

International Joint Ventures and the Boundaries of the Firm

Mihir A. Desai
Harvard University and NBER

C. Fritz Foley
Harvard University

James R. Hines Jr.
University of Michigan and NBER

February 2002

The statistical analysis of firm-level data on U.S. multinational companies was conducted at the International Investment Division, Bureau of Economic Analysis, U.S. Department of Commerce under arrangements that maintain legal confidentiality requirements. The views expressed are those of the authors and do not reflect official positions of the U.S. Department of Commerce. Financial support from the Lois and Bruce Zenkel Research Fund at the University of Michigan and the Division of Research at Harvard Business School is gratefully acknowledged. Comments from seminar participants at Harvard Business School, New York University, and the NBER Strategic Alliances Preconference are gratefully acknowledged.

International Joint Ventures and the Boundaries of the Firm

ABSTRACT

This paper links the declining propensity of multinational firms to share ownership of their foreign operations to increasing returns to coordination associated with managing globalized operations. The paper isolates the characteristics associated with the decision to share ownership in international operations and then employs two exogenous shifts in the relative cost of sharing ownership to identify the underlying dynamics of ownership decisions. The evidence indicates that firms are more likely to establish joint ventures in settings in which it is attractive to purchase inputs from, and sell to, local markets, suggesting a potential role for joint venture partners in facilitating learning about local markets. Joint ventures are less commonly established in situations in which doing so requires a firm to forego what would otherwise be attractive opportunities to use wholly owned affiliates to coordinate integrated production activities across different locations, transfer technology, and engage in worldwide tax planning. Since operational characteristics and ownership levels are endogenously determined, further empirical analysis employs the liberalization of ownership restrictions by host countries in the 1980s and 1990s, and the joint venture tax penalties imposed by the U.S. Tax Reform Act of 1986, as instruments to identify this relationship. The evidence indicates that firms responded to these regulatory and tax changes by expanding the volume of their intrafirm trade as well as the extent of 100 percent affiliate ownership. Point estimates indicate that four percent greater sole ownership of an affiliate is associated with two percent higher intrafirm trade volumes. Taken together, the evidence suggests that growing returns to managing global operations through wholly owned affiliates, together with regulatory and tax changes, gave rise to the sharply declining propensity of American firms to organize their foreign operations as joint ventures over the last two decades.

JEL Classifications: F23, L23, H87.

Mihir A. Desai
Harvard Business School
Morgan 363
Soldiers Field
Boston, MA 02163
Mdesai@hbs.edu

C. Fritz Foley
Harvard Business School
Morgan 228b
Soldiers Field
Boston, MA 02163
cfoley@hbs.edu

James R. Hines Jr.
University of Michigan
Business School
701 Tappan Street
Ann Arbor, MI 48109-1234
jrhines@umich.edu

1. Introduction

The appropriate ownership of productive enterprise is a central issue in economic theory and a very practical question for multinational firms establishing new foreign affiliates. Such firms frequently have the option to own 100 percent, majority, or minority shares of newly created foreign entities; additionally, they might participate in foreign markets by exporting from home countries or by permitting foreign companies to produce under licensing agreements. These alternatives imply varying levels of control and commitment and allow multinational firms to tailor the organization of foreign operations to the circumstances of individual product and geographic markets. A variety of ownership forms entailing less than 100 percent parent ownership, and the accompanying coordination of interests between more than one firm, are loosely grouped in the academic and popular literature and known as “alliances.”

The rapid pace of globalization suggests to many observers that international alliances are essential to the success and survival of multinational enterprises.¹ This viewpoint has not, however, been subjected to sharp statistical tests based on actual practice, in part due to the difficulty of identifying the determinants of such a heterogeneous group of activities as those encompassed by alliances. The purpose of this paper is to identify the factors associated with one class of such activity, situations in which American multinational firms share ownership. The comprehensive U.S. data described in section 4, and analyzed in section 5, offer clues to the magnitudes of the costs and benefits associated with partial ownership, as revealed by the behavior of American companies in creating new foreign affiliates. The data also answer the question of whether the joint venture form of international alliance is an increasingly important

¹ Ohmae (1989), for example, suggests that “Globalization mandates alliances, makes them absolutely essential to strategy.”

feature of international business, and indicate the way in which ownership decisions have responded to the changing nature of globalization over the last two decades.

The behavior of American multinational firms suggests that partial ownership is most valuable to firms with extensive contact with local markets. Affiliates purchasing large fractions of their inputs locally, and those selling large fractions of their output locally, are more likely than others to be organized as joint ventures. Parent companies with extensive foreign operations, and those establishing affiliates in the same industry, are more likely to own minority stakes in newly created affiliates, suggesting that managing shared ownership effectively requires significant expertise. While it is possible that firms choose to share the ownership of their foreign affiliates in settings in which doing so mitigates expropriation risks, the data indicate that parent companies have as much at risk in typical joint venture affiliates as they do in their wholly owned affiliates.

Parent firms are more likely to own majority or 100 percent stakes of affiliates that sell high fractions of their output to related parties or buy high fractions of their inputs from related parties. Majority and wholly owned affiliates are also more likely to make royalty payments to their U.S. parents for the use of intangible assets, and majority and wholly owned affiliates are the most useful to firms seeking to avoid international tax obligations. These patterns suggest that settings in which there are strong benefits to coordinating parent and affiliate operations in order to conduct intrafirm trade, use technology abroad, or avoid taxes, are those in which parents are the most likely to establish their operations as majority or 100 percent owned affiliates. This cross sectional evidence does not, however, demonstrate that ownership is a function of these considerations, since it is possible that both ownership and operational decisions represent joint responses to other unmeasured factors.

Fortunately, it is possible to exploit two types of changes in government policy that affect the relative costs of sharing ownership – the liberalization of ownership restrictions by certain host countries, and the U.S. Tax Reform Act of 1986 – in order to identify the extent of linkage between ownership and coordinated activity between parents and affiliates. American firms operating in countries that liberalize their restrictions on foreign ownership of local affiliates do more trading with their affiliates after liberalization. And American firms in tax situations that reward the ability to coordinate closely with foreign affiliates likewise trade extensively with affiliates. Similar patterns appear with royalty payments. These results are precisely what should appear if intrafirm transactions and majority and 100 percent ownership are complementary phenomena. It follows, therefore, that greater desire to coordinate parent and affiliate trade, technology transfer, and tax planning makes firms more likely to establish their foreign operations with majority or 100 percent ownership.

A comprehensive review of all U.S. overseas affiliate activity from 1982 to 1997 indicates that American multinational firms are decreasingly likely to establish their foreign affiliates as joint ventures. Aggregate activity by joint ventures has fallen considerably over time, and the cross sectional evidence is consistent with an increased appetite for control by multinational parents. Moreover, disappearing government-imposed ownership restrictions explain only a portion of the declining use of shared ownership by U.S. firms.

The forces of globalization appear to have diminished rather than accelerated the use of shared ownership. This is at first surprising, since globalization typically improves the return to international business activity, including joint ventures – but it is understandable if the opportunities created by globalization are best exploited by the use of wholly owned (or majority owned) foreign affiliates. In particular, ease of communication, reduced transportation costs, and

integration of worldwide financial and commodity markets make it possible to coordinate integrated production activities in disparate locations, transfer technology between countries, and arrange international operations to reduce associated tax burdens. All of these activities are most profitably undertaken by foreign affiliates under the majority or sole control of multinational parents.

Section 2 of the paper reviews the theoretical and empirical literature on international joint ventures. Section 3 presents a model that outlines the tradeoffs implicit in choosing ownership levels when operating abroad, thereby serving as the basis of the empirical work to follow. Section 4 provides an overview of the data on international joint ventures and a descriptive perspective on the nature of this activity. Section 5 analyzes the determinants of the ownership fractions of the foreign affiliates of American multinational corporations. Section 6 is the conclusion.

2. *International Joint Venture Activity*²

The existing literature indicates that a number of factors influence a multinational parent's preferences for full or shared ownership of affiliates. The considerations that have received the most theoretical and empirical attention stem from work on transactions costs and contract theory. The transactions cost approach to the organization of firms, developed by Williamson (1975, 1979, 1985), Klein, Crawford, and Alchian (1978), and others, stresses that agents with situation-specific assets confront the possibility of opportunistic behavior by any trading partners. The transaction cost literature, notably the work of Oxley (1997) and Anand and Khanna (2001), also identifies the hazard of technological appropriability in arm's-length relationships and various forms of alliances. These inefficiencies are thought to be mitigated

² This section draws on Desai and Hines (1999).

when activities are organized under common ownership. Based on similar premises, the property rights approach, developed by Grossman and Hart (1986), Hart and Moore (1990), and others, formalizes the notion of asset specificity and focuses on the way in which ex ante investment incentives differ across ownership structures.³ In this framework, joint ownership is generally suboptimal due to the sharing of residual control rights.

The moral hazard problems that arise in cooperative efforts have attracted considerable attention since Holmstrom's (1982) finding that efficient sharing rules do not exist for certain types of partnerships. Subsequent work identifies circumstances in which efficient sharing rules *may* exist, including those with repeated play, unlimited liability, and those in which risk-averse agents use stochastic sharing rules.⁴ In the important case in which assets are jointly used, joint ownership may be an efficient arrangement. Aghion and Tirole (1994) find that "split" property rights can encourage innovation in settings with incomplete information. Similarly, the existence of potential spillovers means that parent firms may benefit from coordinated R&D activity in spite of the associated moral hazard problems.⁵ The moral hazard created by partnership arrangements can facilitate certain types of market transactions. Crampton et al. (1987) note that, in environments with incomplete information, joint ownership of an asset may be consistent with efficient resource allocation.⁶ Similarly, Rey and Tirole (1999) demonstrate that joint ventures can alleviate biased decision-making but can also be associated with complexities arising from divergent objectives.

³ For a careful treatment of the differences between the transactions cost approach and the property rights approach, see Whinston (2000).

⁴ See, for example, Legros and Matthews (1993).

⁵ See Bhattacharya et al. (1992), Kaimen et al. (1992), and Gandal and Scotchmer (1993) for examples.

⁶ Hart and Moore (1998) and other recent work on non-profit cooperative ownership structures considers joint ownership through cooperatives but typically in a not-for-profit setting.

Empirical work on the use of joint ventures by multinational companies suggests that firms select ownership levels that economize on transaction costs.⁷ As outlined by Stopford and Wells (1972), Beamish and Banks (1987), Contractor and Lorange (1988) Gomes-Casseres (1989) and Asiedu and Esfahani (2001), joint ventures balance the benefits of combining complementary assets with costs that include managerial conflicts and shirking. Gagnon and Anderson (1988) present evidence that parents seek higher levels of ownership in affiliates that make greater use of proprietary assets. In a study of technology transfers to Indian firms, Ramachandran (1993) finds that subsidiaries that are 100 percent owned by foreign multinationals receive greater technology transfers than do Indian-owned firms, or subsidiaries that are partially owned by foreign multinationals. In contrast, Hennart (1991) argues that the cost of using market transactions to purchase other firms' intermediate inputs makes joint ventures particularly attractive.

Multinational parents also select ownership levels with eyes to facilitating the coordination of pricing and production decisions. Unlike other types of firms, multinational enterprises (MNEs) have units that are simultaneously active in multiple countries. As a result, these firms have the ability to adjust prices used for intrafirm transfers in order to allocate taxable income among jurisdictions in order to reduce the associated tax liabilities. Horst (1971) and Kant (1990, 1995) model the optimal transfer prices that MNEs should charge in cross border transactions. Kant (1990) points out a limitation of joint ventures by indicating that significant conflicts of interest can arise in setting transfer prices between whole and partially owned affiliates – since MNEs parents have incentives to shift profits away from affiliates owned jointly with other investors. Sole ownership also provides MNEs the control needed to

⁷ These theories are reviewed in Caves (1996).

integrate worldwide operations. Franko (1971) reports limited use of joint ventures by MNEs with the ability to shift production between locations, presumably due to excessive compensation demanded by potential joint venture partners fearing that MNE parents would shift production away from them first.

Recent empirical work on international trade suggests that transaction cost considerations and issues related to the coordination of production and pricing could be of growing importance for MNE parents. Feenstra and Hanson (1996a, 1996b) and Feenstra (1998) point out that the integration of world markets has been accompanied by a disintegration of the production process in which different stages of making a finished good take place in different places. Hanson, Mataloni, and Slaughter (2001) find evidence that parents export a small but growing volume of intermediate goods to affiliates for further processing, and that affiliates play growing roles as distributors and regional exporters. Zeile (1997) indicates that a growing percentage of U.S. MNE parent company trade takes place with affiliated parties. Given that MNEs are transferring more goods within firms, hold-up problems, transfer pricing decisions, and production integration are likely to be of growing importance.

The desire for a local partner is often motivated by learning on the part of resource-constrained firms. Stopford and Haberich (1978) present data suggesting that smaller British MNEs made greater use of joint ventures when entering markets outside of the Commonwealth. Blomstrom and Zejan (1991) find evidence that parents were more likely to choose partial as opposed to 100 percent ownership when diversifying, although Ghemawat, Porter and Rawlinson (1985) suggest the opposite in their study of international coalitions. Kogut (1991) characterizes joint ventures as “real options” that provide firms with information they can use in forming subsequent plans – that may include acquiring their partners or dissolving their joint ventures.

Similarly, Balakrishnan and Koza (1993) view joint ventures as intermediate forms between markets and hierarchies that permit firms to overcome informational asymmetries at low cost.

An additional common motivation for finding a local partner is the need to curry favor with host governments. As recently as two decades ago, many host country governments attempted to restrict foreign ownership of domestic firms. Franko (1989), Gomes-Casseres (1990), and Contractor (1990) argue that sole ownership is generally preferred by multinational parents but occasionally conceded in bargains with host governments. Henisz (2001) and Gatignon and Anderson (1988) present evidence that MNE parents entering countries with higher political risk are more likely to use joint ownership since local firms are well positioned to interact with local government.

Older surveys commonly report a rising use of joint ventures by multinational firms. Anderson (1990) and Geringer and Hebert (1991) claim that American firms rely to an ever-greater extent on international joint ventures, and will continue to do so. Curhan, Davidson, and Suri (1977) document a dramatic rise in the use of international joint ventures by American firms between 1951 and 1975 using survey data collected through the Harvard Multinational Project. Hladik (1985) extends Curhan et al.'s data through 1984 and projects continued growth of international ventures by U.S. firms. In contrast, Desai and Hines (1999) draw attention to the reduced usage of minority ownership after passage of the U.S. Tax Reform Act of 1986, and identify patterns in the data suggesting that the tax penalties introduced in 1986 may be at least partly responsible for the decline.

3. *A Model of Multinational Ownership*

The agency costs intrinsic to joint ventures discourage their formation except in circumstances in which there are important offsetting considerations. The literature on alliances

offers several candidates for such considerations, which fall into a few broad categories, thereby permitting them to be expressed in a manner that makes them possible to test. There are two purposes of this section, the first of which is to identify the restrictions necessary in order to be able to analyze the determinants of whether new affiliates are established as joint ventures, conditional on prior decisions to create new affiliates. The second purpose is to identify an indirect method of measuring the extent to which higher payoffs to intrafirm transfers contribute to the demand for majority or 100 percent ownership of affiliates.

Joint venture theories start from the assumption that firms are guided by profitability considerations in deciding whether or not to establish a foreign affiliate, what fraction of the affiliate the parent company should own, and operational issues such as the deployment of proprietary technology and the volume of intrafirm trade. Since firms make these choices on the basis of specific information, much of which is unavailable to researchers, it can be very difficult to identify causal effects. For example, the evidence (examined in detail in section 5) indicates that firms with extensive trade with their affiliates have higher than average propensities to be majority or 100 percent owners of them. In order to identify an effect of trade on ownership, however, it is necessary to use instruments that affect only one of either ownership or trade. As it happens, instruments (in the form of changing government regulations and tax policies) are available for levels of parental ownership of foreign affiliates. The theory of the firm, elucidated in what follows, implies that such instruments can be properly used to identify other factors that contribute to the demand for whole and partial ownership of affiliates.

The maximum net profit (π) that a foreign affiliate is capable of earning can be expressed as $\pi(X, c, \omega, \varepsilon)$, in which X is a vector of attributes of the parent company and the market in which the affiliate is located, and ε is a vector of residuals. The vector c captures

exogenous determinants of the costs of undertaking transactions between the parent and its affiliate, so that an element of c might be the distance between the parent and affiliate (to the extent that greater distances are associated with higher trade costs), and another element of c might be the extent of the parent company's ownership of intangible assets. Finally, ω represents any ownership restriction imposed by the host country, such as a requirement that foreign investor ownership not exceed 49 percent of any local affiliate. The profit function is understood to capture profits associated with establishing a foreign affiliate net of relevant opportunity costs, so it subtracts, for example, the profits that could otherwise be earned by exploiting opportunities via arm's length contracts with unrelated parties.

It is extremely useful to restrict attention to situations in which the profit function takes the following form:

$$(1) \quad \pi(X, c, \omega, \varepsilon) = f_1(X, c, \varepsilon_1) \cdot f_2(X, c, \omega, \varepsilon_2),$$

in which ε_1 and ε_2 are independently distributed elements of ε , and the function f_2 is defined so that $f_2(\cdot) > 0, \forall (X, c, \omega, \varepsilon_2)$. Profit functions that satisfy the decomposition in equation (1) have several attractive analytic properties, of which the most important is that the decision of whether or not to establish an affiliate is independent of the profit-maximizing choice of parent ownership level.⁸ This property follows from the combination of the simple profit maximization rule that parent firms establish foreign affiliates whenever $\pi(X, c, \omega, \varepsilon) \geq 0$, and the fact that $f_1(X, c, \varepsilon_1) \geq 0$ is a necessary and sufficient condition for $\pi(X, c, \omega, \varepsilon) \geq 0$. Intuitively, a

⁸ An example of a function satisfying these properties is one based on the specification:

$\pi = (\beta_1 X + \beta_{21} X y - \beta_{22} X y^2 + \varepsilon_1) \exp\left\{\phi \left[\beta_3 X + \beta_{41} X y - \beta_{42} X y^2 \right] + \beta_5 X \phi^2 + \varepsilon_2\right\}$, in which y is the level of intrafirm trade, and ϕ is the fraction of an affiliate that the parent owns. In this specification, the costs that are elements of the vector c are embedded in the β terms. It is then possible to construct the $\pi(X, c, \omega, \varepsilon)$ function by solving for profit-maximizing levels of y and ϕ , subject to the ω constraint, and substituting those values into the expression for π .

multinational firm whose profits can be expressed by $\pi(X, c, \omega, \varepsilon)$ as given in (1), and that would maximize profits by owning 100 percent of its affiliate, would also find it profitable (though less so) to establish an affiliate with 30 percent parent ownership, since doing so produces profits given by a value of $[f_1(\cdot)f_2(\cdot)]$ in which $f_2(\cdot)$ incorporates an ownership restriction of 30 percent. Since the ownership level restriction embedded in ω can be selected for any (positive) value without changing the fact that $\pi(X, c, \omega, \varepsilon)$ and $f_1(X, c, \varepsilon_1)$ have the same sign, it follows that the existence of positive profitability is not a function of the fraction of parental ownership.

Profit-maximizing firms choose affiliate ownership levels, denoted $\phi(X, c, \omega, \varepsilon_2)$, that correspond to maximal values of $\pi(X, c, \omega, \varepsilon)$. The host government ownership restriction takes the form that $\phi \leq \omega$. Consequently, for any desired value of $\phi < \omega$, the constraint does not bind, so $\frac{\partial \phi}{\partial \omega} = 0$ and $\frac{\partial \pi}{\partial \omega} = 0$. From equation (1), $\frac{\partial \pi}{\partial \omega} = 0$ implies that $\frac{\partial f_2}{\partial \omega} = 0$. For values of ω for which the constraint does bind, $\frac{\partial \phi}{\partial \omega} > 0$ and $\frac{\partial \pi}{\partial \omega} > 0$, and therefore $\frac{\partial f_2}{\partial \omega} > 0$. The unconstrained profit-maximizing level of ϕ is therefore characterized locally by the point at which the function $f_2(X, c, \omega, \varepsilon_2)$ transits from $\frac{\partial f_2}{\partial \omega} > 0$ to $\frac{\partial f_2}{\partial \omega} = 0$.

It follows, therefore, that in circumstances in which the profit function satisfies (1), it is feasible to estimate desired levels of affiliate ownership by comparing actual levels of affiliate ownership by firms in differing circumstances. In particular, it is not necessary to incorporate the alternative of not establishing an affiliate at all. Given the very great difficulty of including all the information necessary to determine whether firms establish affiliates, and the millions of

observations of potential affiliates that are *not* established, this is a valuable separation. But it is necessary that a restriction of the type embedded in equation (1) hold.

The evidence (examined in detail in section 5) indicates a close connection between the provision of parental inputs and whole or majority ownership of foreign affiliates. The difficulty with interpreting this evidence is that input provision as well as ownership levels represent choices made by firms on the basis of possibly a large number of correlated omitted variables, thereby clouding inference. Ideally, one would want to estimate the $\phi(X, c, \omega, \varepsilon_2)$ function in order to identify $\frac{\partial \phi}{\partial c}$, recalling that c represents the costs associated with the provision of parental inputs. This derivative indicates directly the effect of the costs (and therefore levels) of intrafirm transfers on desired ownership, but in practice, since it is very difficult to measure c , it cannot be reliably estimated.

Fortunately, there is an indirect method of inferring the sign and magnitude of $\frac{\partial \phi}{\partial c}$.

Differentiating the profit function with respect to ω yields $\frac{\partial \pi}{\partial \omega}$, which is the effect of a small change in ω on profitability. Further differentiating this function with respect to c yields $\frac{\partial^2 \pi}{\partial \omega \partial c}$.

Since $\frac{\partial \pi}{\partial \omega}$ is zero unless the ω constraint binds, it follows that, if ω is selected so that

$\omega = \phi(X, c, \omega, \varepsilon)$, then the constraint binds on the positive side and not on the negative side.

(Appropriately redefining the ω constraint to be a minimum ownership constraint rather than a maximum ownership constraint would make the constraint bind on the negative side.) Then a

positive value of $\frac{\partial^2 \pi}{\partial \omega \partial c}$ corresponds to a case in which increasing c raises the value of additional

ownership of an affiliate, while a negative value of $\frac{\partial^2 \pi}{\partial \omega \partial c}$ implies that higher levels of c reduce the value of additional ownership shares. Since c is the cost of exchanges between the parent firm and its affiliates, higher values of c correspond to fewer exchanges between parents and affiliates. Thus, a negative value of $\frac{\partial^2 \pi}{\partial \omega \partial c}$ corresponds to a situation in which greater desired exchange (such as goods or technology trade) between parents and affiliates leads to greater desired parental ownership of affiliates ($\frac{\partial \phi}{\partial c} > 0$).

The challenge is to estimate the function $\frac{\partial^2 \pi}{\partial \omega \partial c}$ in the absence of reliable information on the value of c . For this purpose, it is useful to invoke Hotelling's lemma:

$$(2) \quad y = -\frac{\partial \pi(X, c, \omega, \varepsilon)}{\partial c},$$

in which y is the magnitude of exchange between the parent company and its affiliate. Equation (2) is simply the envelope property that the magnitude of the amount by which profitability falls as costs rise equals the impact that would occur if input choices were not to respond to changing prices. It follows from (2) that:

$$(3) \quad \frac{\partial^2 \pi(X, c, \omega, \varepsilon)}{\partial \omega \partial c} = \frac{\partial^2 \pi(X, c, \omega, \varepsilon)}{\partial c \partial \omega} = -\frac{\partial y(X, c, \omega, \varepsilon)}{\partial \omega}.$$

Equation (3) implies that the effect of ownership restrictions on intrafirm trade equals the effect of trade desirability on the profitability of additional ownership. Neary and Roberts (1980) analyze this symmetry property in some detail in a related context. Since the value of $\frac{\partial y}{\partial \omega}$ is amenable to measurement even in the absence of reliable measures of c , this is a potentially useful method of drawing inferences, and is used in section 5.

A similar method of estimating $\frac{\partial \phi}{\partial c}$ is available if it is possible to identify features, such as special tax provisions, that affect only the cost of holding joint ventures and not the cost of intrafirm exchanges. The U.S. Tax Reform Act of 1986 provides just such an example.⁹ Then letting c_1 denote the cost of intrafirm exchanges such as trade and technology transfers, and c_2 denote the cost of maintaining a foreign affiliate as a joint venture, it follows that:

$$(4) \quad \frac{\partial \phi}{\partial c_1} = \frac{\partial^2 \pi}{\partial c_2 \partial c_1} = \frac{\partial^2 \pi}{\partial c_1 \partial c_2} = \frac{\partial y}{\partial c_2}.$$

Equation (4) implies that the effect of ownership costs on intrafirm transfers is identical – in sign and magnitude – to the effect of intrafirm transfer costs on ownership. The main virtue of the former effect is that it can be estimated with available data. The empirical work reported in section 5 uses both types of specifications, those presented in equations (3) and (4), to estimate the extent to which ownership and transfers are related.

4. *Data and Descriptive Statistics*

The empirical work presented in section 5 is based on the most comprehensive available data on the activities of American multinational firms. The Bureau of Economic Analysis (BEA) Annual Survey of U.S. Direct Investment Abroad from 1982 through 1997 provides a panel of data on the financial and operating characteristics of U.S. firms operating abroad. These surveys ask reporters to file detailed financial and operating items for each affiliate and information on the value of transactions between U.S. parents and their foreign affiliates. The International Investment and Trade in Services Survey Act governs the collection of the data and the Act ensures that “use of an individual company’s data for tax, investigative, or regulatory purposes is prohibited.” Willful noncompliance with the Act can result in penalties of up to \$10,000 or a

⁹ See Desai and Hines (1999) for an analysis.

prison term of one year. As a result of these assurances and penalties, BEA believes that coverage is close to complete and levels of accuracy are high.

U.S. direct investment abroad is defined as the direct or indirect ownership or control by a single U.S. legal entity of at least ten percent of the voting securities of an incorporated foreign business enterprise or the equivalent interest in an unincorporated foreign business enterprise. A U.S. multinational entity (MNE) is the combination of a single U.S. legal entity that has made the direct investment, called the U.S. parent, and at least one foreign business enterprise, called the foreign affiliate. In order to be considered as a legitimate foreign affiliate, the foreign business enterprise should be paying foreign income taxes, have a substantial physical presence abroad, have separate financial records, and should take title to the goods it sells and receive revenue from the sale. In order to determine ownership stakes in the presence of indirect ownership, BEA determines the percentage of parent ownership at each link and then multiplies these percentages to compute the parent's total effective ownership.

The foreign affiliate survey forms that U.S. MNEs are required to complete vary depending on the year, the size of the affiliate, and the U.S. parent's percentage of ownership of the affiliate. The most extensive data are available for 1982, 1989, and 1994 when BEA conducted Benchmark Surveys. In these years, all affiliates with sales, assets, or net income in excess of \$3 million in absolute value and their parents were required to file extensive reports. In non-benchmark years between 1982 and 1997, exemption levels were higher and less information is collected.¹⁰ Although majority-owned affiliates report many accounting items and

¹⁰ From 1983-1988, all affiliates with an absolute value of sales, assets, or net income less than \$10 million were exempt, and this cutoff increased to \$15 million from 1990-1993 and \$20 million from 1995-1997. BEA uses reported data to estimate universe totals when surveys cover only larger affiliates or when only certain affiliates provide information on particular survey forms. Estimated data is unlikely to have a significant impact on the BEA's published data at the industry or country level as data based on actual reports exceeds 90 percent of the

information concerning operations each year, minority-owned affiliates must only file information about sales, net income, assets, employment, employment compensation, and trade with the U.S. in non-benchmark years.

BEA collects sufficient information to allow one to link affiliate level data through time to create a panel. By checking the status of all affiliates that filed forms in the previous year and are expected to fall within reporting requirements, BEA identifies which enterprises leave the sample. By monitoring news services for information on mergers, acquisitions, and other activities of U.S. companies, BEA identifies which new enterprises should be included in the sample. As a result, it is possible to examine the entry and exit of affiliates. Measures of entry and exit are most reliable when looking from one benchmark to the next since there are more extensive efforts to update data in these years. In addition, since all reporting affiliates report the parent's level of ownership in an affiliate annually, it is also possible to examine the consequences of changes in levels of ownership.

Table I displays basic information on the incidence and size of affiliates by level of parent ownership in the three benchmark years – 1982, 1989, and 1994 – and in the most recent year in the panel, 1997. In the most recent benchmark year and in 1997, approximately 80 percent of all affiliates are organized as wholly-owned affiliates with minority and majority ownership each comprising approximately 10 percent of the sample. The dynamics of multinational ownership decisions over the sample period appear quite clearly as the prevalence of minority-owned affiliates declines from 16.5 percent of affiliates in 1982 to 9.7 percent, while the prevalence of wholly-owned affiliates increases from 72.3 percent of affiliates to 80.4 percent. There is little evidence that minority-owned affiliates are smaller than majority-owned

estimated totals of assets and sales in each of the years between 1982 and 1997. To avoid working with estimated

affiliates. In fact, the median sales, assets, and employment of minority-owned affiliates are almost always larger than the median sales, assets, and employment of wholly-owned affiliates. In 1997, median sales for minority-owned affiliates was \$51.5 million while the median sales for majority-owned affiliates was \$41.2 million and the median sales for wholly-owned affiliates was \$41.1 million. Across all measures, partial ownership appears to be associated with larger entities, contrary to some versions of a “toe-in-the water” rationale for partial ownership.

The bottom of Table I displays entry and exit rates of affiliates over the 1982-1989 and 1989-1994 periods. The entry rate is calculated as the number of affiliates appearing in the sample for the first time during the period divided by the number that existed at the beginning of the period. The exit rate is computed by taking the number of affiliates appearing for the last time during the period divided by the number that existed at the beginning of the period. The entry and exit rates are large, suggesting that there is a large amount of turnover among affiliates in the sample. These entry and exit rates also indicate that turnover is associated with a shift towards higher levels of ownership. For minority owned affiliates, the entry rate is significantly less than the exit rate in the 1982-1989 period. For wholly owned affiliates, the entry rate exceeds the exit rate in both periods.

These declines in the propensity to share ownership may represent the changing geographic concentration of multinational activity or purely a response to the reduction in ownership restrictions during the sample period. Figures 1a and 1b consider the dynamics of ownership decisions over the sample period for countries sorted by host country per-capita

data, only affiliates required to provide all the information associated with a particular analysis are considered.

income quartiles, and by a measure of the barriers to acquiring majority stakes.¹¹ Figure 1a demonstrates that the declining use of minority ownership positions is uniform across all quartiles of ownership restrictions as measured by Schatz (2000). In countries in the two highest quartiles of receptivity to controlling acquisition by foreigners, partial ownership is only employed by 14 percent of affiliates in 1997. While affiliates in the most liberal countries are increasingly wholly-owned, affiliates in less liberal quartiles are increasingly majority-owned. Given that the majority of U.S. multinational activity is in the two most liberal quartiles and that these two quartiles were characterized by minimal restrictions during the entire sample period, the declining overall incidence of shared ownership cannot be attributed to ownership restriction liberalizations.

Figure 1b indicates that affiliates in developing countries are the most likely to be only partially owned by their American parents. In the richest countries, partially owned affiliates only comprise 14.5 percent of all affiliates in 1997 and declined significantly over the sample from 23.5 percent in 1982. Within the poorest countries, whole ownership characterizes less than half of all affiliates throughout the sample period. Nonetheless, the mode of partial ownership has shifted considerably over the sample period, with majority ownership taking the place of minority ownership in popularity in the poorest countries.

As indicated in Figure 2, the use of alternative organizational forms and their shifts over time vary considerably across industries. In 1997, minority-owned affiliates account for more than 15 percent of affiliates in the petroleum, food manufacturing, chemical manufacturing, and transportation equipment manufacturing industries while they make up less than 10 percent of

¹¹ Income quartiles are constructed by taking the average value of GNP per capita in 1995 dollars over the 1982 to 1997 period. The quartiles measuring barriers to acquisition are constructed using the rating system developed and documented in Schatz (2000).

affiliates in the industrial machinery manufacturing, electronic manufacturing, wholesale trade, and financial services industry groups. In fact, nearly 88 percent of wholesale trade affiliates are wholly-owned, suggesting that the undertakings of such affiliates are not amenable to partial ownership. The dynamics of organizational form decisions across time also yield insight into those industries where propensities toward ownership modes are most fixed. While relative fractions of ownership fractions are relatively constant in wholesale trade, services, and other industries, a variety of subgroups within manufacturing – particularly transportation and electronics – have undergone significant shifts in ownership patterns toward whole ownership.

Associated with the approximately 20,000 affiliates reporting in each benchmark year are about 2,500 U.S. parents. In order to consider the distribution of the use of partial ownership among parents, Figure 3 focuses on the set of parent systems with 5 or more affiliates and classifies them by the share of their affiliates that are wholly owned. For such parents, the 1997 figures indicate that 38 percent of parents exclusively employ whole ownership and only two percent exclusively employ partial ownership. As such, most larger multinational firms do use partial ownership at least somewhat but not exclusively. The dynamics over time illustrate that the preference for whole ownership among larger multinationals is becoming much more pronounced over the sample period. In 1982, 48 percent of parents used whole ownership in at least 80 percent of their affiliates and by 1997 that figure had risen to 65 percent.

This quest for more control by multinationals over the sample period is mirrored in the histogram of ownership levels conditional on partial ownership in the three benchmark years presented in Figure 4. While Figure 3 emphasizes the shift toward whole ownership, Figure 4 demonstrates that majority control is becoming more and more important for those affiliates structured under partial ownership. Despite the emphasis on equal shares in the joint venture

literature, Figure 4 also demonstrates that only 41 percent of all affiliates that are partially owned are structured with ownership shares between 40 percent and 60 percent in 1997.

Figures 5a and 5b present descriptive evidence that levels of parent ownership are lower for affiliates with higher fractions of their total sales in host countries, those that purchase small fractions of their inputs from the United States, and affiliates that have fewer transactions with other members of their parent system. Figure 5a displays the mean share of goods sold locally for majority-owned and wholly-owned affiliates.¹² In 1997, majority-owned affiliates have 5.8 percent more of their sales in to the local market than wholly-owned affiliates. This pattern is consistent with the hypothesis that parents are more interested in finding a local partner when access to local distribution is more important. The bottom part of the top panel displays the mean value of the ratio of goods purchased from the U.S. by an affiliate to the affiliate's overall sales. Although minority-owned affiliates purchase about 4 percent of the value of their sales from the U.S. over the sample period, this figure is about 6 percent for majority-owned affiliates and 9 percent for wholly-owned affiliates. This pattern is consistent with the hypothesis that a parent is more interested in finding a local partner when its affiliate is obtaining fewer inputs from the U.S. and, presumably, more reliant on the local market for inputs. It is also notable that the tendency of majority and wholly owned affiliates to rely on imports from the U.S. has also accelerated during the sample period which is not true for minority owned affiliates.

Figure 5b examines how levels of within parent system exchanges vary with ownership. The evidence consistently suggests that parents engaging in extensive trade with their affiliates own greater fractions of affiliate equity than do parents with little trade with affiliates and that this trend has accelerated over the sample period. The first part of this panel indicates that

¹² A breakout of local sales is not available for minority-owned affiliates.

affiliates that sell higher fractions of their output to their parents, or to other affiliates in the same parent system, tend to be more closely held by parents. In 1994, wholly-owned affiliates sold an average of 25.8 percent of their output to affiliated parties, while affiliates with majority ownership of the equity sold only 21.4 percent to affiliated parties. The second and third subpanels characterize the reliance on trade with the U.S. by considering the ratio of imports from, and exports to, the U.S. parent to affiliate sales for affiliates with different ownership structures. In 1994, the import ratio for minority-owned affiliates that imported goods from the U.S. was 0.8 percent while the comparable ratio for wholly-owned affiliates was 9.4 percent. Similarly, for affiliates that exported goods to the U.S., minority-owned affiliates exported 1.5 percent of sales to their parents, but majority-owned affiliates sent 7.6 percent of their sales to their parents. The consistent evidence that related-party exchanges take place more frequently under whole-ownership suggests that the degree to which affiliates are embedded within a worldwide production process makes partial ownership considerably less likely. This evidence is also consistent with the theory that affiliates engaging in transactions with other members of the parent system have trouble convincing investors outside the parent system that these transactions take place on fair terms. The dynamics displayed in Figures 5a and 5b also suggest that these tensions may well have increased over the sample period.

5. *The Determinants of Ownership Decisions*

The leading theories of joint ventures carry implications for the impact of observable variables on the choice of whether to form a new venture with 100 percent, majority, or minority parent ownership. Some of these implications bear on the characteristics of countries in which affiliates are located, while others bear on the characteristics of firms that undertake the ventures.

Regulatory and tax policies of host countries have clear potential to influence the desirability of forming new ventures as wholly owned and partially owned affiliates. While the role of regulatory policies that implicitly or explicitly limit ownership percentages is self-evident, the impact of local tax policy is somewhat subtler. Differences between foreign tax rates and the U.S. tax rate introduce tax planning opportunities that are most readily exploited by wholly owned affiliates. The capital structures, payout policies, and transfer pricing practices of wholly owned affiliates can be tailored to reduce the combination of foreign and U.S. tax liabilities. Foreign partners may of course have their own objectives that differ from those associated with avoiding U.S. tax liabilities. In cases in which the foreign tax rate just equals the U.S. tax rate, then the availability of foreign tax credits removes any U.S. tax liabilities on income earned by affiliates, and U.S. tax considerations become unimportant in planning the operations of affiliates. Consequently, differences between foreign tax rates and the U.S. tax rate are likely to encourage firms to establish their affiliates as wholly owned ventures.

Firms without extensive experience in foreign markets are often hypothesized to benefit the most from participation in international joint ventures due to the associated learning opportunities. The empirical implication of this relationship is that companies with operations in large numbers of foreign countries should be the least likely to form new ventures with partial ownership. Firms establishing affiliates in new industries stand to benefit from the experience and information of foreign partners and are therefore more likely to create affiliates that they own less than 100 percent. Firms in research-intensive industries frequently have the ability to use foreign affiliates to exploit intangible assets developed with R&D activity in home countries. The proprietary nature of these intangible assets complicates any transactions with outside parties and therefore makes the use of wholly owned foreign affiliates particularly attractive.

The production and trade patterns of foreign affiliates influence the desirability of 100 percent parent ownership, though the empirical identification of such effects is problematic given the potential endogeneity of trade patterns to ownership. Theories of collaboration in local sales markets suggest that firms are more likely to establish joint ventures with foreign partners when these partners can provide information about and access to local distribution channels. As a result, affiliates selling high fractions of their output locally are the most likely to be established as joint ventures. By contrast, affiliates that trade extensively with their U.S. parents or other related parties are unlikely to be other than 100 percent owned by the parent company. Such affiliates stand to learn little of value about foreign markets from potential foreign partners, and such affiliates stand to benefit from the ability to adjust transfer prices and other aspects of their trade with related parties.

5.1 Entry Decisions and Trade Patterns

Table II presents the results of estimating the determinants of whether new affiliates are formed as wholly owned or partially owned ventures. The sample consists of observations of the first appearances of any affiliates subsequent to 1982; since somewhat more than 18,000 new affiliates appear in the data between 1983-1997 in the countries for which other explanatory variables are available, the sample size slightly exceeds 18,000. The dependent variable is defined to equal one if an affiliate is formed as a wholly owned venture and zero otherwise.

The empirical findings reported in Table II are consistent with the implications of some theories of joint venture formation and are inconsistent with others. The regression reported in column 1 has a large positive estimated coefficient on ownership restrictions, indicating that wholly owned affiliates are more likely to be established in countries whose governments do not restrict foreign ownership of local businesses. The regression reported in column 2 adds

interacted country and industry fixed effects to the specification of the regression reported in column one, thereby introducing thousands of dummy variables, one for each country/industry combination in the sample. As a result, the impact of ownership restrictions is identified only by changes in such restrictions during the sample period, and then only for country/industry cells containing two or more affiliates. The impact of ownership restrictions remains positive and statistically significant in this specification, though its size is reduced to less than half the magnitude of the effect estimated in the regression reported in column 1.

The regression results reported in column 3 of Table II suggest only an insignificant impact of a multinational firm's tax incentive to avoid joint ventures in countries whose tax rates differ greatly from the U.S. tax rate, since the insignificant estimated coefficient on tax rate differences indicates that affiliates located in countries with tax rates that differ from the U.S. tax rate are no less likely to be wholly owned. Since omitted country attributes have the potential to influence this coefficient, it is useful to consider a specification that includes country fixed effects; in such a specification, the tax rate effects are identified by changes over time in the U.S. tax rate and foreign tax rates. The results of estimating this equation with interacted country and industry fixed effects, reported in column 4, differ from those reported in column 3: tax rate differences between foreign countries and the United States now are associated with significantly greater likelihood of establishing wholly owned affiliates. Hence this regression supports the notion that firms with potentially important tax planning opportunities are likely to establish their foreign affiliates as wholly owned entities.

The regressions reported in columns 5-9 of Table II add an explanatory variable equal to the number of (other) countries in which parent firms have foreign affiliates. Estimated coefficients on this variable are uniformly negative and significant, indicating that firms with

extensive foreign experience are more likely than others to establish new ventures with less than 100 percent parent company ownership. This pattern is inconsistent with the hypothesis that firms undertake joint ventures in order to substitute the expertise of foreign partners for their own incomplete knowledge of foreign business activity. Alternatively, the results can be interpreted as suggesting that implementing shared ownership requires significant expertise, at least on the part of the American parent.

Affiliates in three-digit SICs other than those of the parent company are more likely than others to be partially owned by the parent company, as indicated by the negative estimated coefficient on the “Same industry as parent” variable in the regressions reported in column 7. With the inclusion of country and industry fixed effects in the regression reported in column 8 this coefficient becomes positive and insignificant but is again negative and significant in the regression specification reported in column 9. This pattern is consistent with the implications of theories of incomplete parent knowledge of the market environments of some of their own affiliates, since firms without such industry-specific knowledge stand most to benefit from organizing its foreign affiliate as a joint venture.

The regression reported in column 9 of Table II adds an explanatory variable equal to the (aggregate) R&D/sales ratio of the affiliate’s industry. The positive and significant estimated coefficient on this variable confirm that companies operating in research-intensive industries are the most likely to establish wholly-owned ventures, presumably in response to the higher risks of technology appropriation they might face under partial ownership.

The regressions reported in Table III repeat the specifications reported in Table II, but do so with a dependent variable that takes the value one if an affiliate is either wholly owned or majority owned by its American parent company, and takes the value zero if the affiliate is

minority owned by its American parent. The results are qualitatively almost identical to those reported in Table II, with the small difference that the estimated coefficients on tax rate differences, in the specifications without fixed effects, are now positive and significant in the regressions reported in columns 5, 7, and 9.

The regressions reported in Table IV analyze the determinants of whether majority owned ventures are 100 percent owned by parent companies at the time that they are formed. The sample therefore omits observations of ventures that are formed with minority ownership on the part of the American parent. There are two reasons to analyze the data in this way. The first is that the choice between 100 percent ownership and majority ownership is an important economic decision that is somewhat less the product of regulatory pressure than is the choice between majority and minority ownership. The second, and perhaps less inspiring, reason is that far more data are available on the operations of majority owned and 100 percent owned affiliates than are available on the operations of minority owned affiliates.

The regression reported in column 1 of Table IV indicates (reassuringly) that ownership restrictions reduce the likelihood of 100 percent American ownership. Affiliates for which sales to local markets represent large fractions of their total sales are the most likely to be majority but not 100 percent owned. Inclusion of country/industry fixed effects in the regression reported in column 2 reduces the magnitude and statistical significance of this effect. Ownership restrictions likewise have little impact on the extent of parent ownership in the specifications that include country/industry fixed effects. The regressions reported in columns 3 and 4 indicate that affiliates obtaining inputs (imports from the United States, scaled by total affiliate sales) from the United States are the most likely to be 100 percent owned by their American parents. These

results suggest that reliance on the local market for inputs and as a destination for outputs are important criteria in choosing to share ownership.

In addition to local market characteristics, trade with related parties may exert a distinct effect on the ownership decisions of multinationals. Columns 5 through 8 of Table IV present the results of estimating similar specifications in which the independent trade variables are defined to be the ratio of related party sales to an affiliate's total sales, and the ratio of imports from the U.S. parent to an affiliate's total sales. The results appearing in columns 5 and 6 suggest that affiliates that sell to their parent companies, or to related parties, are more likely than others to be wholly owned by their parents – although the effect is muted with the inclusion of country/industry fixed effects. Similarly, the regressions presented in columns 7 and 8 indicate that affiliates that rely heavily on imports from parents are most likely to be wholly owned, and this statistically significant effect persists with the inclusion of country/industry fixed effects.

Taken together, the results presented in Table IV suggest that affiliates that are embedded within a worldwide production process are not as amenable to partial ownership as are other affiliates. One possible interpretation of these results is that the costs of coordination with local partners are much larger for those affiliates engaging in intrafirm trade. These costs could stem from anticipated disputes over the selection of suppliers, transfer pricing for inputs and sales, and whether overall production decisions should be driven by affiliate requirements or U.S. parent motivations. The apparent conflicts associated with shared ownership appear large with respect to intrafirm trade decisions. As operational and ownership decisions may or may not be jointly determined, the analysis presented below employs exogenous shifts in the relative costs of ownership forms to identify more precisely the relationship between these decisions.

5.2 *Differential Coordination Costs over Tax Planning and Technology Transfer*

As discussed above, the costs of joint ownership stem from the need to accommodate the interests of multiple owners and the associated inability to tailor the activities of joint ventures to meet the needs of any one of the parents. This cost is also potentially large for U.S. parents that would otherwise engage in sophisticated international tax avoidance, since doing so frequently entails a large number of transactions between parent companies and foreign affiliates designed to reallocate taxable income away from high-tax jurisdictions and into low-tax jurisdictions. There is an extensive literature that analyzes patterns of reported profitability and intrafirm trade by American multinational firms, finding that trade between members of controlled groups appears to be structured in ways that reduce total tax liabilities.¹³ Very little is known, however, about the extent to which minority ownership might impede a firm's ability to reduce tax liabilities in this way.

Table V analyzes the determinants of affiliate net income. The regression reported in column one indicates that net income is an increasing function of affiliate assets, increasing at a rate of 9.05 percent, and a negative function of the product of assets and local tax rates. The -0.0804 coefficient on the interaction of assets and country tax rates implies that ten percent higher tax rates reduce profitability by 8.9 percent ($.804/9.05 = 0.089$). This finding is consistent with those of the transfer pricing literature, and persists with the inclusion of industry fixed effects, as reported in column 2.

The regressions reported in Table V are run on the whole sample, including minority owned, majority owned, and 100 percent owned affiliates. Columns 3 and 4 interact dummy

¹³ See, for example, Grubert and Mutti (1991), Harris, Morck, Slemrod and Yeung (1993), Klassen, Lang and Wolfson (1993), Hines and Rice (1994), Collins, Kemsley, and Lang (1998), and Clausing (2001); this literature is critically reviewed in Hines (1999).

variables for partial ownership with assets and asset-tax rate interactions, in order to distinguish the net income determination of partially owned affiliates from that of wholly owned affiliates. The results suggest that the net incomes of partially owned affiliates are considerably less sensitive to local tax rates than are net incomes of wholly owned affiliates. The coefficient on the country tax rate and asset interaction in the regression reported in column 3 is -0.099 , while the same interaction with a partial ownership dummy is 0.063 , indicating that almost two thirds of the tax rate effect disappears when affiliates are partially owned. Similar results appear when industry fixed effects are introduced, in the regression reported in column 4, and when minority and majority ownership is distinguished, as in the regressions reported in columns 5 and 6. These findings therefore suggest that shared ownership comes at the cost of considerably reduced ability to fine-tune affiliate operations to minimize taxes of the parent's controlled group.

These results on the reduced transfer pricing flexibility of both minority *and* majority owned affiliates suggest that characterizations of majority-ownership as denoting control (at least in tax planning dimensions) may be flawed. Even local minority partners can serve to deter aggressive transfer pricing behavior. That transfer pricing appears to be constrained in the presence of minority ownership illuminates the coincident interests of local minority owners and governments in constraining aggressive transfer pricing by U.S. multinationals and provides an intriguing alternative possible justification for ownership restrictions.

The use of proprietary technology and other intangible assets can be one of the most difficult operational aspects over which joint venture partners must agree. It is difficult to attach values to such assets, and it can be difficult for parent companies that own them to retain control if they are used by joint ventures in which the parent company has only a minority ownership

stake. As a result, parent companies may be very reluctant to license their intangible properties to joint ventures, despite the high-tech nature of many international joint ventures.

Consequently, it is reasonable to expect that foreign operations that are designed to exploit intangible property developed in the United States will be organized as majority owned or 100 percent owned affiliates.

Table VI explores the impact of these incentives by analyzing the determinants of royalty payments to American parent companies. Foreign affiliates using intangible property developed by their parent companies are required to remit royalties equal to the market value of the technologies used. While there is some evidence that royalty rates are sensitive to tax planning opportunities (and not surprisingly, given the inherent vagueness of the market value criterion), it is believed that firms generally comply with the requirement to pay royalties when intangible capital is used by foreign affiliates.¹⁴ Consequently, royalty payments can be used as indicators of technology transfer.

Column one of Table VI reports the result of a simple logit specification in which the dependent variable equals one if an affiliate pays a nonzero royalty to its American parent company, and equals zero otherwise.¹⁵ The positive and significant coefficient on the dummy variable for majority or 100 percent ownership indicates that these majority or wholly owned affiliates are more likely than minority owned affiliates to receive intangible property from parent companies. If the reduced willingness to transfer technology to minority owned affiliates reflects feared appropriation or exploitation of that technology by minority partners, then the likelihood of transferring technology should be associated with the mechanism available to punish errant joint venture partners. Accordingly, column 2 of Table VI adds a measure of the

¹⁴ See, for example, Hines (1995) and Grubert (1998).

host country's legal protection of private property, and interacts that variable with the ownership measure.¹⁶ The positive and significant sign on the measure of property rights, and the negative and significant sign on the interaction of the property rights measure with the majority or whole ownership dummy, indicates that technology transfer to minority owned affiliates is greater in countries characterized by more secure property rights.

Column 3 of Table VI adds a dummy variables for 100 percent ownership, which, in the absence of the property rights measure, appears to be associated with slightly reduced probability of paying royalties compared to majority ownership. Inclusion of the property rights measure and the associated interactions in column 4 provides further confirmation of the heightened sensitivity to local protections of private property for partially owned affiliates. Columns 5 and 6 add industry R&D/sales ratios as explanatory variables without significantly changing the results that appear in columns 1-4. This evidence is consistent with reluctance on the part of parent firms to establish joint ventures with minority ownership in situations in which it would be valuable to exploit intangible capital developed by the parent, and, should a joint venture be established, to permit the joint venture to use intangible capital owned by the parent company.

The dimensions upon which conflicts appear to make shared ownership most costly – the intrafirm trade required for integrated worldwide production processes, the coordination of international activity to reduce tax obligations, and the transfers of proprietary technology – are precisely those activities that have risen over the last two decades. Figures 6 and 7 provide evidence of the changing nature of the relationship between parents and their affiliates for

¹⁵ Tobit analysis using dollar payments presented in an earlier draft provides similar results.

¹⁶ The property rights index is a measure of the security of property rights in 1996 (on a scale from 1 to 5) derived from Johnson and Sheehy (1996), in which higher numbers correspond to greater protection for private property. The score is based, broadly, on the degree of legal protection for private property, the extent to which the government protects and enforces laws that protect private property, and the probability that the government will expropriate private property.

intrafirm trade and technology transfer, respectively. Figure 6 plots the share of a parent's overall exports and imports that are sent to, or received from, their foreign affiliates. In 1982, U.S. parents relied on their foreign affiliates as a destination for 30.6 percent of their exports and that figure rose to 45.8 percent by 1997. Similarly, Figure 7 demonstrates that the ratio of royalty payments to sales of foreign affiliates across the sample period rose from 0.4 percent to 1.0 percent from 1982 to 1994 for all industries. That trend is consistent across all industries with the exception of industrial machinery and equipment. In order to isolate the relationship between these aggregate phenomena – the heightened requirements to trade internally, transfer knowledge internally, and take advantage of tax arbitrage opportunities – and the declining propensity to share ownership, the following section considers two exogenous changes in the relative costs of using shared ownership.

5.3 Two Experiments

The link between the pattern of increased levels of activities that require coordination, and the declining use of shared ownership, can be identified through exogenous shifts in the ability to undertake such activity or the relative costs of using different ownership forms. The analysis that follows employs two changes in the costs of employing ownership forms to identify whether, in fact, at least some of the reduced willingness to share ownership and the greater incidence of activities that appear to be associated with higher coordination costs reflect the same underlying phenomenon. Specifically, the regressions reported in Tables VII and VIII analyze the impact of two dramatic policy shifts: the liberalization of host country ownership restrictions during the 1980s and 1990s, and the “10-50 basket” provisions of the U.S. Tax Reform Act of 1986 (TRA86). Both policy shifts encouraged greater majority and whole ownership, the first by permitting it, the second by penalizing minority ownership after 1986.

Table VII reports regressions that capture the effect of changes in local ownership restrictions. These complex restrictions are reviewed and summarized by Shatz (2000). Specifically, he considers restrictions on the acquisition of majority ownership of local enterprises and limitations on the creation of greenfield majority owned enterprises in certain sectors, by multinational firms for 54 countries from 1985 to 1996.¹⁷ From these detailed data, we identify 16 significant liberalizations in our sample, and are able to use these liberalizations to explore their ownership effects at the industry level. Ownership responses to liberalization then represent the first stage in an IV estimation of the link between greater intrafirm trade and increased internalization through whole ownership.

The first four columns of Table VII present estimated regression coefficients from specifications in which the dependent variable is the share of all sales attributed to wholly-owned affiliates in each country-industry pair. The sample is restricted to country-industry pairs in countries that experience ownership liberalizations between 1985 and 1996. In column 1, the positive and significant coefficient on the post-liberalization dummy variable reflects the impact of increased adoption of whole ownership subsequent to liberalizations. The inclusion of country-industry fixed effects in column 2 restricts the estimated effects of liberalizations to those arising from changes over time; the estimated magnitude of the impact of liberalizations is only reduced slightly. Columns 3 and 4 consider the differential reaction of industries based on the intensity of R&D activity in that industry. With and without country-industry fixed effects, the coefficients reported in columns 3 and 4 indicate that industries with above sample median

¹⁷ Specifically, a country is defined to have liberalized ownership restrictions when both the "Acquisition Score" and the "Sector Score" are above 3 (on a scale from 1 to 5). The countries experiencing a liberalization during this period are Argentina (1990), Australia (1987), Colombia (1992), Ecuador (1991), Finland (1990), Honduras (1993), Japan (1993), Korea (1991), Malaysia (1987), Mexico (1989), Norway (1995), Peru (1992), Philippines (1992), Portugal (1987), Sweden (1992), Taiwan (1988), Trinidad and Tobago (1990) and Venezuela (1990).

R&D-intensity responded most aggressively to the liberalization of ownership restrictions, suggesting the greater importance of whole ownership to such industries.

The link between changed ownership patterns and changed trade patterns is the focus of the regression reported in column 5 of Table VII, in which the dependent variable is the share of affiliates sales made to related parties. The positive and significant coefficient on the share of affiliate sales made through wholly-owned affiliates offers a simple correlation between the degree of intrafirm trade and internalization through ownership in country-industry pairs. The inclusion of country-industry fixed effects in column 6 allows for the identification of that relationship through temporal changes in the reliance on whole ownership. The positive and significant coefficient reported in column 6 establishes that those country-industry pairs experiencing greater internalization through ownership are those country-industry pairs that experience greater intrafirm trade. In part, this result suggests that the increased reliance on whole ownership is not associated with greater arms-length trade to subcontractors, but rather with greater intrafirm trade.

Columns 7 and 8 of Table VII present instrumental variables (IV) estimates of the link between intrafirm trade and the establishment of 100 percent owned foreign affiliates. The method is to use the specification presented in column 4 as the first stage of an IV equation in which liberalizations are instruments for ownership levels. IV estimation of this relationship, reported in columns 7 and 8, yields positive and significant coefficients on the predicted values of shares of sales through wholly-owned affiliates; the magnitude of the coefficient is robust to the inclusion of year-effects as reported in column 8. These IV results confirm that an exogenous change in the ability to own 100 percent of local affiliates is accompanied by a greater reliance on intrafirm trade. The 0.47 coefficient reported in column 8 is more than seven

times the size of the corresponding coefficient in column 6, suggesting that the presence of correlated omitted variables reduces the estimated impact of ownership on related party trade in OLS regressions. The size of this coefficient implies that ten percent greater sales through wholly-owned affiliates increases affiliate sales to related parties by 4.7 percent.

Table VIII employs the increased tax penalties imposed by TRA86 in an analogous manner to the ownership liberalizations, with the difference that the tax instrument exploits heterogeneity at the parent level. In particular, the segregation of foreign source income associated with minority ownership positions would penalize minority ownership disproportionately for those parents facing high average worldwide foreign tax rates for income generated by their majority and wholly-owned affiliates.¹⁸ Accordingly, the specifications presented in columns 1 and 2 of Table VIII establish the link between increased reliance on whole ownership by American multinationals and their tax positions prior to TRA86. The positive and significant coefficient on the interaction of the post-TRA86 dummy and the high average foreign tax rate dummy in column 2 indicates that parents facing the greatest relative tax costs associated with joint venture activity were those that employed whole ownership most aggressively.

At the parent level, it is possible to identify the link between ownership decisions and intrafirm transfers by examining a parent company's propensity to export to, or import from, related parties. The regressions reported in columns 3 through 6 and 7 through 10 of Table VIII explore the degree to which U.S. parents export to related parties and import from related parties, respectively, as a function of the degree to which they choose to operate through wholly-owned

¹⁸ Such parents would be most likely to be faced with excess foreign tax credits subsequent to TRA86. Accordingly, the segregation of foreign source income from lightly taxed minority ownership positions would reduce the attraction of minority ownership for such parents as they would no longer be able to utilize foreign tax credits generated from other activities through worldwide averaging. Desai and Hines (1999) elaborate on this point.

affiliates. Columns 3 and 7 identify a simple positive correlation between intrafirm trade (either exports to related parties or imports from related parties) and 100 percent ownership of affiliates. The inclusion of parent fixed effects in the regressions reported in columns 4 and 8 of Table VIII permits the effect of whole ownership to be identified only through its temporal variation, but the estimated impact remains positive and significant in the export equation, if rather less so in the import equation. This result provides further evidence that increased ownership over affiliates is associated with greater intrafirm trade, not greater arm-length trade with subcontractors.

Columns 5 and 9 of Table VIII present IV estimates of the link between intrafirm trade and affiliate ownership by using the right hand side variables of column 2 as instruments for ownership in trade equations. The estimated effect of sales by wholly owned affiliates is positive and significant in the export equation, and positive but insignificant in the import equation. The inclusion of year effects in these specifications, the results of which are reported in columns 6 and 10, reduces the magnitude and statistical significance of the coefficient on whole ownership in the export equation, while having the opposite effect on the coefficient in the import equation.

Firms have incentives to select ownership levels and intrafirm trading patterns that correspond to profit maximizing combinations. Assuming that observed behavior is in fact generated by profit maximization, then it follows from the analysis reviewed in section 3 that the impact of ownership on trade is identical to the effect of trade on ownership. Consequently, the IV trade results reported in Tables VII and VIII are consistent with the OLS ownership results reported in Table IV. Hence, the OLS pattern that affiliates that trade with related parties are more likely to be wholly owned is not merely the byproduct of correlated omitted variables. Indeed, the opposite appears to be the case, since all of the IV results in Table VIII – those reported in columns 5, 6, 9, and 10 – indicate much stronger effects of 100 percent ownership

than do their OLS counterparts reported in columns 3, 4, 7, and 8. This is consistent with the results reported in Table VII, obtained in a very different way, indicating that omitted variables if anything tend to make simple OLS regressions understate the effect of ownership on trade, and trade on ownership.

5.4 *Managing Risk through Ownership Shares*

While it is infeasible to consider every possible alternative motivation for establishing an international joint venture rather than a wholly owned foreign affiliate, it is useful to analyze the role of joint ventures in attenuating local risk by reducing the investment exposure of parent firms. If shared ownership is driven by the desire to mitigate business risks, then the declining incidence of shared ownership could be traced to the reduction in environmental risks over the last two decades. In order to identify the link between risk management and the choice of organizational form, Table IX analyzes the relationship between affiliate size and ownership forms and a measure of the expropriation risk. If risk management motivates ownership decisions, then interactions between measures of expropriation risk and ownership form should exhibit predictable signs.

Columns 1 and 2 of Table IX report regressions in which the dependent variable is affiliate assets at time of entry. The estimated coefficient on the majority or wholly owned dummy variable, reported in column one, indicates that the assets of minority owned affiliates exceed those of majority or wholly owned affiliates by \$69.6 million. The inclusion of country-industry fixed effects in the regression reported in column 2 reduces the estimated size difference to \$59.1 million. The regressions reported in columns 3 and 4 indicate that wholly owned affiliates are smaller than majority owned affiliates, and that these differences are robust to the inclusion of country and industry fixed effects.

The apparent larger size of minority owned affiliates can be interpreted in multiple ways. In particular, the larger size could be interpreted as reflecting the decision to split ownership for larger projects in an effort to manage the attendant risks. In order to test this hypothesis, the specifications in columns 5 through 8 include a measure of the risk of expropriation, and interact that measure with ownership form dummies. In these specifications, there is no significant differential responsiveness of investment levels to expropriation risk based on ownership levels, suggesting that risk management is not a primary motivator in choosing ownership forms. The analysis presented in Appendix Table I replicates this analysis with paid-in-capital as the dependent variable and similarly finds no systematic relationship between investment levels, ownership forms, and expropriation risk.

6. *Conclusions*

International joint ventures offer multinational firms the opportunity to make profitable use of market-specific capabilities of joint venture partners, may facilitate cooperation with foreign governments, and offer the prospect of generating knowledge that could be valuable in future business operations. There is also the possibility that economizing on investment funds through the establishment of an international joint venture permits the parent company to reduce exposure and therefore risk that they would otherwise incur. These advantages may be offset by the costs implicit in split ownership of the same assets, and the resulting inability to exploit fully certain fixed assets developed by parent firms, as well as any opportunities to coordinate worldwide operations through financial and other exchanges.

The evidence indicates that American firms were decreasingly likely to establish their foreign affiliates as joint ventures over the 1982-1997 period. In part, this trend reflects changing U.S. tax policies and legal requirements in foreign countries – but the evidence

provided in the paper suggests a deeper unease with international joint ventures that stems from their higher associated coordination costs. The evidence indicates that, in settings characterized by close coordination between foreign affiliates and American parent companies, firms are much less likely than in other settings to establish new ventures with minority parent ownership. Specifically, it appears that international production coordination, tax planning, and the use of intangible property are all much more easily executed with majority or wholly owned foreign affiliates, and that firms establish their foreign affiliates cognizant of this difference. This evidence is confirmed, indeed strengthened, by evidence that regulatory and tax changes that encourage whole ownership of affiliates are accompanied by greater trade between affiliates and related parties.

The reduced significance of distance and nationality that accompanies globalization creates opportunities but also strong competitive pressures for multinational enterprises. While opportunities to trade and communicate between continents more reliably and quickly, and at reduced cost, enhance the attractiveness of international alliances, they likewise increase the return to coordinating operations within multinational firms. The impact of globalization on international joint venture activity depends, therefore, on the relative strength of these two forces. The evidence to date indicates that American firms respond to recent developments by reducing their joint venture activity, preferring instead to maintain control over their foreign affiliates.

References

- Aghion, Philippe and Jean Tirole, 1994, "The Management of Innovation," *Quarterly Journal of Economics* 109, 1185-1209.
- Alchian, Armen A. and Harold Demsetz, 1972, "Production, Information Costs, and Economic Organization," *American Economic Review* 62, 777-795.
- Anand, Bharat and Tarun Khanna, 2000, "The Structure of Licensing Contracts," *Journal of Industrial Economics* 48, 103-135.
- Anderson, Erin, 1990, "Two Firms, One Frontier: On Assessing Joint Venture Performance," *Sloan Management Review* 31, 19-30.
- Asiedu, Elizabeth and Hadi Salehi Esfahani, 2001, "Ownership Structure in Foreign Direct Investment Projects" *Review of Economics and Statistics* 83, 647-662.
- Balakrishnan, Srinivasan and Mitchell P. Koza, 1993, "Information Asymmetry, Adverse Selection, and Joint Ventures," *Journal of International Business Studies* 18, 1-16.
- Beamish, Paul W. and John C. Banks, 1987, "Equity Joint Ventures and the Theory of the Multinational Enterprise," *Journal of International Business Studies* 18, 1-16.
- Bhattacharya, Sudipto, Jacob Glazer and David E. M. Sappington, 1992, "Licensing and the Sharing of Knowledge in Research Joint Ventures," *Journal of Economic Theory* 56, 43-69.
- Blomström, Magnus and Mario Zejan, 1991, "Why Do Multinational Firms Seek Out Joint Ventures?," *Journal of International Development* 3, 53-63.
- Caves, Richard E., 1996, *Multinational Enterprise and Economic Analysis* (Cambridge, U.K.: Cambridge University Press).
- Clausing, Kimberly A., 2001, "The Impact of Transfer Pricing on Intrafirm Trade," in James R. Hines Jr., ed., *International Taxation and Multinational Activity* (Chicago, IL: The University of Chicago Press), 173-194.
- Collins, Julie, Deen Kemsley and Mark Lang, 1998, "Cross-Jurisdictional Income Shifting and Earnings Valuation," *Journal of Accounting Research* 36, 209-230.
- Contractor, Farok J., 1990, "Ownership Patterns of U.S. Joint Ventures Abroad and the Liberalization of Foreign Government Regulations in the 1980s: Evidence from the Benchmark Surveys," *Journal of International Business Studies* 21, 55-73.
- Contractor, Farok J. and Peter Lorange, 1988, *Cooperative Strategies in International*

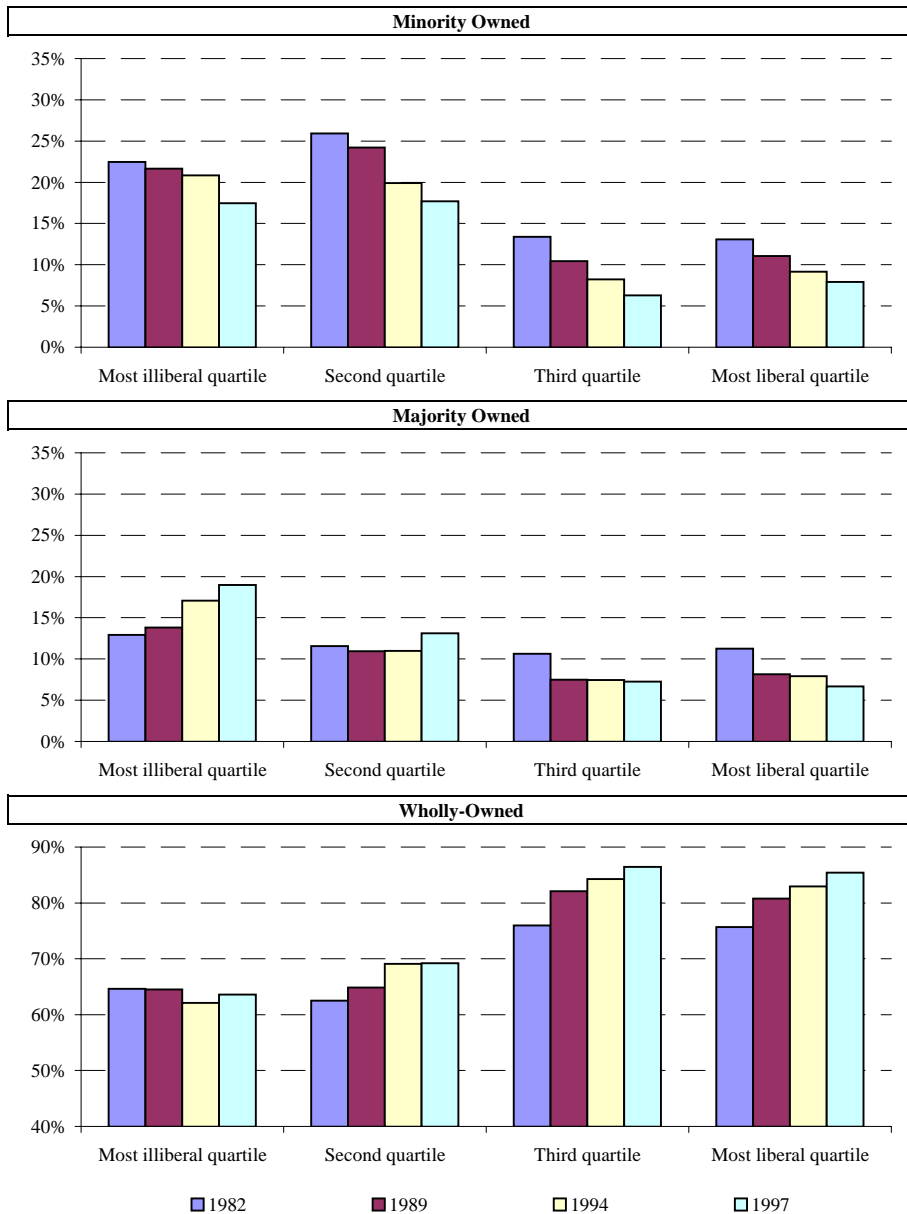
- Business* (Lexington, MA: Lexington Books).
- Crampton, Peter, Robert Gibbons and Paul Klemperer, 1987, "Dissolving a Partnership Efficiently," *Econometrica* 55, 615-632.
- Curhan, Joan P., William H. Davidson and Rajan Suri, 1977, *Tracing the Multinationals* (Cambridge, MA: Ballinger).
- Desai, Mihir A. and James R. Hines Jr., 1999, "Basket Cases: Tax Incentives and International Joint Venture Participation by American Multinational Firms," *Journal of Public Economics* 71, 379-402.
- Feenstra, Robert C, 1998, "Integration of Trade and Disintegration of Production in the Global Economy," *Journal of Economic Perspectives*, 31-50.
- Feenstra, Robert C. and Gordon H. Hanson, 1996a, "Globalization, Outsourcing, and Wage Inequality," *American Economic Review* 86, 240-245.
- Feenstra, Robert C., and Gordon H. Hanson, 1996b, "Foreign Investment, Outsourcing and Relative Wages," in Robert C. Feenstra, Gene M. Grossman and Douglas A. Irwin, eds., *Political Economy of Trade Policy: Essays in Honor of Jagdish Bhagwati* (Cambridge, MA: MIT Press), 89-127.
- Franko, Lawrence G., 1971, *Joint Venture Survival in Multinational Corporations* (New York: Praeger).
- Franko, Lawrence G., 1989, "Use of Minority and 50-50 Joint Ventures by United States Multinationals During the 1970s: The Interaction of Host Country Policies and Corporate Strategies," *Journal of International Business Studies* 20, 19-40.
- Gandal, Neil and Suzanne Scotchmer, 1993, "Coordinating Research through Research Joint Ventures," *Journal of International Business Studies* 22, 249-263.
- Gatignon, Hubert; and Erin Anderson, 1988, "The Multinational Corporation's Degree of Control over Foreign Subsidiaries: An Empirical Test of a Transaction Cost Explanation," *Journal of Law, Economics and Organization* 4, 305-36.
- Geringer, J. Michael and Louis Herbert, 1989, "Measuring Performance of International Joint Ventures," *Journal of International Business Studies* 22, 249-263.
- Ghemawat, Pankaj, Michael E. Porter and Richard A. Rawlinson, 1985, "Patterns of International Coalition Activity," in Michael Porter, ed., *Competition in Global Industries* (Boston, MA: Harvard Business School Publishing), 345-365.
- Gomes-Casseres, Benjamin, 1989, "Ownership Structures of Foreign Subsidiaries: Theory and Evidence," *Journal of Economic Behavior and Organization* 11, 1-25.

- Gomes-Casseres, Benjamin, 1990, "Firm Ownership Preferences and Host Government Restrictions: An Integrated Approach," *Journal of Economic Behavior and Organization* 21, 1-22.
- Grossman, Sanford J. and Oliver D. Hart, 1986, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economics* 55, 279-306.
- Grubert, Harry, 1998, "Taxes and the Division of Foreign Operating Income Among Royalties, Interest, Dividends and Earnings," *Journal of Public Economics* 68, 269-290.
- Grubert, Harry and John Mutti, 1991, "Taxes, Tariffs and Transfer Pricing in Multinational Corporate Decision Making," *Review of Economics and Statistics* 73, 285-293.
- Hanson, Gordon H., Raymond J. Mataloni, Jr. and Matthew J. Slaughter, 2001, "Expansion Strategies of U.S. Multinational Firms," NBER Working Paper No. 8433.
- Harris, David, Randall Morck, Joel Slemrod and Bernard Cheung, 1993, "Income Shifting in U.S. Multinational Corporations," in Alberto Giovannini, R. Glenn Hubbard and Joel Slemrod, eds., *Studies in International Taxation* (Chicago, IL: The University of Chicago Press), 277-307.
- Hart, Oliver and John Moore, 1990, "Property Rights and the Nature of the Firm," *Journal of Political Economy* 98, 1119-1158.
- Hart, Oliver and John Moore, 1998, "Cooperatives vs. Outside Ownership," NBER Working Paper No. 6421.
- Hart, Oliver, 1995, *Firms, Contracts, and Financial Structure* (Oxford: Oxford University Press).
- Henisz, Witold J., 2000, "The Institutional Environment for Multinational Investment," *Journal of Law Economics & Organization* 16, 334-64.
- Hennart, Jean-François, 1991, "The Transaction Costs Theory of Joint Ventures: An Empirical Study of Japanese Subsidiaries in the United States," *Management Science* 37, 483-497.
- Hines, James R. Jr., 1995, "Taxes, Technology Transfer, and the R&D Activities of Multinational Firms," in Martin Feldstein, James R. Hines Jr., and R. Glenn Hubbard, eds., *The Effects of Taxation on Multinational Corporations* (Chicago, IL: The University of Chicago Press), 225-252.

- Hines, James R. Jr., 1999, "Lessons from Behavioral Responses to International Taxation," *National Tax Journal* 52, 305-322.
- Hines, James R. Jr. and Eric M. Rice, 1994, "Fiscal Paradise: Foreign Tax and Havens and American Business," *Quarterly Journal of Economics* 109, 149-182.
- Hladik, Karen J., 1985, *International Joint Ventures: An Economic Analysis of U.S. Foreign Business Partnerships* (Lexington, MA: Lexington Books).
- Holmstrom, Bengt, 1982, "Moral Hazard in Teams," *Bell Journal of Economics* 13, 324-340.
- Horst, Thomas, 1971, "The Theory of the Multinational Firm: Optimal Behavior under Different Tariff and Tax Rates," *Journal of Political Economy* 79, 1059-1072.
- Hortsmann, Ignatius J. and James R. Markusen, 1996, "Exploring New Markets: Direct Investment, Contractual Relations and the Multinational Enterprise," *International Economic Review* 37, 1-18.
- Johnson, Bryan T. and Thomas P. Sheehy, 1996, *1996 Index of Economic Freedom*. Washington D.C.: The Heritage Foundation.
- Kamien, Morton I., Eitan Muller and Israel Zang, 1992, "Research Joint Ventures and R&D Cartels," *American Economic Review* 82, 1293-1306.
- Kant, Chander, 1990, "Multinational Firms and Government Revenues," *Journal of Public Economics* 42, 135-147.
- Kant, Chander, 1995, "Minority Ownership, Deferral, Perverse Intrafirm Trade and Tariffs," *International Economic Journal* 9, 19-37.
- Klassen, Kenneth, Mark Lang and Mark Wolfson, 1993, "Geographic Income Shifting by Multinational Corporations in Response to Tax Rate Changes," *Journal of Accounting Research* 31, 141-173.
- Klein, Benjamin, Robert Crawford and Armen A. Alchian, 1978, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics* 21, 297-326.
- Kogut, Bruce, 1991, "Joint Ventures and the Option to Expand and Acquire," *Management Science* 37, 19-33.
- Legros, Patrick and Steven A. Matthews, 1993, "Efficient and Nearly Efficient Partnerships," *Review of Economic Studies* 68, 599-611.

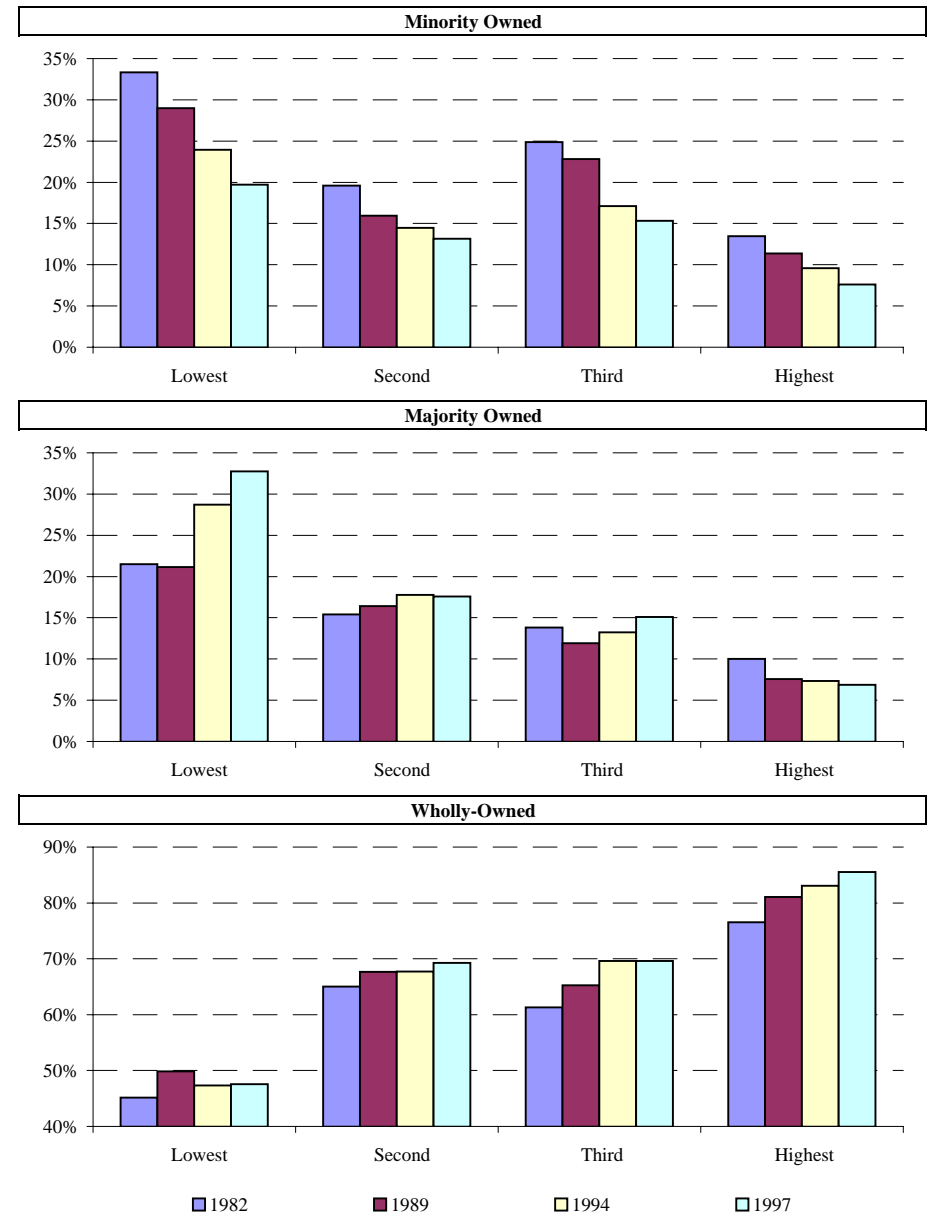
- Ohmae, Kenichi, 1989, "The Global Logic of Strategic Alliances," *Harvard Business Review* (March-April), 143-154.
- Oxley, Joanne E., 1997, "Appropriability Hazards and Governance in Strategic Alliances: A Transaction Cost Approach," *Journal of Law, Economics and Organization* 13, 387-409.
- Rey, Patrick and Jean Tirole, 1999, "Divergence of Objectives and the Governance of Joint Ventures," Working Paper.
- Shatz, Howard, 2000, "The Location of U.S. Multinational Affiliates," Harvard University Ph.D. Thesis.
- Stopford, John M., and K. Haberich, 1978, "Ownership and Control of Foreign Operations," in Michel Ghertman and J. Leontiades, eds., *European Research in International Business* (Amsterdam: North-Holland), 141-167.
- Stopford, John M. and Louis T. Wells, 1972, *Managing the Multinational Enterprise* (New York: Basic Books).
- Svejnar, Jan and Stephen C. Smith, 1984, "The Economics of Joint Ventures in Less Developed Countries," *Quarterly Journal of Economics* 99, 149-167.
- Whinston, Michael D., 2000, "On the Transaction Cost Determinants of Vertical Integration," Mimeograph.
- Williamson, Oliver, 1975, *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: The Free Press).
- Williamson, Oliver, 1985, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (New York: The Free Press).
- Williamson, Oliver E., 1979, "Transaction Costs Economics: The Governance of Contractual Relations," *Journal of Law and Economics* 22, 233-262.
- Zeile, William J., 1997, "Imported Inputs and the Domestic Content of Production by Foreign Owned Manufacturing Affiliates in the United States," in Robert E. Baldwin, Robert E. Lipsey and J. David Richardson, eds., *Geography and Ownership as Bases for Economic Accounting* (Chicago, IL: The University of Chicago Press), 205-232.

Figure 1a
Percent Of Affiliates, By Ownership Restriction And Year



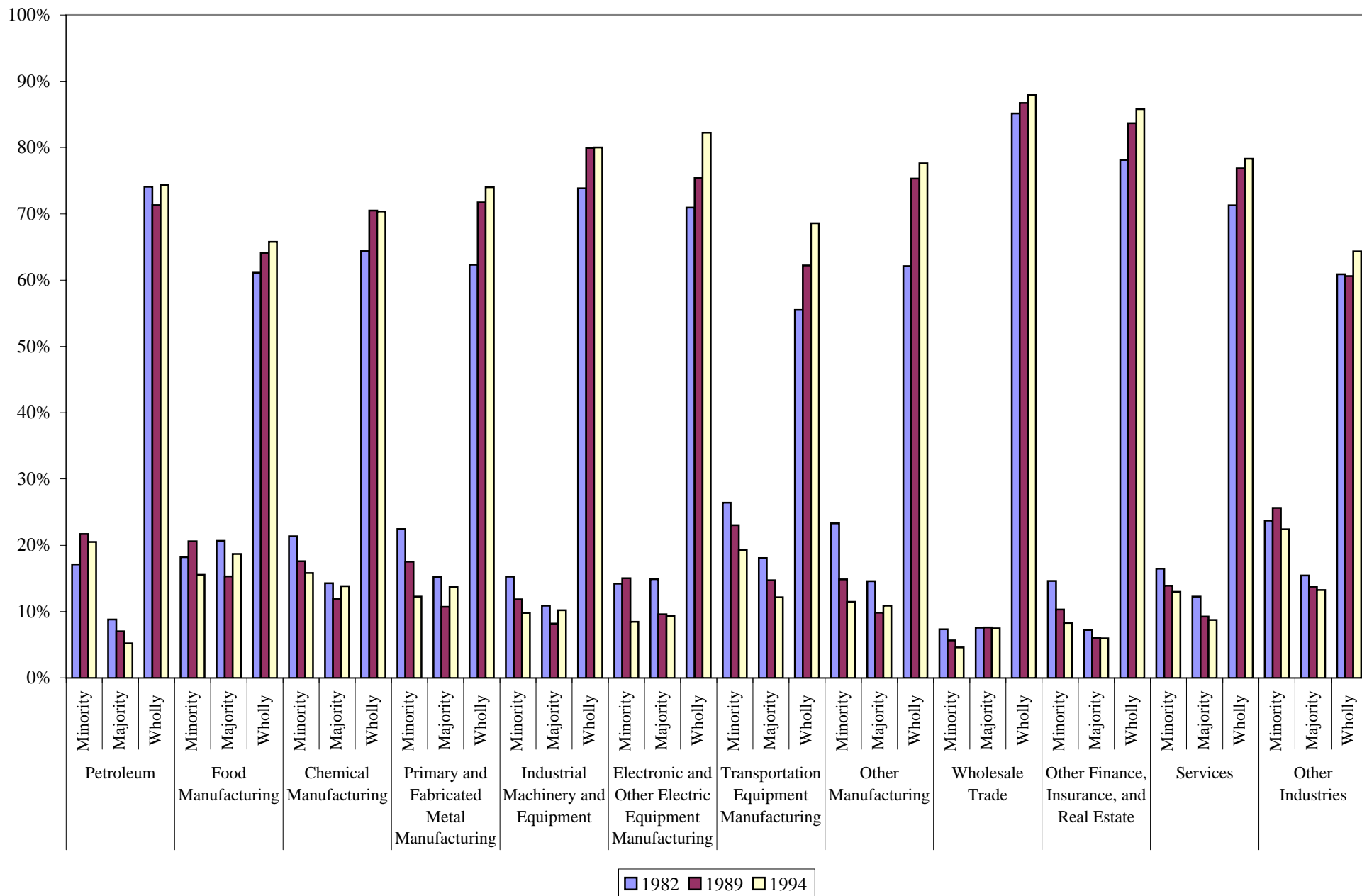
Notes: For each panel, countries are sorted into quartiles based on the nature of their ownership restrictions in 1982, 1989, 1994 and 1997 as measured in Shatz (2000) and described in the text. The three panels represent the share of all affiliates with minority ownership, majority ownership and whole ownership by U.S. parents, respectively.

Figure 1b
Percent Of Affiliates, By Income And Year



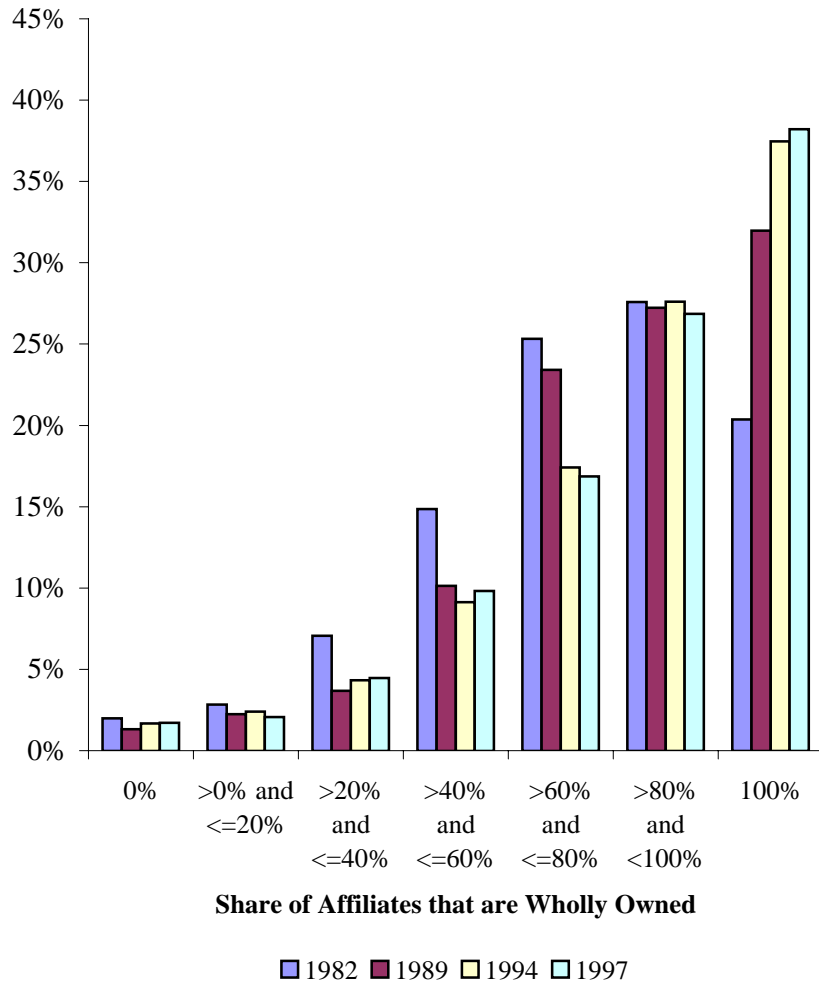
Notes: For each panel, countries are sorted into quartiles based on their gdp/capita in 1982, 1989, 1994 and 1997. The three panels represent the share of all affiliates with minority ownership, majority ownership and whole ownership by U.S. parents, respectively.

Figure 2: The Use of Ownership Forms by Industry, 1982, 1989, 1994



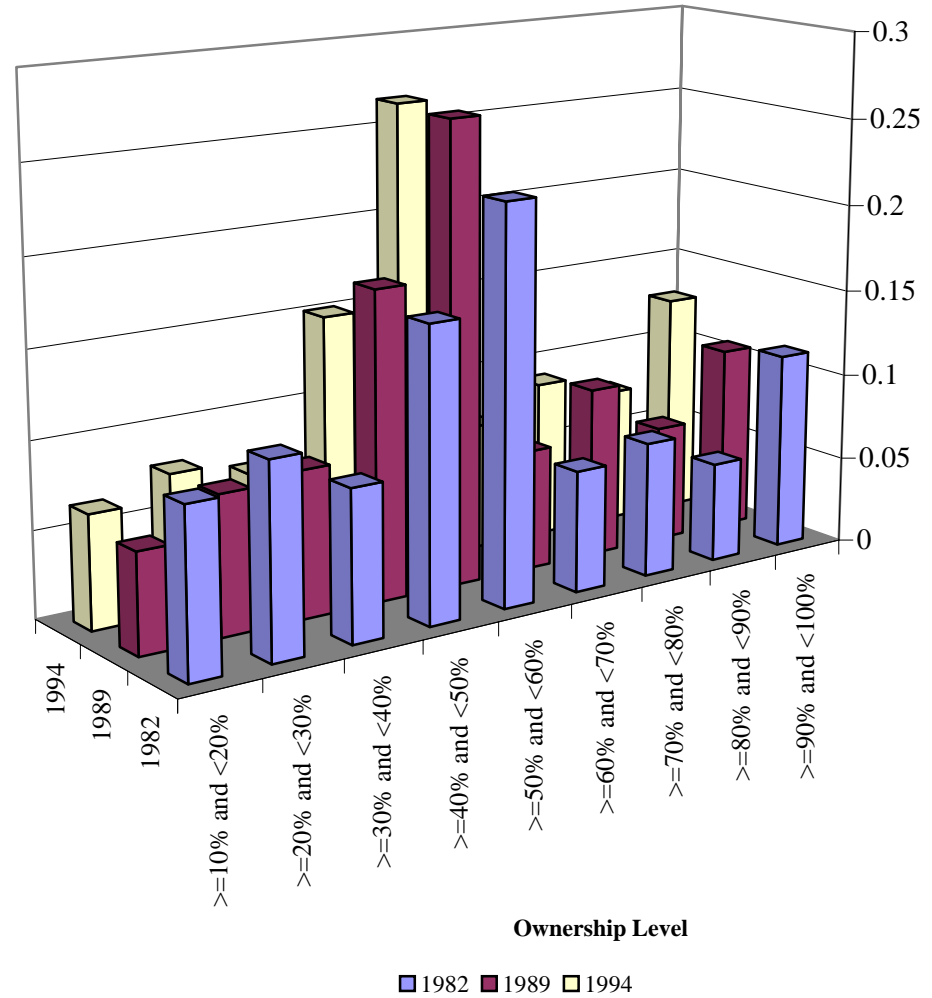
Notes: The bars represent the share of affiliates with minority, majority and whole ownership by U.S. parents by industry for 1982, 1989 and 1994.

Figure 3: The Changing Use of Ownership Levels by Parents with more than 5 affiliates



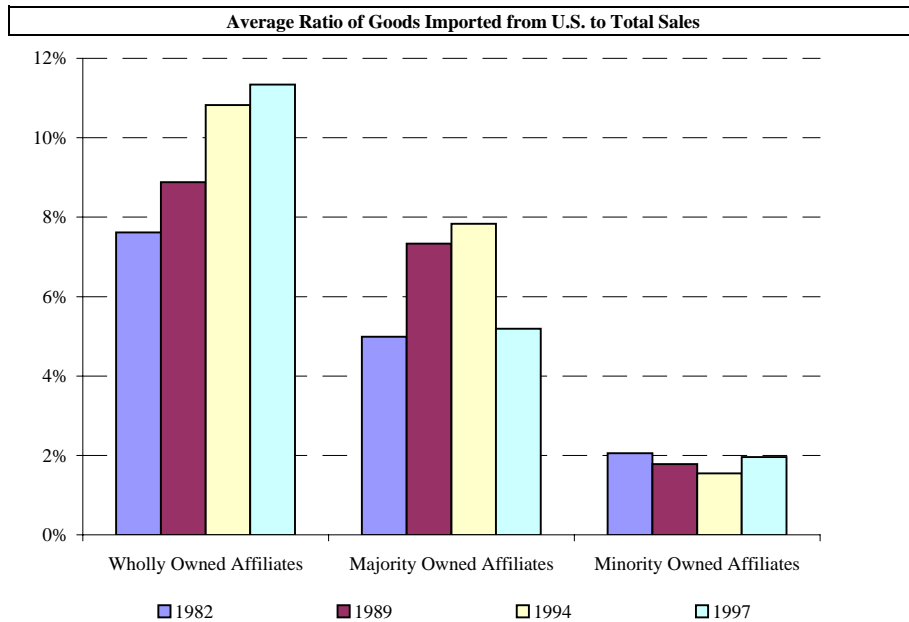
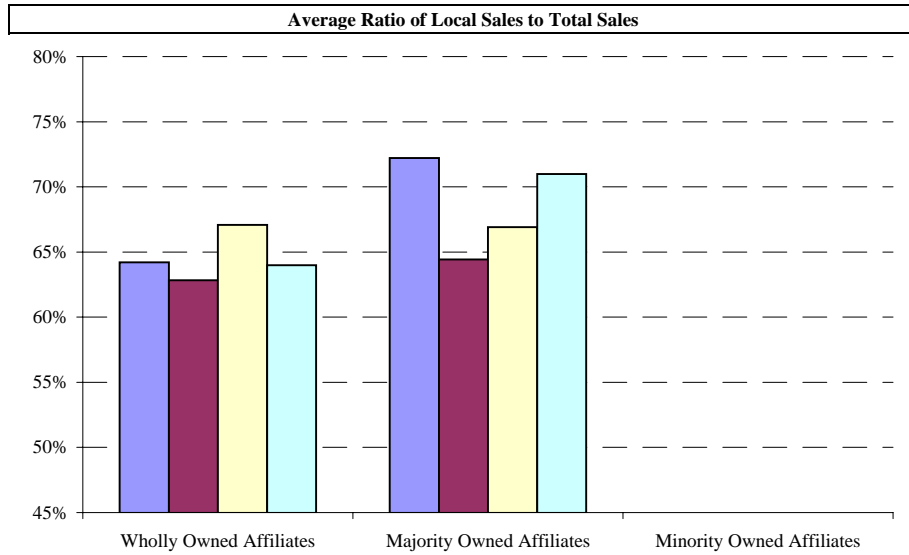
Notes: The bars represent the share of parents in a given year with varying fractions of their affiliates being wholly-owned. The sample is restricted to those parents with at least five affiliates.

Figure 4: The Changing Distribution of Partial Ownership, 1982, 1989, 1994



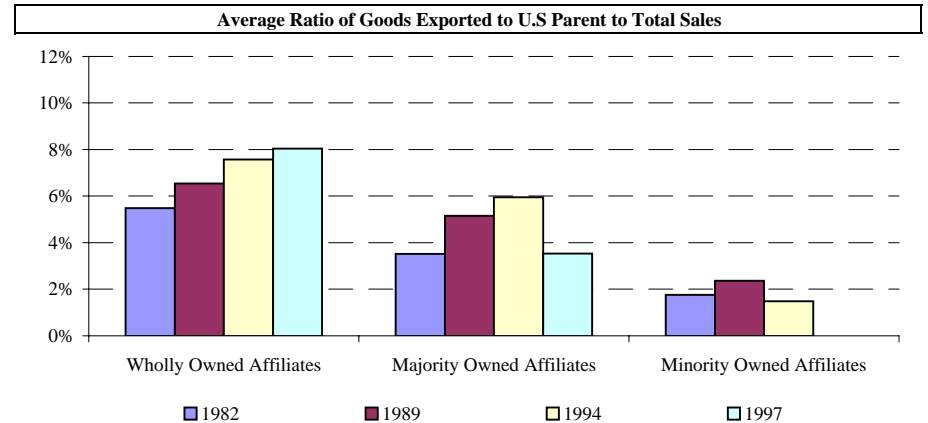
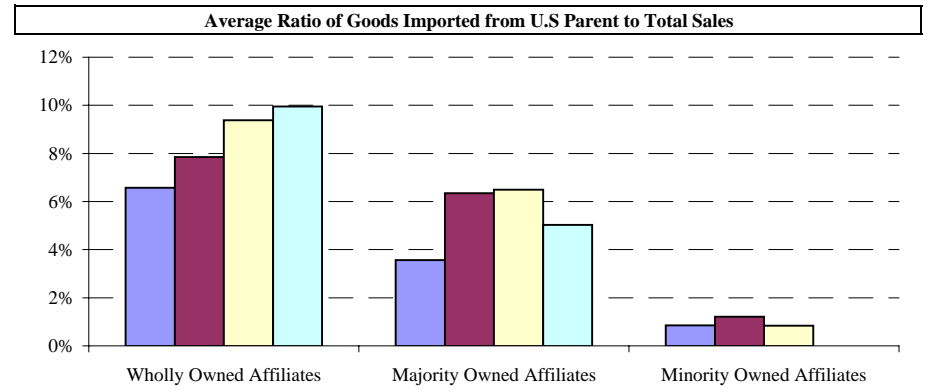
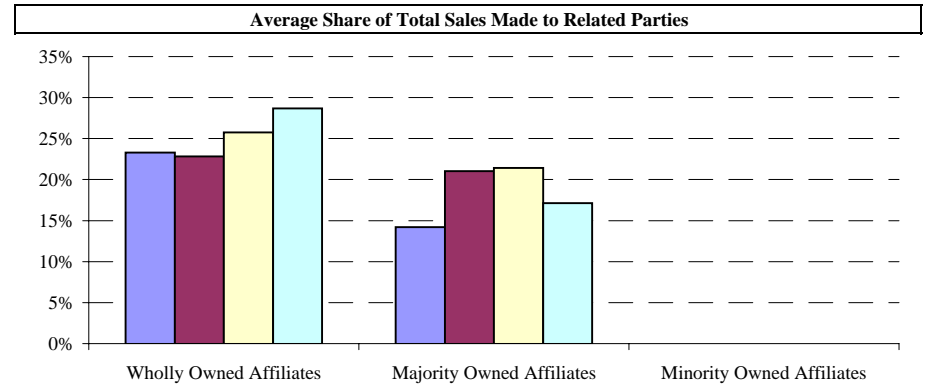
Notes: For each year, the histogram depicts the distribution of partial ownership shares by U.S. parents.

Figure 5a
Sources of Inputs and Destination of Sales by Organizational Form



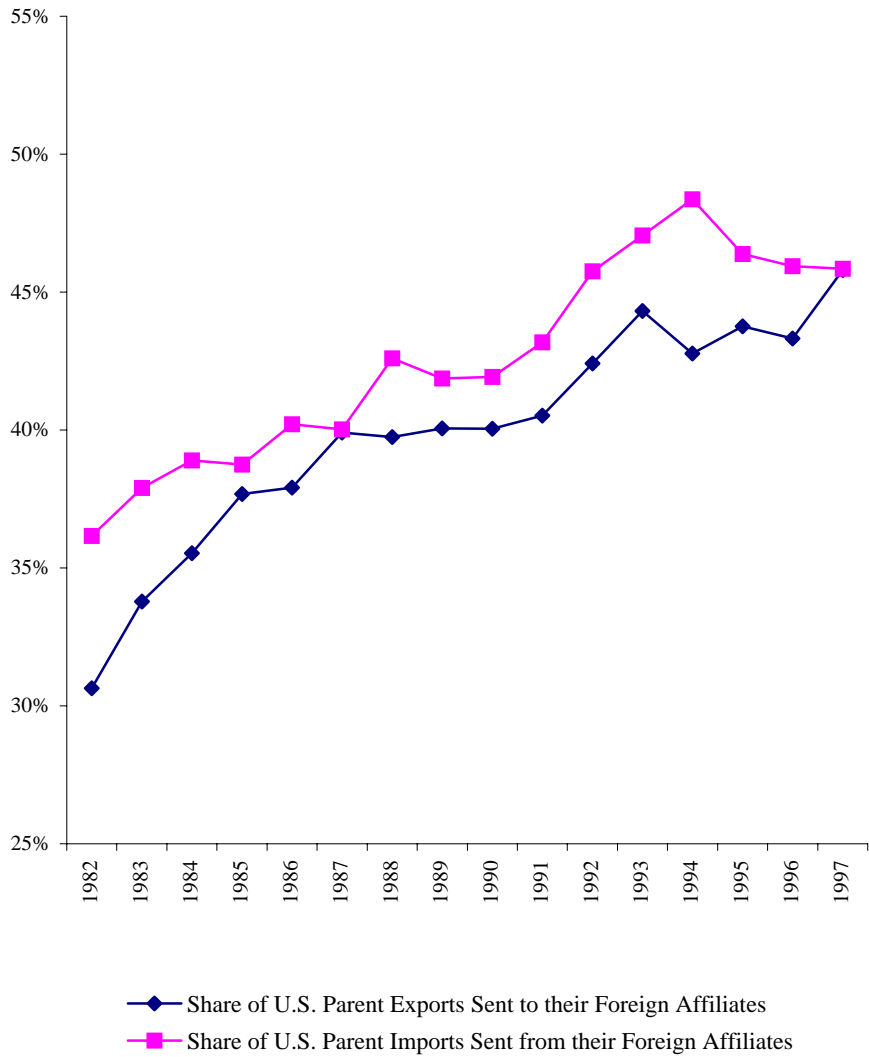
Notes: The top panel displays, by ownership form, the ratio of local sales to total sales for affiliates for 1982, 1989, 1994, and 1997. The bottom panel displays, by ownership form, the ratio of imports from the U.S. to total sales for affiliates for 1982, 1989, 1994, and 1997.

Figure 5b
Related Party Exchanges



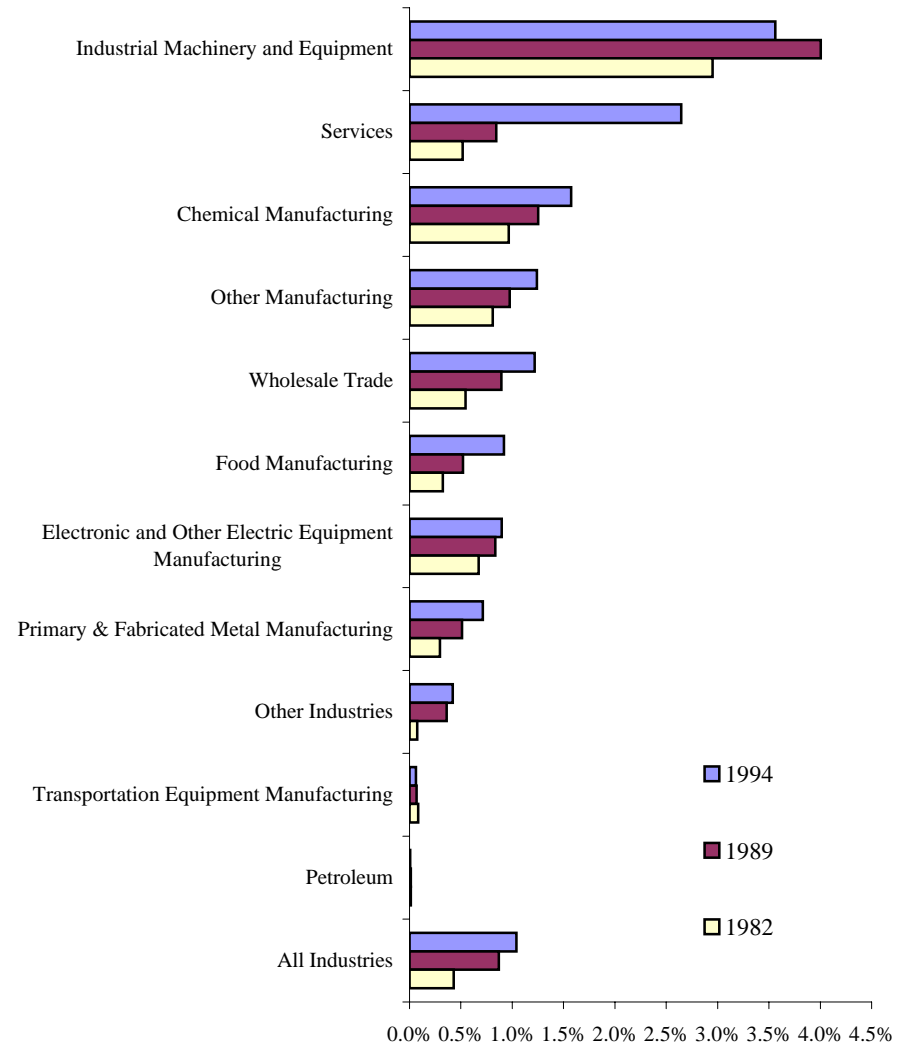
Notes: The top panel displays, by ownership form, the ratio of sales to related parties to total sales for affiliates for 1982, 1989, 1994, and 1997. The middle panel displays, by ownership form, the ratio of imports from the U.S. parent to total sales for affiliates for 1982, 1989, 1994, and 1997. The bottom panel displays, by ownership form, the ratio of exports to the U.S. to total sales for affiliates for 1982, 1989, 1994, and 1997.

Figure 6: The Reliance on Intrafirm Trade for U.S. Multinational Parents, 1982-1997



Notes: The lines depict the share of U. S. Parent exports and imports that are associated with their foreign affiliates.

Figure 7: Ratio of Royalty Payments to Sales of Multinational Affiliates, by Industry and Year



Notes: The bars represent the ratio of royalty payments to sales for affiliates by industry for 1982, 1989, and 1994.

Table I**Descriptive Statistics by Organizational Form**

	Benchmark Years			
	<u>1982</u>	<u>1989</u>	<u>1994</u>	<u>1997</u>
Number of Affiliates				
Wholly Owned Affiliates	13,429	14,606	16,495	10,642
Majority Owned Affiliates	2,086	1,694	1,989	1,308
Minority Owned Affiliates	3,063	2,597	2,413	1,280
Median Sales				
Wholly Owned Affiliates	\$ 10,267	\$ 12,576	\$ 13,489	\$ 41,058
Majority Owned Affiliates	12,982	13,556	16,862	41,159
Minority Owned Affiliates	12,470	13,574	16,568	51,508
Median Assets				
Wholly Owned Affiliates	\$ 9,445	\$ 13,171	\$ 14,045	\$ 44,202
Majority Owned Affiliates	10,611	12,872	16,387	44,016
Minority Owned Affiliates	11,358	12,690	15,282	64,474
Median Employees				
Wholly Owned Affiliates	70	59	61	124
Majority Owned Affiliates	124	111	114	234
Minority Owned Affiliates	100	70	95	205
	<u>1982-1989</u>	<u>1989-1994</u>		
Entry Rate				
Wholly Owned Affiliates	74.9%	57.9%		
Majority Owned Affiliates	57.5%	68.2%		
Minority Owned Affiliates	56.5%	53.8%		
Exit Rate				
Wholly Owned Affiliates	64.8%	45.3%		
Majority Owned Affiliates	67.2%	47.5%		
Minority Owned Affiliates	78.2%	52.7%		

Notes: The top panel provides the number count, median sales, median assets and median employees for all affiliates of U.S. multinationals in the sample by ownership form of the affiliate for 1982, 1989, 1994 and 1997. In 1982, 1989, and 1994, Benchmark Surveys were conducted and, consequently, the cutoff for inclusion in the sample is lower than other years as discussed in the text. The bottom panel reports entry rates and exit rates between Benchmark Surveys by ownership form. Entry rates are defined as the ratio of affiliates appearing in the end year that did not appear in the beginning year of the period to all affiliates appearing in the beginning year. Exit rates are defined as the ratio of affiliates not appearing in the end year that did appear in the beginning year of the period to all affiliates appearing in the beginning year.

Table II

Determinants of Ownership at Entry: Whole vs. Partial Ownership

Dependent Variable: Dummy for Whole Ownership vs. Partial Ownership									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.4482		0.4461		0.7106		0.8956		0.8307
	0.0348		0.0453		0.0494		0.0534		0.0550
Ownership Restrictions Dummy	0.8874	0.4204	0.8882	0.4415	0.8097	0.3964	0.7972	0.3941	0.7931
	0.0403	0.1103	0.0427	0.1106	0.0432	0.1112	0.0433	0.1112	0.0437
Absolute Value of Difference of Median Country Tax Rates from U.S. Statutory Rate			0.0154	2.1757	0.1573	2.1412	0.1461	2.1426	0.2113
			0.2073	0.7327	0.2090	0.7335	0.2097	0.7335	0.2108
Number of Other Countries Operated in by Controlled Group					-0.0145	-0.0111	-0.0172	-0.0108	-0.0157
					0.0010	0.0015	0.0011	0.0016	0.0011
Same Industry as Parent Dummy							-0.3601	0.0482	-0.3778
							0.0380	0.0546	0.0382
R&D/Sales Ratio for Industry									2.2000
									0.4814
Country/Industry Fixed Effects?	N	Y	N	Y	N	Y	N	Y	N
No. of Obs.	18,108	14,016	18,106	14,015	18,106	14,015	18,106	14,015	17,989
Log Likelihood	-9,809	-5,239	-9,808	-5,234	-9,710	-5,208	-9,665	-5,207	-9,582

Notes: The dependent variable is equal to one if the affiliate is wholly owned at entry and zero if the affiliate is partially owned at entry. The specifications in columns 1, 3, 5, 7 and 9 are estimated as logits while the specifications in columns 2, 4, 6, and 8 are conditional logits with country/industry fixed effects. "Ownership Restrictions Dummy" is equal to one if two of the measures of restrictions on foreign ownership as measured by Shatz (2000) are above three on a scale of one to five and is equal to zero otherwise. "Absolute Value of Difference of Median Country Tax Rates from U.S. Statutory Rate" is the absolute value of the difference between the median tax rate faced by an affiliate in a country and the U.S. statutory rate in a given year. "Number of Other Countries Operated in by Controlled Group" for an affiliate is the number of other countries in which the affiliate's parent has an affiliate. "Same Industry as Parent Dummy" is equal to one if the affiliate is in the same industry group as the parent. "R&D/Sales Ratio for Industry" is the average ratio of R&D expenditures to sales for the parents in the industry of the affiliate as measured by domestic parent spending on R&D and domestic parent sales.

Table III

Determinants of Ownership at Entry: Majority vs. Minority Ownership

Dependent Variable: Dummy for Whole Ownership and Majority Ownership vs. Minority Ownership										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	1.4287 0.0430		1.3595 0.0581		1.6782 0.0647		1.8821 0.0713		1.8132 0.0741	
Ownership Restrictions Dummy	0.9983 0.0526	0.6920 0.1401	1.0313 0.0558	0.7203 0.1406	0.9345 0.0566	0.6692 0.1415	0.9189 0.0567	0.6669 0.1417	0.9004 0.0576	0.2845 0.1057
Absolute Value of Difference of Median Country Tax Rates from U.S. Statutory Rate			0.5007 0.2870	2.7924 1.0161	0.6694 0.2898	2.7643 1.0191	0.6612 0.2907	2.8025 1.0199	0.8437 0.2959	1.2833 0.7745
Number of Other Countries Operated in by Controlled Group					-0.0164 0.0013	-0.0130 0.0020	-0.0192 0.0014	-0.0119 0.0021	-0.0164 0.0015	-0.0117 0.0016
Same Industry as Parent Dummy							-0.3861 0.0535	0.1511 0.0786	-0.3996 0.0538	-0.2551 0.0558
R&D/Sales Ratio for Industry									1.6237 0.6793	1.7259 0.6576
Country/Industry Fixed Effects?	N	Y	N	Y	N	Y	N	Y	N	N
Country Fixed Effects?	N	N	N	N	N	N	N	N	N	Y
No. of Obs.	18,108	10,333	18,106	10,332	18,106	10,332	18,106	10,332	17,989	17,964
Log Likelihood	-5,824	-2,630	-5,822	-2,626	-5,751	-2,606	-5,726	-2,604	-5,642	-5,286

Notes: The dependent variable is equal to one if the affiliate is wholly owned or majority owned at entry and zero if the affiliate is minority owned at entry. The specifications in columns 1, 3, 5, 7 and 9 are estimated as logits while the specifications in columns 2, 4, 6, 8 and 10 are conditional logits with country/industry fixed effects. "Ownership Restrictions Dummy" is equal to one if two of the measures of restrictions on foreign ownership as measured by Shatz (2000) are above three on a scale of one to five and is equal to zero otherwise. "Absolute Value of Difference of Median Country Tax Rates from U.S. Statutory Rate" is the absolute value of the difference between the median tax rate faced by an affiliate in a country and the U.S. statutory rate in a given year. "Number of Other Countries Operated in by Controlled Group" for an affiliate is the number of other countries in which the affiliate's parent has an affiliate. "Same Industry as Parent Dummy" is equal to one if the affiliate is in the same industry group as the parent. "R&D/Sales Ratio for Industry" is the average ratio of R&D expenditures to sales for the parents in the industry of the affiliate as measured by domestic parent spending on R&D and domestic parent sales.

Table IV

Determinants of Ownership at Entry: Reliance on Local Markets and Related Party Trade

Dependent Variable: Dummy for Whole Ownership vs. Majority Ownership									
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Constant	1.6677 0.0768		1.5984 0.0784		Constant	1.4275 0.0535		1.3489 0.0547	
Ownership Restrictions Dummy	0.6800 0.0599	0.1398 0.1770	0.6732 0.0607	0.1363 0.1822	Ownership Restrictions Dummy	0.6873 0.0600	0.1464 0.1770	0.6928 0.0603	0.1748 0.1809
Ratio of Local Sales to Total Sales	-0.2466 0.0720	-0.0254 0.1002	-0.2456 0.0727	-0.0229 0.1011	Ratio of Related Party Sales to Total Sales	0.3103 0.0877	0.1957 0.1152	0.3334 0.0887	0.1943 0.1161
Ratio of Goods Imported from U.S. to Total Sales			0.8857 0.1579	0.7635 0.2070	Ratio of Imports from Parent to Total Sales			0.8911 0.1510	0.6909 0.1834
Country/Industry Fixed Effects?	N	Y	N	Y	Country/Industry Fixed Effects?	N	Y	N	Y
No. of Obs.	14,484	8,673	14,291	8,534	No. of Obs.	14,484	8,673	14,418	8,629
Log Likelihood	-5,181	-2,518	-5,096	-2,467	Log Likelihood	-5,180	-2,517	-5,131	-2,492

Notes: The dependent variable is equal to one if the affiliate is wholly owned at entry and zero if the affiliate is partially owned at entry. The specifications in columns 1, 3, 5, and 7 are estimated as logits while the specifications in columns 2, 4, 6, and 8 are conditional logits with country/industry fixed effects. "Ownership Restrictions Dummy" equals one if two of the measures of restrictions on foreign ownership as measured by Shatz (2000) are above three on a scale of one to five and is equal to zero otherwise. "Ratio of Local Sales to Total Sales" is the ratio of local sales to total affiliate sales. "Ratio of Goods Imported from U.S. to Total Sales" is the ratio of imports from the U.S. to total affiliate sales. "Ratio of Related Party Sales to Total Sales" is the ratio of sales to related parties to total affiliate sales. "Ratio of Imports from Parent to Total Sales" is the ratio of imports from the U.S. Parent to total affiliate sales.

Table V
Organizational Form, Profitability and Coordination of Tax Activity

	Dependent Variable: Net Income					
	(1)	(2)	(3)	(4)	(5)	(6)
Assets	0.0905	1.0479	0.1048	1.0581	0.1048	1.1484
	0.0046	0.0781	0.0060	0.0824	0.0060	0.1020
Country tax rate interacted with Assets	-0.0804	-0.0946	-0.0991	-0.1174	-0.0991	-0.1175
	0.0120	0.0125	0.0170	0.0165	0.0170	0.0165
Partial ownership dummy interacted with assets			-0.0459	-0.0223		
			0.0097	0.0108		
Partial ownership dummy interacted with assets and country tax rate			0.0627	0.0573		
			0.0235	0.0246		
Majority ownership dummy interacted with assets					-0.0431	-0.0273
					0.0115	0.0126
Majority ownership dummy interacted with assets and country tax rate					0.0699	0.0817
					0.0265	0.0270
Minority ownership dummy interacted with assets					-0.0485	-0.0134
					0.0134	0.0139
Minority ownership dummy interacted with assets and country tax rate					0.0472	0.0139
					0.0318	0.0355
Industry Fixed Effects?	N	Y	N	Y	N	Y
No. of Obs.	160,777	160,777	160,777	160,777	160,249	160,249
R-Squared	0.2582	0.3377	0.2675	0.3383	0.2684	0.3176

Notes: The dependent variable is the net income of an affiliate. The specifications in columns 1, 3, and 5 are OLS and the specifications in columns 2, 4, and 6 include industry fixed effects. "Assets" are the assets of the affiliates. "Country Tax Rate interacted with Assets" is product of "Assets" and the median country tax rate as calculated in the text. The remaining terms are interactions of ownership dummies with "Assets" and "Country Tax Rate interacted with Assets." Partial ownership dummies equal one for any affiliate not wholly-owned by the U.S. parent.

Table VI
Organizational form and Coordination of Intellectual Property

	Dependent Variable: Dummy for Payment of Royalties						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	-1.6181 0.0380	-1.9740 0.0867	-1.6181 0.0380	-1.9740 0.0867	-1.7360 0.0388	-2.0595 0.0881	
Majority or Whole Ownership dummy	0.2570 0.0398	0.9497 0.0907	0.3367 0.0482	0.8023 0.1087	0.2985 0.0485	0.7602 0.1097	
Property Rights Index (PRI)		0.2095 0.0399		0.2095 0.0399		0.1930 0.0403	
Majority or Whole Ownership dummy interacted with PRI		-0.4141 0.0430		-0.2564 0.0528		-0.2543 0.0532	
Whole Ownership dummy			-0.0948 0.0324	0.1964 0.0717	-0.1312 0.0326	0.1447 0.0722	
Whole Ownership dummy interacted with PRI				-0.2069 0.0391		-0.1981 0.0394	
R&D/Sales Ratio for Industry					6.2413 0.2643	6.0106 0.2672	
Country Fixed Effects?	N	N	N	N	N	N	Y
No. of Obs.	48,053	46,734	48,053	46,734	47,847	46,534	
Log Likelihood	-24,026	-23,581	-24,022	-23,559	-23,717	-23,281	

Note: The dependent variable is equal to one if royalties are paid between the affiliate and parent. The specifications in columns 1 through 7 are logits. The specification in column 8 is a conditional logit with country fixed effects. "Property Rights Index" is an index of the level of protection private property receives. "R&D/Sales Ratio for Industry" is the ratio of R&D expenditures to sales for the industry of the affiliate as measured by worldwide parent spending on R&D and worldwides parent sales. The remaining terms are interactions of ownership dummies with "Property Rights Index."

Table VII

The Relationship between Trade and Ownership Internalization: Liberalizations

	<u>Dependent Variable: Share of Sales through Wholly-Owned Affiliates</u>					<u>Dependent Variable: Share of Affiliates Sales to Related Parties</u>			
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Constant	0.5900 0.0056	0.5984 0.0035	0.6225 0.0082	0.5992 0.0035	Constant	0.0641 0.0041	0.0759 0.0058	-0.1842 0.0541	-0.2046 0.1287
Post liberalization dummy	0.0759 0.0077	0.0593 0.0052	0.0327 0.0113	0.0319 0.0077	Share of Sales through wholly-owned affiliates	0.0825 0.0057	0.0661 0.0079	0.4289 0.0752	0.4696 0.1731
High R&D Intensity Dummy			-0.0610 0.0113						
Post-liberalization dummy interacted with High R&D Intensity Dummy			0.0811 0.0155	0.0498 0.0105					
Country-Industry FE?	N	Y	N	Y	Country-Industry FE?	N	Y	Y	Y
No. of Obs.	12,355	12,355	12,254	12,254	IV w/ Predicted Ownership from (4)?	N	N	Y	Y
R-Squared	0.0078	0.7142	0.0104	0.7137	Year Effects?	N	N	N	Y
					No. of Obs.	10,776	10,776	10,706	10,706
					R-Squared	0.0162	0.7344		

Notes: The dependent variable in the left panel is the share of all sales within a country-industry pair that is sold through wholly-owned affiliates. The sample is restricted to those countries experiencing a liberalization of ownership restrictions between 1985 and 1996 as described in the text. The specifications in columns 1 and 3 are OLS and the specifications in columns 2 and 4 include country-industry fixed-effects. "Post-liberalization dummy" equals one for years after a liberalization of ownership restrictions and equals zero otherwise. "High R&D Intensity Dummy" equals one if the industry has and R&D/Sales ratio above the median and zero otherwise. "Post-liberalization dummy interacted with High R&D Intensity Dummy" is the product of "Post-liberalization dummy" and "High R&D Intensity Dummy." The dependent variable in the right panel is the ratio of sales to related parties to total sales within a country-industry pair. "Share of Sales through wholly-owned affiliates" is the share of all sales within a country-industry pair that is sold through wholly-owned affiliates. The specifications in columns 5 and 6 are OLS and the specification in column 6 includes country-industry fixed effects. The specifications in columns 7 and 8 use the predicted value from the specification in column 4 as an instrument and the specification in column 8 adds year effects.

Table VIII

The Relationship between Trade and Ownership Internalization: TRA86

	<u>Dependent Variable: Share of Sales through Wholly-Owned Affiliates</u>			<u>Dependent Variable: Share of Exports to Related Parties</u>				<u>Dependent Variable: Share of Imports from Related Parties</u>			
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.7566 0.0029	0.7584 0.0027	Constant	0.2717 0.0068	0.3828 0.0087	-0.3430 0.1676	0.0264 0.2418	0.4053 0.0092	0.4928 0.0135	0.3129 0.1525	-0.0886 0.2514
Post TRA86 dummy	0.0193 0.0036	0.0015 0.0078	Share of Sales through wholly-owned affiliates	0.1811 0.0082	0.0389 0.0110	0.9751 0.2157	0.4988 0.3079	0.1401 0.0110	0.0275 0.0172	0.2662 0.1978	0.7748 0.3218
Post-TRA86 dummy interacted with High Average Foreign Tax Rate Dummy		0.0231 0.0087									
Parent Fixed Effects?	Y	Y	Parent Fixed Effects?	N	Y	Y	Y	N	Y	Y	Y
No. of Obs. R-Squared	22,558 0.7791	17,146 0.7489	IV w/ Predicted Ownership from (2)?	N	N	Y	Y	N	N	Y	Y
			Year Effects?	N	N	N	Y	N	N	N	Y
			No. of Obs. R-Squared	15,699 0.0290	15,699 0.7152	12,384	12,384	12,941 0.0123	12,941 0.6984	10,313	10,313

Notes: The dependent variable in the left panel is the share of all sales within a parent system that is sold through wholly-owned affiliates. The specifications in columns 1 and 2 include country-industry fixed-effects. "Post-TRA86 dummy" equals one for years after 1986 and equals zero otherwise. "High Average Tax Rate Dummy" equals one if the average foreign tax rate is greater than the U.S. statutory rate in a given year. "Post-TRA86 dummy interacted with High Average Foreign Tax Rate Dummy" is the product of "Post-TRA86 dummy" and "High Average Foreign Tax Rate Dummy." The dependent variable in columns 3 through 6 in the right panel is the ratio of sales to related parties to total sales within a country-industry pair. The dependent variable in columns 7 through 10 in the right panel is the ratio of imports from the U.S. parent to total sales within a parent. "Share of Sales through wholly-owned affiliates" is the share of all sales within a parent system that is sold through wholly-owned affiliates. The specification in column 5 is OLS and the specification in column 6 includes country-industry fixed effects. The specifications in columns 7 and 8 use the predicted value from the specification in column 4 as an instrument and the specification in column 8 adds year effects.

Table IX

Organizational Form and Risk Management

	Dependent Variable: Assets							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	125,790.20	115,520.40	125,790.20	116,629.80	56,355.42	117,951.40	56,355.42	118,803.40
	11,105.53	12,139.77	11,105.77	12,172.82	87,479.63	13,447.51	87,483.96	13,462.38
Majority or Wholly Owned Dummy	-69,589.47	-58,128.85	-59,661.54	-40,604.17	-111,486.90	-133,607.00	-96,011.09	-117,074.10
	11,286.20	12,821.05	12,476.09	14,300.31	88,207.57	107,840.80	95,843.00	110,846.40
Wholly owned dummy			-11,860.54	-22,415.09			-24,792.99	-29,180.44
			6,071.51	8,659.94			40,578.85	72,583.68
Expropriation Risk Measure					8,648.29		8,648.29	
					9,849.56		9,850.05	
Majority or Wholly Owned Dummy Interacted with Expropriation Risk					3,330.15	7,850.57	3,388.45	7,921.13
					9,946.87	12,053.44	10,947.88	12,630.39
Wholly Owned Dummy Interacted with Expropriation Risk							632.07	835.82
							4,963.17	8,175.96
Country/Industry Fixed Effects?	N	Y	N	Y	N	Y	N	Y
No. of Obs.	23,135	23,135	23,135	23,135	20,185	20,185	20,185	20,185
R-Squared	0.0042	0.1943	0.0044	0.1947	0.0062	0.1872	0.0065	0.1876

Notes: The dependent variable is the assets of an affiliate. The specifications in columns 1, 3, 5 and 7 are OLS and the specifications in columns 2, 4, 6 and 8 include country- industry fixed effects. "Expropriation Risk Measure" is an index of the level of expropriation risk faced by an investor. The remaining terms are interactions of ownership dummies with "Expropriation Risk Measure."

Appendix Table I

Organizational Form and Risk Management

Dependent Variable: Paid-in-Capital Owned by U.S. Parent				
	(1)	(2)	(3)	(4)
Constant	5,522.08	3,287.80	13,218.66	3,195.53
	616.69	1,177.35	5,025.55	1,232.59
Wholly Owned Dummy	2.98	2,595.45	-8,239.86	3,867.32
	697.80	1,449.90	5,633.91	13,532.53
Expropriation Risk Measure			-857.02	
			564.07	
Wholly Owned Dummy Interacted with Expropriation Risk			913.85	-131.53
			625.29	1,391.26
Country/Industry Fixed Effects?	N	Y	N	Y
No. of Obs.	14,823	14,823	13,373	13,373
R-Squared	0.0000	0.2440	0.0001	0.2384

Notes: The dependent variable is the assets of an affiliate. The specifications in columns 1, 3, 5 and 7 are OLS and the specifications in columns 2, 4, 6 and 8 include country- industry fixed effects. "Expropriation Risk Measure" is an index of the level of expropriation risk faced by an investor. The remaining terms are interactions of ownership dummies with "Expropriation Risk Measure."