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Financial sector diversification and MNC valuation

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ABSTRACT

We extend the literature on MNC performance by examining the relationship between market valuation of MNCs and intangibles associated with financial expertise. We identify firms as having financial expertise if they have diversified their business in the financial sector. We argue that financial expertise enhances the ability of MNCs to internalize financial transactions and take advantage of financing and investment opportunities around the world. Therefore, it is a potentially significant source of market power. Our test results demonstrate that as the degree of multinationality increases market valuation is positively related with financial expertise even after we account for several other control factors. Our findings imply that MNCs with financial expertise can be viewed as possessing an additional intangible, which essentially is the financial equivalent of the traditionally examined intangible assets, such as technological “know-how,” goodwill, and managerial expertise.

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1. Introduction

Internalization theory implies that geographic diversification is valuable when the benefits from the creation of intra-firm markets for the transfer of firm-specific intangible assets related advantages across borders, that bypass incomplete or non-existent external markets, exceed the organizational and agency costs associated with doing business in foreign countries. In support of this notion, [Morck and Yeung \(1991\)](#), followed by many others, found that intangibles associated with consumer goodwill

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and technical expertise increase the value of multinational firms (Morck and Yeung, 1992; Allen and Pantzalis, 1996; Pantzalis, 2001). Others (Buckley and Casson, 1998; Kogut and Zander, 1993) have argued that MNCs derive benefits from operating a geographically dispersed network of subsidiaries that enable them to absorb shocks and take advantage of growth opportunities not available to their local competitors in foreign countries. These networks provide MNCs with operating flexibility and are sources for an array of valuable real options (Pantzalis, 2001). An important part of the MNC network of operations is the internal financial market that links financing, investment, and risk management activities of the different affiliates. These internal financial markets span several geographic, business, and currency areas and provides MNCs with numerous advantages and strategic options (Desai et al., 2004). The ability of MNCs to internalize financial transactions and take advantage of financing and investment opportunities is a potentially significant source of market power. In essence, expertise in operating an internal capital market in an efficient manner and taking advantage of financial arbitrage across borders can be viewed as the financial intangible equivalent of technological “know-how,” goodwill, and managerial expertise.

Many of the prior studies examining the sources of MNC market power have focused on the traditional intangibles associated with technological “know-how,” marketing, and managerial expertise. To the best of our knowledge, there is no study thus far that empirically examines whether intangibles associated with financial expertise result in higher valuations for MNCs. In this study, we proxy financial expertise intangibles by an indicator variable that takes the value of one if the firm reports a business segment in the 6000 SIC range (i.e., in the financial industries domain). While it may be an imperfect measure of intangibles associated with internal capital markets and firms’ ability to conduct financial arbitrage across borders, we believe that this variable is appropriate. It largely captures a firm’s foray in the financial sector implying a higher probability that the firm possesses the expertise needed to run an internal capital market efficiently. Additionally, reporting a business segment in the financial services sector is also indicative of a greater likelihood that the firm has the ability to interact with financial markets, bypass capital market segmentation, and monitor for financial arbitrage opportunities.

The value of internal capital markets to MNCs depends upon how efficiently capital is allocated. Agency issues often arise in internal capital markets that distort the allocation (Scharfstein and Stein, 2000). Whether the “dark side” of internal capital markets prevails over the aforementioned advantages from operating a financial affiliate within a MNC is an empirical question. We argue that the ability of management to overcome the agency issues and efficiently allocate funds across the firm is a valuable intangible asset for MNCs. Having financial affiliates (our financial expertise proxy) result in a net benefit in the case of MNCs as the potential opportunities that arise within an internal capital market spanning several geographic and business areas outweighs the associated costs. Thus, we hypothesize that MNCs with financial subsidiaries should be better able to overcome the “dark side” of internal capital markets, take advantage of arbitrage opportunities by internalizing incomplete financial markets, and, consequently, display better performance on a cross-sectional basis.

Our investigation extends the literature by examining the relationship between intangibles associated with financial expertise and market valuation of MNCs. We find that, on average, in the absence of financial sector diversification, the market values (proxied by Tobin’s q , hereafter Q) of domestic firms are significantly higher than those of MNCs. However, among firms with financial expertise, the mean Q of MNCs is significantly greater than that of domestic firms. Our multivariate tests reveal that Q is positively related with financial expertise even after we account for several other factors that are associated with Q . The results are consistent with the notion that financial expertise is an important intangible asset and a source of monopolistic power for U.S. MNCs. Our findings imply that MNCs that report operations in the financial services sector possess the ability to overcome internal capital market agency issues and create value as this intangible asset is leveraged across foreign markets.

2. Financial sector diversification and MNC intangibles

The ability of internal capital markets to efficiently allocate funds across divisions of diversified firms has received considerable attention in the literature. Early studies (Williamson, 1975; Myers and Majluf, 1984; Shleifer and Vishny, 1992) argued that diversified firms create internal capital markets

that mitigate asymmetric information problems. More recently, Stein (1997) argued that internal capital markets bypass the informational asymmetries of external capital markets. In line with that argument, Matsusaka and Nanda (2001) and Scharfstein and Stein (2000) demonstrate that diversified firms utilize internal capital markets to finance projects that, due to information asymmetry and agency costs, cannot be financed externally.

Several articles that have examined the agency costs of internal capital markets suggest that diversified firms cross-subsidize other segments of their business. Diversified firms cross-subsidize money losing segments creating greater value loss in conglomerates than they would as stand alone firms (Berger and Ofek, 1995; Lamont, 1997). Stein (1997) stated that managers who allocate resources by ranking projects on a relative basis are better at relative rankings when their forecasting errors are correlated across projects. It follows that because the error terms in ranking the projects will be less correlated if the projects are undertaken in geographically dispersed markets, managers will be less efficient in ranking projects across international markets. Thus, multinationality can increase the agency costs associated with internal capital markets.

Several theoretical explanations of internal capital markets' agency costs exist. Scharfstein and Stein (2000) provide a theoretical framework of "corporate socialism" in which weaker divisions get subsidized by stronger ones especially when the strength of the divisions diverges greatly. Rajan et al. (2000) predict that capital budget gets shifted toward the weaker division in a firm to make it behave more cooperatively in joint production with other divisions. The general implication of corporate socialism in internal capital allocation is that weaker divisions are being cross-subsidized by stronger ones, and the problems will be most acute when the divisions in question have widely divergent investment opportunities. Accessing foreign markets increases the divergence between the firm's investment opportunities. We suggest that multinational firms have higher agency costs associated with internal capital markets. Those multinational firms that are best able to overcome the agency costs associated with internal capital markets possess intangible assets that can be leveraged across international markets.

Empirical work on internal capital markets has provided some insight into the efficiency of these markets to allocate resources compared to external capital markets. When the allocation of resources in the internal capital market is inefficient, the firm will suffer a loss in value relative to a case where more efficient allocation would be feasible. MNCs are viewed as serving more diverse markets than domestic firms. The disparity between markets magnifies the potential inefficiencies of the internal capital market leading to a greater potential for loss in value for MNCs. The inefficiency in internal capital markets can be used to help explain why multinational firms have often been found to sell at a discount relative to their domestic counterparts (Denis et al., 2002). The inefficient allocation is more likely when there is a large disparity between projects under consideration. We investigate conditions in which the internal capital market inefficiencies can be mitigated resulting in an increase in value for the MNC.

The internalization theory predicts that firms with intangible assets are better able to overcome the additional costs of international business creating value for the firms. It is the presence of these intangibles being leveraged across several markets that increase the MNC's benefits from diversification. Morck and Yeung (1991) found that intangibles, such as consumer goodwill and technical expertise, deployed in a multinational setting increase the value of the MNC. In another study, Morck and Yeung (1992) used an event study and found that the presence of information based assets creates value for firms pursuing foreign acquisitions. These findings suggest that intangibles create value in the presence of multinationality and that multinationality in itself does not create value.

Geographical diversification exacerbates the agency costs associated with internal capital markets. Diversification in the financial sector, and the associated financial expertise, might help MNCs to overcome the agency issues associated with internal capital markets and create value by arbitraging across incomplete financial markets. The financial subsidiary might also enhance the use of capital budgeting methods, thereby reducing some of the agency issues commonly found in internal capital markets. MNCs that have the expertise needed to overcome internal capital market imperfections, in effect, hold a valuable intangible asset. We suggest that MNCs that have financial industry expertise are better able to overcome the agency costs associated with internal capital markets. We assume that firms that report a business segment in financial industries are more likely to possess financial exper-

tise and the necessary level of financial sophistication needed to impose stricter, value maximizing standards for allocating resources across the firm. Furthermore, we argue that those firms that are able to overcome the problems associated with internal capital markets create more value if they are multinational.

We use the presence of a financial subsidiary to proxy for an intangible asset related to the ability to overcome internal capital market imperfections. We hypothesize that the presence of a financial subsidiary creates more value for multinational firms than it does for domestic firms. Multinational firms have access to more markets for their goods allowing them to leverage their intangible assets across more markets. This increased leveraging of intangible assets associated with efficient internal capital market resource allocation should, therefore, be larger for multinational firms than for purely domestic firms. We predict that the benefits from multinationality will be positively associated with the presence of a financial subsidiary.

3. Sample selection and univariate analysis

The sample consists of 73,308 firm-year observations from 1976 to 2004 with business segment data available on Compustat. Financial firms (firms with primary SICs between 6000 and 6999) are excluded from the sample. We measure the degree of firms' multinationality based on their foreign sales ratios.¹ Our main variable of interest is an indicator variable, *FINDUM*, that takes the value of one if the firm reports a non-primary business segment in the financial industries, and the value of zero otherwise. While it is an imperfect measure of intangibles associated with internal capital markets and firms' ability to conduct financial arbitrage across borders, we believe that this variable is appropriate. It largely captures a firm's foray in the financial sector implying a greater probability that the firm possesses the expertise needed to run an internal capital market efficiently. In addition, reporting a business segment in the financial services sector is also indicative of a greater likelihood that the firm has the ability to interact with financial markets at home and abroad, can bypass capital market segmentation caused by regulation and/or investor perceptions, and monitor the investments' horizon for financial arbitrage opportunities. The foreign sales ratio, *FSALER* (measured as the ratio of foreign sales to total sales), is used to create two alternative measures of multinationality, *MNCDUM*. When *FSALER* is greater than zero (or, alternatively, greater than 10%), *MNCDUM* takes the value of one, and the value of zero otherwise.

Table 1 provides summary statistics for the entire sample. Tobin's *q* (*Q*) is our market value proxy, estimated using the methodology of Chung and Pruitt (1994). The average *Q* for the sample is 1.3831 implying that, on average, firms in the sample have a significant amount of future growth opportunities reflected in their valuations. *SIZE* is measured as the natural log of total assets. Since multinational firms are generally larger than domestic firms, we need to control for size to ensure that the results we obtain are not due to cross-sectional size differences. *TDR* is the total debt ratio computed as the ratio of total debt to total assets used to capture any cross-sectional value effect related to capital structure. *EBITS* is earnings before interest and taxes scaled by total sales to measure profitability. *CAPXS* is the capital expenditures of the firm scaled by total sales. Both capital expenditures and profitability are expected to have a strong positive impact on firm value. Therefore, they need to be included in our model as control variables. *XRDS* is a research and development (R&D) intensity measure computed as research and development expenditures scaled by total sales used to proxy for technological "know-how," a key intangible asset that impacts firm value. *NSEG* is the total number of business segments in which the firm operates and is used to capture any change in value due to diversification.

To determine if multinationality itself creates value, we compare the *Qs* of domestic firms to the *Qs* of MNCs. We use the foreign sales ratio to create two alternative classifications of firms as multinational or domestic. First, we classify all firms with a foreign sales ratio greater than zero as multinational, and all firms with a foreign sales ratio equal to zero as domestic. This method will classify firms as multinational even if they have few foreign sales. Next, we classify all firms with a foreign sales ratio

¹ Dunning (1980), Siddharta and Lall (1982), Kim and Lyn (1986), and Sullivan (1994) have used foreign sales ratios as a proxy for the degree of multinationality.

Table 1
Summary statistics for entire sample.

Variable	Mean	Standard deviation	Fifth percentile	Ninety-fifth percentile	Observations
Q	1.3831	1.5003	0.1798	4.3233	73,308
SIZE	4.7946	2.0664	1.6895	8.5147	73,308
TDR	0.2431	0.2310	0	0.6999	73,308
EBITS	-0.2716	1.7141	-1.3364	0.2872	73,308
CAPXS	0.1663	0.4292	0.0063	0.6428	73,308
XRDS	0.1291	0.5682	0	0.3684	73,308
FSALER	0.1128	0.2080	0	0.5726	73,308
FINDUM	0.0382	0.1917	0	0	73,308
NSEG	1.5088	0.9730	1	10	73,308

Note: The table provides summary statistics for 73,308 firm-year observations from 1976 to 2004 of firms with business segment data available on Market Insight. Financial firms (primary SIC code between 6000 and 6999) are excluded from the sample. Q is Tobin's q estimated using the methodology of Chung and Pruitt (1994). SIZE is measured as the natural log of total assets. TDR is the total debt ratio which is the ratio of total debt to total assets. EBITS is earnings before interest and taxes scaled by total sales. CAPXS is the capital expenditures of the firm scaled by total sales. XRDS is measured as research and development expenditures scaled by total sales. FSALER is the foreign sales ratio which is measured as the ratio of foreign sales to total sales. FINDUM is a dummy variable that equals one if the firm reports a non-primary financial (SIC code between 6000 and 6999) business segment, and zero otherwise. NSEG is the total number of business segments in which the firm operates.

of 10% or less as domestic, and all firms with a foreign sales ratio greater than 10% as multinational. Table 2 provides summary statistics for the subsamples of domestic and multinational firms as well as summary statistics for financially diversified and not financially diversified firms. For each subsample, we provide the mean and standard deviation values of all variables used in the multivariate tests. Also reported are the mean differences, computed as the mean of the domestic firm minus the mean of the multinational firms, and the corresponding *t*-statistic (in square brackets) or the mean of not financially diversified firm minus the mean of the financially diversified firm.

Panel A of Table 2 classifies firms with a foreign sales ratio of zero (greater than zero) as domestic (multinational). Using this definition of multinationality, we obtain 47,479 firm-year observations for the domestic firms' sample and 25,829 firm-year observations for the MNC subsample. The average Qs of domestic firms are significantly larger than the average Qs of multinational firms. This suggests that in our sample, multinational firms, on average, are valued lower than domestic firms. This is consistent with our expectations that multinationality itself does not create value. Comparisons of the other variables' mean values across the two subsamples reveal several interesting observations. Consistent with prior studies, MNCs are larger, more profitable, and have lower capital expenditures and R&D intensity than domestic firms. Although the debt ratios are statistically significantly higher for domestic firms than for MNCs, the difference is not economically significant (25% for multinational firms as compared to 23% for domestic firms). Both domestic and multinational firms appear to be just as likely to be financially diversified.

Panel B of Table 2 uses a foreign sales ratio greater than 10% to define multinationality. Using this definition of multinationality, we obtain 51,912 domestic firm-year observations and 21,396 multinational firm-year observations. The results using this alternative measure of multinationality are similar to those reported in Panel A. These univariate findings suggest that multinationality, on average, does not increase the perceived value for firms.

To determine whether, on average, financial expertise by itself increases the perceived value of the firm we compare the Qs of firms that are financially diversified to the Qs of firms that are not financially diversified. In Panel C of Table 2 firms reporting non-primary financial (SIC code between 6000 and 6999) are classified as financially diversified. Using this definition, we obtain 70,506 not financially diversified firm-year observations and 2802 financially diversified firm-year observations. Over the entire sample financially diversified firms on average have lower Qs than non-financially diversified firms implying that financial diversification on average does not increase the perceived value for firms.

To determine whether, on average, financial expertise increases the perceived value of MNCs relative to that of domestic firms, we compare average Qs after double sorting our sample on multinationality and on whether the firm reports a financial business segment or not. The results are reported

Table 2

Summary statistics for domestic firms versus multinational firms and financially diversified versus not financially diversified.

Panel A: multinationality defined as firms with foreign sales ratio greater than zero					
Variable	Domestic firms (N = 47,479)		Multinational firms (N = 25,829)		Mean difference [t-statistic]
	Mean	Standard deviation	Mean	Standard deviation	
Q	1.4158	1.5432	1.3230	1.4160	0.0928 ^a [8.0029]
SIZE	4.2942	1.9359	5.7146	1.9808	-1.4205 ^a [-94.1290]
TDR	0.2516	0.2367	0.2276	0.2191	0.0239 ^a [13.4048]
EBITS	-0.3732	1.9808	(0.0847)	1.0359	-0.2885 ^a [-21.8374]
CAPXS	0.1940	0.4820	0.1154	0.3028	0.0786 ^a [23.7861]
XRDS	0.1530	0.6644	0.0853	0.3194	0.0677 ^a [15.4299]
FSALER	0	0	0.3203	0.2374	
FINDUM	0.0380	0.1913	0.0386	0.1926	-0.0006 [-0.724]
NSEG	1.4036	0.8391	1.7021	1.1554	-0.2985 ^a [-40.1188]
Panel B: multinationality defined as firms with foreign sales ratio greater than 10%					
Variable	Domestic firms (N = 51,912)		Multinational firms (N = 21,396)		Mean difference [t-statistic]
	Mean	Standard deviation	Mean	Standard deviation	
Q	1.4029	1.5312	1.3350	1.4211	0.0679 ^a [5.5683]
SIZE	4.3932	1.9624	5.7688	1.9866	-1.3756 ^a [-85.9726]
TDR	0.2519	0.2361	0.2219	0.2166	0.0300 ^a [16.0091]
EBITS	-0.3440	1.9100	-0.0956	1.0826	-0.2483 ^a [-17.8668]
CAPXS	0.1863	0.4677	0.1179	0.3113	0.0684 ^a [19.6719]
XRDS	0.1448	0.6405	0.0911	0.3299	0.0537 ^a [11.6453]
FSALER	0.0048	0.0177	0.3750	0.2246	
FINDUM	0.0397	0.1954	0.0345	0.1826	0.0052 ^a [3.3393]
NSEG	1.4369	0.8810	1.6830	1.1479	-0.2461 ^a [-31.3401]
Panel C: financially diversified defined as firms reporting a non-primary financial (SIC code between 6000 and 6999) business segment					
Variable	Not financially diversified (N = 70,506)		Financially diversified (N = 2802)		Mean difference [t-statistic]
	Mean	Standard deviation	Mean	Standard deviation	
Q	1.3996	1.5164	0.9672	0.9178	0.4324 ^a [14.9842]
SIZE	4.7296	2.0260	6.4315	2.3767	-1.7019 ^a [-43.2983]
TDR	0.2380	0.2291	0.3714	0.2403	-0.1333 ^a [-30.1511]
EBITS	-0.2849	1.7432	0.0642	0.5384	-0.3491 ^a [-10.5800]
CAPXS	0.1673	0.4327	0.1413	0.3260	0.0260 ^a [3.1450]
XRDS	0.1338	0.5787	0.0113	0.0669	0.1225 ^a [11.2013]
FSALER	0.1137	0.2090	0.0922	0.1817	0.0215 ^a [5.3669]
MNCDUM	0.2930	0.4551	0.2637	0.4407	0.0292 ^a [3.3393]
NSEG	1.4374	0.8818	3.3037	1.3613	-1.8663 ^a [-110.00]

Note: The table provides summary statistics for 73,308 firm-year observations from 1976 to 2004 of firms segmented on the amount of foreign sales and financial sector diversification. Two alternative measures are used to define multinationality. In Panel A, firms with foreign sales ratios of zero are classified as domestic firms, and firms with foreign sales ratios greater than zero are classified as multinational firms. In Panel B, firms with foreign sales ratios of 10% or less are classified as domestic, while firms with foreign sales ratios greater than 10% are defined as multinational. In Panel C, firms reporting a non-primary financial (SIC code between 6000 and 6999) business segment are classified as financially diversified. Only firms with business segment data available on Market Insight are included in the sample. Financial firms (primary SIC code between 6000 and 6999) are excluded from the sample. Q is Tobin's q estimated using the methodology of Chung and Pruitt (1994). SIZE is measured as the natural log of total assets. EBITS is earnings before interest and taxes scaled by total sales. TDR is the total debt ratio which is the ratio of total debt to total assets. CAPXS is the capital expenditures of the firm scaled by total sales. XRDS is measured as research and development expenditures scaled by total sales. FSALER is the foreign sales ratio measured as the ratio of foreign sales to total sales. FINDUM is a dummy variable that equals one if the firm reports a non-primary financial (SIC code between 6000 and 6999) business segment, and zero otherwise. MNCDUM is a dummy variable that is equal to one if the firm has a foreign sales ratio greater than 10%, and zero otherwise. NSEG is the total number of business segments in which the firm operates. The t-statistic provides a measure of statistical difference of the means between the domestic and multinational firms ($\text{Mean}_{\text{domestic}} - \text{Mean}_{\text{multinational}} = 0$) with statistical significance indicated by a, b, and c representing significance at the 1%, 5%, and 10% levels, respectively.

Table 3

Comparison of Tobin's q averages across groups of firms sorted on multinationality and financial expertise.

	Domestic firms	Multinational firms	Mean difference
Panel A: multinationality defined as firms with foreign sales greater than zero			
Firms without a business segment in the financial sector	1.4349 [1.5606] 45,673	1.3346 [1.4294] 24,833	0.1003 ^a [8.3954]
Firms with a business segment in the financial sector	0.9310 [0.8777] 1806	1.0330 [0.9835] 996	-0.1020 ^a [-2.8197]
Mean difference	0.5040 ^a [13.6386]	0.3016 ^a [6.5974]	
Panel B: multinationality defined as firms with foreign sales greater than 10%			
Firms without a business segment in the financial sector	1.4227 [1.5498] 49,849	1.34390 [1.4311] 20,657	0.0788 ^a [6.2803]
Firms with a business segment in the financial sector	0.9243 [0.8497] 2,063	1.0870 [1.0772] 739	-0.1626 ^a [-4.1454]
Mean difference	0.4984 ^a [14.5149]	0.2569 ^a [4.8316]	

Note: This table provides a test for the difference in means of the Tobin's q across groups of firms classified based on whether they are domestic or multinational and whether they report a business segment in the financial sector or not. Two alternative measures are used to define multinationality. In Panel A, firms with foreign sales ratios of zero are classified as domestic firms, while firms with foreign sales ratios greater than zero are classified as multinational firms. In Panel B, firms with foreign sales ratios of 10% or less are classified as domestic, and firms with foreign sales ratios greater than 10% are defined as multinational. Tobin's q is estimated using the methodology of Chung and Pruitt (1994). The mean difference of Tobin's q between the groups and the corresponding t-statistic are provided. Also reported are the standard deviation of Tobin's q (in brackets below the mean values) and the frequency as the bottom number in each cell. Statistical significance indicated by a, b, and c representing significance at the 1%, 5%, and 10% levels, respectively.

in Table 3, where Panel A contains results based on the zero foreign sales ratio classification of domestic firms and Panel B employs the classification that utilizes the 10% foreign sales ratio benchmark. The Q_s of domestic firms are significantly higher than the Q_s of MNCs in the absence of a financial business segment. However, in the presence of a financial business segment, the MNCs' Q is, on average, significantly higher than that of domestic firms. These findings are consistent with our expectation that financial expertise is more beneficial for MNCs as it allows them to exploit the benefits of internal capital markets across geographically dispersed areas and possibly engage in financial arbitrage.

4. Multivariate test method and results

4.1. Methodology

The univariate tests reported in Tables 2 and 3 do not control for other factors that can impact the value of the firm (Q). To determine whether differences in Q_s between MNCs and domestic firms can indeed be partly attributed to financial expertise, we need to account for the other control variables in a multivariate regression test. We start by modeling the MNC market value relationship as follows:

$$\text{market value} = f(\text{multinationality, financial expertise, size, leverage, intangibles, profitability, capital intensity, functional diversification}) \quad (1)$$

The functional relationship in Eq. (1) can be transformed into the following equation form model to be estimated:

$$Q = \beta_0 + \beta_1 MULT + \beta_2 FINDUM + \beta_3 SIZE + \beta_4 TDR + \beta_5 XRDS + \beta_6 EBITs + \beta_7 CAPXS + \beta_8 NSEG \quad (2)$$

where $MULT$ is the measure of multinationality and all other variables are as defined previously. MNC theory predicts that there is a correlation between firm-specific skills (intangibles) and the higher market valuation associated with multinationality. Therefore, following past studies (Morck and Yeung, 1991; Doukas and Pantzalis, 1999; Pantzalis, 2001), the model should contain interaction terms of the firm's international involvement and its level of intangibles. Here, we have the traditional intangibles measured by R&D intensity, but also financial expertise.

The rationale for the inclusion of interaction terms in the model is that, according to internalization theory, the market value impact of multinationality is a function of the existence of intangibles. Thus, the coefficient β_1 from Eq. (1) can be modeled as

$$\beta_1 = \beta_0 + \beta_1 XRDS + \beta_2 FINDUM \quad (3)$$

Thus, substituting Eq. (3) in Eq. (2), the resulting modified model to be estimated is specified as

$$Q = \beta_0 + \beta_1 MULT + \beta_2 FINDUM + \beta_3 (MULT \times FINDUM) + \beta_4 XRDS + \beta_5 (MULT \times XRDS) + \beta_6 SIZE + \beta_7 TDR + \beta_8 EBITs + \beta_9 CAPXS + \beta_{10} NSEG \quad (4)$$

To control for the extent to which different intangibles are substitutes for each other, we also include an interaction term between *FINDUM* and *XRDS*. Including the interaction term into Eq. (4) results in the following specification of the model:

$$Q = \beta_0 + \beta_1 MULT + \beta_2 FINDUM + \beta_3 (MULT \times FINDUM) + \beta_4 XRDS + \beta_5 (MULT \times XRDS) + \beta_6 (FINDUM \times XRDS) + \beta_7 SIZE + \beta_8 TDR + \beta_9 EBITs + \beta_{10} CAPXS + \beta_{11} NSEG \quad (5)$$

If the results demonstrate support for our hypothesis that multinationality itself does not create value, then the coefficient β_1 should be negative and significant. We hypothesized that multinationality in the presence of intangibles creates value. For the results to support our hypothesis that financial expertise can be viewed as a valuable intangible asset for MNCs, then the coefficient β_3 of the interaction term between our measure of multinationality and financial expertise in Eq. (5) should be positive and significant. The coefficient β_5 of the interaction term between our measure of multinationality and technological “know-how” in Eq. (5) appearing positive and significant would support our hypothesis that technological “know-how” is a valuable intangible asset for MNCs.

4.2. Results

In Table 4, we provide the results for a total of four fixed effects regressions employing two different models while using two different definitions of multinationality. The chi-square statistic from the Hausman test indicates that a fixed effects regression should be used to estimate the models. The first fixed effects regression model includes several control variables. The second fixed effects regression drops the *EBITs* variable from the model allowing us to check the stability of the model. These two models are estimated using two alternative measures of multinationality. The first is a continuous variable, the foreign sales ratio, *FSALER*. The second is an indicator variable, *MNC DUM*, that takes the value of one if *FSALER* is greater than 10%. The results are consistent across all panels indicating that our evidence is robust across econometric models and different measures of multinationality.

Consistent with prior evidence, the coefficient of the multinationality variable is generally negative and significant indicating that expansion overseas reduces firm value.² These results are consistent with our expectations that coefficient β_1 in Eq. (5) is negative and significant. The results from Table 4 are also consistent with our expectations that the intangibles associated with financial expertise and R&D intensity would be positively associated with multinationality. We found that the coefficients β_3 and β_5 of the interactions of the multinationality variable with the intangibles variables in Eq. (5) are always positive and significant. In particular, R&D intensity interacted with multinationality (coefficient β_5) is always positively associated with *Q* implying that advantages associated with technological “know-how” create value for the firm as they are transferred within the firm across international markets. More importantly, we also find that the interaction of multinationality and the

² For example, Morck and Yeung (1991) find that multinationality measured by the log of the number of foreign subsidiaries has a negative impact on valuation for MNCs operating in many foreign countries. Siddharta and Lall (1982) find a similar result for large MNCs, while Allen and Pantzalis (1996) find that the number of foreign subsidiaries is negatively related to performance for the group of MNCs with broad, concentrated foreign operations networks.

Table 4
Multivariate regressions.

Variables	Model			
	FSALESR		MNCDDUM	
Size	−0.1816 ^a (−21.98)	−0.1849 ^a (−22.45)	−0.1799 ^a (−21.73)	−0.1833 ^a (−22.21)
TDR	−1.9117 ^a (−64.04)	−1.9117 ^a (−63.99)	−1.9118 ^a (−64.19)	−1.9111 ^a (−64.02)
EBITS	−0.0269 ^a (−4.89)		−0.0271 ^a (−4.85)	
CAPXS	0.0744 ^a (4.82)	0.0978 ^a (6.77)	0.0745 ^a (4.90)	0.0977 ^a (6.77)
XRDS	−0.0421 ^b (−2.23)	0.0170 (1.19)	−0.0437 ^b (−2.31)	0.0158 (1.10)
NSEG	−0.0131 (−1.63)	−0.0130 (−1.62)	−0.0123 (−1.53)	−0.0123 (−1.53)
FINDUM	0.0146 0.39	0.0180 (0.48)	−0.0121 (−0.31)	−0.0133 (−0.35)
FINDUM × XRDS	−0.1135 (−0.31)	−0.1245 (−0.34)	−0.1114 (−0.31)	−0.1197 (−0.33)
FSALER	−0.0998 ^a (−2.86)	−0.0967 ^b (−2.32)		
FSALER × XRDS	0.0043 ^a (2.86)	0.0043 ^a (2.85)		
FSALER × FINDUM	0.3738 ^a (2.61)	0.3828 ^a (2.60)		
MNCDDUM			−0.0699 ^a (−4.05)	−0.0683 ^a (−3.96)
MNCDDUM × XRDS			0.0050 ^a (3.26)	0.0049 ^a (3.27)
MNCDDUM × FINDUM			0.2212 ^a (3.69)	0.2209 ^a (3.69)
Industry dummies	No	No	No	No
Year dummies	Yes	Yes	Yes	Yes
	$N = 73,308$ $R^2_{\text{within}} = 0.1022$	$N = 73,308$ $R^2_{\text{within}} = 0.1018$	$N = 73,308$ $R^2_{\text{within}} = 0.1024$	$N = 73,308$ $R^2_{\text{within}} = 0.1021$
	$R^2_{\text{between}} = 0.2295$	$R^2_{\text{between}} = 0.2272$	$R^2_{\text{between}} = 0.2300$	$R^2_{\text{between}} = 0.2278$
	$R^2_{\text{overall}} = 0.1625$ $X^2 = 787.94^a$	$R^2_{\text{overall}} = 0.1615$ $X^2 = 754.76^a$	$R^2_{\text{overall}} = 0.1628$ $X^2 = 797.36$	$R^2_{\text{overall}} = 0.1619$ $X^2 = 764.37$

Note: This table provides multivariate regressions of Tobin's q (estimated using the methodology of Chung and Pruitt, 1994) on firm characteristics. The coefficients and t-statistics (in parenthesis) are provided for four regressions using a fixed effects model using two measures of multinationality. The first measure of multinationality is the foreign sales ratio (FSALESR), and the second measure of multinationality is defined as a dummy variable (MNCDDUM) that takes the value of one if the foreign sales ratio is greater than 10%, and zero otherwise. SIZE is measured as the natural log of total assets. TDR is the total debt ratio which is the ratio of total debt to total assets. EBITS is earnings before interest and taxes scaled by total sales. CAPXS is the capital expenditures of the firm scaled by total sales. XRDS is research and development intensity measured as research and development expenditures scaled by total sales. NSEG is the number of business segments in which the firm operates. FINDUM is a dummy variable that equals one if the firm reports a non-primary financial (SIC code between 6000 and 6999) business segment, and zero otherwise. FSALER is the foreign sales ratio measured as the ratio of foreign sales to total sales. The twelve industrial sectors are identified as the Fama-French industrial sectors based on the firm's primary SIC code. Firms in the financial sector (i.e., firms with primary SIC code between 6000 and 6999) were excluded from the sample. Statistical significance indicated by a, b, and c representing significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Accounting for endogeneity.

Panel A: first stage model estimating the likelihood of being a firm that diversifies into the financial sector		
	Coefficient	z-Statistic
FSALER	-0.6455 ^a	-11.14
Size	0.1166 ^a	16.32
TDR	0.2845 ^a	6.21
EBITS	0.0420 ^b	2.27
CAPXS	-0.0231	-0.74
XRDS	-0.3794 ^a	-2.89
NSEG.NET	0.1292 ^a	14.57
R_NAF	-0.1782 ^a	-14.11
S&P	0.2572 ^a	5.69
AMEX	-0.0175	-0.43
NYSE	-0.0129	0.41
NASDAQ	-0.0633 ^b	-2.09
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Panel B: fixed effects regressions using two measures of multinationality		
Variable	FSALERSR	MNCDUM
Size	-0.1828 ^a (-21.57)	-0.1808 ^a (-21.31)
TDR	-1.9366 ^a (-62.76)	-1.9344 ^a (-62.75)
EBITS	-0.0291 ^a (-5.14)	-0.0292 ^a (-5.16)
CAPXS	0.0724 ^a (4.73)	0.0722 ^a (4.71)
XRDS	-0.0499 ^a (-2.60)	-0.0513 ^a (-2.67)
NSEG	-0.0280 ^a (-3.19)	-0.0268 ^a (-3.05)
FINDUM	0.0242 (0.64)	-0.0026 (-0.07)
FINDUM × XRDS	-0.1561 (-0.43)	-0.1570 (-0.44)
FSALER	-0.0655 (-1.51)	
FSALER × XRDS	0.0044 ^a (2.89)	
FSALER × FINDUM	0.3625 ^b (2.47)	
MNCDUM		-0.0597 ^a (-3.41)
MNCDUM × XRDS		0.0051 ^a (3.33)
MNCDUM × FINDUM		0.2129 ^a (3.57)
MILLS	0.7879 ^a (3.95)	0.7530 ^a (3.81)
Industry dummies	No	No
Year dummies	Yes	Yes
	$N = 72,060$ $R^2_{\text{within}} = 0.1024$ $R^2_{\text{between}} = 0.2298$	$N = 72,060$ $R^2_{\text{within}} = 0.1026$ $R^2_{\text{between}} = 0.2302$
	$R^2_{\text{overall}} = 0.1645$ $X^2 = 797.24^a$	$R^2_{\text{overall}} = 0.1647$ $X^2 = 797.57^a$

Note: This table provides the coefficients and corresponding significance statistics for a two-stage regression model. The first stage regression is presented in Panel A and estimates the probability of being a firm with a financial subsidiary. The first column provides the coefficients and the second column provides z-statistics for the probit model estimating the likelihood of being a firm that diversifies into the financial sector. Panel B presents coefficients and t-statistics (in parenthesis) for two second-stage fixed effects regressions using two measures of multinationality. In the second-stage regressions, Tobin's q is regressed on firm characteristics and the estimated probability from the first stage as a correction of selectivity (Inverse of Mills' Ratio). The first measure of multinationality is the foreign sales ratio (*FSALER*), and the second measure of multinationality is defined as a dummy variable (*MNCDUM*) that takes the value of one if the foreign sales ratio is greater than 10%, and zero otherwise. *SIZE* is measured as the natural log of total assets. *TDR* is the total debt ratio which is the ratio of total debt to total assets. *EBITS* is earnings before interest and taxes scaled by total sales. *CAPXS* is the capital expenditures of the firm scaled by total sales. *XRDS* is research and development intensity measured as research and development expenditures scaled by total sales. *NSEG* is the number of business segments in which the firm operates. *NSEG.NET* is the number of non-financial segments in which the firm operates. *R_NAF* is the residual portion of the analyst covering not related to size. *S&P* is a dummy variable that is equal to one if the firm is listed in the S&P 500. *AMEX* is a dummy variable that is equal to one if the firm is listed on American Stock Exchange. *NYSE* is a dummy variable that is equal to one if the firm is listed on the New York Stock Exchange. *NASDAQ* is a dummy variable that is equal to one if the firm is listed on NASDAQ. *FINDUM* is a dummy variable that equals one if the firm reports a non-primary financial (SIC code between 6000 and 6999) business segment, and zero otherwise. *MILLS* is the first stage probability of being a firm with a financial subsidiary. The twelve industrial sectors are identified as the Fama-French industrial sectors based on the firm's primary SIC code. Firms in the financial sector (i.e., firms with primary SIC codes between 6000 and 6999) were excluded from the sample. Statistical significance indicated by a, b, and c representing significance at the 1%, 5%, and 10% levels, respectively.

financial diversification dummy (coefficient β_3) is always positive and significant implying that financial expertise can also be viewed as a valuable intangible asset and when employed overseas creates value for the firm. These results are consistent with Morck and Yeung's (1991) finding that in the presence of technological "know-how" and financial expertise, the value of geographical diversification is positive.

The coefficient on the interaction between financial diversification and R&D intensity is always insignificantly negative. This implies that there is no increase in perceived value of firms that have the intangibles of R&D intensity and financial diversification. The correlation coefficient between financial diversification and R&D is -0.0413 and significant at the 1% level. Taken together, these results suggest that R&D intensity and financial diversification are not compliments for each other.

4.2.1. Robustness tests: endogeneity

It might be that the characteristics of firms that choose to diversify into the financial sector are causing the change in perceived value of the financially diversified firms. To control for the endogeneity issue, we use a two-stage least squares regression model (Campa and Kedia, 2002). Table 5 provides the results for the two-stage least squares regression models. Panel A of Table 5 provides the results for the first stage regression. In the first stage, we use a probit model to estimate the likelihood of being a firm that diversifies into the financial sector (*MILLS*). We controlled for multinationality, size, leverage, profitability, and R&D intensity as we did in the previous regressions. We also used the number of non-financial segments in which the firm operated (*NSEG_NET*) and the residual number of analysts following (*R_NAF*) in the probit model. To determine the residual number of analysts following the firm, we estimated the number of analysts following the firm based on the size of the firm. *R_NAF* is defined as the difference between the actual number of analysts following and the predicted number of analysts following based on the size of the firm. We used an indicator variable that took the value of one if the firm was listed in the S&P 500; otherwise, it was assigned a value of zero. We also used indicator variables to indicate whether the firm was listed on the New York Stock Exchange (*NYSE*), the American Stock Exchange (*AMEX*), or NASDAQ (*NASDAQ*). The indicator variable was assigned a value of one if it was listed on the corresponding exchange and zero otherwise. In the second-stage regression, *Q* is regressed on firm characteristics and the probability of being a firm that has diversified into the financial sector as a correction of selectivity (Inverse of Mills' Ratio). The modified model to be estimated in the second regression is specified as

$$Q = \beta_0 + \beta_1 MULT + \beta_2 FINDUM + \beta_3 (MULT \times FINDUM) + \beta_4 XRDS + \beta_5 (MULT \times XRDS) + \beta_6 (FINDUM \times XRDS) + \beta_7 SIZE + \beta_8 TDR + \beta_9 EBIT5 + \beta_{10} CAPXS + \beta_{11} NSEG + \beta_{12} MILLS \quad (6)$$

The *MILLS* variable controls for the self-selectivity of diversification into the financial sector. The results were consistent with our previous findings. Panel B of Table 5 provides the results of the two second-stage regressions of Eq. (6) using two measures of multinationality. Even after controlling for self-selectivity and firm characteristics, the coefficient β_3 of the interaction of multinationality and financial diversification in Eq. (6) are significantly positive.³ These results suggest that financial diversification increases the perceived value of multinational firms.

5. Conclusion

The results of our univariate and multivariate tests provide evidence that multinational firms benefit from financial services diversification. The presence of a financial affiliate increases the Tobin's *q* of multinational firms relative to that of domestic firms. Multivariate tests based on several models were estimated and yielded consistent results indicating that the interaction of multinationality with financial diversification is positively associated with *Q*. Collectively, these results support our hypothesis that firms expanding their multinational networks benefit from financial expertise. The

³ The model was also estimated excluding the profitability variable (*EBIT5*) with qualitatively similar results. We also ran several regressions that included a control variable for the impact of relationship lending and found qualitatively similar results.

findings are consistent with the notion that financial expertise can help create efficient internal capital markets and exploit financial arbitrage opportunities across areas spanning different currencies and businesses.

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