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Profitability and Ownership Structure of U.S. Ventures Abroad: Why Are Majority-Owned Affiliates More Profitable Than Other U.S. Affiliates?

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Abstract

This paper explores a striking empirical pattern that has gone unnoticed in the literature: U.S. multinationals' majority-owned ventures abroad are more profitable than their minority-owned and 50-50 joint ventures. On average, majority-owned foreign affiliates in manufacturing earned a 6.4% return on assets in 1977-2003, compared to 3% for other U.S. affiliates abroad. This pattern is found across most sectors and countries. We explain these findings with a new theoretical framework that views both the ownership structure and the profitability of a foreign venture as functions of the value created by the ownership-specific capabilities that the MNC brings to a host country. These capabilities can give it a competitive advantage against the local firms. Where these capabilities are strong, the MNC is likely to choose whole or majority ownership; its profits are also likely to be highest in these activities. Where the firm's capabilities are weak, it is likely to seek additional capabilities from local firms through a joint venture; these investments are also likely to yield lower profits. We test these theoretical predictions by constructing measures of the revealed international competitive advantage of U.S. MNCs. Our analysis confirms that the profitability gap is significantly higher in sectors where U.S. MNCs are more competitive. We also test for the possible effects of affiliate size, age, non-dividend payments and host country characteristics including tax rates, GDP per capita and policies towards foreign direct investment.

Key words: Joint ventures, FDI theory, profitability, diversification

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1. Introduction

This research explores a striking empirical pattern that has gone unnoticed in the literature: the majority-owned ventures abroad by U.S. multinational companies (MNCs) are substantially and systematically more profitable than 50%-owned and minority-owned joint ventures of these firms. The paper presents a theoretical framework and our empirical work to date attempting to explain this pattern using data from the U.S. Department of Commerce and the U.S. Census Bureau. It presents summary tables, comparative graphs, and statistical analyses that examine this pattern across industries and countries.

Although the performance of U.S. joint ventures abroad has received a notable attention in the business press recently[1], their profitability has not been rigorously studied in the academic literature. Desai, Foley and Hines (2004) document the sharply declining propensity of American firms to organize their foreign operations as joint ventures over the last two decades, but focus on the determinants of the ownership structure rather than profitability.

Several previous studies have examined the determinants of profits of MNCs' foreign affiliates [e.g., Leftwich (1974), Lupo et al. (1978), Connor and Mueller (1982), Lecraw (1984), Fairchild and Sosin (1986), Landefeld et al. (1992), Kumar (1991) and (1994)]. None of these studies discovered the empirical pattern we study. Neither did more recent research on multinationality and performance (see for example Bowen 2007 and Rugman et al. 2007), which has focused on

1 *Wall Street Journal* has reported that dozens of international JVs in India, including those of Goldman Sachs Group and Merrill Lynch & Co., have bogged down, and in many cases dissolved ("Foreign Firms Find Rough Passage to India", WSJ February 1, 2007). *Financial Times* report on Anheuser Busch's dual approach to the Chinese market, as unlike most foreign investors there, Anheuser decided to operate both a JV (with Tsingtao Brewery) and wholly owned ventures, ("Two-barrel Approach for Anheuser", FT February 13, 2007).

the overall return on foreign assets and regional aspects, not differences between profitability of various ownership forms.

We test several obvious hypotheses that might explain the pattern, including possible effects of (1) subsidiary size, (2) subsidiary age, (3) host-country tax rates, (4) host country policies towards FDI and (5) subsidiary financial structure. None of these factors explains the pattern sufficiently well.

We develop a framework using the elements of the theory of foreign direct investment (FDI), the economics of project finance, and the resource-based view of the firm. This framework is simple, but powerful. It even helps to shed light on other puzzles in the fields of international business and strategy, such as whether expansion abroad leads to "value destruction" (Click and Harrison, 2000; Lu and Beamish, 2004 and Greene et al., 2006).

Our framework views both the ownership structure and the profitability of a foreign venture as functions of the value created by the ownership-specific capabilities that the multinational company brings to the host country. In sum, we begin by assuming that firms will invest in a new project as long as the rate of return on that project exceeds their cost of capital. Second, we use elements of FDI theory to argue that the return to a foreign firm doing a project in a host country is higher than that of a local firm undertaking the same project. But this excess return may vary: MNCs from investing in "core" areas of their business can be expected to have strong resources that exceed those of local firms; MNCs investing in more "peripheral" areas of their business are less likely to have less dominant resources.

Based on these fundamental assumptions, the crux of our explanation is as follows. MNCs investing in peripheral areas of their business will be more likely to share ownership with a local firm in a 50-50 or minority joint venture, in an effort to shore up their resources with local resources. At the same time, the MNC can expect to earn lower returns on these resources than on investments in its core business. As a result, the projects elected for non-majority joint ownership are likely to have lower profitability than those where the US firm has more control.

An alternative formulation of this framework is that the US minority-owned and 50-50 joint ventures we see are not by the same MNCs that invest in the wholly-owned (or majority-owned) ventures, but instead are by smaller or less-capable rivals that by necessity take on partners with a larger ownership stake to match the strategies of their more-capable rivals. In this view, the minority-owned joint ventures are not peripheral projects inside the same *firms*, but instead are subsidiaries of firms that themselves are in some sense peripheral in the *industry*. This formulation of the argument can explain the same aggregate patterns that we see, and we have as yet no way of distinguishing between the two formulations.

To test the predictions of our model we construct two measures of the ownership-specific capabilities that reflect the competitive advantage of US firms vis-à-vis their foreign rivals: (1) the propensity of US firms to sell via their foreign affiliates and (2) the inverse of the share of foreign affiliate sales on the total US sales in a particular sector. Industries where foreign affiliate sales are relatively high should be industries where US MNCs can successfully challenge foreign rivals. At the same time, US firms with strong-ownership specific capabilities ("competitive advantage") should prevent their foreign rivals from generating large sales in the US. If our

model is correct, the measures should be strongly correlated with and explain a large part of the profitability gap. Our regression analysis confirms these hypotheses.

The paper begins with an exposition of the empirical patterns in Section 2 that follows; we will use graphical presentations extensively, because the profitability measures of interest vary subtly across industries, regions, and time. Following the exposition of patterns, we develop a model to explain these patterns in Section 3, again using a graphical method. Extensions of this model to related topics are in Section 4. In Section 5, we examine a series of more-or-less traditional explanations for the profitability gap; none of these sufficiently explain the patterns we see. We also test here the explanatory factors that are in line with our model: measures of the international competitive advantage of US firms. Section 6 concludes.

2. Patterns of Profitability and Affiliate Ownership

2.1. Measuring Profitability and Ownership. The measures of profitability we employ are calculated from the Annual and Benchmark Surveys of U.S. Foreign Direct Investment Abroad published by the Bureau of Economic Analysis (BEA).[2] The BEA data groups all foreign affiliates into two broad categories: "All" affiliates and "Majority-Owned" affiliates. Majority-owned affiliates are those in which the U.S. voting ownership is higher than 50%, including wholly-owned subsidiaries. The bulk of the affiliates that fall into the majority-owned category are in fact wholly-owned subsidiaries;[3] in our model, we term these cases *wholly-owned*

2 The Bureau of Economic Analysis (BEA), a subdivision of the U.S. Department of Commerce collects detailed operating and financial data of the entire universe of U.S. foreign affiliates every five years approximately. These data are published in the so called Benchmark Surveys. In addition, the BEA collects a data for a sample of the universe every year and publishes the results in the so called Annual Surveys. Under U.S. law every person or company having more than 10% of voting ownership in a foreign business, has to fill the BEA surveys. Only data for non-bank affiliates of non-bank parents are used in this paper.

3 According to Mataloni and Fahim-Nader (1996), 90% of the majority-owned affiliates in the BEA Surveys are wholly-owned subsidiaries (88% and 85% if measured by assets and sales, respectively).

ventures. Those affiliates which are not classified as majority-owned by the BEA, we will usually call "minority-owned" in this paper, even though they include 50-50 joint ventures.[4] In our model, we refer to these cases as *jointly-owned ventures*. Financial and operating data for these joint venture affiliates is calculated as the difference between the All Affiliates and Majority-owned Affiliates in the BEA data.

We use return on assets (ROA) as the primary measure of profitability; it is calculated as net income over book assets. It is important to note that this return is measured at the level of the affiliate – it is not the return that is repatriated to the MNC, but the actual ratio of net income to assets for the subsidiary's business. Even so, the use of accounting profit ratios to assess performance of companies has been criticized by, for example Schmalensee (1989) and Bresnahan (1989). According to these critics, accounting measures may not adequately reflect real economic returns. The discrepancy comes from the fact that accounting measures are generally not adjusted for inflation, and that costs such as depreciation, research and development, and personnel training are accounted for as period expenses (in order to minimize tax liabilities), and therefore total assets may not reflect the real economic value of a firm's investment at a particular point in time. In general these practices tend to overstate steady-state accounting rates of return. Unfortunately, adjusting accounting data for these potential biases requires detailed firm-level data, which is very seldom available. Since the BEA data we use below do not provide any firm specific information,[5] for the rest of the paper were are forced to assume that most of these biases do not affect asymmetrically majority and minority-owned foreign affiliates.[6]

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4 Within our joint venture category, 54% of the affiliates are 50-50 joint ventures (40% and 44% if measured by assets and sales, respectively), according to Mataloni and Fahim-Nader (1996).

5 Under U.S. law, the BEA cannot publish any information that permits the identification of specific firms or persons.

6 There is evidence that indicates that these biases are in fact important in BEA data. For example, when affiliate assets valued at historical costs are adjusted to current cost or market value, rates of return change considerably (see Howenstine and Lawson (1991)). However, there is no reason to believe that they effect differently majority and minority-owned subsidiaries.

The industrial organization literature has also addressed the question of which profit measure is a better indicator of investor's profitability, e.g., return on equity, return on assets, or price-cost (sales) margins. In general, return on assets is preferred over return on equity since it gives an indication of profitability regardless of capital structure (Schmalensee, 1989). Return on assets is also preferred over sales margins because the latter one ignores the investment necessary to generate a dollar of net profit (Salamon, 1985). However, sales margins are less prone to suffer from inflation biases than return on assets.[7] Hence, in the empirical part of the paper we use return on assets (ROA); in tests not shown here we also used sales margins as alternative measures of profitability of foreign affiliates.[8]

2.2 Profitability Gaps Across Industries. The ratio of net income to total assets (ROA) for majority-owned and minority-owned affiliates in several broad industry sectors[9] is shown in Figure 1. In the graphs for All Industries, majority-owned affiliates are more profitable than minority-owned affiliates in all years except for 1995, 1996 and 2003, with an average "profitability gap" of 1 percentage point. But this gap is not the same for all sectors or time periods. In the Mining sector, for example, majority and minority-owned affiliates show similar returns over assets. The pattern in Manufacturing, which accounted for about a quarter to third of US foreign affiliates, shows a robust profitability gap higher than 2 percentage points in all but three years. The average gap in manufacturing was 3.4% percentage points in 1977-2003. Services show a mixed pattern, with a substantial negative gap in the first half of the 1980s, but an overall overage gap of 2 percentage points.[10] While the trend in the services sector is towards

7 In fact, if sales margins are calculated as earnings before depreciation and taxes over sales, the resulting measure is free of inflation biases (see Lupo et al. (1978)).

8 Since these ratios are calculated as total net income over total assets of all affiliates, they can be seen as weighted averages (weighted by assets) of the individual rates of return of all the firms in the industry. Since sales margins (i.e., income after taxes/sales) showed very similar patterns, we include here only the figures for the returns over assets. Some statistical tests used results for both return on assets and sales margins.

9 These sectors are at the 1-digit level in the BEA's industry classification, which corresponds roughly to the 1-digit categories in the Standard Industrial Classification (SIC).

10 Because the gap is always defined as the excess of majority ROA over minority ROA, we use the terms "positive" and "negative" to indicate the direction of the gap.

a larger gap, the data for manufacturing and for all industries show a gradual narrowing of the gap over time. The gap for all industries had shrunk from 2.1% points in 1977-1990 to 0.5% points in 1991-2003 and the gap for manufacturing had halved from 4.2% to 2.1% points during the same time period.

Within the manufacturing sector, there are important differences in the profitability gap across different industries. The following table ranks industries by the average size of the gap in ROA between majority and minority affiliates over the period 1977-2003. Two measures of this gap are shown – the percentage point difference in ROA levels and the size of this difference as a share of the ROA for majority-owned affiliates in the industry. The second measure is useful to confirm that the percentage-point gap is not due to higher overall levels of ROA. On average, manufacturing majority-owned affiliates earned a return on assets of 6.4% while minority-owned affiliates earned 3.0% in 1997-2003. These ratios yield the gap of 3.4 percentage points shown in the last line of the table, which is 53% of the 6.4% return to majority affiliates.

The industry ranking in Table 1 already begins to suggest where to look for underlying causes of this pattern. The ranking by ROA gap appears to correspond to some well-known patterns of investment of US MNCs – the industries at the top of the table are those that we traditionally associate with high firm-specific advantages for US MNCs and those at the bottom are those that we traditionally associate with lack of such advantages. We will pursue this point further in explanation below. For now, however, it is important to realize that the ROA gaps do not reflect the average profitability of US MNC investment, as might be suggested by a simple application of the traditional FDI model. (On the overall profitability of FDI, see Connor and Mueller, 1982; and Kumar, 1991 and 1994.)

Table 1
Industries ranked by ROA Gap, Majority- and Minority Owned Affiliates, 1977-2003

SECTOR (3-DIGIT CLASSIFICATION)	ROA MAJ. OWNED	ROA MIN. OWNED	%-POINT ROA GAP	GAP AS % OF MAJ ROA
Office and computing machines	9.7%	1.0%	8.7%	90.0%
Electronic components & accessories	7.4%	1.6%	5.8%	78.3%
Beverages	11.0%	5.7%	5.4%	48.8%
Instruments and related products	7.5%	2.8%	4.7%	63.1%
Radio, TV and telecom equipment	6.3%	2.8%	3.5%	55.7%
Agricultural chemicals	6.1%	2.6%	3.3%	56.9%
Motor vehicles and equipment	4.1%	1.1%	3.1%	74.4%
Drugs	11.4%	8.9%	2.5%	22.2%
Rubber products	5.4%	3.2%	2.2%	40.2%
Fabricated metal products	5.0%	3.1%	1.9%	37.4%
Grain mill and bakery products	7.2%	5.3%	1.9%	26.4%
Construction and mining machinery	2.4%	0.8%	1.7%	68.8%
Stone, clay, nonmetallic mineral goods	5.6%	4.3%	1.4%	24.3%
Industrial chemicals and synthetics	5.4%	4.9%	0.5%	9.3%
Printing and publishing	5.9%	5.9%	0.1%	1.0%
Nonferrous	3.0%	3.0%	0.0%	-0.4%
Ferrous	4.4%	4.6%	-0.2%	-5.1%
Household appliances	4.1%	4.4%	-0.3%	-6.3%
Miscellaneous plastics products	6.3%	6.9%	-0.6%	-9.5%
Textile products and apparel	4.2%	5.2%	-1.0%	-23.4%
Glass products	5.3%	6.5%	-1.2%	-21.6%
Tobacco products	11.3%	12.9%	-1.7%	-14.7%
Paper and allied products	4.7%	6.8%	-2.1%	-44.6%
Lumber, wood, furniture and fixtures	3.3%	6.3%	-3.0%	-91.7%
Soap, cleaners and toilet goods	7.2%	12.1%	-4.9%	-68.4%
All manufacturing sectors	**6.4%**	**3.0%**	**3.4%**	**53.1%**

Notes: The average gap is a simple average of the gaps in different years. Data were not available for all years. The calculations include 1977 plus annual data for 1982-2003.

In most industries, the size of the ROA gap tends to vary over time, as shown by Figures 2 and 3. The pattern in 2-digit sectors such as foods and chemicals appears to be fairly stable over time, with a standard deviation of ROA gap less than half of the mean. But the gap in many other, most notably more disaggregated 3-digit sectors, fluctuates significantly. For example in office and computing machines it starts wide and narrows to zero by 2000, while that in motor vehicles and equipment starts narrow, climbs to over 4% in 1985-1995, and ends the period in the negative, i.e. with minority ROA exceeding majority ROA. This may be due to a relatively small number of observations for disaggregated sectors, particularly those at 3-digit levels and for joint ventures. Table 2 summarizes means and standard deviations of ROA and gap estimates and provides data on the number of observations for majority-owned and other ventures.

2.3. Profitability Gaps across Countries. An obvious problem that arises when comparing profitability at the country level is that we are not able to control for industry characteristics that may influence affiliate profitability.[11] In an effort to control partially for these differences, and to check the robustness of results in the last section regarding manufacturing affiliates, we restrict our attention to manufacturing affiliates in the cross-country analysis.[12] The country patterns are shown in Figures 4 and 5. The analysis of profitability at the country level tends to confirm the basic results at the industry level. In no case did minority affiliates earn consistently higher ROAs than majority affiliates. The ROA gaps closed gradually over the period in many countries, most notably in Italy, Japan and Asia-Pacific. In some regions—e.g. Latin America and Middle East—the gaps remained roughly constant at close to zero.

2.4. The Stylized Patterns. The BEA data reveal the following stylized facts, which we will begin to explain in the rest of this paper:

1. *The overall profitability of majority-owned ventures is higher than those of other ventures in most industries; we call this the profitability gap. Profitability is measured here as a return on assets for the venture as a whole, not as the repatriated return to equity invested by the MNC.*

2. *This profitability gap is especially pronounced in those industries in which US MNCs have strong firm-specific advantages. For example, majority-owned ventures in computers and beverages are much more profitable than minority-owned joint ventures in those sectors; the reverse is true in textiles and soaps.*

11 Since published BEA data contains industry observations (3-digit level) for some countries and regions, it may be possible to control for industry characteristics there. However, many observations in these tabulations are not available because of confidentiality reasons. In the future we intend to incorporate the analysis of profit measures at this level of detail if possible.

12 As argued before, inter-industry differences within manufacturing seem to be less important for subsidiary profitability than U.S. ownership, but even if they were not, the analysis at the country level would still be warranted if the industry distribution of investment within a particular country is not too dissimilar for majority and minority-owned affiliates.

3. *The profitability gap had narrowed to below zero by 2003 for the aggregate industry and manufacturing sectors. The gap narrowed for most of the 3-digit, disaggregated manufacturing sectors studied; for some of them it varied significantly over time. Only few of the sectors (services, for example) showed a consistent trend of widening of the gap.*

3. A Model of Affiliate Profitability

We develop below a model of FDI investment that we believe can explain the empirical patterns discussed so far. Our argument will be presented using the illustrations in Figures 6 through 10. Our explanation combines elements from three strands of the literature that have developed separately: (1) the economics of project investment; (2) the theory of foreign direct investment (FDI); (3) and the resource-based view of the firm.

3.1. Economics of Project Investment. We begin by assuming that at any time a firm has a choice among many investment projects and that it will choose to invest in those projects that yield a return higher than its cost of capital. If these projects are arranged in descending order of return, they will determine the marginal return to capital (MRC) for the firm, as shown in Figure 6.[13] To the left of where this curve crosses the cost of capital curve, the firm will invest; to the right it will not. These assumptions are consistent with traditional project finance and do not reflect any special conditions in FDI.

3.2. Marginal Returns in FDI. There is no reason why this simple project-finance model would not also hold for investments across borders. In other words, a firm will face multiple investment projects in a given host country that, if arranged by descending order of return, will determine its MRC in that host country. Whether or not these foreign returns are higher or lower than returns

[13] We use return on investment here without distinguishing between assets and equity. In tests not shown here we found that the profitability gap pattern is not sensitive to how profitability is measured and is independent of financial structure of subsidiaries. For the sake of this argument, therefore, we simply assume that all projects are financed from equity and that return on investment is the same as return on assets.

in the home country is not material to our argument. The theory of FDI does not require that foreign returns be lower or higher than home returns, though it is often informally assumed that returns abroad are lower than in the home market.

The theory of FDI *does* require that the returns to the MNC be higher than the returns to local firms, because the former must overcome the "liability of foreignness."[14] In other words, the bare returns on the project in the host location must be higher for an MNC-project than for a project undertaken by a local firm, because the MNC has added costs of transferring technology, communicating at a distance, and overcoming lack of knowledge and contacts in the host economy.

As a result, FDI theory predicts that if we see an investment by a foreign firm, it must be because that firm has some sort of competitive advantage over local firms. In our framework, we can illustrate this in by allowing the MRC curve for the MNC to be higher than that for the local firm, as shown in Figure 7. The spread between these two curves indicates the extent of the competitive advantage of the foreign firm – when the MNC has great advantages, its MRC will be higher, relative to the local firm's, than when its advantages are thin.[15]

A corollary argument is that the MNC must have firm-specific resources that produce advantages over the local firm. Traditionally, the FDI literature has identified resources like proprietary technology, brand-name, management skills, access to export markets, and such as the kind of firm-specific resources that could grant an MNC advantages over local firms.[16] In our model, the

[14] The earliest discussion of this liability is in Hymer (1966) and Caves (1972); the point is well established in the literature; see a recent review in the special issue of *Journal of International Management* (2002).

[15] We are assuming implicitly that the cost of capital to MNCs and local firms are the same. This is usually not the case, but there is no need to complicate the model with such differentials. One can think of this assumption as stemming from an efficient market for international financial capital – by no means a reality, but an assumption that focuses attention on firm-specific factors that are even less likely to be transferred across borders through perfect markets.

[16] In Dunning's eclectic framework (1977), these are "ownership advantages." For now, we leave aside his "internalization advantages," which refer to the factors that lead the firm to internalize the transfer of these ownership advantages rather than exploit them through contracts. Since we do not have evidence on contractual transfers, we are in effect assuming that the firm-specific advantages in our model require internalization if they are to yield competitive advantage abroad.

MNC can be said to have firm-specific advantages that are transferable to the host country through ownership and that will yield then in that environment a return higher than what local firms could earn on their own resources.

3.3. Marginal Returns and Ownership Structures. The discussion so far has assumed implicitly that the foreign firm and local firm exploit their competitive advantages through wholly-owned ventures. But the model also allows us to see when a joint venture between the two firms would be attractive. This is shown in Figure 8.

The MRC curves for MNC and local firm are shown in separate panels in Figure 8; the directions of the horizontal axes are reversed in the two panels. The lettered locations represent projects that rely on specific bundles of resources of the each firm. Projects A, B, and C are all above the MNC's cost of capital and so can be done solo by the foreign firm. Projects A and B, especially, can be said to draw on the firm's "core" capabilities – they provide the highest returns to the proprietary advantages of the firm. Projects D and E are below the cost of capital and so would not be done, at least not solo; these projects are more "peripheral" to the firm – they may draw only marginally on its key proprietary advantages.

Even so, when combined in joint ventures with resources that the local firm would use for projects F and G, the firm's peripheral bundles D and E would yield returns DF and EG. Of these, DF lies above the firm's cost of capital, and so it would pay to devote D to that project (D otherwise would have earned a lower return). The key to this argument is, of course, the concave form of the dotted line indicating the joint ventures' returns. In our framework, these curves must be concave if a firm is *ever* going to do a joint venture. Put differently, if a joint venture promises returns that are below the return to each firm's private use of the resources it contributes to the venture, then the firm would not do the joint venture. This concave form represents the "value creation" or "synergy" of the joint venture.

3.4. Varying Advantages of MNC and Local Firms. The situation in Figure 8, in which the MNC has competitive advantages over the local firm, would lead to investment in three projects – A, B, and C would be wholly-owned by the MNC and DF would be a joint venture. It should be evident how this leads to the empirical patterns we saw earlier: the average return on A, B, and C (all wholly-owned projects) are higher in this situation than the return to DF (a joint venture project). Furthermore, the profitability gap between the wholly-owned and jointly-owned ventures increases with the relative advantage of the foreign firm – precisely what we saw in the data, most strikingly in the ranking in Table 1. As the relative advantage of the foreign firm increases, the MNC's MRC curve will rise higher on the left, so that the distance between A and B and DF will increase.

It is also easy to see from this graphic model when the profitability gap might be reversed, that is, when the average return on wholly-owned projects would be lower than on joint ventures. That situation is shown in Figure 9. In this illustration, the local firm has competitive advantages over the foreign firm – not the usual assumption in the FDI literature, but one logically consistent with our model. In this situation, it will again pay for the foreign firm to invest in some wholly-owned projects (such as A), but the returns on a joint venture that draws on strong local capabilities (BF) may in fact be higher than the return to the solo venture. Why would the local firm be willing to form this joint venture? Again, only because of the concave form of the dotted line – the local firm will get a higher return in BF than if it used its F resources solo.

When might a situation like this arise? Two conditions must apply. First, the local firm does have all the resources needed to compete successfully and could keep the foreign firm out of the market, particularly considering the liability of foreignness. But the foreign firm might have some resources that, by themselves, might not be sufficient to sustain a wholly-owned investment but that could add value to a local venture. Examples might be the very industries in which we saw "negative" profitability gaps – soap, toiletries, textiles, and so on. The local firm

might be able to do fine by itself, but an MNC might bring value with a brand-name or chemical formula.

By varying the relative positions of the MRC curves, therefore, we can generate the full range of profitability gaps shown in the data. Large positive gaps stem from strong MNC advantages; negligible gaps suggest parity; and large negative gaps stem from weak MNC advantages. We do not observe the extreme situation in which local firms so dominate foreign firms that there is no FDI at all, for obvious reasons.

The full range of possibilities for a given MNC is shown in Figure 10, which represents a modified MRC curve that takes into account the possibility of joint ventures with another firm with varying capabilities. The MNC can invest solo along the line AB; below B, it will not invest. But when offered the option of forming a joint venture with another firm, it may find projects to the right of the vertical line that are above its cost of capital. When the potential partner has only mildly attractive capabilities, these joint ventures can only achieve returns along CD; in this case, the average return of the wholly-owned ventures will exceed that of the joint ventures. When the firms are at parity, the return to joint ventures should be equal to returns on wholly-owned ventures.[17] Finally, when the potential partner has capabilities that far exceed the MNC's, then the joint-venture returns in GH will on average exceed the solo returns.

3.5. Profitability Gaps as an Indicator of Relative Advantages. If this model reflects reality, then one can interpret the profitability gap in a particular industry and country as the "revealed" competitive advantage of U.S. firms compared to local firms. The data discussed above correspond roughly with such an interpretation. For example, as noted already, it is reasonable to argue that the competitive advantage of U.S. firms is strongest in computers, semiconductors and

[17] Of course, each firm only gets a share of these returns, but they also contribute only a corresponding share of the assets. One way to visualize this case of parity is to think about the two firms as identical – mixing and matching each other's resources then does not yield more, or less, than using one's own resources.

beverages, lowest in soaps and lumber, and moderate in such sectors as rubber. In addition, we saw that the profitability gap widened and narrowed over time in some industries and countries. These trends might indicate changes in the revealed advantages of U.S. firms compared to local firms. The recent narrowing profitability gap in the motor vehicles and equipment sector and with Asia-Pacific might reflect this.

3.6. Profitability Gaps and Host Government Policies. The argument that profitability gaps reflect revealed competitive advantage does assume that the firm is free to invest in whatever projects it wishes. What if there are restrictions on foreign investment, especially ownership restrictions?[18] In such cases, the firm in Figure 8 may simply not be allowed to invest in A, B, and C, or at least will have such restrictions placed on it that these investments will yield lower returns. On the other hand, the firm will be encouraged to invest in DF, and indeed may receive incentives that will increase the return to that joint venture. It is easy to see that the result will then be a smaller profitability gap than without host-government restrictions, even in situations when the foreign firm enjoys competitive advantages.

3.7. An Alternative Formulation of the Model. Our model describes project choices by a single firm. From this perspective, projects along the MRC curve in Figure 6 represent successively less attractive ways of using the firm's proprietary advantages. The MRC is then the investment frontier for a given firm and the resulting wholly-owned and jointly-owned ventures are then different projects in the firm's portfolio.

A different formulation of the model would see the MRC curve as representing the investment frontier for an industry or collection of firms; the projects underlying this curve might then be

[18] The investment calculus in countries with host-government restrictions is systematically different from that in countries without such restrictions, as explained in Gomes-Casseres (1990).

investments by rivals in the industry. In this view, the leading firms would have the highest returns on their assets in a given industry, followed by second-tier rivals with lower returns.

In this interpretation of Figure 8, it would be the second-tier firms that would form joint ventures and the leading firms that form wholly-owned ventures in the industry. Indeed, there is some evidence that small firms in an industry are often compelled by competition to follow their larger rivals abroad and that they then often need joint ventures to enter markets in which they could not succeed alone (Gomes-Casseres, 1989).

The aggregate data and stylized facts discussed above are consistent with this formulation too, and we have as yet no way to discriminate between the explanations. Because the data we have are at the industry level (or country level), we do not observe single firms and cannot disentangle average returns for the industry from average returns for firms in the industry. One implication of the industry-MRC model may be that the steepness of the MRC curve depends on industrial organization variables, such as the distribution of firms in the industry.

4. Extensions of the Model

4.1. Diversification and Multinationality

Our model has one more attractive feature that makes it compelling. With minor revisions, it can be used to explain two other types of empirically-observed profitability gaps, one of which has long been a puzzle in the strategy literature. There is a long literature on the "diversification discount," by which is meant the empirical observation that firms that diversify outside their core business tend to have a relative lower market value, all else equal, than those which don't diversify. Usually, this discount is measured by Tobin's Q, which is roughly the difference between the market capitalization of a firm and the total book value of its assets.

Our framework is readily modified to explain this puzzle. Firms that invest in projects outside their core will receive a lower return on those projects than on their core projects. As they do that, their average return on assets will decline, leading to a lower market capitalization, holding constant the value of assets. Indeed, the business-level data in a study of conglomerates by Maksimovic and Phillips (2002) seems consistent with this approach.

A more recent observation in the finance literature is the "multinationality discount," also measured by Tobin's Q. The pattern here is that the value of the firm (again relative to its book assets) declines as it invests in more countries. This observation seemed to fly in the face of claims about the positive role of global strategies. Among the first papers to explore this was Click and Harrison (2000); in Denis, Denis, and Yost (2002) the multinationality discount is explicitly compared to the diversification discount and found to be of roughly equal magnitude. Curiously, neither of these papers finds a satisfactory explanation for their strong empirical results. Denis, Denis, and Yost (2002) even conclude that the costs of globalization outweigh the benefits.

Our framework would suggest otherwise. First, it should be easy to see how the model applies to investment outside the home country. The same liability of foreignness discussed above would mean that, all else equal, projects outside the home country would carry a lower return than projects that use the same firm capabilities inside the home country. An additional reason for lower returns abroad might be that the firm's home-grown capabilities may, in fact, not be fully appropriate to the foreign environment. In either case, the average return to projects abroad would be lower than the average return to domestic projects. As a result, for a given level of assets, the net income of the firm would be lower, leading to a lower market capitalization.

But this does *not* mean that it is destructive for the firm to invest abroad (or, indeed, for firms to diversify, in the preceding puzzle). Even in the foreign investments, the return to investment

exceeds the firm's cost of capital – the price that shareholders and debtors ask for their money. As a result, the firm is still *creating value for these investors*, even if it is reducing its excess of market over book value.

4.2. Value Destruction in JVs? We do not have data to test whether Tobin's Q would rise or fall as firms invest in relatively more joint ventures. But we bet it would fall. The data suggest strongly that average profitability of a firm's assets would decline the more it invests in joint ventures; as argued above, this would lead to a decline in the excess of market over book value. But, as above, this need not be an irrational move for the firm; nor would it have to be justified by "strategic" or non-financial arguments. The rationale for such investments is the same as the rationale for diversification and for foreign investment – to exploit more fully the firm's capabilities. As long as the investments outside the core continue to yield returns over the firm's cost of capital, they create value for the firm's owners.

But, inside the firm, managers would be well-advised to apply a different yardstick to their joint ventures than they do to their wholly-owned ventures. They cannot expect the same average return across these organizational forms, much like they would not expect the same return for a foreign investment and a project in the firm's home base. In this respect, popular reports that alliances are more profitable than wholly-owned ventures are downright misleading. Better to recognize that joint ventures and other alliances are used when the firm cannot go it alone, and that it cannot expect to get its choice returns in these cases.

The same is true for every other project that in some way extends the firm's capabilities into a new area. Here, we tackled the puzzle of profitability gaps among organizational forms; we have seen that the approach applies equally well to profitability gaps among industrial or geographic portfolios.

5. Empirical Tests for Possible Determinants of the Profitability Gap

We examined a number of possible explanations for these patterns using variables that previous researchers have found were important to MNC profitability. Due to the lack of detailed firm-level data, we have to limit our analysis to the effects of affiliate size, age, foreign income tax rate, host country policies, and non-dividend payments. No of these factors was sufficient in explaining the gap. In line with our model, we propose to use the international competitive advantage of US multinationals as an explanatory variable for the profitability gap. We use the ratio of foreign sales of US MNEs to their total US sales (or total sales in their sector in the US) as one measure of this competitive advantage of US firms compared to local firms. The other measure that reflects the US competitiveness is the inverse of the ratio of foreign affiliate sales in the US to total US sales (or sales of US firms in the US) in the same sector.

5.1. Effects of US competitiveness. The crux of our model is that large positive gaps stem from strong advantages of US MNCs relative to local firms abroad; negligible gaps suggest parity; and large negative gaps stem from weak US MNC advantages. To test whether one can interpret the profitability gap in a particular industry as the "revealed" competitive advantage of US firms compared to local firms, we need to consider an alternative measure of US MNCs' international competitive advantage and explore how it relates to (explains) the profitability gap. One way to measure the international competitive advantage of US firms is to look at the relative importance of their foreign sales. Two such measures of competitiveness are US Fsales / US Sales and US Fsales / Sales US, where US Fsales are sales of US MNCs abroad, US Sales are total sales in their sector at home, and Sales US are sales of US MNCs at home. We have derived Sales US as a difference between US Sales and sales of foreign MNCs in the US (in a specific sector), denoted as Fsales US[19].

[19] US Fsales are sales of foreign affiliates of US corporations (using BEA data); US Sales are net selling values, f.o.b. plant to the customer, after discounts and allowances and excluding freight charges and excise taxes and interplant transfers (using U.S. Census Bureau's Manufacturers' Shipments, Inventories, and Orders (M3) survey. FSales US are sales of affiliates of foreign corporations in the U.S. (from BEA surveys).

Tables 3 and 4 capture these ratios and their correlation with the ROA gap studied in this paper. Table 3 suggests that there was an overall trend towards more international engagement in all 14 sectors where data were available. The average foreign sales intensity (using total US Sales) had grown from 19.9% in 1983-1990 to 32.4% in 1991-2000. In line with the predictions of our theoretical model, the seven sectors with the highest profitability gap are the sectors with the highest ratio of foreign to US sales for those sectors. The correlation between this ratio and the ROA gap is 0.30, although it has dropped notably from 0.50 in 1983-1990 to 0.26 in 1991-2000. Table 4 explores the same relationship using a ratio of foreign sales of US MNEs to their US sales, and finds a similar correlation of 0.34 between this ratio and the profitability gap. When we include US sales of the US firms in the denominator, the correlation with the gap is 0.29.

High foreign sales of US firms may reflect overall globalization of an industry for a particular country, i.e. conditions that favor international expansion of all firms, not competitiveness per se. To control for this effect, we also incorporate foreign sales penetration in the US into the measures of US competitiveness. The ratios of foreign sales to all sales and domestic sales of US firms both show a negative correlation with our profitability gap (-0.18 and -0.22 respectively), as our model predicted (see Table 6). When we construct an index of US competitiveness that has a difference between US sales abroad and foreign sales in the US in the numerator and sales by US firms in the same sector in the denominator ([US Fsales-Fsales US]/Sales US), we find even stronger correlation with the gap (0.35, please see Table 6). The Index of Globalization ([US Fsales+Fsales US]/Sales US) shows a more modest correlation of 0.16 with the gap.

We have tested the impact of the six aforementioned variables on the profitability gap in a multivariate regression. The coefficients on all measures of competitiveness were statistically and economically significant. One measure of the US propensity to sell abroad, for example, showed a coefficient of 0.55, while the respective coefficient for the foreign penetration of the US market it was 0.33. These are very significant effects, given that the average ROA gap was

2.2% and the average US propensity to sell abroad was 30.9% in 1991-2000 for the sectors analyzed in this regression (see Table 4). The average foreign penetration of the US market was 18.3% in 1991-2000 (see Table 4). The globalization variable hasn't shown a significant impact on the gap in our regression analysis (see Table 6).

5.2. Effects of Affiliate Size. One explanation for the profitability gap may be that majority-owned affiliates are larger than minority-owned ones and benefit from economies of scale. But our tests using affiliate assets as well as sales as measures of size, indicate that majority-owned affiliates in fact are not systematically larger than minority-owned affiliates; on the contrary, the latter seem on average larger than the former. In terms of assets, the average gap between the assets majority- and minority-owned affiliates was -$25.1 million for 1983-2000 (about 41% of the average assets of majority-owned).

To test the significance of this finding across industries, we performed a test for the difference in mean size across all 32 manufacturing industries (3 digit level) for which we have data. In all the cases, the null hypothesis of majority-owned and minority owned-affiliates having similar sizes cannot be rejected (tests not shown in this paper).[20] We performed similar tests for data aggregated at the country level and obtained fundamentally the same results (i.e., that minority-owned affiliates are not systematically smaller than majority-owned ones). Because of space considerations we do not report the results here.

We also ran a regression of the difference in profitability on differences in size of foreign affiliates in manufacturing industries (not shown in this paper). Here too, differences in size do not explain differences in profitability. In all the regressions, the coefficient of the size variable

20 A caution note is in order here. Using industry averages to compare firm sizes is not ideal since it is well known that distributions of firm sizes are highly skewed (Schmalensee (1989)). Thus, by using industry averages to compute our tests, we are implicitly assuming that the distribution of firm sizes within a particular industry is not too dissimilar for majority and minority-owned affiliates.

is either insignificant or has the wrong sign. The overall explanatory power of the regressions is also very poor. (Regressions using country-level data gave very similar results.) Overall, these results lead us to conclude that the positive relationship between U.S, ownership and profitability cannot be explained by differences in affiliate sizes[21].

5.3. Effects of Affiliate Age. Another explanation for the profitability gap may be that majority-owned affiliates are older than minority-owned ones, and so benefit from economies of experience or depreciated assets. Since we do not have access to information regarding the average age of affiliates, we again cannot test directly whether the difference in profitability is caused by differences in age. However, based on an examination of how assets and sales of both affiliate types have grown over time, we believe that this explanation is highly unlikely.

In 1991-2000, assets of majority-owned affiliates have grown much faster (8% per year) than investment in minority-owned affiliates (2.2% per year), suggesting that the average age of assets in majority-owned affiliates should be lower. Thus, if age and profitability are positive correlated, as some researchers have suggested[22], the univariate tests for differences in mean returns that we performed earlier are probably biased towards acceptance of the null hypothesis of equal means. In fact this constitutes a plausible explanation for the reduction in the statistical significance of our mean tests during the 1990s. In short, we do not believe that the positive relationship between U.S. ownership and affiliate profitability is caused by differences in the age of the subsidiaries.

5.4. Effects of Foreign Tax Rates. Another possible explanation for the profitability gap may be that regulations in host countries may influence accounting practices for foreign subsidiaries and so the accounting measures of profitability that we use. In particular, one can expect profits from

[21] We have also considered sales as the measure of size. The results were similar as with the assets.
[22] See Lupo, L. A., A. Gilbert, and M. Liliestedt (1978).

majority-owned subsidiaries to be more easily shifted to locations with lower tax rates, which would then show higher profitability than otherwise. (Here it is important to remember that most of majority-owned affiliates in BEA data are in fact wholly-owned subsidiaries.)

To test for such effects, we plotted the profitability gap against the effective foreign tax rate of host countries in 1989 (from Desai and Hines, 1999). There appeared to be a tendency for the difference in profitability to decline as the foreign tax rate increases. To further test this apparent relationship, we ran a regression of the profitability gap on the foreign tax rate (not shown in this paper). The coefficients of the tax variable are negative significantly different from zero, indicating that the profitability gap was smaller in countries with relatively higher tax rates. That is what one would expect if MNCs were able to shift profits of wholly-owned ventures from high- to low-rate countries.

However, this relationship needs to be corroborated for other years and for more countries (we have tax rates for about 33 out of the 50 or so countries for which we have return data). Moreover, we expect the high tax rate countries to share other characteristics that may influence FDI ownership policies (for example, high tax rates were strongly correlated with high restrictions towards FDI in 1989), as discussed later. And, regardless of this possibility of excluded country factors, we do not find that the tax rate effect is large enough to explain all the difference in profitability between majority and minority-owned affiliates and it does not explain why some sectors within the same country have large positive and other negative gaps.

5.5. Effects of Host Country Policies. The theoretical discussion in section 3.6. suggests that there might be a lower or even negative profitability gap in countries that have FDI restrictions on majority ownership. For example, this may be the reason for the negative and fluctuating profitability gap for Mexico, a country well known for having had strong disincentives for wholly-owned foreign investment, at least until recently. (Interestingly, the gap turns positive

from 1990 onwards.) The host-restrictions argument may also explain the negative gaps in Petroleum and Mining in Figure 1; these are industries in which many host governments have long restricted wholly-owned investments or have found ways to extract profits from wholly-owned affiliates. As a result, they may have equalized the returns to wholly-owned and jointly-owned ventures, to the extent that MNCs in these industries have become indifferent between these entry modes. Finally, the reversal over time of the profitability gap in Services (Figure 1) is intriguing – it suggests that before the 1990s U.S. firms were either barred from wholly-owned investments in such fields or did not enjoy much advantage; later this changed.

To test more formally for the effect of the host country policies, we have plotted the profitability gap against the index of host country restrictions to FDI developed by Shatz (2000). The index measures openness to FDI on a scale of 1 to 5, with 5 signifying the most open or liberal. It takes into account factors such as sectoral restrictions to FDI and approval processes, restrictions to acquisitions and bans on a whole or majority ownership of foreign affiliates. It is available for 1986-1995. When we plotted the gap against the FDI restrictions index, there was a tendency for countries with more liberal regimes to have a higher gap, in line with our theoretical discussion. However, when we ran a regression of the gap on the index of FDI restrictions, the coefficient on the restrictions was not statistically significant, indicating that it doesn't offer as strong explanation for the gap as our main competitiveness argument[23].

5.6. Effects of Non-dividend Payments. The last possible explanation for the profitability gap is that MNC receive returns in different forms from majority- and minority-owned ventures. In particular, they use transfer pricing, royalties, fees, and debt charges more extensively in minority-owned ventures; these costs would then depress the profitability of the ventures as

[23] As mentioned in the section 5.5., it is possible that the host country tax rates and FDI policies are in themselves a result of some other characteristic of the country. We have tested for the hypothesis that the less developed countries (LDCs) that have higher taxes and more restrictive FDI regimes. The LDCs indeed tend to have higher taxes and more restrictive FDI policies, but the effect was not statistically significant. The relationship between the gap and the GDP per capita was also not statistically significant.

compared to majority affiliates. While an MNC would have an incentive to extract profits in this way in minority-owned ventures, it may not always be able to do so, because of limited voting rights in the venture. On balance, therefore, it is an empirical matter whether we observe more non-dividend payments in minority ventures than in majority ones.

The BEA data used here do not show detail of dividend and non-dividend payments. But in another data series, the BEA publishes data on the U.S. direct investment position and balance of payments by ownership (i.e., all affiliates and majority-owned affiliates). The direct investment position is equal to the U.S. parent share in equity plus any net outstanding loans at the end of each year; it intends to be a measure of the total funds committed by the U.S. parent to their foreign affiliates. From the balance of payments statistics BEA derives direct investment income (which includes the U.S. share in earnings and net interest payments from affiliates), investment royalties and license fees, and other investment services (which includes management and other fees). By adding all these sources of U.S. parent income and dividing by their investment position, we can calculate an alternative measure of total return over total funds committed abroad according to U.S. ownership.

The results of tests with these data were mixed. We first tested the significance of the difference in mean returns for both types of affiliates. Unfortunately, we only had access to Position and Balance of Payments data for the Benchmark Surveys (1977, 1982, 1989, 1994 and 1999). Furthermore, even for these years many of the observations (especially for industry data) were not available. There were also a fair number of outlying data points that skewed the results. As a result, a simple test of means was inconclusive – we could not reject the hypothesis that majority and minority ventures earned the same average return. We then used a Wilcoxon Rank Test to evaluate the different between majority or minority returns. In all but one of the tests majority-owned affiliates' returns ranked higher than minority-owned. The difference in ranks was significant at the 10% level in five of twelve cases. This suggests that, even after considering

non-dividend income streams, majority-owned affiliates remain relatively more profitable than minority-owned ventures.

6. Conclusion

This paper is a first cut at what seems to be a pervasive and important empirical pattern: majority-owned affiliates of US affiliates abroad tend to be more profitable than non-majority owned affiliates. Our theoretical framework implies that a firm's choice of the entry mode (majority- versus non-majority ownership) is affected by its competitive advantage compared to its foreign rivals. Our empirical tests confirm that firms in sectors where the U.S. is more competitive show a higher profitability gap between their majority-owned affiliates and other affiliates abroad. Limitations of our methods and data have already been noted along the way. Foremost among these is the lack of disaggregated firm-level data from the BEA. We intend to pursue this with the BEA, in the hope of deepening and refining this research with better data.

Nevertheless, if the general direction of our theoretical arguments holds true, there may be important implications for research in other areas and with other methods. Research on boundaries of the firm–including work on alliances and networks–has seldom dealt directly with the question of profitability. Transaction-cost models and market-entry models are predicated on the relative profitability of different organizational firms, but seldom attempted to test directly whether and why one form is more profitable than another. The same holds for resource-based models of the firm.

Our research suggests that developing an explicit model of profitability of the MNC will yield various benefits. We applied such a model here to explain one set of strategic choices faced by an MNC – the conditions under which the firm will invest in majority-owned and non-majority-

owned ventures. Related models can no doubt be used to explain other strategic choices, including exporting, market entry, diversification, and mergers.

Our model also highlights the need for research in areas that we would have thought were already well known. Chief among these is the definition and measurement of an MNC's firm-specific advantage compared to local firms. We used this well-known construct to explain the higher profitability of majority-owned projects in certain industries. Our preliminary tests for this relationship—using ratios based on US sales abroad and foreign sales in the US—have been encouraging, but further refinement of the measures and their use in additional multivariate regression analysis with firm-level data will be needed to provide a firmer support for our theoretical arguments. At any rate, we would encourage such research that returns to the basic micro-economic foundations of the MNC theory.

Appendix

Figure 1
Return over Assets by US Ownership in Broad Industry Sectors
(1977-2003, 1 digit level; majority- vs minority-owned incl. 50-50 JVs)

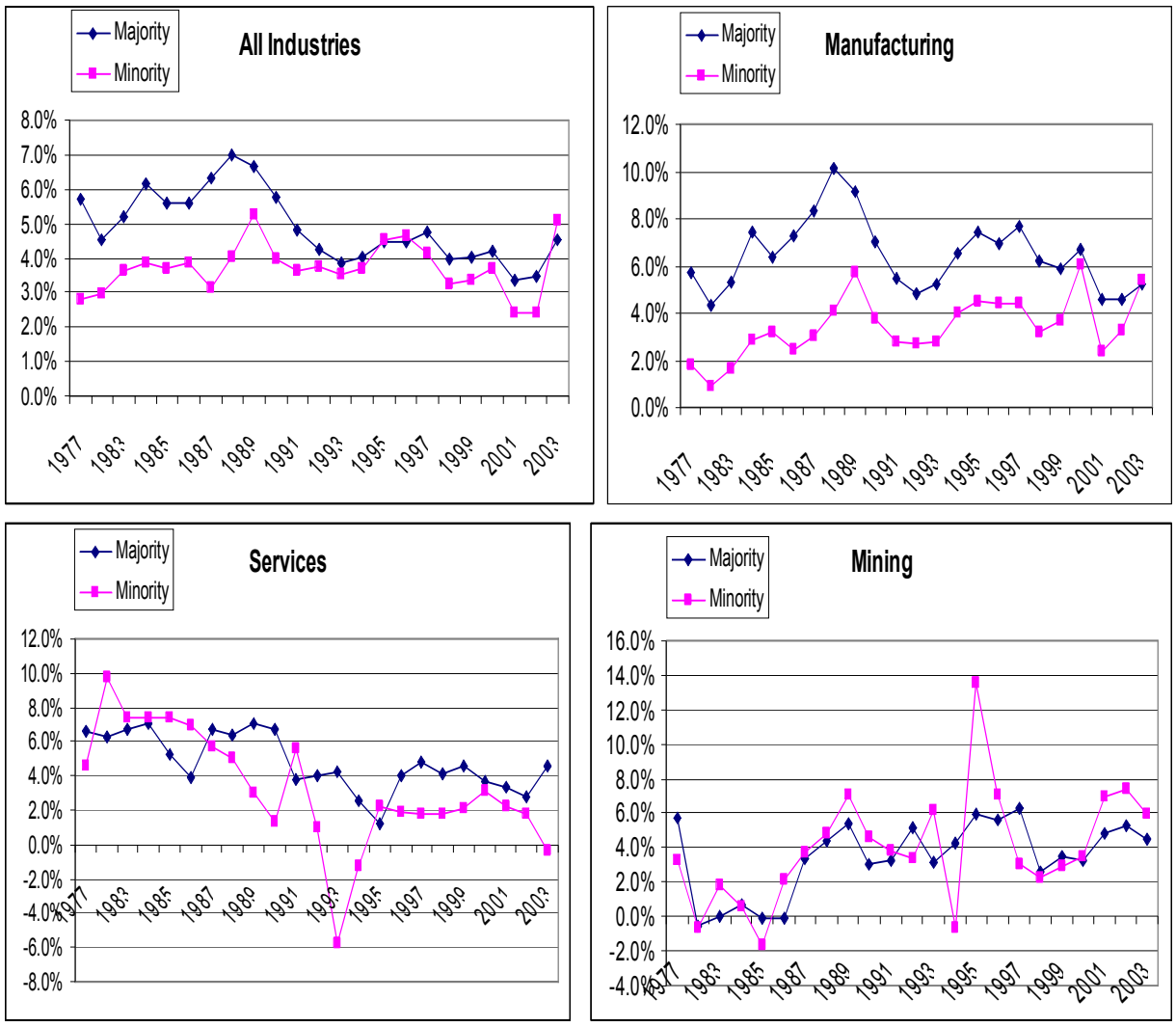
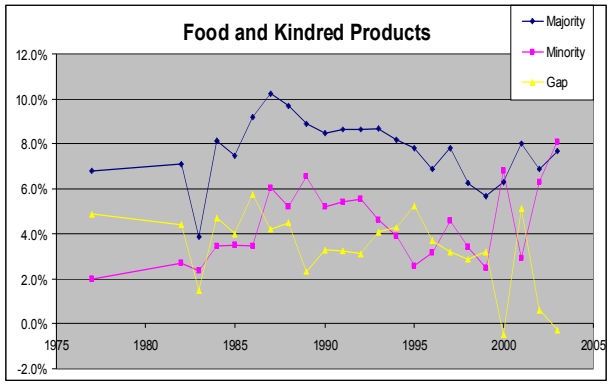
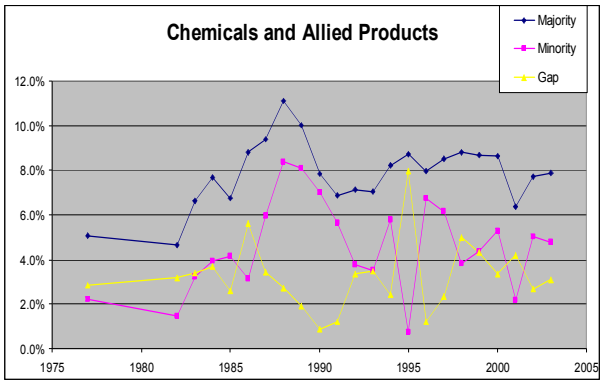
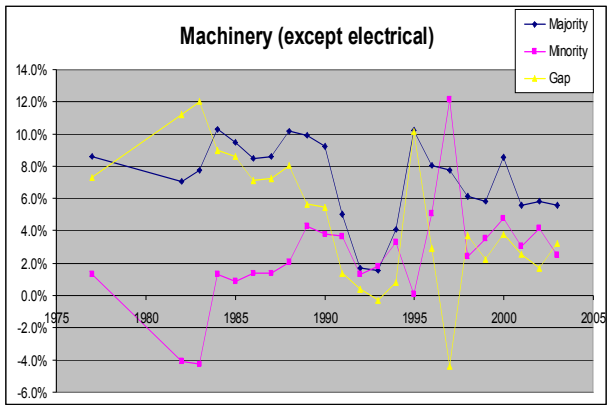
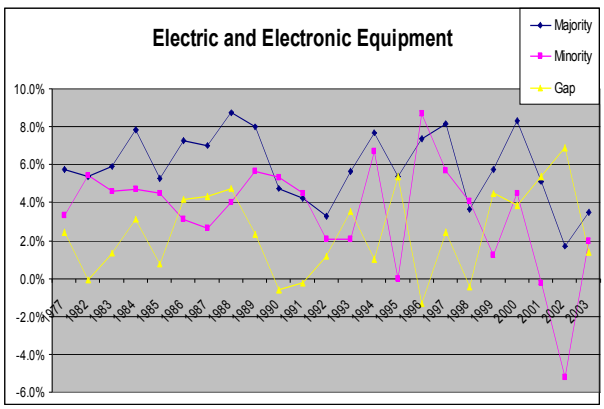


Figure 2
Return over Assets by US Ownership in Selected 2-digit Manufacturing Sectors
(1977-2003, 2 digit level; minority includes 50-50 JVs)









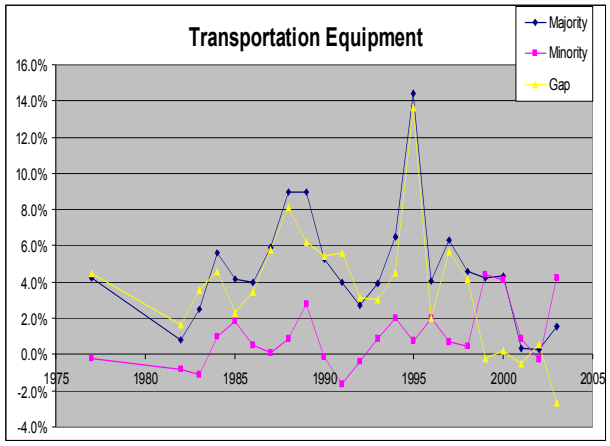


Figure 3
Return over Assets by US Ownership in Selected 3-digit Manufacturing Sectors
(1977-1994, 3 digit level; minority includes 50-50 JVs)

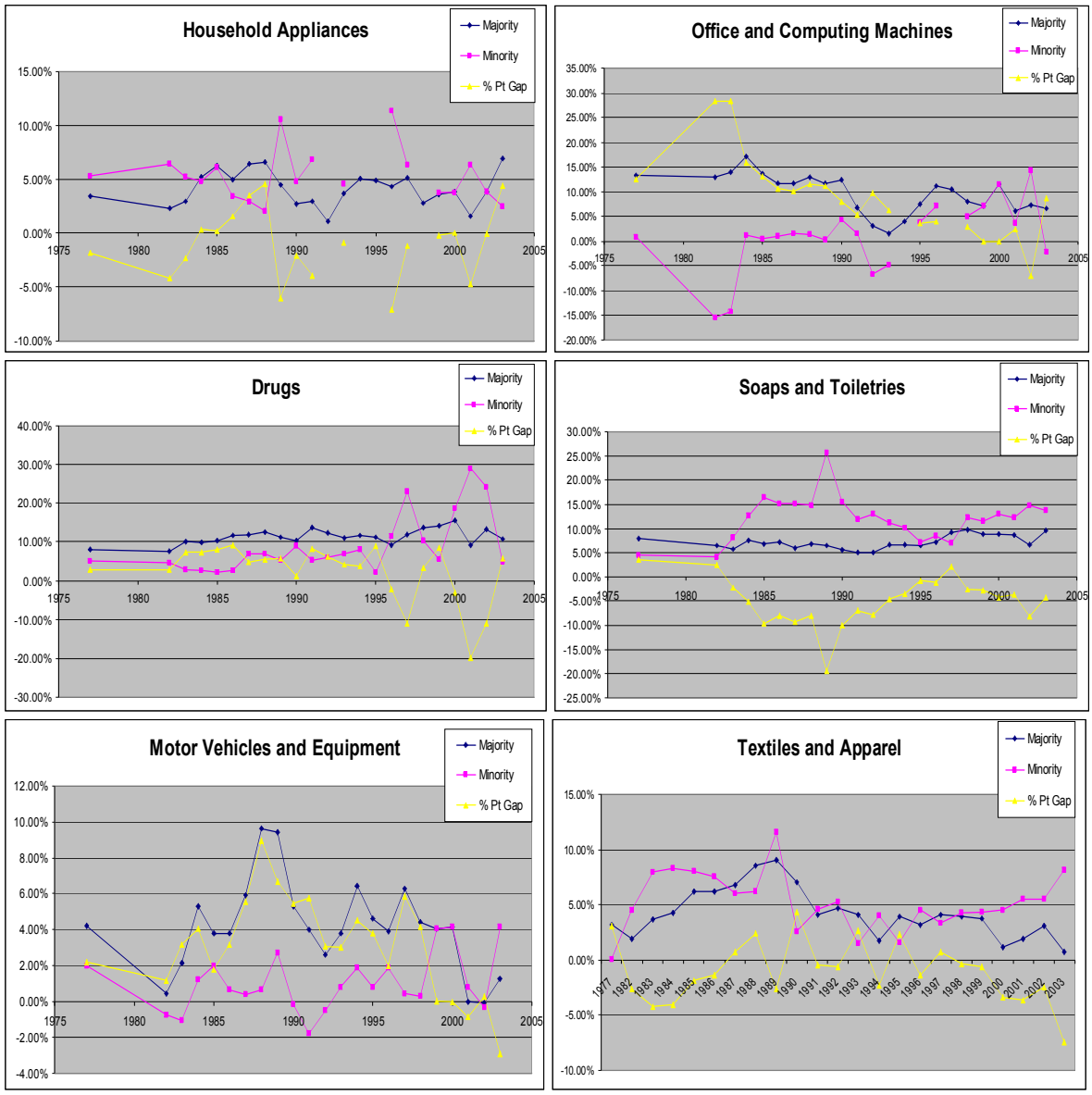


Figure 4
Return over Assets by US Ownership in Selected Developed Countries
(1977-2003, Manufacturing Affiliates; minority includes 50-50 JVs)

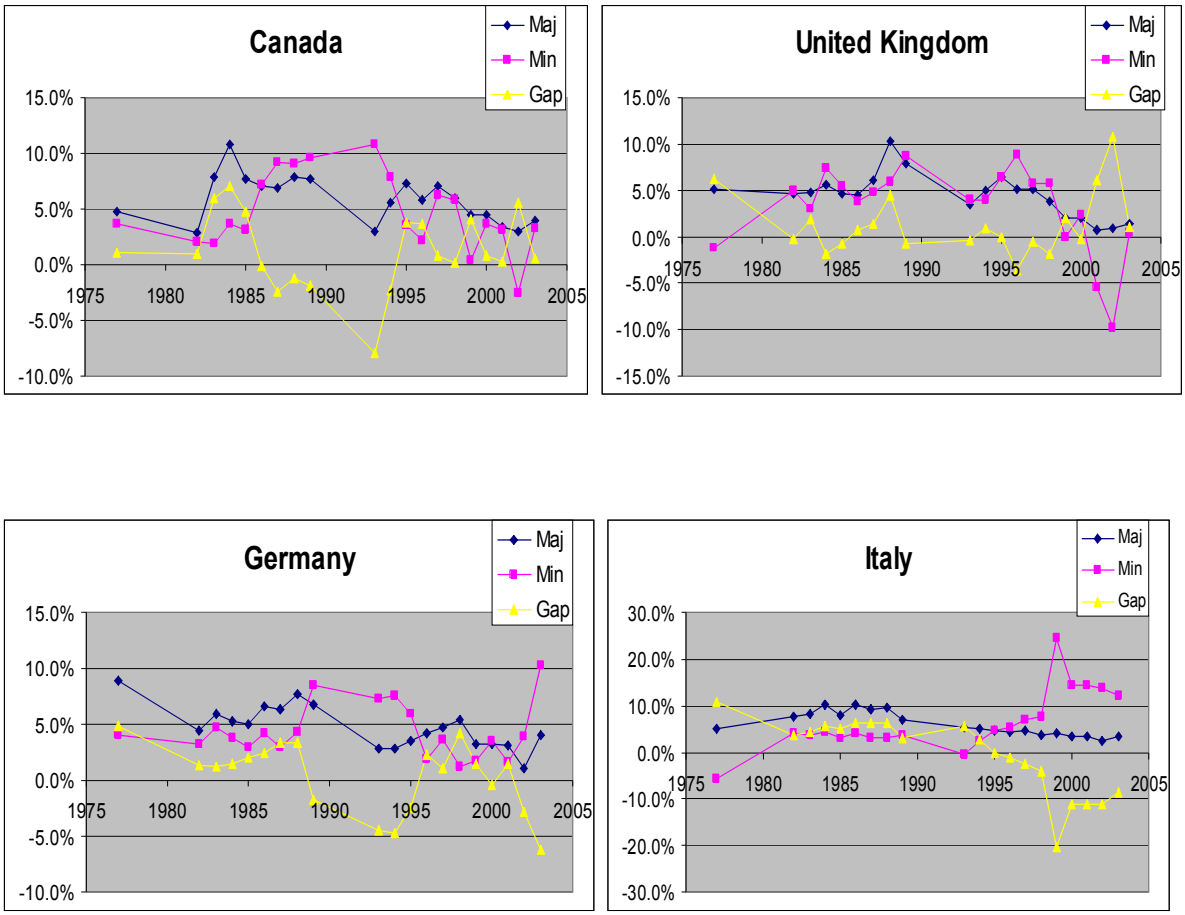


Figure 5
Return over Assets by US Ownership in Selected Regions
(1977-2003, Manufacturing Affiliates; minority includes 50-50 JVs)

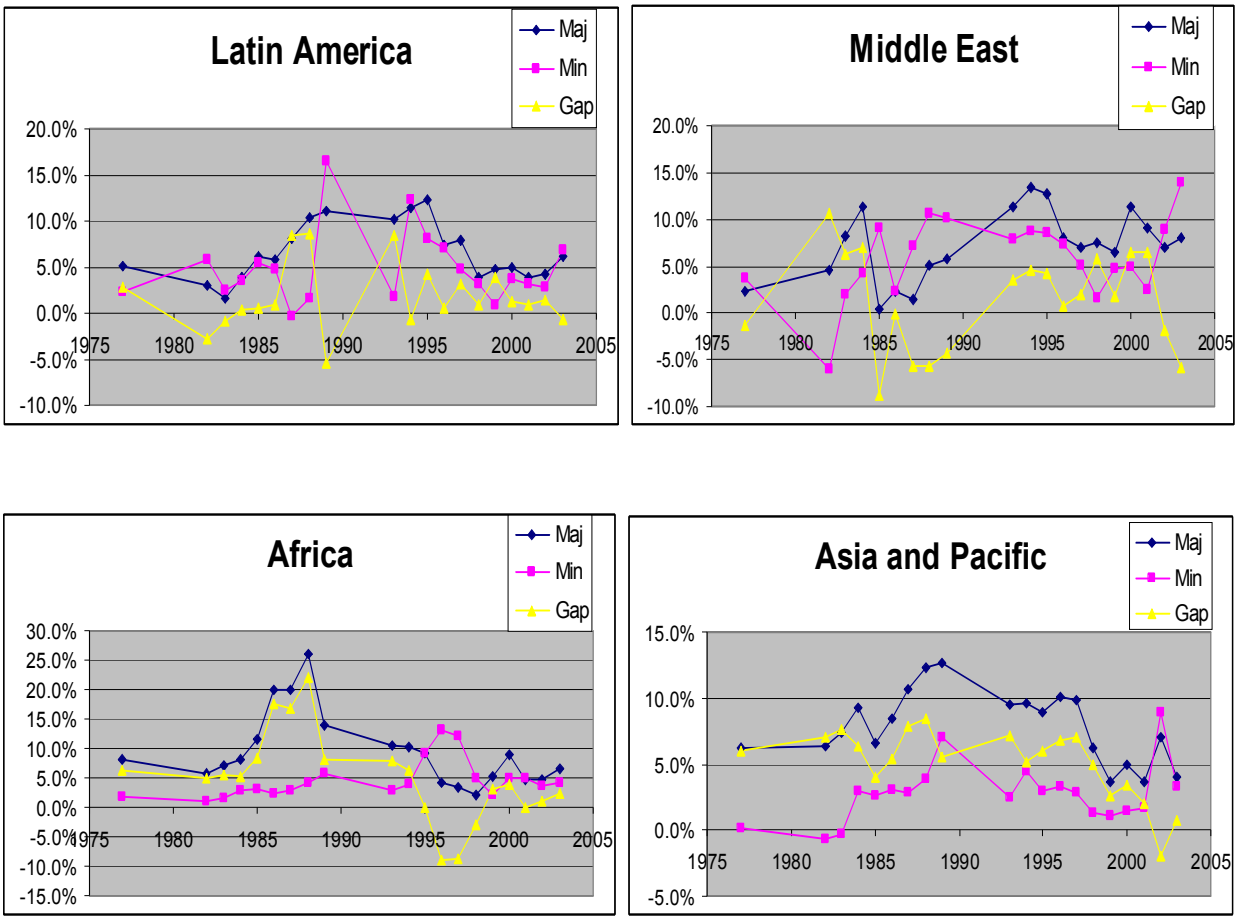


Figure 6
The Marginal Return to Capital

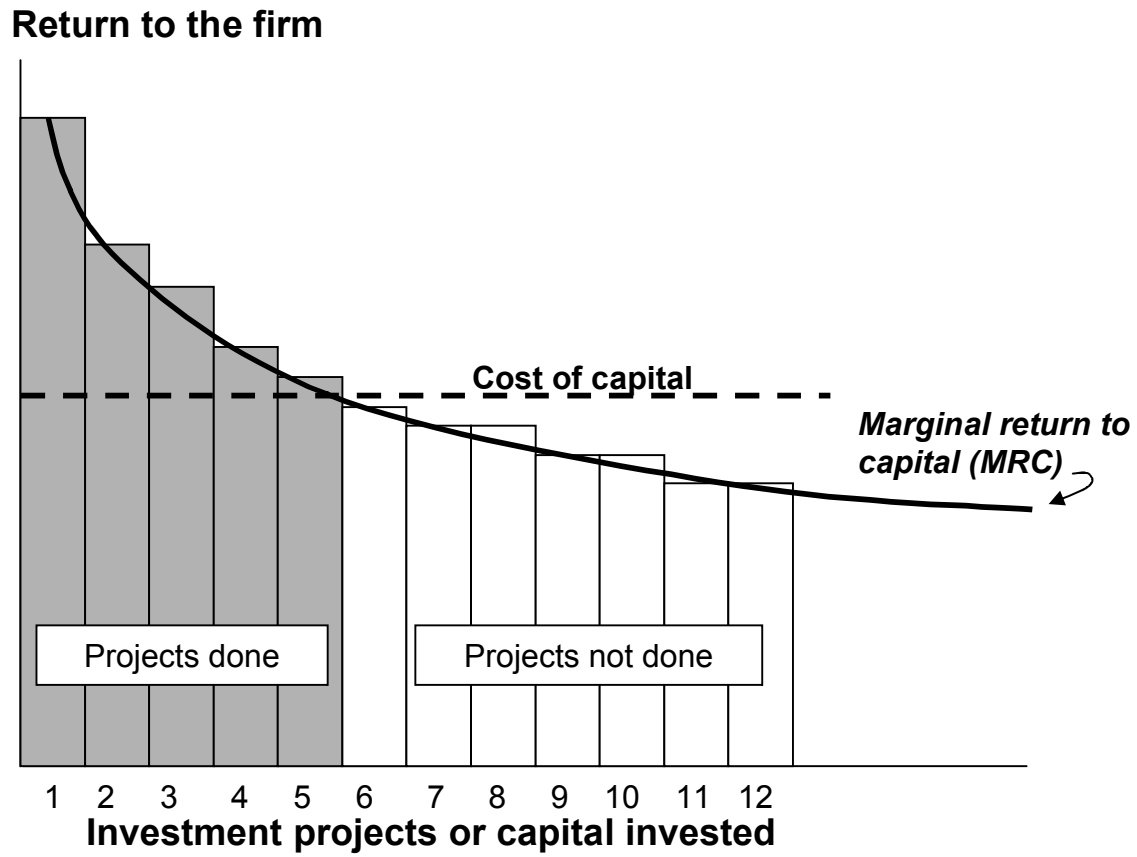


Figure 7
Marginal Return to Capital when MNC has Advantage over Local Firm

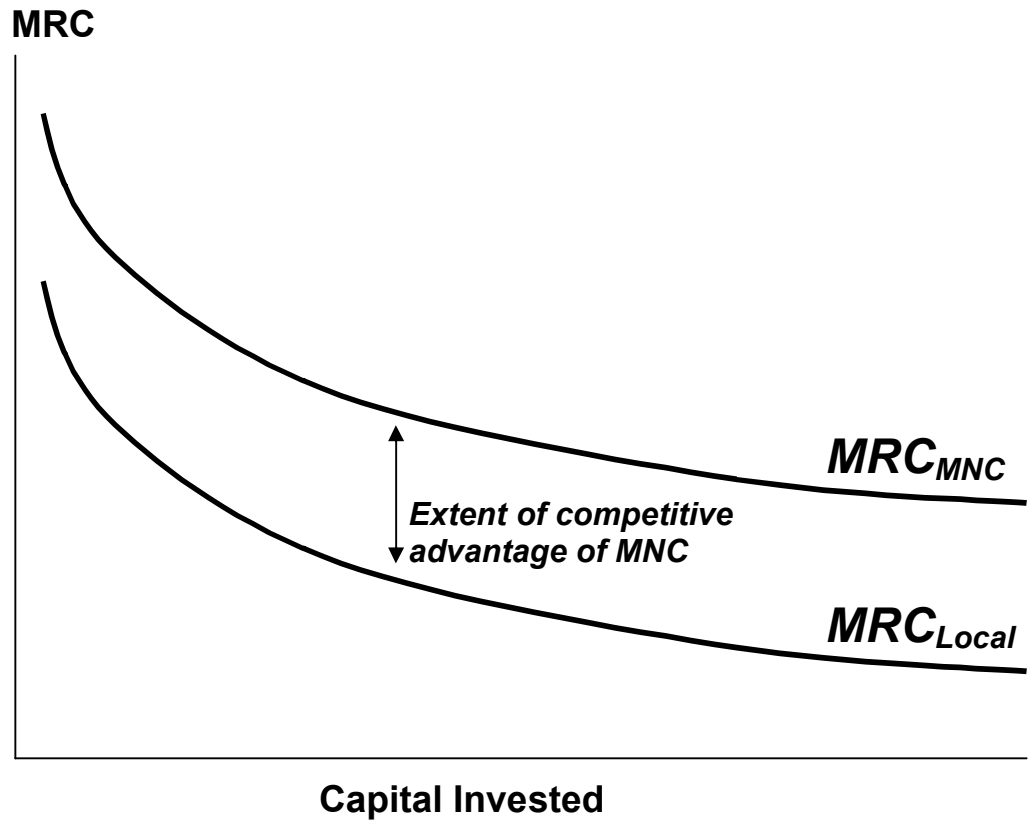


Figure 8
Marginal Returns and Joint Ventures when MNC has Advantage

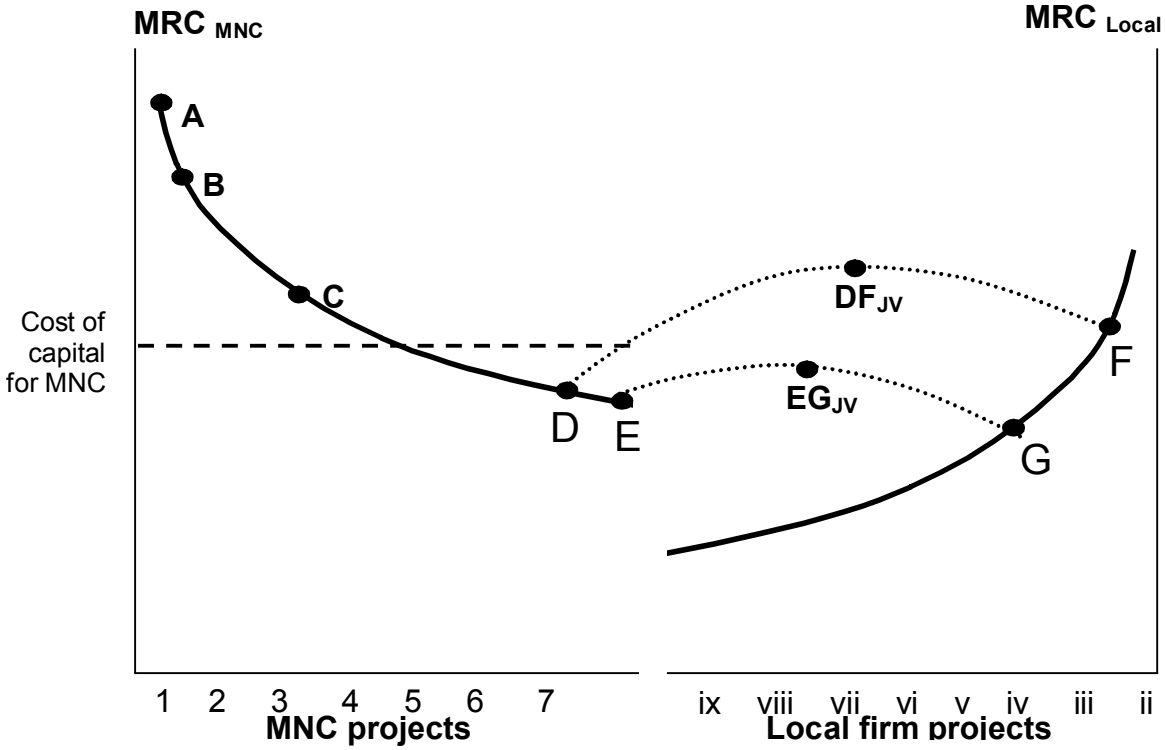


Figure 9
Marginal Returns and Joint Ventures when Local Firm has Advantage

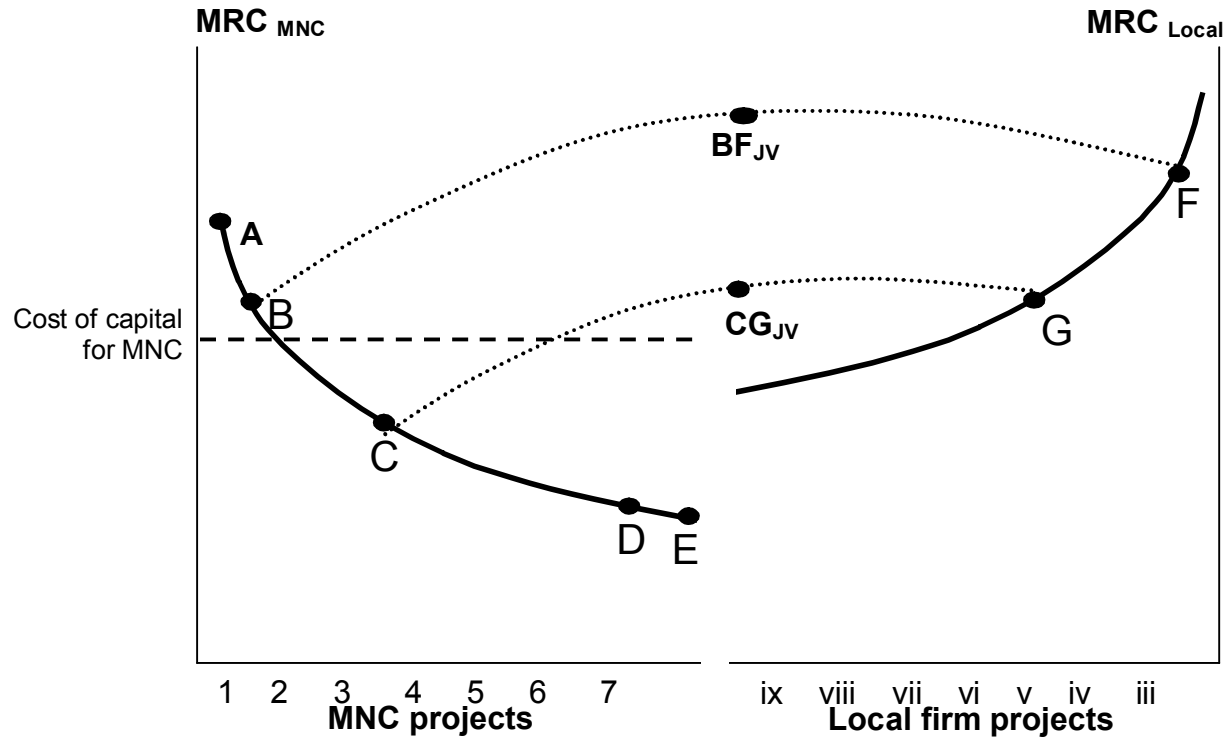
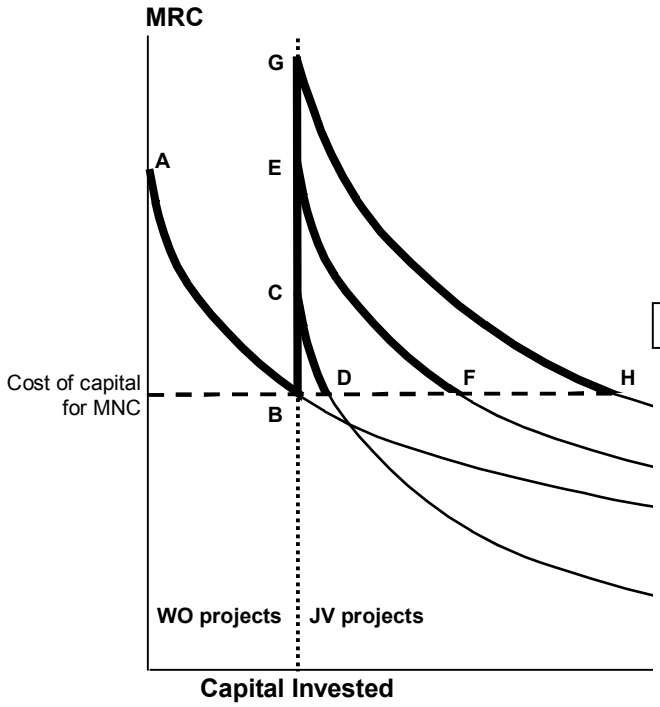


Figure 10
Modified MRC with Different Ownership Structures and Relative Advantages



(AB) MRC on WO projects

(GH) MRC on JVs in Countries Where Locals Have Advantage Over MNC

(EF) MRC on JVs in Countries Where MNC and Locals are at Parity

(CD) MRC on JVs in Countries Where MNC Has Advantage Over Locals

$$Avg_{GH} > Avg_{AB} = Avg_{EF} > Avg_{CD}$$

Table 2
Summary Statistics, Return on Assets, Majority- and Minority-Owned US Affiliates Abroad, 1977-2003

	MAJ	MIN	GAP	MAJ	MIN	GAP	MAJ	MIN	GAP	MAJ	MIN
1-digit sectors	**ROA Mean**	**ROA Mean**	**ROA Mean**	**Stdev % points**	**Stdev % points**	**Stdev % points**	**Stdev % of mean**	**Stdev % of mean**	**Stdev % of mean**	**Firms Avg #**	**Firms Avg #**
Manufacturing	6.4%	3.1%	3.4%	1.5%	1.3%	1.4%	23.3%	41.6%	42%	6,390	1,052
Petroleum	20.2%	-22.2%	42.4%	70.6%	207.6%	277.4%	350.0%	-935.3%	655%	1,168	299
Finance	4.0%	0.6%	3.4%	2.1%	3.3%	2.5%	53.4%	523.1%	74%	2,110	173
Services	4.8%	2.8%	2.0%	1.6%	3.4%	3.1%	33.9%	122.7%	152%	1,452	223
Mining	3.5%	3.5%	-0.1%	2.1%	3.3%	2.5%	61.5%	94.1%	-4943%	89	44
All Industries	4.9%	3.9%	1.0%	1.0%	0.7%	1.0%	20.8%	18.8%	100%	15,710	2,173
2-digit sectors											
Food and kindred Products	7.7%	3.9%	3.8%	1.4%	1.7%	1.7%	18.2%	42.6%	44%	554	118
Chemicals and Allied Products	7.9%	4.1%	3.7%	1.5%	2.0%	1.5%	18.7%	48.2%	41%	1,578	295
Primary and Fabricated Metals	4.7%	5.1%	-0.4%	2.1%	13.9%	14.0%	44.8%	272.0%	-3157%	567	106
Machinery, except electrical	7.2%	2.2%	5.0%	2.5%	3.2%	4.1%	35.0%	145.6%	82%	909	94
Electric and Electronic Equipment	5.9%	3.0%	2.9%	1.9%	2.8%	2.2%	31.6%	92.5%	79%	739	104
Transportation Equipment	4.7%	0.9%	3.8%	3.1%	1.7%	3.4%	66.9%	179.4%	89%	330	86
3-digit sectors											
Drugs	11.4%	8.9%	2.5%	2.0%	7.5%	7.4%	17.4%	84.9%	293.3%	457	23
Soaps, cleaners and toilet goods	7.2%	12.1%	-4.9%	1.4%	4.6%	5.0%	19.2%	37.8%	-101.1%	328	21
Office and computing machines	9.7%	1.0%	8.7%	3.9%	7.1%	8.4%	40.6%	738.3%	96.2%	141	14
Household appliances	4.1%	4.4%	-0.3%	1.6%	2.4%	3.3%	38.2%	55.4%	-1255.6%	59	10
Electronic components and accessories	7.4%	1.6%	5.8%	2.7%	4.7%	4.2%	36.3%	290.0%	73.1%	406	37
Motor vehicles and equipment	4.1%	1.1%	3.1%	2.5%	1.6%	2.7%	60.3%	152.8%	88.6%	281	77
Textiles and apparel	4.2%	5.2%	-1.0%	2.2%	2.6%	2.8%	52.2%	50.1%	-282.4%	153	24

Variables definition[24]

ROA ... Return on assets (net income over book assets)

MIN ... Minority-owned affiliates of US corporations (up to 50% US ownership)

MAJ ... Majority-owned affiliates of US corporations (over 50% US ownership)

GAP ... Percentage-point difference between ROA on majority- and minority-owned affiliates

US Fsales ... Sales of US affiliates abroad

US Sales ... Total sales of US and foreign firms in the US

Fsales US ... Sales of foreign affiliates in the US

Sales US ... Sales of US firms in the US (US sales – Fsales US)

US Foreign Sales Ratio ... US Fsales / US Sales

Foreign Sales in US Ratio ... Fsales US / US Sales

US Foreign Sales Intensity ... US Fsales / Sales US

Foreign Sales Intensity in US ... Fsales US / Sales US

Globalization Index ... US Foreign Sales Intensity + Foreign Sales Intensity in US

US Competitiveness Index ... US Foreign Sales Intensity – Foreign Sales Intensity in US

Table 3
Sales of US Corporations Abroad/Total Sales in their Sector in US, 1983-2000

	1983-2000	1983-2000	1983-1990	1991-2000
Industry	Avg ROA GAP	Avg US Fsales/ US sales	Avg US Fsales/ US sales	Avg US Fsales/ US sales
Office and computing machines	8.6%	89.1%	77.1%	99.8%
Beverages	6.3%	30.5%	17.7%	45.2%
Electronic components and accessories	4.6%	33.7%	30.2%	36.6%
Instruments and related products	4.4%	19.5%	15.7%	23.3%
Radio, TV, and communication equipment	4.2%	22.7%	17.5%	27.9%
Motor vehicles and equipment	3.9%	57.4%	45.3%	67.0%
Drugs, soap, cleaners, and toilet goods	2.6%	41.1%	25.6%	58.8%
Fabricated metal products	1.4%	10.0%	8.7%	11.0%
Stone, clay and glass products	1.1%	11.6%	9.7%	13.6%
Rubber & miscellaneous plastics products	0.7%	16.6%	15.2%	18.3%
Nonferrous	0.2%	9.3%	6.4%	11.6%
Ferrous	-0.3%	2.6%	2.5%	2.6%
Textile products and apparel	-0.5%	9.7%	6.4%	12.4%
Paper and allied products	-1.6%	15.9%	10.8%	20.0%
Average for these sectors	**2.4%**	**25.4%**	**19.9%**	**32.4%**

[24] US Fsales are sales of foreign affiliates of US corporations (using BEA data); US Sales are net selling values, f.o.b. plant to the customer, after discounts and allowances and excluding freight charges and excise taxes and interplant transfers (using U.S. Census Bureau's Manufacturers' Shipments, Inventories, and Orders (M3) survey. Fsales US are sales of affiliates of foreign corporations in the U.S. (from BEA surveys).

Table 4
Sales Ratios: US propensity to sell abroad, foreign sales penetration in US, 1991-2000

	1991-2000	1991-2000	1991-2000	1991-2000
	Maj/Min	US Fsales	US Fsales	Fsales US
Industry	ROA Gap	/US Sales	/Sales US	/US Sales
Beverages	7.6%	45.2%	67.1%	14.7%
Instruments and related products	5.0%	23.3%	27.8%	11.3%
Radio, TV & communication equipment	4.9%	27.9%	47.9%	34.7%
Office and computing machines	4.7%	99.8%	112.8%	13.8%
Electronic components and accessories	4.3%	36.6%	48.8%	10.0%
Motor vehicles and equipment	3.7%	67.0%	101.3%	25.0%
Stone, clay and glass products	2.6%	13.6%	55.1%	28.7%
Nonferrous	0.1%	11.6%	28.0%	21.2%
Fabricated metal products	0.0%	11.0%	27.7%	11.7%
Textile products and apparel	-0.3%	12.4%	20.5%	12.6%
Ferrous	-2.0%	2.6%	27.4%	26.1%
Paper and allied products	-4.1%	20.0%	30.4%	9.3%
Average for these sectors	**2.2%**	**30.9%**	**49.6%**	**18.3%**

Note: US Fsales are sales of US MNEs abroad. Sales US are sales of US corporations at home. FSales US are sales of foreign affiliates in the US. US Sales are total sales in a sector in the US. US Sales = Sales US + FSales US. The data for Fsales US were available only for 1991-2000.

Table 5
Foreign Sales Intensity, Globalization and US Competitiveness, 1991-2000

	1991-2000	1991-2000	1991-2000	1991-2000
	US Foreign Sales Intensity	Foreign Sales Intensity in US	Index of Globalization	Index of US Competitiveness
Sector/Definition	US Fsales/ Sales US	Fsales US/ Sales US	US Fsales+Fsales US/Sales US	US Fsales-Fsales US/Sales US
Beverages	67.1%	17.9%	85.0%	49.2%
Instruments and related products	27.8%	12.7%	40.5%	15.1%
Radio, TV & communication equipment	47.9%	53.6%	101.5%	-5.7%
Office and computing machines	112.8%	16.3%	129.1%	96.5%
Electronic components & accessories	48.8%	13.8%	62.6%	35.0%
Stone, clay and glass products	55.1%	45.4%	100.5%	9.7%
Nonferrous	28.0%	27.0%	55.0%	1.0%
Fabricated metal products	27.7%	13.2%	40.9%	14.5%
Textile products and apparel	20.5%	14.7%	35.2%	5.8%
Ferrous	27.4%	35.4%	62.8%	-8.0%
Paper and allied products	30.4%	11.7%	42.1%	18.7%
Motor vehicles and equipment	101.3%	42.5%	143.8%	58.8%
Average for these sectors	**49.6%**	**25.4%**	**75.0%**	**24.2%**

Note: US Fsales are sales of US MNEs abroad. Sales US are sales of US corporations at home. FSales US are sales of foreign affiliates in the US. US Sales are total sales in a sector in the US. US Sales = Sales US + FSales US. The data for Fsales US were available only for 1991-2000.

Table 6
Correlation table for key variables, 1991-2000

	ROA GAP	*US FSALES*	RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
ROA GAP	1							
US Fsales	0.17	1						
1. US Fsales/ Sales US	0.29	0.62	1					
2. Fsales US/ Sales US	-0.22	-0.06	-0.05	1				
3. US Fsales/ US Sales	0.34	0.80	.85	-0.04	1			
4. Fsales US/ US Sales	-0.18	-0.05	-0.03	0.99	-0.01	1		
5. Index of US Competitiveness	0.35	0.57	.90	-0.48	0.76	-0.45	1	
6. Globalization Index	0.16	0.54	0.89	0.41	0.76	0.43	0.60	1

Note: US Fsales are sales of US MNEs abroad. Sales US are sales of US corporations at home. FSales US are sales of foreign affiliates in the US. US Sales are total sales in a sector in the US. US Sales = Sales US + FSales US. The data for Fsales US were available only for 1991-2000.

Table 7
Profitability gap, US competitiveness and globalization of sectors, 1991-2000

EXPLANATORY VARIABLES	DEPENDENT VARIABLE: NET INCOME/ASSETS (GAP BETWEEN MAJORITY & THE REST OF US VENTURES ABROAD)					
Constant	0.0162* (0.0090)	0.0166* (0.0092)	-0.0004 (0.0016)	-0.0059 (0.0163)	0.0162* (0.0090)	0.0166* (0.0092)
US Fsales		0.0001 (0.0016)		0.0001 (0.0001)		0.0001 0.0001
1. US Fsales/ Sales US	0.0302*** (0.0116)	0.0322** (0.0015)				
2. Fsales US/ Sales US	-0.0458* (0.0232)	-0.046* (0.0023)				
3. US Fsales/ US Sales			0.5661*** (0.2602)	0.5496** (0.2591)		
4. Fsales US/ US Sales			-0.3434** (0.1373)	-0.3331** (0.1368)		
5. Index of US Competitiveness					0.0380*** (0.0132)	0.0391*** (0.0140)
6. Globalization Index					-0.0078 (0.0127)	-0.0069 (0.0137)
N (observations)	248	248	248	248	248	248
R squared	0.1263	0.1267	0.1045	0.1252	0.1263	0.1267

Note: US Fsales are sales of US MNEs abroad. Sales US are sales of US corporations at home. FSales US are sales of foreign affiliates in the US. US Sales are total sales in a sector in the US. US Sales = Sales US + FSales US. The data for Fsales US were available only for 1991-2000.

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.
Standard errors are presented in parentheses.

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