

**DEGREE OF FOREIGN SALES AND FOREIGN ASSETS
AS JOINT INDICATORS OF FIRM PERFORMANCE**

Reference No. P-3610

To be Presented at
1999 ABAS International Conference
Barcelona, Spain
Monday 10 July, 1999

CHADWICK NEHRT
School of Business
Quinnipiac College
275 Mt. Carmel Ave.
Hamden, CT 06518
Tel: 1-203-288-5251 x.8303
Fax: 1-203-281-8664
Net: nehrt@quinnipiac.edu

ABSTRACT

DEGREE OF FOREIGN SALES AND FOREIGN ASSETS AS JOINT INDICATORS OF FIRM PERFORMANCE

This paper investigates the relationship between degree of foreign sales (FSTS) and foreign assets (FATA) on the one hand, and firm financial performance on the other. It starts by testing whether domestic firms outperform internationally-oriented firms, then goes on to investigate what degrees of foreign sales and foreign assets are associated with higher firm financial performance. Models include linear, curvilinear and interacted internationalization variables. We find that the relationship is more complex than allowed by a quadratic model. We find also that FSTS and FATA each contribute explanatory power when included in the same model.

Key words: Internationalization; quadratic; interaction

INTRODUCTION

There is a growing literature on the relationship between firm financial performance and the degree of internationalization of a firm (e.g., Vernon, 1971; Dunning, 1985; Geringer, Beamish and daCosta, 1989; Hitt, Hoskisson & Kim, 1997). Yet, many aspects of this relationship are still not well understood. First, there is the issue of whether or not internationalized firms outperform domestic firms. Studies have found positive (e.g., Kim & Lyn, 1986; Vernon, 1971), negative (e.g., Siddharthan & Lall, 1982) and no statistically significant relationships (e.g., Brewer, 1981; Dunning, 1985; Rugman, Lecraw & Booth, 1985). Further research on the sign of the relationship is needed.

Second, while early literature investigated this relationship with internationalization modeled linearly (e.g., Vernon, 1971; Dunning, 1985; Kim & Lyn, 1986), later scholars modeled internationalization quadratically (e.g., Geringer, Beamish and daCosta, 1989; Hitt, Hoskisson & Kim, 1997). Delois and Beamish (1998) note that further research on the shape of the relationship is needed.

Third is the issue of how internationalization is measured. Most studies measure it as either foreign sales over total sales (Horst, 1973; Hughes, Logue & Sweeney, 1975; Buckley, Dunning & Pearce, 1978; Siddharthan & Lall, 1982; Kumar, 1984; Yoshihara, 1985; Buhner, 1987; Grant, Jammie & Thomas, 1988; Collins, 1990) or as foreign assets over total assets (Errunza & Senbet, 1981; Daniels & Bracker, 1989; Sambharya, 1996). In fact, it may be that each can contribute independently to explaining differences in firm financial performance.

Fourth, it seems plausible that the interaction of intensity of foreign sales and intensity of foreign assets may have explanatory power. Researchers and managers both should be interested in determining the degree of asset internationalization that best supports the firm's degree of sales internationalization

Finally, most studies have either considered the performance of MNCs versus domestic firms (Vernon, 1971; Horst, 1973; Hughes et al., 1975; Siddharthan & Lall, 1982; Kumar, 1984; Shaked, 1986; Michel & Shaked, 1986; Buhner, 1987; Fatemi, 1988; Collins, 1990), or the impact on performance of greater or lesser degrees of internationalization among MNCs (Buckley et al., 1978; Brewer, 1981; Rugman & McIlveen, 1985; Rugman et al., 1985; Kim & Lyn, 1986; Kim, Hwang & Burgers, 1989; Haar, 1989; Geringer et al., 1989). However, few studies have considered domestic firms versus MNCs together with relative performance among MNCs.

SCOPE OF THE ARTICLE

This paper is directed at responding to those needs. We test hypotheses concerning (1) the relative performance of domestic firms versus MNCs; (2) whether exporting is the better mode of internationalization; (3) whether the relationship between internationalization and firm financial performance is better modeled linearly or quadratically; (4) whether the relationship between internationalization and firm financial performance is better modeled using foreign sales over total sales, foreign assets over total assets or the two together; and (5) what interaction between foreign sales over total sales and foreign assets over total assets contributes best to firm financial performance.

The database consists of 103 firms in the international pulp and paper industry, based in thirteen countries (Australia, Canada, France, Germany, Ireland, Japan, Malta,

New Zealand, South Africa, Spain, Sweden, the UK, and the US). Most internationalization papers use single-country or, at best, two-country databases (a key exception is Rugman, Lecraw & Booth, 1985). Consequently, the use of an international database is another contribution of this paper. With proper country control variables, an international database allows us to assess whether Anglo-American-derived theories hold for countries with different political economies (Caves, 1989).

By internationalization, we mean the business done by a firm outside of its home market. That business may be broadly separated into sales abroad through exports or through local manufacture. The term “market” as used in this paper will generally refer to a country, unless used in an obvious other context such as “product market”.

This paper focuses on the relationship between international diversification and firm performance, *ceteris paribus*. It is not our intent in this paper to bring product diversification into the discussion, even though multinational companies often are involved in more than one line of business. The issue of dual diversification (the interaction between international diversification, product diversification and firm performance), while important, is outside of the scope of this paper.

HYPOTHESES DEVELOPMENT

The first question to investigate is whether or not internationalization benefits a firm. Theoretically, internationalization benefits a firm through diversification of risk to cash flows (Agmon & Lessard, 1977), and a combination of internalizing ownership advantages while leveraging location-specific comparative advantages (Dunning, 1977, 1985). Findings have varied substantially. Some studies have found a positive relationship as hypothesized (e.g., Kim & Lyn, 1986; Vernon, 1971). Others have found

no relationship (e.g., Brewer, 1981; Dunning, 1985; Rugman, Lecraw & Booth, 1985), a negative relationship (e.g., Siddharthan & Lall, 1982), or even an inverted U relationship (Geringer et al., 1989; Hitt et al., 1997).

While the evidence is unclear, we feel that the failure of some studies to find the hypothesized relationship is due more to methodological issues than to the non-existence of the relationship. For instance, two companies may have the same level of foreign sales over total sales, but one reaches the level mostly through exports, the other mostly through local manufacture. A fall in tariffs or transportation costs will benefit the exporter at the expense of the local manufacturer. Dock strikes or bad weather may harm the exporter while not much affecting the local manufacturer. The point is that even though the two companies are measured the same way for degree of internationalization, there is an important dimension that is not being measured. Consequently, we would expect to find no relationship when the two firm types are affected in an opposite manner, and perhaps a negative relationship if one type is negatively impacted by events while the other emerges unscathed. The reader can surely develop additional circumstances under which these two firm types will be impacted in different ways, resulting in a confounding of the relationship between firm financial performance and degree of internationalization. (We investigate this methodological issue later in this paper.)

Our hypothesis is in line with the theory on this topic:

H1: Firms with international sales will outperform firms with no international sales, *ceteris paribus*.

Next, we investigate whether or not exporting is a better mode of internationalization. In the general case, the alternative would be all other modes (FDI,

licensing, contract manufacture). However, in our case the alternative is mostly to FDI as in the pulp and paper industry there is very little licensing or contract manufacturing. We have no preconceived ideas on whether exporters should outperform FDIers. We do, though, believe that there will be a difference in performance. Our hypothesis is:

H2: The financial performance of exporters will differ from that of other types of internationalizers, *ceteris paribus*.

Third, we investigate whether the relationship between degree of internationalization and firm financial performance is better modeled linearly or quadratically. Earlier studies tended to model the relationship linearly, either because the idea of a quadratic relationship was foreign to the researchers or because the degree of internationalization in those earlier days was not sufficient for decreasing returns to manifest themselves. Within the last decade, though, several researchers have tested for a non-linear relationship between firm financial performance and degree of internationalization (Grant, Jammine & Thomas, 1988; Daniels & Bracker, 1989; Geringer et al., 1989; Hitt et al., 1997). The first two studies used earlier data and found no statistically significant negative impact on firm financial performance of high levels of internationalization. The latter two studies used more recent data and specifically tested for inverted U relationships. They found them.

An inverted U relationship means that (1) no international diversification and low international diversification are associated with lower firm performance, (2) a mid-range of international diversification is associated with higher firm performance, and (3) high levels of international diversification are associated with lower firm performance.

Greater internationalization benefits the firm up to a point after which more

internationalization is associated with decreased performance (Daniels & Bracker, 1989; Geringer et al., 1989; Hitt et al., 1997).

This rationale is based upon bounded rationality (Williamson, 1975). Managers can only absorb so much information and manage effectively in so many areas. Prahalad & Bettis (1986) make a similar argument concerning product diversification. Williamson did not apply his concept to managing across geographic (cultural, economic and political) boundaries, but the idea is the same. As the geographic scope of a company expands, the ability of top management to deal effectively with such a broad range of factors is constrained. For each country in which the corporation does business, top management at headquarters must deal with the ramifications of differences in language (verbal and non-verbal), social institutions, political systems, economic infrastructure, and so on. They must do so even when local management can guard them from day-to-day operating problems, as top management sets the over-all strategy for the corporation which must be based on an understanding of the country environments in which the firm operates. The complexity is even more daunting when the firm has overseas manufacturing operations, since operating and coordinating manufacturing facilities overseas is more complex than simply exporting.

As we are using more recent data, we will also predict an inverted U relationship:

H3: The relationship between firm financial performance and degree of internationalization will be an inverted U, *ceteris paribus*.

Fourth, we investigate whether the relationship between internationalization and firm financial performance is better modeled using foreign sales over total sales, foreign assets over total assets or the two together. Many studies have used foreign sales over

total sales alone (e.g., Dunning, 1985; Rugman, Lecraw & Booth, 1985; Shaked, 1986; Michel & Shaked, 1986; Collins, 1989; Haar, 1990). Others have used foreign sales over total sales and foreign assets over total assets, but in separate models (Errunza & Senbet, 1981; Daniels & Bracker, 1989; Sambharya, 1996). Yet, including foreign sales over total sales and foreign assets over total assets in the same model is under-studied.

If foreign sales over total sales and foreign assets over total assets truly represent different measures of internationalization, then one would expect that both of them would contribute to a model's explanatory power. Consequently, our hypothesis is:

- H4: Foreign sales over total sales and foreign assets over total assets represent separate measures of internationalization. As a result, when included simultaneously in a model, both will be statistically significant, *ceteris paribus*.

Finally, we investigate what interaction between foreign sales over total sales and foreign assets over total assets contributes best to firm financial performance. This is an understudied area. Firms can internationalize in different ways. Those with a low level of international assets are essentially exporters. Firms with high levels of international assets rely upon FDI for their internationalization.

It doesn't make much sense for our purposes to interact the two continuous variables in question, either in their linear or quadratic forms. The reason is that the results will only really tell us about the low end and the high end of the spectrum. Middle values of an interacted term could come from middle values of both first-order terms, from a high value of the sales term and a low value of the assets term, or from a low value of the sales term and a high value of the assets term.

If we divide each continuous variable into high, middle and low categories (one third of the values in each category) and interact them, we obtain a 3x3 matrix with nine cells. Of course, not all of the cells are feasible. For instance, it seems improbable that there would be any firms with low international sales but high international assets, or even a middle level of international assets.

Depending upon the industry, different configurations of sales and assets may be preferable. We have no preconceived ideas about the ideal configuration. Consequently, our hypothesis is:

- H5: Some configurations of low, middle and high foreign sales over total sales interacted with low, middle and high foreign assets over total assets will have a positive relationship with firm financial performance, *ceteris paribus*.

DATA, VARIABLE OPERATIONALIZATIONS AND MODELS

The database is 103 firms in the international pulp and paper industry. Data come from Worldscope. A single industry dataset controls for the fact that the economics of internationalization varies from industry to industry. The firms are headquartered in thirteen countries: Australia (1 observation), Canada (14), France (3), Germany (3), Ireland (2), Japan (21), Malta (1), New Zealand (1), South Africa (4), Spain (1), Sweden (1), UK (23) and US (28). Data are collected for 1994. Fifty-one of the firms do business overseas while fifty-two do not. Foreign sales as a percentage of total sales for all 103 firms (including those for which the value is 0) averages 19%. For those firms that actually have foreign sales, the value varies from 5% to 84%, with a mean of 32% and a median of 37%. These fifty-one firms that have international sales have foreign assets ranging from 0% to 85% of total assets, with a mean of 35% and a median of 36%.

As mentioned above, scholars must be concerned about whether or not internationalization theories, generally developed within the framework of an Anglo-American political economy, apply also to other political economies (Caves, 1989). Because of differences in political economies, we control for potential political-economic influences by using separate dummy variables for Canadian origin, Japanese origin, UK origin, other European origin, and remaining non-US origin. (This yields 7 observations that score a 1 for “Other Non-US Origin,” the smallest number of “1” scores for any of these dummy variables. There are 10 observations for “Other European,” the next smallest.) Their performance comparison is to companies originating in the US.

The variables have been operationalized as follows:

The **dependent variable**, firm performance, has been operationalized as market value divided by book value (both in local currency). This operationalization is similar to the “market value of common equity minus net worth” used by Errunza & Senbet (1981) . It focuses on how the market values the company, rather than on accounting-based measurements such as return on assets (ROA) or return on sales (ROS). Because capital flows fairly freely between the countries represented in this study, but accounting standards remain quite different, it is expected that market value over book value will be more comparable across the countries.

The **independent variables of interest** are:

DOMESTIC: A company with no foreign sales or foreign assets. We predict a negative parameter estimate.

EXPORTER: A dummy variable coded 1 if the firm has foreign sales but no foreign assets, 0 otherwise. We predict only that the parameter estimate will be statistically significant.

FSTS: Foreign sales (no matter whether exports or sales by overseas manufacturing subsidiaries) divided by total sales, both in local currency. We predict a positive parameter estimate.

*FSTS*²: FSTS squared. We predict a negative parameter estimate, consistent with an inverted U relationship.

FATA: Foreign assets divided by total assets, both in local currency. We predict a positive parameter estimate.

*FATA*²: FATA squared. We predict a negative parameter estimate, consistent with an inverted U relationship.

Hi-FSTS: A dummy variable coded 1 for firms with values of FSTS in the upper third of all FSTS values, 0 otherwise.

Mid-FSTS: A dummy variable coded 1 for firms with values of FSTS in the middle third of all FSTS values, 0 otherwise.

Lo-FSTS: A dummy variable coded 1 for firms with values of FSTS in the lower third of all FSTS values, 0 otherwise.

Hi-FATA: A dummy variable coded 1 for firms with values of FATA in the upper third of all FATA values, 0 otherwise.

Mid-FATA: A dummy variable coded 1 for firms with values of FATA in the middle third of all FATA values, 0 otherwise.

Lo-FATA: A dummy variable coded 1 for firms with values of FATA in the lower third of all FATA values, 0 otherwise.

Control variables are:

Total Assets: This is a control variable for size and is stated in thousands of US\$ for comparison purposes. There are two points of view on the relationship between firm size and firm performance. The first is that the relationship is positive, as larger firms may benefit from economies of scale and scope that are unavailable to smaller firms. The second is that the relationship is negative, as smaller firms are not subject to diseconomies associated with too large of an organization, specifically the inability of managers to adequately understand the details of divergent businesses and country environments. Morck & Yeung (1991) discuss this issue in more detail. Given the extent of internationalization evident in this

sample, and so the potential for failing to understand the business environment, we predict a negative parameter estimate.

Geographic Dummies: We construct five geographic dummy variables, coded 1 if the observation is from that country or geographic region, 0 if it is not. The dummies are for Canada, Japan, the UK, Other European, and Other Non-US. The excluded variable is for US-based observations.

Models

We use OLS regression to test the models, run on PC-SAS (version 6.12). The first model tests H1 (Non-domestic firms will outperform domestic firms) and H2 (the financial performance of exporters will differ from that of other types of internationalizers). It is:

$$\text{Market Value / Book Value} = \alpha + \beta_1 \text{Domestic} + \beta_2 \text{Exporter} + \mathbf{B}\mathbf{X}$$

where α is the intercept term, the β s are parameter estimates for their respective variables, \mathbf{B} is a vector of parameter estimates for the control variables, and \mathbf{X} is a vector of the control variables.

Hypothesis 3 (the relationship between firm financial performance and degree of internationalization will be an inverted U) goes beyond a simple dummy representation of degree of internationalization. Consequently, the models substitute continuous measures of degree of internationalization for the dummy measures in the previous model. There is a model in which degree of internationalization is measured as foreign sales over total sales and one which measures degree of internationalization as foreign assets over total assets:

$$\begin{aligned} \text{Market Value / Book Value} &= \alpha + \beta_1 \text{FSTS} + \beta_2 \text{FSTS}^2 + \mathbf{BX} \\ \text{Market Value / Book Value} &= \alpha + \beta_1 \text{FATA} + \beta_2 \text{FATA}^2 + \mathbf{BX} \end{aligned}$$

The following model tests H4 (Foreign sales over total sales and foreign assets over total assets represent separate measures of internationalization. As a result, when included simultaneously in a model, both will be statistically significant):

$$\begin{aligned} \text{Market Value / Book Value} &= \\ &\alpha + \beta_1 \text{FSTS} + \beta_2 \text{FSTS}^2 + \beta_3 \text{FATA} + \beta_4 \text{FATA}^2 + \mathbf{BX} \end{aligned}$$

Finally, we come to Hypothesis 5 (some configurations of low, middle and high foreign sales over total sales interacted with low, middle and high foreign assets over total assets will have a positive relationship with firm financial performance). We include all nine cells in the model, for the sake of completeness, but with the knowledge that some of the cells will have insufficient observations to allow statistical inference. Abbreviations used in the model are: LoS=Lo FSTS; MidS=Mid FSTS; HiS=Hi FSTS; LoA=Lo FATA; MidA=Mid FATA; HiA=Hi FATA; and terms such as LoSLoA are interactions of the two first-order terms (in this case, LoS and LoA). It is understood, also, that not all variables can appear in the model simultaneously. As this is exploratory research, we will run various combinations that drop different variables from the model in our search for the true relationship. The model is:

$$\begin{aligned} \text{Market Value / Book Value} &= \\ &\alpha + \beta_1 \text{LoS} + \beta_2 \text{MidS} + \beta_3 \text{HiS} + \beta_4 \text{LoA} + \beta_5 \text{MidA} + \beta_6 \text{HiA} + \\ &\beta_7 \text{LoSLoA} + \beta_8 \text{LoSMidA} + \beta_9 \text{LoSHiA} + \\ &\beta_{10} \text{MidSLoA} + \beta_{11} \text{MidSMidA} + \beta_{12} \text{MidSHiA} + \\ &\beta_{10} \text{HiSLoA} + \beta_{11} \text{HiSMidA} + \beta_{12} \text{HiSHiA} + \mathbf{BX} \end{aligned}$$

RESULTS

The correlation matrix indicates that high collinearity exists between some of the independent variables. This will reduce the statistical significance of the parameter estimates for those variables. Specifically, this could be a problem for our independent variables of interest. They are highly correlated with each other (FSTS, FSTS², FATA, and FATA² inter-correlated in the range of 0.80 to 0.95) and with the country/regional dummies. Alternative measures may be necessary and will be developed and tested in the discussion section if needed.

Table 1 shows the results of the regression runs for hypotheses one and two. Model 1 is the baseline model with just the control variables. The R² is 0.21, the adjusted R² is 0.16 and the F-value is 4.230 (prob>F=0.0008). The parameter estimate for firm size is statistically significant and negative, as predicted. It appears that, at least for this sample, smaller firms outperform larger firms. Of the country/regional dummies, only “Other Non-US countries” appear to outperform the US firms in the sample. The performance of UK firms and of Other European firms does not differ from that of US firms. The performance of Japanese and Canadian firms is below that of US firms. These results hold in the main in subsequent models.

Model 2 of Table 1 shows the results when the DOMESTIC and EXPORTER variables are added to the baseline model. The R² is 0.23, the adjusted R² is 0.17 and the F-value is 3.530 (prob>F=0.0013). The parameter estimate for DOMESTIC is statistically non-significant, perhaps due to collinearity with the dummies for UK (0.40), Japan (0.50) and Other Europe (0.40). This means that it is not possible to say whether or

not the financial performance of MNCs is greater than that of domestic firms. Hypothesis 1 is not supported.

Hypothesis 2 appears to be marginally supported: the parameter estimate for EXPORTER is statistically significant at the 0.105 level (two-sided). However, on closer examination, there is only one observation that scores a 1 for this dummy variable. All of the other firms score a 0. This is odd, as exporting is strong in the international pulp and paper industry. What this means is that out of the group of 51 MNCs in the dataset, only one has international sales but no international assets (i.e., it is an EXPORTER as defined above). Due to these results, we will re-define the DOMESTIC and EXPORTER variables and re-test the relationship in the discussion section.

Hypothesis 3 (the relationship between firm financial performance and degree of internationalization will be an inverted U) is not supported, nor is Hypothesis 4 (Foreign sales over total sales and foreign assets over total assets represent separate measures of internationalization. As a result, when included simultaneously in a model, both will be statistically significant). Table 2 shows the results of the regression runs for the relevant models. When entered separately, neither foreign sales over total sales (Model 3) nor foreign assets over total assets (Model 4) show evidence of an inverted U relationship with firm financial performance. (They also do not show a linear relationship if the quadratic term is dropped from the model.) Nor do they show statistically significant parameter estimates when both quadratic terms are entered simultaneously in the model (Model 5).

Needless to say, this is cause for thought. Again, we look to the correlation matrix and note strong collinearity that may result in an overstatement of the standard

deviations and so an understatement of the statistical significance of the parameter estimates. (Again, FSTS, FSTS², FATA, and FATA² inter-correlated in the range of 0.80 to 0.95; many correlations with the country dummies in the 0.35 to 0.55 range.) In the next section, we will attempt different measures of the constructs in an attempt to tease out relevant relationships.

Finally, we look at the results for Hypothesis 5 (some configurations of low, middle and high foreign sales over total sales interacted with low, middle and high foreign assets over total assets will have a positive relationship with firm financial performance). Because only three of the cells had sufficient observations (LoSLoA had 13 observations, MidSMidA had 9, and HiSHiA had 14), we only show the results for those cells and their associated first-order terms. They are in Table 3. Model 6 shows Lo-FSTS, Lo-FATA, and the LoSLoA interaction added to the baseline model. There are no statistically significant results. It does not appear that low levels of foreign sales over total sales, foreign assets over total assets, or the interaction between the two, results in anything different from average financial performance.

Model 7 shows Mid-FSTS, Mid-FATA and their interaction added to the baseline model. Mid-FSTS is positive and statistically significant, and Mid-FATA is negative and statistically significant at the 0.10 level. The interaction term MidSMidA is statistically significant only at the 0.12 level. The parameter estimate is negative. Given the high correlations between the first-order and interaction terms, it is not surprising that MidSMidA's significance level is what it is. The findings suggest that a middling level of foreign sales over total sales (first-order term) will result in better financial

performance but, when married to a middling level of foreign assets over total assets, financial performance will be worse.

The reason could be one of bounded rationality (Williamson, 1975). It is becoming more accepted that the true relationship between degree of internationalization and firm financial performance is an inverted U (with low and high level of internationalization resulting in lower performance than mid levels). At low levels of internationalization, the benefits are outweighed by the costs. At middle levels the opposite holds true. And at high levels of internationalization, senior managers are not able to effectively manage such a broad business.

Combining mid levels of foreign sales over total sales with mid levels of foreign assets over total assets could result in the same overload for managers. Whereas a mid level of internationalization may not be too much to handle, when combined with a mid level of foreign assets (which has, recall, a negative parameter estimate as a first-order term) it overwhelms the manager.

Model 8 shows the results for the interaction of Hi-FSTS with Hi-FATA. There are some strong statistically significant findings. Interestingly, Hi-FATA is positive and statistically significant at the 0.002 level 2-sided. Hi-FSTS is negative and not statistically significant on a 2-sided basis. The interaction term, HiSHiA, is negative and statistically significant. The interaction's negative parameter estimate is probably a legacy of the negative Hi-FSTS parameter estimate. That is, that while high levels of foreign assets over total assets are financially beneficial, they are not when combined with high levels of foreign sales over total sales.

The reason for this is undoubtedly the bounded rationality argument developed above.

DISCUSSION

Revised Models

The first topic to cover is that of the failure to find results for models 3 through 8 (Hypotheses 3 and 4). It is possible that the relationship between degree of internationalization (whether measured as foreign sales over total sales or foreign assets over total assets) and firm financial performance is more complex than simply linear or quadratic. The six first-order degree of internationalization dummy variables developed to test Hypothesis 5 could serve well to test the relationship between degree of internationalization and firm financial performance. The only difference is that in the following tests the variables are means differenced so that it is possible to change the dummy variables included in the model and have the results remain the same for all unchanged variables.

We formulate an alternative model to Model 5 (which had FSTS and FSTS²), and call it Model 3_A:

$$\text{Market Value / Book Value} = \alpha + \beta_1 \text{DOMESTIC} + \beta_2 \text{Lo-FSTS} + \beta_3 \text{Mid-FSTS} + \beta_4 \text{Hi-FSTS} + \mathbf{BX}$$

The beauty of this model is that it allows the domestic firms to show their own results, something that is not possible to do when foreign sales over total sales is treated as a continuous variable. Table 4 shows the results. Model 3_A shows, as we saw earlier, that domestic firms fare no better than average. What about the internationalized firms? It appears that, while low levels of foreign sales over total sales are associated with

average performance, middling levels are associated with higher-than-average performance and high levels of foreign sales over total sales are associated with lower-than-average performance. This describes an inverted U shape, as hypothesized.

Model 4_A considers foreign assets over total assets as opposed to foreign sales over total sales. The results here are not as strong as for foreign sales over total sales. Mid-FATA is the only variable of interest that approaches statistical significance. It is negative at the 0.10 2-sided level. This would seem to describe a non-inverted U.

Finally, Model 5_A examines all of the foreign sales over total sales and foreign assets over total assets dummy variables in the same model. The results indicate that Models 3_A and 4_A may have suffered from missing variables. That is, parameter estimates are not less significant in this model compared to the other two, indicating that there does not appear to be collinearity problems with including the foreign sales over total sales and foreign assets over total assets variables together. In fact, virtually all of the parameter estimates of interest are more statistically significant in the combined model than in the individual models (with the exception of Lo-FSTS which is still nowhere near statistical significance). This would seem to indicate that Models 3_A and 4_A suffered from missing variables, specifically those variables included in the other model.

In particular, the non-inverted U shape of the relationship between foreign assets over total assets and firm financial performance appears more prominently. Higher levels of foreign assets over total assets appear to be associated with higher levels of firm financial performance. These levels are just as high as with foreign sales over total sales (in the range of 40% to 85%, with means that are virtually the same at about 60%), so why the difference in findings? One explanation may be that many firms have purchased

existing operations overseas, so that much of the strain of start-up is alleviated through an on-going concern. Firms that rely more on exports for internationalization may have to work harder. Alternatively, it could simply be that political/economic factors such as exchange rates favored those who internationalized using FDI versus exports.

In short, it appears that foreign sales over total sales and foreign assets over total assets can individually contribute explanatory power when included in the same model of firm financial performance regressed on degree of internationalization.

Implications

For researchers, the implications of this finding are clear. Scholars must investigate further the relationship between foreign sales over total sales, foreign assets over total assets and firm financial performance. For managers, findings of this kind are helpful if they are based upon the relevant industry. For pulp and paper industry executives, it appears as though foreign sales over total sales has the usual inverted U shape but that foreign assets over total assets has a slight non-inverted U. It could be that the best way to internationalize in this industry is through FDI, perhaps the purchase of existing firms overseas.

Caveats

This is a single industry study. For researchers, that limits the generalizeability of the findings to the sample industry and perhaps to similar industries. For managers, this “limitation” is perhaps a blessing. The relevancy of the findings are known. Too often, multi-industry studies yield results that are ostensibly universal but in fact may not apply to the manager’s industry due to its unique characteristics.

TABLE 1
Regression Results
Dependent Variable = Market Value / Book Value

	Model 1	Model 2
Intercept	0.995***	1.012***
(t stat)	8.445	8.402
Firm Size	-4.9E-8**	-5.6E-8**
(t stat)	-2.222	-2.383
Canada Dummy	-0.385**	-0.373**
(t stat)	-2.091	-1.999
Europe Dummy	-0.385	-0.276
(t stat)	-1.358	-0.951
Japan Dummy	-0.381**	-0.363*
(t stat)	-2.299	-1.975
UK Dummy	0.428	0.303
(t stat)	1.290	0.892
Other Non-US	0.468*	0.478*
(t stat)	1.938	1.956
DOMESTIC	--	-0.024
(t stat)	--	-0.251
EXPORTER	--	-0.996 [†]
(t stat)	--	-1.635
N	103	103
R ²	0.209	0.231
Adjusted R ²	0.160	0.166
F	4.230	3.530
Prob > F	0.0008	0.0013

[†] = significant at the 0.1054 level, 2-sided

* = significant at the 0.10 level, 2-sided

** = significant at the 0.05 level, 2-sided

*** = significant at the 0.01 level, 2-sided

TABLE 2
Regression Results
Dependent Variable = Market Value / Book Value

	Model 3	Model 4	Model 5
Intercept	0.937***	0.944***	0.924***
(t stat)	7.027	7.178	6.825
Firm Size	-4.7E-8*	-5.5E-8**	-5.3E-8**
(t stat)	-1.934	-2.167	-2.071
Canada Dummy	-0.367*	-0.374**	-0.358*
(t stat)	-1.977	-2.009	-1.910
Europe Dummy	-0.287	-0.356	-0.249
(t stat)	-0.956	-1.231	-0.817
Japan Dummy	-0.326*	-0.320*	-0.304 [‡]
(t stat)	-1.797	-1.756	-1.642
UK Dummy	0.378	0.414	0.354
(t stat)	1.128	1.235	1.041
Other Non-US	0.499**	0.492**	0.508**
(t stat)	2.037	2.010	2.057
FSTS	0.008	--	0.009
(t stat)	0.990	--	0.067
FSTS ²	-0.0002	--	-0.0009
(t stat)	-1.231	--	-0.501
FATA	--	0.008	0.009
(t stat)	--	0.972	0.650
FATA ²	--	-0.0001	-0.00007
(t stat)	--	-0.988	-0.408
N	103	103	103
R ²	0.223	0.217	0.223
Adjusted R ²	0.157	0.151	0.145
F	3.375	3.264	2.730
Prob > F	0.0019	0.0025	0.0055

‡ = significant at the 0.104 level, 2-sided

* = significant at the 0.10 level, 2-sided

** = significant at the 0.05 level, 2-sided

*** = significant at the 0.01 level, 2-sided

TABLE 3
Regression Results
Dependent Variable = Market Value / Book Value

	Model 6	Model 7	Model 8
Intercept	0.997***	0.959***	0.922***
(t stat)	7.858	8.243	7.779
Firm Size	-4.4E-8*	-6.3E-8**	-5.0E-8**
(t stat)	-1.946	-2.899	-2.273
Canada Dummy	-0.393**	-0.387**	-0.358**
(t stat)	-2.091	-2.216	-2.030
Europe Dummy	-0.466	-0.331	-0.227
(t stat)	-1.602	-1.246	-0.793
Japan Dummy	-0.391**	-0.323**	-0.306*
(t stat)	-2.257	-1.998	-1.892
UK Dummy	0.468	0.386	0.442
(t stat)	1.397	1.244	1.356
Other Non-US	0.510**	0.570**	0.544**
(t stat)	2.069	2.528	2.337
Lo-FSTS	-0.372	--	--
(t stat)	-1.210	--	--
Lo-FATA	0.187	--	--
(t stat)	0.619	--	--
LoSLoA	0.257	--	--
(t stat)	0.562	--	--
Mid-FSTS	--	0.967***	--
(t stat)	--	3.764	--
Mid-FATA	--	-0.340*	--
(t stat)	--	-1.649	--
MidSMidA	--	-0.571	--
(t stat)	--	-1.565	--
Hi-FSTS	--	--	-0.346
(t stat)	--	--	-1.487
Hi-FATA	--	--	0.909**
(t stat)	--	--	3.179
HiSHiA	--	--	-0.738*
(t stat)	--	--	-1.855
N	103	103	103
R ²	0.227	0.342	0.308
Adjusted R ²	0.152	0.279	0.241
F	3.028	5.374	4.594
Prob > F	0.0032	0.0001	0.0001

* = significant at the 0.10 level, 2-sided

** = significant at the 0.05 level, 2-sided

*** = significant at the 0.01 level, 2-sided

TABLE 4
Regression Results
Dependent Variable = Market Value / Book Value

	Model 3 _A	Model 4 _A	Model 5 _A
Intercept	0.999***	1.042***	1.052***
(t stat)	7.840	8.093	8.504
Firm Size	-6.1E-8**	-5.3E-8**	-6.6E-8***
(t stat)	-2.477	-2.127	-2.761
Canada Dummy	-0.393**	-0.380**	-0.414**
(t stat)	-2.140	-2.048	-2.341
Europe Dummy	-0.205	-0.475*	-0.268
(t stat)	-0.696	-1.655	-0.930
Japan Dummy	-0.312*	-0.355*	-0.309*
(t stat)	-1.681	-1.896	-1.733
UK Dummy	0.336	0.409	0.289
(t stat)	1.022	1.232	0.911
Other Non-US	0.486**	0.534**	0.561**
(t stat)	2.012	2.165	2.400
Lo-FSTS	-0.046	--	-0.078
(t stat)	-0.390	--	-0.522
Mid-FSTS	0.327**	--	0.478***
(t stat)	2.456	--	3.462
Hi-FSTS	-0.225*	--	-0.298**
(t stat)	-1.745	--	-2.023
DOMESTIC	-0.055	0.067	-0.102
(t stat)	-0.478	0.568	-0.914
Lo-FATA	--	0.098	0.096
(t stat)	--	0.816	0.655
Mid-FATA	--	-0.199*	-0.358***
(t stat)	--	-1.643	-2.926
Hi-FATA	--	0.168	0.262*
(t stat)	--	1.308	1.961
N	103	103	103
R ²	0.263	0.240	0.333
Adjusted R ²	0.191	0.166	0.252
F	3.679	3.258	4.127
Prob > F	0.0006	0.0017	0.0001

* = significant at the 0.10 level, 2-sided

** = significant at the 0.05 level, 2-sided

*** = significant at the 0.01 level, 2-sided

REFERENCES

- Agmon T. and Lessard D. R. (1977). Investor recognition of corporate international diversification. *Journal of Finance*, 32 (September), 1049-55.
- Brewer, H.L. 1981. Investor Benefits from corporate international diversification . *Journal of Financial and Quantitative Analysis*. March : 113-124.
- Buckley, Peter J., John H. Dunning and Robert D. Pearce. 1978. The influence of firm size, industry, nationality and degree of multinationality on the growth and profitability of the world's largest firms 1962-1972. *Weltwirtschaftliches Archiv*. 114:243-257
- Buhner, Rolf. 1987. Assessing international diversification of West German corporations. *Strategic Management Journal*. 8: 25-37.
- Carpano, Claudio, James J. Chrisman and Kendall Roth. 1994. International strategy and environment: An assessment of the performance relationship. *Journal of International Business Studies*. 25(2):325-342.
- Caves, Richard. 1989. International differences in industrial organization. In Richard Schmalensee and Robert D. Willig (eds.), *Handbook of Industrial Organization*. Amsterdam: North-Holland, pp1226-1250.
- Collins, J. Markham. 1990. A market performance comparison of U.S. firms active in domestic, developed and developing countries. *Journal of International Business Studies*. 21(2):271-287.
- Daniels John D. and Bracker J. 1989. Profit performance: Do foreign operations make a difference. *Management International Review*. 29. 47-56.
- Delios, Andrew and Paul W. Beamish. 1998. Geographic scope, product diversification and the corporate performance of Japanese firms. Working Paper.
- Dunning, John. 1985. The United Kingdom. In *Multinational enterprises, economic structure and international competitiveness*. John Dunning (ed.). Chichester and New York: John Wiley and Sons.
- Errunza, Vihang R. and Lemma W. Senbet. 1981. The effects of international operations on the market value of the firm : theory and evidence. *The Journal of Finance*. 36 (May) : 401-417.
- Fatemi, Ali M. 1988. The effect of international diversification on corporate financing policy. *Journal of Business Research*. January:17-30.
- Geringer J.M., Paul W. Beamish and R.C. daCosta. 1989. Diversification strategy and internationalization: Implications for MNE performance. *Strategic Management Journal*. 10:109-119.
- Grant, R.M., Azar P. Jammine and Howard Thomas. 1988. Diversity, diversification and profitability among British manufacturing companies 1972-84. *Academy of Management Journal*. 31(4) :771-801.

- Haar, Jerry. 1989. A comparative analysis of the profitability performance of the largest U.S., European and Japanese multinational enterprises. *Management International Review*. 29:5-18.
- Hitt, M. A., R.E. Hoskisson & H. Kim. 1997. International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal*, 40:767-798.
- Horst T.E. 1973. Firm and industry determinants of the decision to invest abroad. *Review of Economics and Statistics*. 54(August):258-266.
- Hughes, John S., Dennis E. Logue and Richard James Sweeney. 1975. Corporate international diversification and market-assigned measures of risk and diversification. *Journal of Financial and Quantitative Analysis*. 627-637.
- Kim, W. C., P. Hwang and W.P.Burgers. 1989. Global diversification strategy and corporate profit performance *Strategic Management Journal*. 10: 45-57
- Kim, W. C., P. Hwang and W.P.Burgers. 1993. Multinationals diversification and the risk return trade off. *Strategic Management Journal*. 14 : 275-286
- Kim, Wi Saeng and Esmeralda O. Lyn. 1986. Excess market value, the multinational corporation and Tobin's q ratio. *Journal of International Business Studies*. Spring: 119-125.
- Kumar, A. 1984. Comparative analysis of U.K. domestic and international firms. In *New theories of the multinational enterprise*. A.R. Rugman (ed.). New York: St. Martin's Press.
- Michel, A. & Israel Shaked. 1986. Multinational corporations vs domestic corporations: Financial performance and characteristics. *Journal of International Business Studies*. 16:89-100.
- Morck, R., & B. Yeung. 1991. Why investors value multinationality. *Journal of Business*, 64(2): 165-187.
- Prahalad, C. K. and Richard Bettis. 1986. The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7:485-501.
- Rugman, Alan M., Donald J. Lecraw and L.D. Booth. 1985. *International business: Firm and environment*. New York: McGraw Hill.
- Rugman, Alan and John McIlveen. 1985. Canadian multinationals: Identification, performance and strategic management. *Management International Review*. 23:4-14.
- Sambharya, Rakesh. 1996. Foreign experience of top management teams and international diversification strategies of U.S. multinational corporations. *Strategic Management Journal*. 17:739-746.
- Shaked, Israel. 1986. Are multinational corporations safer? *Journal of International Business Studies*. Spring:83-106.

- Siddharthan, N. and S. Lall. 1982. Recent growth of the largest U.S. multinationals. *Oxford Bulletin of Economics and Statistics*. 44(February):1-13.
- Vernon, Raymond. 1971. *Sovereignty at bay: The multinational spread of U.S. enterprises*. New York: Basic Books.
- Williamson, Oliver E. 1975. *Markets and hierarchies: Analysis and antitrust implications*. New York: Free Press.
- Yoshihara, Hiro. 1985. Multinational growth of Japanese manufacturing enterprises in the postwar period. *Proceedings of the Fuji international conference on business history*. Tokyo: University of Tokyo Press.