-0.007	0.352	-0.033	0.001	1.215	0.000
Adj. R-sq	0.0244		0.0250		0.1355	

PROFIT MARGIN is (firm net income + firm interest expense × (1−median industry effective tax rate)) / total firm sales, minus the industry median profit margin in year *t*. *ASSET TURNOVER* is total firm sales / total firm assets, minus the industry median asset turnover in year *t*. $MISMATCH_t^{Firm}$ aggregates $MISMATCH_t^{Sub}$ across all subsidiaries in an affiliated group, where $MISMATCH_t^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3. $DEC\text{-}MISMATCH_t^{Firm}$ aggregates $MISMATCH_t^{Sub}$ across all subsidiaries in an affiliated group that are inappropriately decentralized (i.e., the predicted value of *Decentralized Sub* from Expression (1) is lower than the observed

value). See **Table 4 Panel A** for all other variable definitions. Industry and year indicator variables are included in all specifications. All continuous variables that are interacted are mean-centered. Reported p-values are based on tests using standard errors clustered by firm.

Table 5 Panel A

Subsidiary-Level Logistic Regressions of Change in Decision-rights on Lagged Measures of Performance, Mismatch, and Control Variables for 16,660 Subsidiary-Years

Dependent Variable =	Pr(Δ *Decision Rights*)			
	(1a)		(2a)	
Independent Variables	**coefficient**	**p-value**	**coefficient**	**p-value**
$MISMATCH_{t-1}^{Sub}$	4.192	0.002	4.195	0.000
ROA_{t-1}^{Sub}			0.175	0.343
$MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$			-1.274	0.035
ENVIRONMENT CHANGE	1.850	0.000	1.863	0.000
RELATIVE SIZE	0.468	0.000	0.469	0.000
AGE	-0.298	0.000	-0.298	0.000
INTERCEPT	-1.977	0.000	-1.975	0.003
Pseudo R-sq	0.2279		0.2284	

Δ *Decision Rights* is an indicator equal to 1 if the parent changed the assignment of decision-rights from that of the previous period (e.g., 1994 to 1999) for a particular subsidiary and 0 otherwise. $MISMATCH_{t-1}^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3 in year *t-1*. ROA_{t-1}^{Sub} is (subsidiary net income + subsidiary interest expense × (1 − median country/industry effective tax rate))/total subsidiary assets, all in year *t-1*, minus the industry median ROA in year *t-1*. *ENVIRONMENT CHANGE* is the absolute value of the change in the probability of decentralizing decision-rights, Pr(*Decentralized Sub* =1), from year *t-1* to *t*. *RELATIVE SIZE* is the ratio of the subsidiary's total assets to the firm's total foreign assets in year *t*. *AGE* approximates the subsidiary's age in year *t* as the natural log of the number of years since the subsidiary first began reporting to the BEA. Industry and year indicator variables are included in all specifications. All continuous variables that are interacted are mean-centered. Reported p-values are based on tests using standard errors clustered by firm.

Table 5 Panel B

Subsidiary-Level Logistic Regressions of Change in Decision-rights on Lagged Measures of Performance, Mismatch, and Control Variables for 16,660 Subsidiary-Years

Dependent Variable =	Pr(Δ *Decision Rights*)			
	(1b)	(2b)		
Independent Variables	**coefficient**	**p-value**	**coefficient**	**p-value**
$MISMATCH_{t-1}^{Sub}$	4.190	0.000	4.194	0.000
$DEC\text{-}MISMATCH_{t-1}^{Sub}$	-0.822	0.000	-0.817	0.001
ROA_{t-1}^{Sub}			0.193	0.295
$MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$			-1.277	0.034
$DEC\text{-}MISMATCH_{t-1}^{Sub} \times ROA_{t-1}^{Sub}$			-1.023	0.442
$ENVIRONMENT\ CHANGE$	2.153	0.000	2.168	0.000
$RELATIVE\ SIZE$	0.462	0.000	0.463	0.000
AGE	-0.305	0.000	-0.307	0.000
$INTERCEPT$	-1.883	0.000	-1.877	0.000
Pseudo R-sq	0.2290		0.2295	

Δ *Decision Rights* is an indicator variable equal to 1 if the parent changed the location of decision-rights from that of the previous period (e.g., 1994 to 1999) for a particular subsidiary and 0 otherwise. $MISMATCH_{t-1}^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3 in year *t-1*. $DEC\text{-}MISMATCH_{t-1}^{Sub}$ is the squared residual from Expression (1) estimated in column 4(a) of Table 3 in year *t-1* only when *Decentralized Sub* is equal to one, and zero otherwise. ROA_{t-1}^{Sub} is (subsidiary net income + subsidiary interest expense × (1−median country/industry effective tax rate)) / total subsidiary assets, all in year *t-1*, minus the industry median ROA in year *t-1*. *ENVIRONMENT CHANGE* is the absolute value of the change in the probability of decentralizing decision-rights, Pr(*Decentralized Sub* =1), from year *t-1* to *t*. *RELATIVE SIZE* is the ratio of the subsidiary's total assets to the firm's total foreign assets in year *t*. *AGE* approximates the subsidiary's age in year *t* as the natural log of the number of years since the subsidiary first began reporting to the BEA. Industry and year indicator variables are included in all specifications. All continuous variables that are interacted are mean-centered. Reported p-values are based on tests using standard errors clustered by firm.

Table 6

*Subsidiary-Level Logistic Regressions of Decentralized Subsidiary
on Variables Reflecting Earnings Management Motivation for Functional Currency Choice for
45,990 Subsidiary-Years*

Independent Variables	Dependent Variable = Pr(*Decentralized Sub* = 1)			
	(1b)		(2b)	
	coeff.	p-value	coeff.	p-value
TRANSLATION EXPOSURE	-0.025	0.772	-0.021	0.797
FX RISK	-0.014	0.419		
TRANSLATION EXPOSURE × FX RISK	0.017	0.442		
FX VOLATILITY			-2.433	0.000
TRANSLATION EXPOSURE × FX VOLATILITY			0.229	0.484
Pseudo R-sq	0.2125		0.2370	

See **Table 2** for variable definitions. All subsidiary, firm, and country characteristic variables from **Table 3** are included in this regression. Industry and year indicator variables are included in all specifications. All continuous variables that are interacted are mean-centered. Reported p-values are based on tests using standard errors clustered by firm.

Appendix A
Data Appendix

The International Investment Division of the Bureau of Economic Analysis (BEA) conducts annual surveys of U.S. multinationals and their foreign affiliates. The first benchmark survey was performed in 1982. The parent is also required to report information about its domestic operations. There are penalties for noncompliance and the BEA staffs check the forms for accuracy and completeness. To be reported on the BEA Benchmark Surveys of U.S. Direct Investment Abroad, a foreign affiliate must meet a specific size threshold in terms of assets, sales, or net income or loss. The size thresholds were $3 million in the 1982, 1989, and 1994 Benchmark surveys. The size thresholds were $7 million and $10 million in the 1999 Benchmark survey and 2004 Benchmark survey, respectively. Specifically, we used the following surveys (see http://www.bea.gov/surveys/diasurv.htm): BE-10B(LF) (Long Form) Report for Nonbank Foreign Affiliate; BE-10B(SF) (Short Form) Report for Nonbank Foreign Affiliate; BE-10B (BANK) Report for Bank Foreign Affiliate.

Estimates are made for at least some foreign affiliates that are below the reporting thresholds so that the BEA universe of foreign affiliates is essentially complete in each year. In the 1982, 1989, and 1994 benchmark surveys, no estimates were made for affiliates below the $3 million threshold. However, for the 1999 and 2004 benchmark surveys, estimates are made for foreign affiliates irrespective of their size. While we do not use any of the estimated operating and financial data in our study, we do include these foreign affiliates when computing firm-level variables, such as the number of countries in which the parent company conducts international business through foreign affiliates.

The information collected by the BEA includes a set of financial statements for each foreign affiliate, as well as some additional financial, investment and operating data. The instructions to the reporting company (i.e., the parent) are to "translate foreign affiliate financial statements, i.e., balance sheets and income statements from the host country currency to U.S. dollars using FAS 52, as would be required to incorporate foreign statements into the U.S. [parent's] financial statements for reports to shareholders." Thus, we can observe the outcome of the translation process at the affiliate-level, prior to the consolidation of the affiliates' financial and operating data with that of the parent company.

We capture the current year and prior year account balance for each affiliate. We determine an affiliate's functional currency as the parent's currency (U.S. dollar) when we do not observe changes in an affiliate's translation adjustment *equity* account and determine the functional currency as the subsidary's local currency when we observe these changes. This is consistent with FAS 52 which states that when the functional currency is the foreign currency, translation adjustments that arise from consolidating that foreign operation are not included in net income, but rather go directly to equity. We exclude BEA estimated data and only infer account changes, and thus, functional currencies from affiliate data reported by each company in a particular survey year.