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International Diversification of the Lower 400 Firms of the S&P 500 Index

E. Tylor Claggett and Danny M. Ervin

During the twelve year period from 1992 through 2003, little overall change occurred in international business activity within a representative group of approximately 100 large, U.S. domestic and multinational firms (Claggett & Stutzman, 2002; Claggett & Ervin, 2005). These results were unexpected given the focus and attention on “globalization” of the business world

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during the preceding decade (Ip, 1999).¹ Therefore, it is possible the supposed international business growth may have taken place within the next tier of U.S. firms during the examination period.

This research examines recent, more appropriate data from 1998 through 2004 for a second group of firms, the lower 400 of the S&P 500, to determine if the earlier published findings are true for the slightly smaller and less prominent firms. Or has there been a recent significant change in the amount of international business activity by these firms?

Background

During the 1990s, investment professionals and academics were advocating the virtues of diversifying portfolios with international securities (Chan, Hwang, & Burgers, 1993). It was demonstrated increased exposure to international business activity, either direct or indirect international investment, would represent enhanced diversification within the investor’s existing portfolio (Chan et al., 1993). Other researchers, on the other hand, were finding

evidence that investors did not diversify interna-tionally to a great extent (Baxter & Jermann, 1997).

It is plausible the typical passive investor, holding a broad U.S. portfolio, may experience increased portfolio internationalization if more of the held firms were engaging in increased levels of international business. The investor may be gaining the highly recommended benefits of international diversification from interactive business growth. Given the findings of the earlier papers, apparently, this was not the case for the S&P 100 firms.

Clearly, portfolio the management implications are important if a noteworthy increase in overseas business activity exists within the group of lower 400 S&P firms. Specifically, with increased diversification, investors can expect the same (or higher) returns with lower (or the same) risk, effectively moving the efficient investment frontier from right to left. This would be the case if lower 400 S&P firms were held in the portfolio and their international business activities yield more and more

returns that are less than perfectly correlated with the returns from their U.S. business activities.

Mathur and Hanagan (1983) assert that investment in U.S. multinational firms may possess unique advantages for achieving the desired effects of international diversification. Such an approach has the advantage of no additional transaction costs and exposes the investor to less risk, if multinational companies are duly knowledgeable about their particular lines of business in foreign countries. As an example, Ford Motor Company and General Motors Corporation are arguably more knowledgeable about automobile business opportunities in overseas markets than most, if not all, professional money managers.

For these reasons, the domestic portfolio featuring multinational firms may be superior (with respect to risk and return) to the domestic portfolio utilizing other methods of international diversification studied (Tamir & Lessard, 1977).

With respect to other methods, there are several well-known techniques for the U.S. investor to accomplish international diversification including direct investment in foreign firms, purchasing either international or global mutual funds or buying American Depository Receipts (ADRs). Unfortunately, a

variety of constraints and circumstances may exist which inhibit the use of such techniques. Many attractive foreign multinational corporations derive much of their business in the U.S. market. Therefore, the American investor may not be diversifying his or her portfolio as much as believed by taking direct or indirect positions in such firms. Other issues include limited access to information, political and sovereign risk, host country regulations and legal system differences, cultural and language barriers, accounting and reporting differences, exchange rate risk, transactions costs, etc.

Data

Our measures of the size (i.e., allocation) of a U.S. multinational firm's foreign operations are derived from the proportion(s) of international sales revenue (in U.S. dollars) to the total revenue (both domestic and foreign) of the firm.² The raw data for this study is from **COMPUSTAT**, which includes annual sales revenue by geographic area for the seven-year period, 1998 through 2004. The data originated from 10K reports, filed with the SEC, and appropriate annual reports. Historical data for this seven-year period provide a reasonable extension of the earlier studies and reflects the most recent data available. Firms

reporting such figures have the option to use and define up to five geographic areas per fiscal year. For example, one firm may report annual sales information for an area defined as Asia while a second firm may report annual sales information for an area defined as Japan (**COMPUSTAT**, 2002, p. 316). Firm data are self reported and, largely, provided at the option of the firm. Despite these shortcomings, there was no attempt to modify the information.

Companies selected for this study are essentially those found in the lower 400 of the S&P 500 index during the seven-year period. Of course the index's firm list, from year-to-year, changed slightly as a result of a few additions, deletions and mergers. Furthermore, many firms, such as most financial institutions (e.g. banks), utilities and railroads, etc., were not included as geographic revenue information was not provided or there were observed data inconsistencies. Fortunately, over 200, or more than half, of the lower 400 firms provided the appropriate and useable data to **COMPUSTAT** for all seven years. Regardless of the month when the firm's fiscal year began, observations were grouped according to the calendar when the firm's fiscal year ended. This avoided unnecessary and arbitrary data matching issues.

Methodology

Our assessment of international operations by the selected U.S. firms reflect, not only the proportion of aggregate foreign sales revenue, but the utilization of the relative international revenue index (IRI) developed in the earlier papers as well. Both of these are measures of foreign business exposure during a given year, and both are necessary because they emphasize different aspects of international diversification. IRI measures the degree of diversity in foreign revenues and addresses the issue of how dependent a firm is on one or more global markets while aggregate foreign revenue measures the total foreign business exposure of the given firm.³

The IRI of this study is based on the format of the Herfindahl-Hirschman Index (Hirschman, 1964). The Herfindahl-Hirschman Index considers both the number of firms within an industry and the size of each firm's respective market share. Similarly, the IRI considers the number of markets (both domestic and foreign) in which each firm participates and its respective revenue proportion in each market. The yearly

IRI value for each firm is calculated as follows:

$$IRI_{iy} = \frac{10,000}{\sum_{g=1}^m (PS_{iyg})^2}$$

where PS_{iyg} is the percentage of sales revenue for firm i , during year y , in the g^{th} market ($m = 5$ is the maximum number of markets allowed by **COMPUSTAT**). For example, if a firm had 100 percent of its sales revenue in only one market (i.e., the domestic market), its IRI_{iy} would be equal to one (1). Of course, this value means the firm is not internationally diversified. At the other end of the IRI scale, the maximum possible IRI_{iy} value is five (5). This value can occur only when a firm reports 20 percent of its yearly sales revenue in each of five geographic markets. Inclusion of non-multinational firms lowers the mean and sets the lower limit of the range for both the aggregate foreign sales revenue proportions and the IRI values.

Results

Annual aggregate statistics for both measures of

international business exposure are revealed in Tables 1 and 2. The most noticeable feature is the pronounced upward trend for both the foreign percentage of revenue and IRI concentration values over the seven-year period. This feature is of great consequence because it differs significantly from previous findings associated with the S&P 100 equities and, therefore, there are major portfolio management implications. The preliminary reaction is portfolios containing equity securities of the lower 400 firms of the S&P 500 have experienced increasing international diversification during the period, 1998-2004.

In addition, the magnitudes of the international revenue percentage mean indicate noteworthy international business exposure with the lower 400 firms. These firms appear to have the same 30 plus percent recorded for the S&P 100 firms (Claggett and Ervin, 2005) during the last three years of the examination period.

Table 1
Aggregate International Revenue Percentages by Year

| Year | Count | Range | Equally Weighted | | Revenue Weighted | |
|------|-------|----------|------------------|-------|------------------|-------|
| | | | Mean* | Sigma | Mean** | Sigma |
| 1998 | 257 | 0 – 90.2 | 16.52 | 19.66 | 15.54 | 18.72 |
| 1999 | 209 | 0 – 90.8 | 26.28 | 20.19 | 22.01 | 19.18 |
| 2000 | 205 | 0 – 90.3 | 29.14 | 19.02 | 24.52 | 18.59 |
| 2001 | 208 | 0 – 91.0 | 29.55 | 19.82 | 23.53 | 19.38 |
| 2002 | 205 | 0 – 91.7 | 31.38 | 19.90 | 25.61 | 20.26 |
| 2003 | 205 | 0 – 91.6 | 34.19 | 21.88 | 27.79 | 21.90 |
| 2004 | 211 | 0 – 84.5 | 34.62 | 21.79 | 28.52 | 21.66 |

* Mean and standard deviation over seven-year period 28.40% and 21.07%

** Mean and standard deviation over seven-year period 23.65% and 19.96%

Table 2
International Revenue Index (Concentration) by Year

| Year | Count | Range | Equally Weighted | | Revenue Weighted | |
|------|-------|----------|------------------|-------|------------------|-------|
| | | | Mean* | Sigma | Mean** | Sigma |
| 1998 | 257 | 1 – 3.97 | 1.47 | 0.61 | 1.41 | 0.52 |
| 1999 | 209 | 1 – 3.75 | 1.76 | 0.65 | 1.59 | 0.57 |
| 2000 | 205 | 1 – 3.86 | 1.84 | 0.63 | 1.67 | 0.58 |
| 2001 | 208 | 1 – 3.77 | 1.86 | 0.68 | 1.65 | 0.61 |
| 2002 | 205 | 1 – 3.83 | 1.93 | 0.71 | 1.71 | 0.65 |
| 2003 | 205 | 1 – 3.97 | 1.99 | 0.74 | 1.77 | 0.70 |
| 2004 | 211 | 1 – 3.99 | 2.04 | 0.77 | 1.83 | 0.74 |

* Mean and standard deviation over seven-year period 1.827 and 0.7055

**Mean and standard deviation over seven-year period 1.654 and 0.6260

A second contradiction with the earlier studies is the relatively smaller means of the revenue weighted aggregate statistics when compared to equally weighted counterparts. This implies the larger firms

within the sample had less international business exposure than the smaller, perhaps more specialized, firms. These results are significantly different from those of the earlier two studies

that highlighted S&P 100 firms.

Table 3 contains the results of two Kruskal-Wallis One-Way ANOVA tests. These results indicate very statistically

Table 3
Kruskal-Wallis One-way Anova Results

| Year | Count | International | IRI | Conversion of USD to:* | |
|------------|-------|----------------------------------|------------|------------------------|-------|
| | | Revenue Percentage Mean Ranks | Mean Ranks | Euro | Yen |
| 1998 | 257 | 484.89 | 486.63 | 0.854 | 130.9 |
| 1999 | 209 | 709.45 | 715.41 | 0.939 | 113.8 |
| 2000 | 205 | 774.97 | 782.62 | 1.085 | 107.9 |
| 2001 | 208 | 780.82 | 782.40 | 1.117 | 121.6 |
| 2002 | 205 | 818.82 | 821.21 | 1.061 | 125.2 |
| 2003 | 205 | 870.68 | 855.18 | 0.885 | 116.0 |
| 2004 | 211 | 877.88 | 873.61 | 0.805 | 108.2 |
| Chi Square | | 139.65 | 133.81 | | |
| df | | 6 | 6 | | |
| p-value | | < 0.0001 | < 0.0001 | | |

* Yearly average calculated as the average of all ask prices for the year
Source: <http://www.oanda.com/convert/fxhistory>

significant and well-defined increases in international business activities over the examination period for the lower 400 firms. This is true with respect to both the aggregate foreign revenue and the IRI concentration measures. Furthermore, one can not help but notice the steady and consistent nature of the increases for both measures over the entire examination period.

In the Claggett and Ervin (2005) paper, international business activity appeared to be greater (although not statistically significant) for the years with a weaker dollar. More generous accounting translations during those years seemed like the logical explanation for this casual observation; however, no such

clear relationship emerges in this study; nevertheless, and for the reader's convenience, annual U.S. dollar to euro and Japanese yen exchange rates are also provided in Table 3.⁴ The relationship between international business activity and the strength of the dollar has been the subject of much research. It is complex and still calls for further investigation which is beyond the scope of this study.

Conclusions and Future Research

These findings strongly imply investors and money managers should have considered lower 400 equity securities for passive enhancement of international diversification during the

period, 1998-2004. This is in direct contrast to the results of previous studies (Claggett & Stutzman, 2002 and Claggett & Ervin, 2005) that suggest relatively little change in both the proportion of business done overseas and the degree of diversity among world-wide geographic markets for firms making up the S&P 100 for the period, 1992-2003. Furthermore, and according to recent *The Wall Street Journal* articles (Laise, 2005; Clements, 2005), many Wall Street strategists and financial planners are currently advocating even more exposure to international equity opportunities. This recommended active approach (with all of the previously mentioned, possible negative

consequences) may be largely unnecessary if the trend found in this study continues for small cap firms and/or the lower 400 firms of the S&P 500.

Although the S&P 100 firms may have experienced a plateau with respect to their international business activities, the findings in this paper are convincing evidence the lower 400 firms of the S&P 500 have been expanding their international businesses. Perhaps even more recent increases in international business activities have occurred within smaller firms not part of the S&P 500. In addition, various industries have undoubtedly witnessed different amounts and growth rates of international business during the recent past. Until the appropriate data is examined, these questions go unanswered.

Suggestions for further research are many. To verify the suspected shift in the efficient investment frontier from right to left, one approach could be to set up and compare two relatively well matched portfolios. The portfolios could be created by identifying pairs of matched firms (size, SIC code, etc.) within the population of lower 400 S&P firms. Each paired firm could then be assigned to one of the portfolios according to whether it experienced higher or lower international business activity as indicated by the two measures used in this paper. Finally, each portfolio's return and volatility

of returns could be compared over the appropriate examination period(s). The same methodology could be employed to study portfolios of smaller firms that are not part of the S&P 500 or portfolios consisting of firms in specific industries.

Acknowledgement

This article uses appropriate data to extend two earlier articles (Claggett & Stutzman, 2002; Claggett & Ervin, 2005). The previous authors found little overall change in international business activity within a representative group of approximately 100 large, multinational U.S. domestic firms during the twelve year period from 1992 through 2003. The earlier studies focused on firms that comprise the S&P 100 while this study features firms that encompass the lower 400 firms of the S&P 500 from 1998 through 2004. The findings of this paper are very different in that these slightly smaller and less prominent domestic firms exhibited major increases in total international business activity and as well as more diversification among specific global markets. Ostensibly, investors and money managers would have gained increased international diversification by merely holding lower 400 equity securities during the examination period. They should seriously consider these results in their future decisions regarding international diversification.

Endnotes

1. Unfortunately, the author did not attempt to quantify recent trends relative to this form of diversification.

2. The use of sales revenue to measure business exposure in foreign markets has the appeal of avoiding issues such as where the goods are produced vs. where they are sold, where the firm has placed its resources, and the proportion of foreign raw materials and intermediate parts. Unlike foreign trade balances and exports, which measure cross-border transactions for the most part, foreign sales includes goods produced overseas and sold overseas by U.S. multinational firms as well as goods produced in the U.S. and sold overseas. The major concern is whether the U.S. investor has the business exposure. Foreign sales versus total sales is one variable for international diversification used by Mathur, Singh, and Gleason (2001) for many of the same reasons. Furthermore, many international sales come about via U.S. firms selling their products to second or intermediary firms that, in turn, sell the product overseas. Therefore, in all likelihood, the actual amount of foreign sales revenue is understated.

3. In some cases, domestic firms reported the majority of their sales in a given year were concentrated in one or more foreign markets. Such firms

may provide U.S. investors with more international diversification (as measured by a higher percentages of foreign sales) than domestic companies that reported a minority of their sales spread across several foreign markets (as measured by an IRI measure). For example, if firm A reports 60 percent of its sales in the U.S. and 40 percent of its sales in a foreign market while firm B reports 40 percent of its sales in the U.S. and 60 percent of its sales in a foreign market, both would show the same IRI measure, but firm B obviously provides the U.S. investor with more international business exposure and, hence, more international diversification.

4. During this study's examination period, FASB Statement No. 52 (SFAS 52) impacted GAAP in that it prescribed how firms were to translate local 'functional' currencies into dollars (using a so called 'triangulation' method) during the transition period, January 1, 1999 through December 31, 2001, plus the following six months when local currencies were still legal tender. Consequently, there may have been significant year-to-year changes in the way the companies of this study converted foreign revenues into dollar equivalents.

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