Measuring the Impact of Globalization:
An Analysis of the Risk and Return of Multinational Firms

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2/28/01

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Abstract: There have been several debates in the literature over the issue of multinational firms and their impact on profitability and risk. Previous literature suggests that multinational firms decrease their systematic risk owing to the diversification benefit of having cash flows in different countries. More recent empirical evidence has surfaced suggesting the contrary in that multinationals may increase their risk due to an increase in the standard deviation of cash flows from such additional risk factors as political risk, exchange rate risk, and information asymmetry. In conjunction with lower risk, it has been posited that firms have higher leverage. Empirical studies on profitability have shown similar rates of return for both domestic and international firms. Through the use of pooled regression analysis this paper finds support for the hypothesis that multinational firms experience lower debt, and lower profitability.

INTRODUCTION

The goal of the corporation is to maximize shareholder value. In exchange for the investment that they have made in the company, shareholders have the expectation for the highest return on their investment with a particular risk exposure. Management, the agent, can improve shareholder value by either increasing return or reducing risk. On the surface this seems like a very simple premise. In order to determine the return, we must be able to measure the risk involved. We measure risk in two ways. First, there is the risk that is caused by random events that are unique to a particular firm, which is called diversifiable, or unsystematic risk. Secondly, there is risk that stems from market factors that affect most firms, such as inflation, recessions, high interest rates, etc that is undiversifiable or systematic in nature. Shareholders are most concerned with systematic risk. Risk is unavoidable, although it is definable. Given that risk is unavoidable, the first question for shareholders becomes where will they incur the least amount of risk, while gaining the best return. When assessing where the highest correlation of these two factors will be found, the decision factor is whether the maximization of wealth will take place in the domestic verses international markets. While the optimal strategy is an important consideration, this paper

does not address it. The focus of this paper shall remain strictly on the determination of the relationship between risk-return based on the degree of internationalization.

INTERNATIONALIZATION and RISK-RETURN of the FIRM

Degree of Internationalization

International business literature does not provide a consistent result in determining that internationalization will lead to an increase in profitability or lower risk. As we survey the literature, the first thing we note is that the research focused on shareholder returns in the multinational corporation (*MNC*) relative to the returns obtainable from a similar purely domestic firm, Reeb, Kwok, and Baek (1998). As we move forward over time, purely domestic firms are more difficult to identify, as even the smallest firms, through the advent of technology and communication, are able to operate on an international basis. There is also a portion of research, Shapiro (1978), which focuses on the diversification benefit that accrues to MNC's that have cash flows in less than perfectly correlated markets. This is not unlike the concept of portfolio diversification. However, what this portion of the research still does not provide is to what extent globalization impacts this benefit, if at all. What we are searching for is the degree of globalization or more commonly referenced as degree of internationalization (DOI). This task seems a bit daunting and somewhat arbitrary.

Despite the theoretical and practical application of validating theories of international business, there remains no clear definition, which can be estimated with any degree of accuracy, a measurement of the degree of internationalization (*DOI*) for a firm. Through the use of loosely structured or even unstructured inductive frameworks of the instrumental approach, some scholars have tried to infer DOI of a firm by examining the evolution structure and processes of relationships among its demographic, strategic market, organizational, product and attitudinal characteristics of international expansion [Johanson and Vahlne (1977); Forsgren (1989); Welch and Luostarinen (1988)]. Unfortunately, the reliability of measurement has been absent from the process. This raises the concern that findings may be accepted in spite of the fact they may contradict with prevailing theory.

Another approach has been to provide quantitative data on observable scientific principles and then apply an element of differentiation to the DOI by isolating a singular criterion. The most common approach has been to establish proxies of DOI to include foreign subsidiary sales as a percentage of total sales, foreign assets as a percentage of total assets, and the number of foreign subsidiaries, and to use it as single criteria. One of the concerns with the single criteria approach is that it does not allow you to take measurement error into account. An even more critical point is that single measures look at only one portion of the entire domain, which can lead to misrepresentation of the data.

Sullivan (1994) narrowed the scope of the definition, by categorizing several studies that were undertaken to identify the relationship between the degree of internationalization of a firm and the impact on the firm's financial performance. Parallel to previous research, Sullivan postulated that the DOI of a firm has three major attributes: performance (what goes on overseas), structural (what resources are found overseas) and attitudinal (what is top management's international orientation). The studies included in the survey were consistent in using two measures of degree of internationalization: foreign sales to total sales and foreign assets to total assets. Measures of performance varied using such variables as return on sales, return on assets, return on equity and beta.

Systematic Risk

In general if international capital markets are perfectly integrated, transaction costs are low, and investors are rational and risk adverse, then there is no diversification benefit to international corporations. As noted previously, markets are imperfect. The existing literature recognizes the potential risk-reduction via corporate multinational diversification, Lessard, (1983) and Fatemi (1984). There are two main types of methodology that have been employed in predicting corporate financial performance, and more particularly, insolvency-risk. The first is based on financial ratio analysis and the second is based on portfolio analysis. In regards to financial analysis ratios, each ratio alone can provide useful information. However, relevancy is determined by the interaction of all the ratios in conjunction with each other. One must also note that this process usually requires a long observation period in order to

provide statistically significant results. Methodology, which is based on portfolio analysis, where the risk indicator is systematic risk, takes on a different perspective. The relevant variability for solvency assessment is asset return variability rather than equity systematic risk.

The literature includes substantial information on the potential effects of international diversification, but little in the way of risk-reduction through corporate international diversification. By calculating the failure-probabilities of multinational corporations and comparing them to domestic corporations, Shaked (1985), set out to show that MNC's have a lower insolvency-probability than domestic corporations and that the systematic risk is lower as well. His results found that the mean insolvency-probability of the MNC's was significantly lower than that of the DMC's, MNC's are more capitalized than DMC's and the average systematic risk (beta) of MNC's is significantly lower than that of DMC's.

However, one can raise the issue that if globalization reduces the risk for multinational corporations, then why would a MNE expect a higher rate of return from their foreign operations (Reeb, et al, 1998). One answer is that the incremental risk of globalization would outweigh the risk diversification.

From a practical, real-world point of view, their work is consistent with practitioner usage of higher discount rates in evaluating international projects. Intuitive thinking suggests that if an international project decreases systematic risk, firms would use a lower discount rate to evaluate these projects. However we find that because of the element of uncertainty, this does not occur. This uncertainty can stem from a variety of factors such as political risk, exchange rate risk, managerial inexperience and information asymmetry, just to name a few factors. Madura (1998), indicates that the greater the uncertainty about a projects forecasted cash flows, the larger the discount rate applied to cash flows, other things being equal.

It must be acknowledged that the use of higher discount rates for international projects is at odds with the literature on the level of systematic risk. We need a clear understanding of the level of

systematic risk in the multinational corporation since it is important in effectively pricing equity, determining the cost of capital and in evaluating projects (Reeb et al).

Profitability

The argument has been raised that foreign operations are more profitable than comparable domestic operations, and this is a motivation for organizations to engage in expansion beyond their home territories. If we accept this argument, we would then expect MNC's to be more profitable than their domestic counterparts, uninational corporations (Fatemi, 1984). To prove this, there needs to be a comparison of the profitability of MNC's to uninational corporations (UNC's).   However since we cannot control the financial reporting systems of the two types of organizations, we may subject the results to measurement bias. To avoid this, a more indirect method of comparing rates of return for MNC stockholders to rates of return for UNC stockholders would be more appropriate. The rational for this approach has been that any abnormal profits associated with foreign operations will result in higher dividends and/or a higher price of the common stock, and this would be reflected in the realized rates of return. Measurement bias is a concern with these types of studies. To achieve more desirable risk-return characteristics, Fatemi (1984) and Madura (1998), argue that comparing the performance of a portfolio of multinationals to the portfolio of purely domestic firms would be the appropriate measurement technique. Moreover, even if one can show that multinational enterprises are more profitable than uninational enterprises, then the question becomes whether an increase in the degree of internationalization would lead to an increase in profitability.

Leverage

The general premise in regards to leverage and how it affects business risk is that all things held constant, the higher the firm's operating leverage, the higher the business risk. It is argued that MNC's operate in less than perfectly correlated economies; they in fact should be able to support more debt than their domestic counterparts. This diversification should also entitle the MNC to have lower earnings

volatility, which could translate into having lower earnings volatility and the probability of decreased bankruptcy. With the expectation of lower bankruptcy costs, it seems logical that the MNC's would have higher leverage ratios. However, a number of studies suggests that MNC's have less debt in their capital structures than do domestic companies, Lee, (1986); Fatemi, (1988); and Lee and Kwok, (1988).

Current empirical work, Lee (1988) and Burgman (1996), find that contrary to common expectations, multinational corporations appear to have lower target debt ratios than purely domestic firms. Furthermore, Burgman (1996) found no evidence that international diversification lowers earnings volatility.

CONCEPTUAL FRAMEWORK

In this paper, we first begin by establishing a model for the degree of internationalization and then we proceed to test the model against risk and return factors. Building on the premise that the degree of internationalization incorporates performance factors, we use foreign sales to total sales and foreign assets to total assets as a proxy definition for DOI. The variables are first examined individually against risk and return indicators, which is a common statistical technique in many of the empirical studies. We go beyond this initial step to create an index of internationalization by combining these performance factors. The rational for indexing stems from empirical evidence, Sullivan (1994) that posits single variant analysis may be more subject to measurement error than multi variant analysis.

Additionally, we examine the systematic risk of a multinational's operation. Both the operational environment of the firm and the economic environment in which it operates have an impact on the level of systematic (beta) risk that it will experience. Conventional wisdom would conclude that this systematic risk is lower for MNC's that diversify overseas. Kwok and Reeb (2000) argue to the contrary that US firms coming from a stable economy expanding overseas will experience an increase in risk not offset by the diversification benefit. They further postulated that the reverse is also true, firms coming from less stable economies will experience a decrease in risk. We test the hypothesis of US firms going into overseas markets to see if it supports or disputes conventional thinking.

In conjunction with this concept of internationalization is the relationship of leverage and degree of internationalization and the impact of debt on a firms operation. Using debt to total assets as a proxy for leverage, we postulate for our sample group that traditional capital structure theory, which suggests for MNC's expanding overseas, that as risk decreases, there should be an increase in debt utilization.

While numerous studies have examined these issues through the use of simple regression techniques, which seek to improve upon the results by using the more robust statistical estimation of pooling data, which is the simultaneous use of cross section and time series data.

METHODOLOGY

Data Sources

The survey companies used in this study are comprised of 103, randomly chosen US firms, with net income during the survey period over $1,000,000, who have both foreign sales and foreign assets for the five-year period 1998-1994. Firms used in this study had a least 10 percent of their sales originating overseas, an implicit criterion used in many of the previous studies, Daniels (1984); Geringer, Beamish and DaCosta (1989); Siddharthan and Lall (1982); and Stopford and Wells (1972). The companies chosen in the survey came from the Worldscope database. Data for the variable used also came from the Worldscope database with the exception of beta, which was obtained using the ValueLine database.

Variables and Measures

Multinationality - Numerous other studies have operationalized this variable. The most commonly used measures are the ratio or foreign sales to total sales (*FSTS*) and foreign assets to total assets (*FATA*). Foreign sales to total sales (*FSTS*) is often viewed as a proxy for a firm's dependence on its cross border operations for revenue, while foreign assets to total assets (*FATA*) is a measure of cross border production. Given the predestination of measurement error in using a single variant, these two variables have been combined to construct an index of multinationality. Each of these operationalizations has its own merits and contributes to different aspects of foreign involvement. Taking the average of the

ratios and combining them together formulate a composite index. The companies in the survey are the indexed by their level of multinationality. Three groupings were created based on ranking the companies in the sample and taking one standard deviation from the sample mean. Group I shows the highest level of internationalization, Group II an average level and Group III displays the lowest level of internationalization.

Performance - Performance is expressed in terms of financial performance, and is measured by return on equity (*ROE*).[1] This is one of the common measured as identified in Sullivan (1994). Beta is used as a measure of systematic risk. It should be noted that beta was taken as a published statistic and not calculated.

Leverage - Leverage is expressed in terms of the ratio debt divided by total assets.

Data Analysis

Data were analyzed using a pooled crosssection-time series regression process. The benefit of using a pooling technique is that it provides an examination of variations among crosssectional units simultaneously with variations within individual units over time. The ultimate advantage is that it allows for more complex analysis over either crosssection or time series analysis individually. However, there are other advantages to using pooled regression, such as: pooled data sets usually provide an increased number of data points, and that generates additional degrees of freedom and; incorporating information relating to both cross section and time series variables can substantially diminish the problems that arise when there is an omitted variables problems.[2]

Three procedures can be used for estimating models with pooled data; the first technique simply combines or pools all the time series or cross section data and then estimates the underlying model by using ordinary least squares; the second involves the recognition that omitted variables may lead to

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[1] We did not focus on P/E ratios since the stock price could be affected in the short-run by speculative factors. In this study, the focus is the profitability of the firm and not short-run stock price performance.
[2] For more details on pooling cross section and time series data see Pindyck and Rubinfeld, Econometric Models and Economic Forecasts, Fourth Edition, p: 250-260.

changes in the cross section and time series intercepts and models with fixed effects add dummy variables
to allow for these changing intercepts; and finally, a third technique improves the efficiency of the first
least squares estimation by accounting for cross section and time series disturbances, Pindyck and
Rubinfeld (1998).

The model for the panel or pooled series is as follows:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \text{ for } i = 1,2,\ldots, N \text{ and } t = 1,2,\ldots, T$$

where N is the number of cross section units and T is the number of time periods, Y is the dependent
variable (*ROE*, *DEBT* and *BETA*) and X is the independent variable (*FATA*, *FSTS*, and the average of the
two). We performed nine regressions representing permutations of the above dependent and independent
variables. The sample used 103 companies for cross section analysis and five-years of observations.

RESULTS AND DISCUSSION

Table I represent data for the pooled least squares regression. It should be noted that data on beta
obtained in a five-year average format and therefore, could not be constructed in a pooled format.
Pooling was accomplished for Return on Equity and Debt variables only. The effect of pooling provides
additional observations as well as the opportunity to gain improvement in the overall statistical methods.
It should be noted that there are several areas where the use of pooled least squares regression showed
statistical significance in the data over the use of simple least squares. Due to data being unavailable for
beta over the entire five-year period, we were unable to statistically test beta using the pooled regression
method. For the purpose of reporting consistent results using a similar method over all variable tested, we
shall report the major findings using the simple least squares regression method represented in Table II,
however we shall point out those areas in the analysis where the pooled regression methods provided
significant results.

The first major difference in the use of statistical methods can be noted in the measure of
profitability for the Group I, the highest level of internationalization. The results using pooled regression
analysis showed that as internationalization increased, profitability decreased. The simple regression

method did not show statistical significance in this category. The debate in the literature is in regards to whether domestic and international firms show any difference in profitability. As the paper does not provide for a control group of domestic organization, we are unable to commit further on this analysis.

However, we do find interesting and statistically significant results on the issue of leverage for international firms. From the results it is noted that as the degree of internationalization increases, debt decreases. These results are confirmed in the simple least squares regression method for the total sample. More dramatic are the results obtained by using the pooled least squares regression method. Greater improvement in statistical significance is seen in the total sample, Group I, Group II and Group III. There are only two variables across these four sections, which do not show statistical significance; FSTS in Group II and the Index in Group III. Leverage is generally viewed in the context of its relationship to business risk. Considering the conventional argument that since MNC's are operating in less than perfectly correlated economies, they should be capable of supporting more debt. Our findings run counter intuitive to this thinking. There is support for our findings from previous literature, Lee (1968), Fatemi (1988) and Lee and Kwok (1988). The arguments in support of these findings center on the notion that firms are unable to take advantage of the diversification benefit of operating overseas, and are therefore more risky, lowering their opportunity to acquire additional funds from external sources.

In considering the issue of whether a composite index provides a more meaningful measure of internationalization than a single variable, we examine those results where we found statistical significant. First we look at the total sample for debt, using the simple least squares regression. Here it is noted that the variable FSTS is more significant than the index. Moving to the pooled regression data for debt, in the total sample, the index showed better significance. An examination of Group I shows that the variable FATA and the index have similar results. For Groups II and III the variable FATA had better results over the index. The first thing we are able to conclude is that FSTS did not appear to be a major factor in any of the results. Given the mixed results between FATA and the index, we cannot determine any major conclusions as to the more appropriate measure of internationalization.

Results for the affect of internationalization on the systematic risk of the firm are inconclusive using the simple least squares method. We can only comment that for the total sample and across all three measures of internationalization, FATA, FSTS and the composite index, the results show that as internationalization increases the systematic risk also increases. These results do not support the thinking of, Lessard (1983) and Fatemi (1984) regarding the literature that states internationalization decreases the systematic risk of multinationals, nor does it support Reeb and Kowk (1998). Our sample does not provide the statistical significance necessary to conclusively support or reject either hypothesis. That is, we could not show that the DOI is significant in the overall risk of the company.

CONCLUSION

In regards to the pooled regression technique verses the simple regression technique there is adequate data available that supports consideration of this technique, especially where there is the possibility that a large sample group will be used. It should also be noted that even in those areas where statistical significance was not obtained, the pooled least squares method showed improvement in the results over the simple least squares method.

The fact that the results regarding debt runs counter intuitive to conventional thinking, opens the door to additional research in this area. It would be important to investigate the underlying factors that would cause debt to be lower. Given that the impact of a firm's risk has been tied to the level of debt that they are able to carry, it is beneficial that we continue our analysis of understanding the impact of internationalization on a firm's risk. If beta will continue to be used as a measure of systematic risk, then it may be more feasible in the analysis to use a calculated measure of beta, rather than a published statistic to see if statistically significant results can be obtained. The other option is to examine more robust measure of risk.

In finding profitability to be lowered for international firms, as with our discussion on debt, further investigation can be launched into understanding those factors, which cause the results that were

obtained. Again several measures of profitability exist and the selection of different measure may produce more reliable results.

Finally, a word about the development of a composite index for measuring the degree of internationalization. As the results indicated there are mixed results over using a single variable verses a composite index. What can be noted from our results is that since FSTS showed no major impact, it may be beneficial to use a weighted average of these variables with a stronger weighting on FATA rather that a balanced weighting. There are many factors that impact internationalization other than performance and the composite may need to be made up of factors in these other areas to provide a clearer representation of internationalization.

Table I
Pooled Regression Analysis

TABLE 1A: POOL REGRESSION				
TOTAL SAMPLE				
		ROE		**DEBT**
FATA	t1	-0.862	t1	-2.687
	β1	-0.055	β1	-0.149
	Prob.1	0.389	Prob.1	0.007
FSTS	t1	-1.001	t1	-5.440
	β1	-0.056	β1	-0.258
	Prob.1	0.317	Prob.1	0.000
INDEX	t1	-0.598	t1	-4.667
	β1	-0.038	β1	-0.255
	Prob.1	0.549	Prob.1	0.000

TABLE 1B: POOL REGRESSION				
GROUP 1				
		ROE		**DEBT**
FATA	t1	-1.744	t1	-2.939
	β1	-0.207	β1	-0.278
	Prob.1	0.085	Prob.1	0.004
FSTS	t1	-2.006	t1	-2.163
	β1	-0.253	β1	-0.395
	Prob.1	0.048	Prob.1	0.034
INDEX	t1	-2.192	t1	-2.987
	β1	-0.309	β1	-0.449
	Prob.1	0.031	Prob.1	0.004

TABLE 1C: POOL REGRESSION				
GROUP 2				
		ROE		**DEBT**
FATA	t1	-0.774	t1	-3.832
	β1	-0.076	β1	-0.019
	Prob.1	0.439	Prob.1	0.000
FSTS	t1	-0.478	t1	-0.178
	β1	-0.037	β1	-0.325
	Prob.1	0.633	Prob.1	0.859
INDEX	t1	-0.729	t1	-2.642
	β1	-0.075	β1	-0.304
	Prob.1	0.467	Prob.1	0.009

TABLE 1D: POOL REGRESSION				
GROUP 3				
		ROE		**DEBT**
FATA	t1	-0.739	t1	2.563
	β1	-0.662	β1	1.233
	Prob.1	0.462	Prob.1	0.012
FSTS	t1	-1.623	t1	-1.832
	β1	-1.107	β1	-0.691
	Prob.1	0.108	Prob.1	0.070
INDEX	t1	-1.714	t1	0.084
	β1	-1.815	β1	0.050
	Prob.1	0.090	Prob.1	0.934

The above tables are comprised of cross sectional and time series data, using a pooled least squares regression method for the variables measuring profitability and leverage. The groupings for internationalization were compiled by taking the adding the variables FATA and FSTS, then dividing them by two. The total composite score ranked the index. Taking one standard deviation from the mean developed groupings. Equal weighting were used for the variables in the composite index. There were a total of 103 companies in the survey. Group I includes 16 companies, Group II has 69 and Group III a total of 18 companies.

Table II
Simple Regression Analysis

TABLE 2A: SIMPLE REGRESSION						
TOTAL SAMPLE						
		ROE		DEBT		BETA
FATA	t1	-0.306	t1	-1.319	t1	0.027
	β1	-0.036	β1	-0.174	β1	0.000
	Prob.1	0.760	Prob.1	0.190	Prob.1	0.978
FSTS	t1	-0.449	t1	-2.809	t1	0.979
	β1	-0.045	β1	-0.307	β1	0.002
	Prob.1	0.655	Prob.1	0.006	Prob.1	0.329
INDEX	t1	-0.400	t1	-2.205	t1	0.563
	β1	-0.045	β1	-0.276	β1	0.001
	Prob.1	0.689	Prob.1	0.029	Prob.1	0.575

TABLE 2B: SIMPLE REGRESSION						
GROUP 1						
		ROE		DEBT		BETA
FATA	t1	-0.863	t1	-1.415	t1	0.045
	β1	-0.262	β1	-0.517	β1	0.000
	Prob.1	0.403	Prob.1	0.179	Prob.1	0.965
FSTS	t1	-1.138	t1	-1.395	t1	-0.952
	β1	-0.297	β1	-0.448	β1	-0.006
	Prob.1	0.274	Prob.1	0.185	Prob.1	0.357
INDEX	t1	-1.169	t1	-1.648	t1	-0.546
	β1	-0.372	β1	-0.631	β1	-0.004
	Prob.1	0.262	Prob.1	0.122	Prob.1	0.594

TABLE 2C: SIMPLE REGRESSION						
GROUP 2						
		ROE		DEBT		BETA
FATA	t1	-0.129	t1	0.070	t1	-1.104
	β1	-0.023	β1	0.021	β1	-0.005
	Prob.1	0.897	Prob.1	0.945	Prob.1	0.273
FSTS	t1	0.122	t1	-2.372	t1	0.614
	β1	0.016	β1	-0.519	β1	0.002
	Prob.1	0.903	Prob.1	0.021	Prob.1	0.541
INDEX	t1	0.017	t1	-1.506	t1	-0.137
	β1	0.003	β1	-0.450	β1	-0.001
	Prob.1	0.987	Prob.1	0.137	Prob.1	0.892

TABLE 2D: SIMPLE REGRESSION						
GROUP 3						
		ROE		DEBT		BETA
FATA	t1	-0.376	t1	1.516	t1	-1.316
	β1	-0.919	β1	2.371	β1	-0.036
	Prob.1	0.712	Prob.1	0.149	Prob.1	0.207
FSTS	t1	-1.142	t1	-1.348	t1	1.811
	β1	-2.048	β1	-1.629	β1	0.036
	Prob.1	0.270	Prob.1	0.196	Prob.1	0.089
INDEX	t1	-1.374	t1	-0.186	t1	0.662
	β1	-4.545	β1	-0.446	β1	0.027
	Prob.1	0.188	Prob.1	0.855	Prob.1	0.517

Table II is comprised of cross sectional and time series data using simple least squares regression method and averaging the variables measuring risk, profitability and leverage. The same criteria for achieving the composite index and the individual groupings that were used in Table I are also used in this table.

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