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INTERNATIONAL FINANCE

The Effects of International Operations on the Market Value of the Firm: Theory and Evidence

VIHANG R. ERRUNZA and LEMMA W. SENBET*

I. Introduction

THIS PAPER INVESTIGATES the existence of monopoly rents associated with international operations in a market-value theoretic framework. The benefits of international operations evolve from such factors as (1) imperfections in the product and factor markets, (2) differential international taxation, and (3) imperfections in the financial markets. In this paper, these factors are subject to an equilibrium analysis in the context of recent advances in financial theory. In particular, imperfections in the financial sector arising from corporate international diversification are examined in a framework which allows (a) supply adjustments by multinational firms and (b) the interaction of barriers to international capital flows faced by both firms and investors.

Taking the U.S. capital market and investors as a base, we then specify the conditions under which the foregoing imperfections get “priced out” in an equilibrium. These pricing effects cannot be detected empirically through the methodologies employed by the existing studies which examine the effects of corporate international diversification. Indeed, it was an attempt to rescue the limitations of these studies which initially motivated our paper. The existing empirical inquiries into this area rely on traditional risk-adjusted performance measures (e.g., [7]) or international analogs of return generating processes (e.g., [1, 8]). Instead, at the empirical level, we employ a “value-based” method which is in the same vein of the Thomadakis [17] approach developed to identify the monopoly benefits of industrial market structure. We conduct the tests over subperiods characterized by differential government controls in an attempt (a) to separate the pure financial motives for multinationality from other motives, and (b) to detect if the benefits of international operations carry through recent periods.

II. Imperfections in the Real Sector

Direct foreign investment motives continue to be largely rationalized in the context of the theory of industrial organization. It is argued that firms invest

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abroad, because they possess peculiar advantages and hence can earn rents higher than those achieved by local competitors. The advantages that multinational firms possess over uninational firms constitute a departure from market perfection. Multinational enterprises provide capital, technology, and entrepreneurial or managerial skills to the foreign economies where they are combined with local factors of production. However, if markets are perfect, local firms can buy the technology and other skills available to multinationals. If so, local firms are at no relative disadvantage and international firms have no special incentive to direct their investment abroad.¹

The existence of imperfections in the product and factor markets *per se* is not sufficient to rationalize direct foreign investment, but these imperfections must accord systematic and special advantages to multinationals over uninationals. If such advantages exist, they will manifest themselves in the market value of the multinational enterprise. Thus, two firms with different degrees of international involvement,² which are otherwise identical, will differ in their current market valuation if international involvement gives rise to monopolistic advantages. Consider a single foreign investment expenditure to be made at the beginning of next period. Firm *A*, unlike Firm *B* which plans to be purely domestic, holds an option for this discretionary investment. (A purely domestic firm is posited for exposition only; one is hard-pressed to observe such a firm). Otherwise firm *A* and firm *B* are identical, and they are both assumed to be all-equity financed. In this simple scenario, the current value of firm *A*, which possesses an option for international involvement, can be broken into two components in the tradition of the familiar Miller-Modigliani (1961) growth-valuation model. Explicitly,

$$V_A = V_B + V_I = V_B + \int_0^\infty P(s)Z(s)[V_I(s) - I] ds \quad (1)$$

where

V_B = the market value of firm *B* or the value of currently held assets of firm *A*

V_I = the value of an option for future foreign direct investment. This is analogous to the value of growth opportunity.

$P(s)$ = the current price of a dollar delivered next period if a particular state of the world, *s*, occurs.

$Z(s)$ = the decision variables where; $Z(s) = 1$ if $V_I(s) \geq I$, $Z(s) = 0$ otherwise.

$V_I(s)$ = the worth of a foreign investment expenditure next period given a

¹ In the absence of perfectly competitive product and factor markets, the monopoly rents accruing to multinationals may be due to (a) advantages in the *product* markets, such as superior marketing skills, product differentiation from heavy advertising or some form of collusive behavior in product pricing, (b) advantages in the *factor* markets such as patent-protected technology, superior managerial skills or special access to capital markets. (c) economies of *scale* through vertical or horizontal integration, and (d) government *regulations* providing special advantages to certain multinationals in the form of creating barriers to entry of competitors. The latter two are specially important in explaining direct foreign investment as opposed to domestic production and exporting.

² Assume for the moment that we are able to identify an index which captures the degree of international involvement. This problem is discussed in Section V.

particular state occurs. This is the discounted value of the economic cash flows as of next period, given state s .

We have now recast the industrial organization-based theory of multinationality in the context of the theory of finance in a stylized fashion. This is intended to establish a basis for our desire to *empirically* assess the effects of international operations in the market value-theoretic framework. To date, multinationality has never been assessed in terms of its impact on current market valuation, and hence we can hardly answer even the basic question as to whether or not direct foreign investment is of excess benefit over its domestic counterpart.³ A positive value of V_I reflects future direct investment which is expected to yield rent in excess of the opportunity cost of capital. This investment is discretionary. Consequently, V_I is best regarded as the value of an option for future foreign investment. The option value is zero if factor and product markets are perfectly competitive permanently. Under the absence of oligopoly and barriers to entry into international operations, competition ensures equality between the value of direct foreign investment and its associated expenditure in every contingency.

Consider now a U.S.-based multinational firm. The full value of the special opportunities that this firm possesses should be reflected in the current price of its stock. Consequently, an empirical analysis based on a risk-return trade-off in the traditional sense cannot capture these special opportunities. However, the benefits of direct foreign investment, if any, can be detected by an empirical investigation based on market valuation. Recent studies (e.g., [7]) which attempt to document the risk adjusted performance of U.S.-based multinationals must assume that the U.S. financial markets are unable to recognize the advantages of direct foreign investment in capitalizing stock prices. Agmon and Lessard [1] provide evidence for investor recognition of international involvement, but they too are unable to document if, indeed, direct foreign investment is beneficial in terms of contributing to market value. They base their study on an international analog of the market model which cannot capture the benefits accrued to pre-existing stockholders.⁴ On the other hand, traditional theories of direct foreign investment which assess the benefits of such investment in terms of accounting profitability are not equipped to deal with market valuation either.

³ An expanded version of (1) should, of course, incorporate the capitalized value of monopoly rents arising from (a) the currently held domestic assets and options for future discretionary domestic investments, and (b) the current level of international involvement and options for future direct foreign investment. The empirical analysis is based on the expanded version.

⁴ The studies cited above do not actually address the issue of imperfections in the real sector. They deal with the plausible ability of multinationals to provide indirect portfolio diversification. Hence, they address imperfections in the financial sector which are subjects of Section IV of this paper. However, again the benefits from the financial sector cannot be detected by their empirical methodologies. We shall say more about this later in Section IV.

These studies have been criticized on other grounds as well. Using a similar methodology as Agmon and Lessard [1], Jacquillat and Solnik [8] conclude that multinational firms cannot be a valid substitute for international portfolio diversification. On the basis of conceptual arguments and empirical tests, Errunza and Yalovsky [6] demonstrate that the two-factor world market model is inappropriate to test investor recognition of the international composition of the U.S.-based multinationals, and hence calling for a different methodology.

III. Imperfections Characterized by International Taxation

Taxes may affect both *real* and *financial* decisions. Consequently, it is instructive to treat them separately. We wish to specify the conditions under which differential international taxes contribute to differential market valuation for the domestic and multinational firms by utilizing results of Senbet [15].

To simplify the discussion we consider again two firms comparable in every respect except that (a) one is purely domestic and the other is binational, and b) the binational firm is levered by borrowing in both domestic and foreign capital markets, while the domestic firm is unlevered. The comparability is ensured by envisioning the existence of the unlevered domestic firm which is expected to generate an identical net operating income ($\tilde{Y}$) as the global income of the binational firm, expressed in domestic currency. Thus, the net operating incomes have been standardized in terms of the domestic currency in order to adhere to the generalized risk class concept and to isolate the effects of tax differentials and leverage. It is important to employ this generalized risk class concept; otherwise one could end up with a misleading result in which exchange risk *alone* becomes consequential to international capital structure decisions (see, for instance, [15]). We further assume foreign earnings are subject either to foreign taxes only (capital-import neutrality) or to domestic taxes only, with full credit for foreign taxes but with the domestic tax rate as the controlling rate (modified capital-export neutrality concept).

Under the preceding scenario one can obtain the binational firm valuation which is different from the Modigliani and Miller (MM) (1963) tax-adjusted domestic firm valuation.

Specifically,⁵

$$V_L = V_U + \alpha_F V_U \left(\frac{T_D - T_F}{1 - T_D} \right) + T_D B + \theta_F B (T_F - T_D) \quad (2)$$

where

V_L = the value of the levered binational firm.

T_D, T_F = the proportional domestic and foreign corporate taxes, respectively.

B = the market value of debt.

$V_U + T_D B$ = the value of the levered domestic firm (albeit identical to the binational firm in every other respect).

α_F = the fraction of income attributable to foreign investment.

$\theta_F B$ = the value of foreign borrowing.

The model is derived under the environment of differential taxes, differential international interest rates, and foreign exchange risk, but the existence of differential international interest rates and foreign exchange risk are of no consequence to capital structure policies. Thus, the valuation in (2) could have been derived under any arbitrage international capital asset pricing model.

⁵ See Senbet [15] for the details of the derivation. The valuation which recognizes differential international *personal* and *corporate* taxes is more complex and it is not reproduced here.

However, tax differentials have an impact on market valuation under this framework.

The valuation model in (2) recognizes tax effects on both real and financial variables. The second term captures the tax induced effect of foreign investment on market value while the last term recognizes government subsidy of debt financing. The two effects are *countervailing*, and hence *a priori* yield corner solutions for investment and financing decisions if the firm operates under unlimited degrees of freedom. Abstracting from other imperfections from non-competitive behavior in the product and factor markets, the unconstrained firm has an incentive to entirely locate in a low tax regime while simultaneously borrowing in a high tax regime. However, this solution disappears once we recognize that the firm is entitled to a tax subsidy from a given country only if it operates in that country. A mere borrower cannot be subsidized, and hence the multinational firm must balance its books per national origin. That is, the sum of the market values of financial claims must be equal to the market value of the associated assets in each country. With this constraint, it is easy to see that international tax differentials and their accompanying government subsidies lead to interdependent leverage and production allocations across countries.

Thus, the analysis here underscores the fact that the *net* impact of differential international taxation on the firm's international financing and investment decisions may contribute to market value in excess of domestic valuation. This occurs as a result of government tax policies even under the environment of perfectly competitive factor and product markets. However, the preceding analysis has a limitation in the sense that its framework relies heavily on the traditional tax-adjusted MM valuation model. Recently, Miller [11] re-examines the tax impact in a more general equilibrium framework in which firms make supply adjustments in response to investor demand for taxable bonds. In an environment of differential personal taxation, the demand curve is upward sloping in a yield-quantity space for taxable corporate bonds. Value-maximizing firms make supply adjustments up to a point where they become indifferent between equity and bond financing. But this point of indifference implies that corporate bonds are priced in such a way that the tax subsidy from debt financing evaporates altogether.

Our analysis can be extended into a general equilibrium framework so as to yield results similar to Miller [11]. However, the Miller analysis ignores other imperfections, such as agency problems associated with external capital. Barnea, Haugen and Senbet [3] generalize the Miller equilibrium by incorporating agency problems and costs of tax arbitrage by investors. With agency problems, corporations face a downward sloping supply curve in a yield-quantity space for taxable bonds while the elasticity of the demand curve itself is altered due to costly tax arbitrage. In this scenario, there emerges optimal capital structures across firms as a result of the trade-off between agency costs of external capital and yield differentials. Once again we are back to a situation in which tax subsidies exist and affect market value even in a general equilibrium framework. Thus, in the international context we still wish to maintain that tax differentials across national boundaries may contribute to the market value of the firm in line with the specification in (2).

IV. Imperfections in the Financial Sector

In this section we wish to provide an equilibrium analysis of barriers to financial capital flows across national boundaries and the role of the multinational firm in circumventing these barriers. To put things in proper perspective, we first overview the equilibrium implications of international portfolio diversification by investors in an environment devoid of barriers. We then introduce the notion that multinational firms provide a vehicle for international portfolio diversification in the presence of barriers. This notion has been recognized for sometime, but its equilibrium implications are not well-established in the existing literature. Nor has this notion been subject to an empirical analysis which is capable of verifying the relevance of diversification at the international firm level. We wish to argue that the equilibrium implications of corporate international diversification are of the same nature as the pricing effects of limited diversification in equilibrium in which multinational stocks command a price premium. We then extend this to an environment in which firms are allowed to make appropriate supply adjustments and, under certain conditions, we find that the existence of barriers *per se* do not yield price differentials among purely domestic and multinational stocks.

A. The Merits of International Portfolio Diversification

For quite some time, international portfolio theorists (e.g., Levy and Sarnat [10], Errunza [5]) have argued that the multinational mean-variance frontier can dominate the national market portfolios. This argument follows from the construction of efficient frontiers on the basis of *ex post* stock price and dividend data. The international frontier dominates due to the lower correlations of returns across countries as compared to the correlation within each country.

Since the mean-variance efficiency dominance is demonstrated without considering international capital flow barriers, an immediate implication is that international capital market merger is beneficial to investors. This is, of course, unlike the usual notion of irrelevant corporate merger where opportunities for home-made merger is already available to investors. This can be seen easily if one stretches the argument of portfolio theorists further to a general equilibrium. Merger of segmented markets into a unified international capital market affects security prices due to (a) an expansion of the investment opportunity set, and (b) an aggregation of investor preferences across national boundaries. This merger effect is Pareto-optimal for at least certain classes of utility functions.⁶

The Pareto-optimality occurs as a result of lifting the existing barriers to international capital flows. It is also assumed initially that the existing national markets are completely segmented due to these barriers. The existing structure of the international capital market perhaps falls somewhere between complete integration and complete segmentation, but this is an empirical question. There

⁶ Cohn and Pringle [4] and Subrahmanyam [16] analytically demonstrate that the consequences of international capital merger are of positive value to the existing security holders. In particular, Subrahmanyam demonstrates that for the cases of quadratic, exponential, and logarithmic utility functions, international capital market integration is Pareto-optimal.

exists an emerging literature, which is largely empirical, arguing that the international firm can serve as a substitute vehicle for a partially or completely impeded international portfolio diversification. In the presence of barriers to portfolio capital flows, for instance, the U.S. investor can diversify by simply purchasing shares of U.S.-based multinational firms. We now turn our attention to this indirect diversification and subject it to an equilibrium investigation.

B. An Equilibrium Analysis of Corporate International Diversification

Recently, a theory of direct foreign investment has emerged which draws upon portfolio theory. Some (e.g. Rugman [13]) have attempted to provide a rationale for direct foreign investment by merely observing that multinational firms enjoy more stable earnings than unilateral firms because of geographic diversification of the *real* asset portfolio.⁷ The trouble with the preceding argument, as recognized later also by Rugman [14], is that if international financial markets are integrated and perfectly competitive, diversification at the firm level can be duplicated at the investor level at no cost. Thus, investors would become indifferent between achieving their desired degree of international diversification through holding off-shore stocks and through holding stocks of multinational firms. Indeed, in such an environment a simple separation property obtains whereby all investors hold the international market portfolio. The international market portfolio itself consists of all marketable risky assets in the universe in accordance with their relative values. Otherwise an international capital market equilibrium cannot exist. Thus, a pure financial motive for corporate international diversification disappears altogether in a well-functioning international capital market.

Without loss of generality, we now turn our attention to U.S.-based investors and multinational firms for the equilibrium analysis. This is also consistent with our empirical analysis in the next section which employs U.S. data. Suppose that investors face barriers to international investment in various forms, such as interest equalization tax (now lifted), information gaps, relative inefficiency in foreign capital markets, the possibility of expropriation of foreign holdings, and other restrictions on the extent of foreign ownership. Such barriers are endemic to the activities of international firms as well, as we shall examine them later. These impediments clearly lead to a failure in a simple separation property such that optimal portfolios of U.S. investors may no longer contain all risky assets in the universe.⁸ Direct merger of national capital markets may no longer be Pareto-optimal. However, indirect merger through multinational firms is feasible. Thus, apart from advantages resulting from imperfections in the real sector, U.S.-based multinationals possess a relative advantage over purely domestic firms in the

⁷ We should note also that if risk diversification alone is a valid motive, it would provide a partial answer to the issue of exporting vs. direct foreign investment. While exporting reduces the variability of only consolidated sales revenues, direct foreign investment can provide more stability to both consolidated sales and costs of production.

⁸ If impediments arise in the form of exchange risk alone, a generalized separation property may exist in which all investors find it optimal to hold a linear combination of the international market portfolio and the exchange risk-hedging fund.

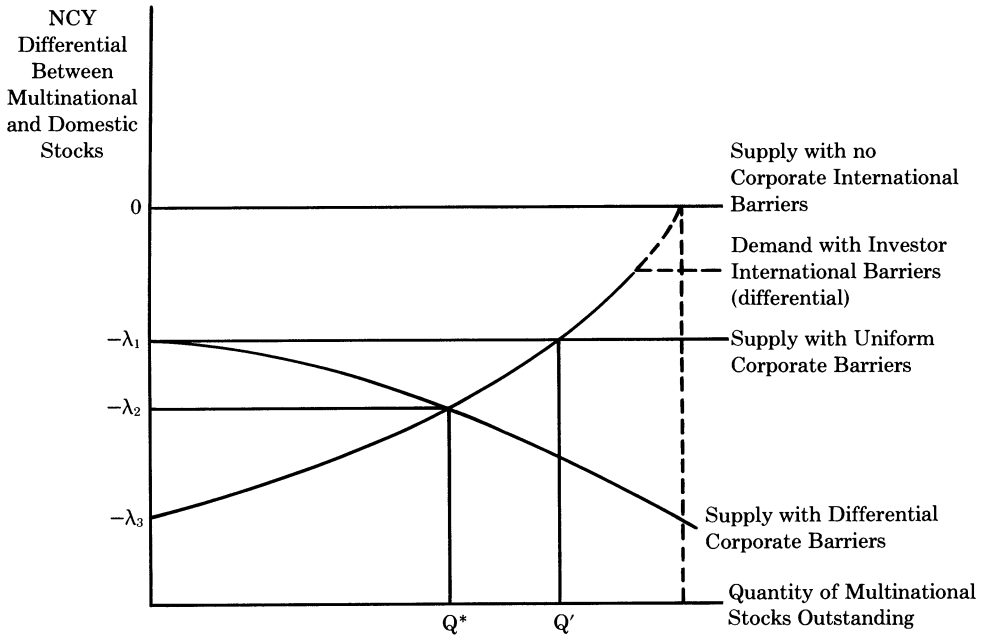


Figure 1

The Equilibrium Yield Relationship Between Multinational and Domestic Stocks

sense of better international diversification services. Notice that multinationals need not be perfect substitutes for the idealized international portfolio diversification for the relative advantage to occur.

Who benefits from the indirect merger? Notice again that international firms have special advantages in the financial sector which are quite analogous to monopoly rents in the real sector. If the U.S. market is well-functioning, investors must accept a smaller *equilibrium* expected return on multinational stocks than on otherwise equivalent but purely domestic stocks. In other words, they pay a price *premium*. This premium is in the same vein of valuation of options for future discretionary foreign investments as expressed in (1), because it arises from activities of value-maximizing firms. An international firm is not a costless financial intermediary. Moreover, since the diversification services provided by multinationals are already “priced out,” attempts to verify these services through traditional performance evaluation techniques as well as through risk-return generating processes are unwarranted.

We now wish to extend our analysis to an environment in which multinational firms make supply adjustments. Consider a more realistic case where investors face differential costs of barriers to international investment. As depicted in Figure 1 there exists a nominal certainty-equivalent yield (NCY) differential between multinational and domestic stocks at which there is no demand for the former.⁹ This negative differential is denoted as $-\lambda_3$. However, this differential

⁹ The NCY is an outcome of only risk-adjustment measured in the traditional way against the relevant (international) market factor. It is still unadjusted for the additional factor reflecting the

must continue to diminish so as to entice investors in *regressively* lower costs of barriers to international investment.¹⁰ Thus, the demand curve is upward sloping.

The supply curve is flat through the zero NCY differential, if corporations face no costs of barriers to direct foreign investment. However, the curve shifts downward horizontally if corporations face uniform barriers. At any rate, the demand curve may stretch to the supply curve passing through a zero differential yield. If corporations face no barriers to entry into foreign operations, barriers on the investor side *per se* may not lead to yield differentials between purely domestic and multinational stocks. Thus, the *mere* existence of investment barriers to capital flows faced by investors alone may be of no consequence to the creation of pure financial advantage for multinational expansion in terms of relative value over uninational operation.

However, the picture is altered as soon as we allow multinational firms to face international barriers which are costly. If we take a more realistic view that these costs are not uniform across firms, the supply curve must bend down as depicted in Figure 1 in order to entice firms in progressively higher costs. The intersection between the supply and demand curves generate an equilibrium NCY differential equal to $-\lambda_2$. Again this amounts to a price premium for multinational stocks due to their services in providing an expanded investment opportunity set. As we argued earlier, the existing empirical methodologies are not capable of verifying the existence of the price premium. We should also emphasize that, in a more general equilibrium, it is the *interaction* of costs of barriers at both investor and corporate levels which leads to a relative price advantage for multinational stocks. If the excess market valuation resulting from this pure financial phenomenon can be separated empirically, it is an indication of the significance of international barriers facing not only investors but multinational firms as well. The equilibrium framework developed here rationalizes *multidirectional* capital movements as well, because the analysis is generalizable to any other well-functioning national capital market base.

V. Empirical Investigation

The empirical specification is based on a market-value theoretic framework. The empirical test is not intended to be a direct test of a closed form valuation model, but rather an attempt to establish the existence of monopoly rents in international operations. Thus, we shall make no *a priori* specification of the structure of the international capital market nor do we postulate the degree of international capital market integration. We shall only rely on the functioning of the U.S. capital market and focus on U.S.-based multinationals.

benefits provided by multinational stocks in providing an expanded investment opportunity set. The significance of this additional adjustment, which is directly related to the degree of international involvement, depends on supply adjustments made by international firms, as we shall see shortly.

¹⁰ This is analogous to Miller [11] where taxable corporate bonds must pay increasing return so as to entice investors in *progressively* higher tax rates. The analogy, though, is somewhat reversed, because as we argued earlier multinational stocks possess inherent advantages in providing the benefits of international portfolio diversification. These diversification services are now being priced out, and investors with high costs of barriers are willing to accept high negative differentials in yield.

The testable hypotheses relate to the excess market valuation attributable to international involvement. The specification employed here is similar to Thomadakis [17] who attempts to establish the existence of monopoly rents in industrial market structure, but we utilize a different empirical technique. Suppose that the excess valuation arises purely from international operations. The excess valuation can be posited as:

$$V - I = E = E(R, M_{ic}, g_i M_{if}, C) \quad (3)$$

where

- I = the reproduction cost of the firm's currently held assets
- R = the risk of future excess returns attributable to multinationalism
- M_{ic} = the firm's monopoly power arising from the current degree of international involvement
- M_{if} = the firm's monopoly power regarding future foreign investments
- g_i = expected growth rate in international involvement

The excess valuation is defined up to a scale parameter, C . If M_{if} is zero, g will be of no consequence to E . The excess valuation, E , is not merely a function of variables relating to the firm's international involvement. There exists some empirical evidence which supports the relationship between current industrial market structure and the capitalized value of monopoly rents [17]. In view of this, the preceding functional form in (3) should be expanded to include M_c , the firm's power of oligopolistic restriction regarding the output of currently held assets and M_f , the firm's power of oligopolistic restriction in future investment.

For testing purposes, the expanded version of (3) is linearized:

$$ev = \alpha + \beta_1 R + \beta_2 M_c + \beta_3 M_{ic} + \beta_4 (g M_f) + \beta_5 (g_i M_{if}) + \mu, \quad (4)$$

where

$$ev = \frac{E}{S} \text{ (normalized for size),}$$

S = total sales.

B. Empirical Methodology

The major hypothesis in (4) is a *joint* test of the relationship between excess market valuation and the degree of international involvement and the ability of traditional measures of this involvement (e.g., the proportion of foreign-generated sales) to convey information about the relationship.

1. The Relationship Between Excess Valuation and International Involvement

The multiple-partial correlation coefficients are used to describe the overall relationship between ev and independent variables M_{ic} and $g_i M_{if}$, while controlling for M_c , $g M_f$ and R variables.¹¹ That is, we test the hypothesis,

$$H_0: \rho_{ev(M_{ic}, g_i M_{if}) | M_c, g M_f, R} = 0$$

¹¹ For further details on multiple-partial correlation coefficients and its associated F test, see Kleinbaum and Kupper [9, pp. 168–170].

using sample multiple-partial correlation.¹² To test the above hypothesis, we calculate the F statistic.

$$F = \frac{[SSR(\text{only } M, gM_f, R \text{ in model}) - SSR(\text{all variables in model})]/k}{SSR(\text{all variables in model})/n - p},$$

where k refers to the number of restrictions (i.e. 2 in this case), n refers to the number of observations and p refers to the number of parameters in the full model (i.e. total number of independent variables plus the constant—6 in this case), and $SSR(\cdot)$ is the relevant sum of squared residuals.

We reject H_0 at the α significance level if $F \geq F_{k, n-p, 1-\alpha}$. Similarly, we test four additional hypotheses to investigate the marginal contributions of each of the international variables while controlling for the other variables.

2. Measures of International Involvement

The degree of international involvement has traditionally been represented by the proportion of the firm's revenue from foreign sources (e.g., [1]). An alternate representation is the proportion of the firm's net earnings or net assets from foreign sources. For testing purposes, it is hypothesized here that M_{ic} and M_{if} are functions of foreign-generated sales (FS), net assets (FA), or net income (FE). Following [17], M_c and M_f are hypothesized as functions of the industrial concentration ratio (IC). Thus, in expression (4) M_c and gM_f are replaced by IC and gIC . Likewise, M_{ic} and g_iM_{if} are replaced by FS and g_iFS (or FA and g_iFA or FE and g_iFE).

3. The Time Period

Ideally, the empirical analysis should focus on the time period used by Agmon and Lessard (AL) for the sake of comparison. However, it should be divided into four time segments characterized by different levels of restrictions on capital flows from the U.S. This is intended to serve two purposes. First, it enables us to separate monopoly rents attributable to imperfections in the financial sector from those in the real sector. Second, it enables us to see if the benefits of international operations persist into current periods.¹³ Starting from the beginning of AL sample period, the time segments should be identified as follows on the basis of U.S. restrictions on capital flows:¹⁴

¹² Equivalently, one could also test $H_0: \beta_3 = \beta_5 = 0 \mid M_c, gM_f, R$.

¹³ It is inappropriate to lump the entire time span as done by the existing studies. This is because, one cannot distinguish the results obtained due to barriers that were in effect only for part of the sample period from those caused by the inherent structure of the existing international financial markets. We have benefited from conversations with R. Krainer on this point.

¹⁴ The time span has been divided into four segments only on the basis of U.S. capital flow restrictions. International capital market imperfections may also result from barriers to capital flows imposed by foreign governments. Further, even if the international capital market is well-integrated and well-functioning and barriers to international portfolio capital flows are non-existent, two firms with different degrees of international involvement, which are otherwise identical, will differ in their current market valuation, if the direct foreign investment is characterized by monopolistic or special advantages in the product and/or factor markets. Thus, the difference in the relationship between international involvement and excess market valuation over different time segments should not be expected *a priori* to be highly significant. However, the relationship would be expected to be somewhat stronger for the time period in which there were U.S. government restrictions on capital flows.

January 1959–June 1963	Few restrictions
July 1963–December 1967	Interest Equalization Tax (IET) in July 1963 and voluntary foreign direct investment controls in 1965 (Rodriguez and Carter [12], pg. 565).
January 1968–December 1973	IET and mandatory FDI controls (Rodriguez and Carter [12], pg. 50).
January 1974–December 1977	No restrictions.

Despite the empirical attraction of conducting separate tests for each of the above time segments, lack of data, particularly in the international involvement measures during the two early periods (as discussed in the next section), limit the scope of this empirical work to the two latter segments.

4. *The Measurement of Variables*

The excess value (*ev*) was formed by Thomadakis [17] as the difference between total firm value (market value of equity and book value of debt) and book value of assets, normalized by sales. In the absence of the wealth transfer problem of the agency tradition, this is equivalent to using the sales normalized differential between market value of equity and net worth,¹⁵ i.e.,

$$ev = \frac{\text{Market Value of Common Equity} - \text{Net Worth}}{\text{Annual Sales}}$$

Excess values were calculated for each company at the end of December of each year for the entire time period. Only firms with December fiscal year end were included in the sample.¹⁶

The risk variable *R*, can be computed as the traditional systematic risk (β) of the stock rates of return. To abstract from financial leverage, β would have to be unlevered. However, there are problems with this particular risk measure, and

¹⁵ Further, the use of book value of debt is quite prevalent in finance literature due to the information problems in obtaining market value of debt. The accounting bias in the value of net worth will cause no harm if it is not systematically related to either industrial market structure or to the degree of international involvement. The use of replacement costs for a smaller sample and time period has yielded similar results. We wish to thank T. Williams for the replacement cost data.

¹⁶ If firms with different fiscal year-ends were included in the sample, the excess values would be calculated at the end of different months (corresponding to fiscal year-ends) for various firms and the market conditions may have changed in the intervening period. Even though the financial statements are generally released a few months after fiscal year-end, we assume no information content on announcement, i.e., all information in annual reports of December fiscal year-end firms is impounded in December end market valuation of their common equity. As Ball and Brown [2, pg. 170] observe, most of the information contained in reported income is anticipated by the market before the annual report is released.

¹⁷ (a) Beta reflects the systematic risk of normal as well as monopolistic rents and hence the use of beta in accordance with our specification assumes that both classes of earnings have the same level of risk. The existing finance literature does not provide a framework for the decomposition of beta into its appropriate components; (b) If the diversification at the firm level is relevant, one can argue that β may no longer be a complete measure of risk nor a complete attribute of asset pricing. In an environment in which certain assets provide diversification services, additional factors enter in pricing securities. (c) At an empirical level, there are problems in the selection of the appropriate market index and/or return generating process for multinational assets. (See, for instance, [6]).

hence we have employed the total variability of stock returns as a measure.¹⁷ We believe this is adequate, since our testing procedure does not call for a closed form specification of the valuation equation in which the exact coefficient associated with the risk measure must be known. The various growth rates are calculated for each period in the usual manner. For instance,

Growth in Foreign Earnings

$$= g_{fe} = \sqrt[n]{\frac{\text{Foreign Earnings @ End of Period}}{\text{Foreign Earnings @ Beginning of Period}}} - 1$$

where n is the number of years in each period.

5. Data Sources

There are two major published sources that report foreign involvement measures. The Business International Inc. has reported foreign sales, net assets, and net income figures for U.S. multinationals since 1966. "The Outlook" and "Foreign Sales Reports" published by Standard and Poor has reported foreign sales figures since 1969. The data for the earlier years of both services are very fragmented, and the sample sizes grow substantially over time. Consequently, the empirical work reported in the next section covers only the later two periods (i.e. January 1968–December 1973 and January 1974–December 1977).¹⁸

C. Results

To test the five hypotheses outlined in the preceding subsection, the following regressions were run using beginning, ending and average observations for the two periods and each of the two samples.

$$ev = \alpha_1 + \beta_1(\sigma_R) + \beta_2(IC) + \beta_3(g_D) + \mu_1$$

$$ev = \alpha_2 + \gamma_1(\sigma_R) + \gamma_2(IC) + \gamma_3(g_D) + \gamma_4(FI) + \gamma_5(g_{fi}) + \mu_2$$

$$ev = \alpha_3 + \delta_1(\sigma_R) + \delta_2(IC) + \delta_3(g_D) + \delta_4(FI) + \mu_3$$

$$ev = \alpha_4 + \rho_1(\sigma_R) + \rho_2(IC) + \rho_3(g_D) + \rho_5(g_{fi}) + \mu_4$$

Where, σ_R denotes standard deviation of total stock returns, FI and g_{fi} represent the foreign involvement measures-sales, net assets or earnings, and their growth, respectively. The rest of the variables were defined earlier.

1. Multiple Foreign Components (Business International Data)

The F significance levels for various hypotheses based on the three measures of international involvement are reported in Table 1. The current degree of international involvement proxied by the foreign sales percentage is positively related to excess value and is very significant after controlling for domestic market structure and risk variables during both periods. The insignificant results

¹⁸ Sample sizes are further reduced due to the (1) need to include firms with only December end fiscal years, (2) non-availability of four firm industry concentration ratios obtained from the Census of Manufacturers, (3) missing entries in the financial data derived from annual and monthly Compustat tapes, (4) problems of continuity resulting from mergers, acquisitions, etc.

Table 1
Multiple Foreign Components

January 1968–December 1973					January 1974–December 1977				
Number of Degrees of Freedom ¹	Hypothesis Tested ²	<i>F</i> Significance Level for Foreign Component			Number of Degrees of Freedom	Hypothesis Tested	<i>F</i> Significance Level for Foreign Component		
		<i>FS</i>	<i>FA</i>	<i>FE</i>			<i>FS</i>	<i>FA</i>	<i>FE</i>
Beginning of Period									
<i>FS</i>	#1	0.041	0.466	0.999	<i>FS</i>	#1	0.070	0.060	0.643
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 21	#2	0.027	0.280	0.959	<i>D</i> : 46	#2	0.034	0.316	0.436
<i>FA</i>					<i>FA</i>				
<i>N</i> : 2	#3	0.553	0.884	0.989	<i>N</i> : 2	#3	0.848	0.126	0.641
<i>D</i> : 32					<i>D</i> : 42				
<i>FE</i>	#4	0.206	0.540	1.000	<i>FE</i>	#4	0.342	0.032	0.596
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 32	#5	0.015	0.223	0.991	<i>D</i> : 44	#5	0.022	0.070	0.416
End of Period									
<i>FS</i>	#1	0.005	0.351	0.206	<i>FS</i>	#1	0.017	0.393	0.122
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 41	#2	0.001	0.172	0.075	<i>D</i> : 43	#2	0.010	0.209	0.140
<i>FA</i>					<i>FA</i>				
<i>N</i> : 2	#3	0.678	0.736	0.845	<i>N</i> : 2	#3	0.274	0.501	0.054
<i>D</i> : 38					<i>D</i> : 42				
<i>FE</i>	#4	0.939	0.617	0.894	<i>FE</i>	#4	0.224	0.579	0.148
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 42	#5	0.001	0.162	0.079	<i>D</i> : 37	#5	0.009	0.236	0.449
Average for the Period									
<i>FS</i>	#1	0.026	0.724	0.638	<i>FS</i>	#1	0.019	0.474	0.431
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 47	#2	0.009	0.518	0.359	<i>D</i> : 50	#2	0.013	0.374	0.260
<i>FA</i>					<i>FA</i>				
<i>N</i> : 2	#3	0.555	0.698	0.914	<i>N</i> : 2	#3	0.315	0.477	0.358
<i>D</i> : 45					<i>D</i> : 48				
<i>FE</i>	#4	0.485	0.631	0.800	<i>FE</i>	#4	0.180	0.401	0.514
<i>N</i> : 2					<i>N</i> : 2				
<i>D</i> : 46	#5	0.009	0.483	0.349	<i>D</i> : 47	#5	0.009	0.322	0.360

Notes:- (1) Degrees of Freedom:- *N* denotes Numerator, *D* denotes Denominator. They are slightly different for various hypothesis being tested. The reported d.f. correspond to hypothesis #1.

(2) Refer to Table 2.

for foreign net assets or foreign net earnings as the proxy for current international involvement are not surprising. This is because the two latter proxies are even further away from the ideal measure of international involvement than sales.¹⁹ The reported foreign net asset and net earnings figures are outcomes of the home and host country accounting conventions, translation procedures used by the

¹⁹ According to AL [1], the ideal measure of foreign activity is the proportion of total market value represented by non-U.S. operations, sales, etc.

Table 2
Large Sample (Foreign Sales)

January 1968–December 1973					January 1974–December 1977				
Number of Degrees of Freedom ¹		Hypothesis Tested ²	Calculated <i>F</i> Value	<i>F</i> Significance Level	Number of Degrees of Freedom		Hypothesis Tested	Calculated <i>F</i> Value	<i>F</i> Significance Level
<i>N</i>	<i>D</i>				<i>N</i>	<i>D</i>			
Beginning of Period									
2	65	#1	9.663	0.0002	2	78	#1	3.207	0.0459
1	66	#2	19.699	0.0000	1	79	#2	6.422	0.0133
1	66	#3	7.542	0.0078	1	79	#3	0.784	0.3786
1	65	#4	10.184	0.0022	1	78	#4	0.067	0.7965
1	65	#5	10.678	0.0017	1	78	#5	4.027	0.0482
End of Period									
2	68	#1	18.154	0.0000	2	115	#1	3.611	0.0301
1	69	#2	36.173	0.0000	1	116	#2	7.285	0.0080
1	69	#3	0.006	0.9401	1	116	#3	0.123	0.7262
1	68	#4	0.433	0.5127	1	115	#4	0.000	1.0000
1	68	#5	36.300	0.0000	1	115	#5	7.093	0.0089
Average for the Period									
2	100	#1	11.339	0.0000	2	134	#1	5.461	0.0053
1	101	#2	21.236	0.0000	1	135	#2	10.389	0.0016
1	101	#3	0.203	0.6537	1	135	#3	1.036	0.3107
1	100	#4	1.365	0.2454	1	134	#4	0.567	0.4529
1	100	#5	22.433	0.0000	1	134	#5	9.818	0.0021

Notes:- (1) Refer to Table 1.

(2) Key to hypothesis tested:

$$\#1-H_0: \rho_{ev(M_{ic}, g_i M_{if}) | M_c, g M_f, R} = 0$$

$$\#2-H_0: \rho_{ev(M_{ic}) | M_c, g M_f, R} = 0$$

$$\#3-H_0: \rho_{ev(g_i M_{if}) | M_c, g M_f, R} = 0$$

$$\#4-H_0: \rho_{ev(g_i M_{if}) | M_c, g M_f, R, M_{ic}} = 0$$

$$\#5-H_0: \rho_{ev(M_{ic}) | M_c, g M_f, R, g_i M_{if}} = 0$$

multi-national corporation (MNC), as well as intercompany allocations. Thus, not only are they arbitrary, but they may not be comparable across firms or even subsidiaries of an MNC.

The growth in foreign investments is also positively related to excess value but it is not a significant variable except in association with the current level of international involvement. This suggests that either there are no monopoly rents associated with the firm's options for future foreign investments or that our proxy is independent of $g_i M_{if}$.

We suggested earlier that the relationship between international involvement and excess market valuation would be somewhat stronger during the period characterized by U.S. restrictions on capital flows in comparison to the period devoid of such barriers. Significance levels of F values for hypotheses 1, 2 and 5 for regressions that use foreign sales as the proxy for current international

involvement are consistent with the above hypothesis. That is, significance levels during the January 1975–December 1977 period are generally higher than corresponding F significance levels during the period January 1968–December 1973.

2. Large Sample (Standard and Poor's Data)

Table 2 reports calculated F values and their significance levels for various hypotheses during the two time periods under consideration. These results use foreign sales as the proxy for the measure of international involvement. Since foreign sales were found above to play an important role in the determination of monopolistic rents associated with international involvement, these results based on a substantially larger sample constitute added importance.

Again, we find current international involvement to be positively related to excess market valuation and is highly significant. The growth in foreign involvement is not a significant variable unless it is accompanied by the current involvement variable, except at the beginning of the earlier period when it is positively related to excess market value. The observed significance of the growth variable may be due to the absence of monopoly rents from options for future foreign investments, poor measurement of the growth variable, or extreme uncertainty regarding future foreign growth. The relationship between international involvement and monopoly rents is also stronger during the earlier period characterized by barriers to capital flows. Thus, the results based on the large sample essentially corroborate those reported earlier for the small sample.

VI. Conclusion

This paper has investigated the existence of monopoly rents associated with international operations due to differential international taxation and imperfections in the product, factor and financial markets. These factors are subject to an equilibrium analysis in a framework that permits supply adjustments by multinational firms and demand adjustments by international investors under conditions of barriers to real and financial capital flows. This analysis constitutes a basis for an empirical assessment of the effects of international operations in the market value—theoretic framework. The empirical results based on multiple-partial correlation coefficient methodology suggest that there exists a systematic positive relationship between the current degree of international involvement and excess market value. The growth in international involvement is also positively related to excess value, but, in most cases, it is not significant unless it is accompanied by a variable for current involvement. The relationship between international involvement and monopolistic rents was stronger during the earlier period characterized by barriers to capital flows in comparison to the later period during which no substantial restrictions were in effect. This provides an initial indication of the relative contribution of financial barriers (and hence the merit of corporate international diversification) vis-a-vis other factors towards monopoly rents arising from direct foreign investment.

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