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THE INTERNALIZATION BENEFITS OF TRANSFER PRICE MANIPULATION

Abstract

The ability to arbitrage differences in government policies through transfer price manipulation (TPM) is a key benefit of internalizing cross-border transactions. Empirical work has focused on tax-motivated income shifting; almost nothing has been done on how product characteristics and market structures affect TPM. Using transaction-level US import data, we find direct evidence of aggressive transfer pricing in response to both market and government imperfections.

(64 words)

Key words: transfer pricing, international taxation, internalization, international trade

THE INTERNALIZATION BENEFITS OF TRANSFER PRICE MANIPULATION

Internal transactions "allow the MNE to exercise its 'multinationality'", compensate for the costs of operating abroad, and achieve competitive advantage" (Cravens, 1997, p.129). Internalization theory argues that MNEs exercise their multinationality by choosing internal instead of arm's length transactions when transaction costs are high due to missing or imperfect markets (Buckley and Casson, 1976). The authors argue that internalization is likely in four cases: missing futures markets, bilateral monopoly, buyer uncertainty, and restrictions on price discrimination (pp. 37-38). Internalization is also likely in a fifth case: where differences in government regulations offered arbitrage opportunities (pp. 38-39).

Transfer pricing is the setting of prices for internal (intrafirm) transactions in goods, services, intangibles and capital flows within the MNE. Transfer price manipulation (TPM) is the strategic setting of transfer prices above or below opportunity cost so as to avoid (but not evade, since evasion is illegal) government controls and/or arbitrage differences in regulations between countries (Horst, 1971; Eden, 1998). The ability to arbitrage through TPM is Buckley and Casson's fifth motivation for internalization.

Transfer pricing, while receiving little attention in the popular press, is a critical issue for managers of multinational enterprises. MNEs, through transfer price manipulation, can achieve a higher after-tax global profit than can two non-related firms. TPM can lower the firm's cost of capital and/or create a greater return from cash flow by reducing the MNE's worldwide regulatory burden (Harris, Morck, Slemrod and Yeung, 1993). Income shifting through TPM can improve the MNE's financial performance, allowing the firm to achieve higher rents on its intangible assets. TPM therefore can create an additional benefit from internalizing markets over and above reduction of transaction costs.

Because world markets are incompletely integrated, firms can add value through cross-border operations that exploit semiglobalization. The flexibility to transfer resources, using internal transactions, effectively and efficiently through a global network is the primary advantage MNEs have over domestic firms (Kogut and Kulatilaka, 1994). Ghemawat (2003) theorized that value-adding responses to semiglobalization should be based on either arbitrage (exploiting differences across countries) or

integration (exploiting similarities across countries). In this paper, we argue that transfer price manipulation is a value-adding response to the arbitrage opportunities created by semiglobalized markets.

Transfer pricing is also important for policy makers. International trade between related parties is huge, representing half of US imports and one-third of US exports (Census, 2000). In addition, intrafirm trade shares vary widely by commodity group, industry and country (Feenstra and Shiells, 1997; Zeile, 1997), suggesting that TPM should have uneven impacts across commodities, industries and bilateral trade balances. TPM should have even larger effects on small, open countries where intrafirm trade is a higher percent of total trade and GDP.

Arguing that TPM was a "problem of considerable concern to host governments", Buckley and Casson (1976, pp. 108-109) authors hypothesized that the MNE's ability to engage in transfer price manipulation was affected by markets and governments (p. 44):

> [the] ability to minimize the impact of government interventions through transfer pricing; the exploitation of transfer pricing depends not only on the *nature of the product* and the *structure of the external market*, but also on the *characteristics of the fiscal systems* in the various regions linked by the market. (italics added)

Most transfer pricing scholars have focused on the latter half of this quote; that is, the link between characteristics of fiscal systems (e.g., tariffs, taxes, exchange controls) and TPM. Little work has been done on the linkages between product characteristics, market structure and TPM. Examining the effects of governments and markets as incentives for manipulating transfer prices is the raison d'être for this paper. We develop propositions linking governments and markets to TPM, and test these propositions on a dataset of US import transactions.

Our paper is set up as follows. First, we review the empirical evidence on the linkages between government and market imperfections and transfer price manipulation. We then develop hypotheses about TPM aggressiveness motivated by market and government imperfections. Our hypotheses are tested on a confidential dataset from the US Bureau of Labor Statistics (BLS) of 260,079 monthly US merchandise import transactions from 116 countries, for the time period June 1998 to March 2000.

Our results provide strong support for the argument that both markets and governments affect the incentives to internalize markets and engage in transfer price manipulation. Our paper also provides the first empirical evidence of how market structure and product characteristics can affect MNE aggressiveness in transfer pricing. Based on these results, we argue that transfer pricing is a dynamic capability for multinationals (Teece, Pisano and Shuen, 1997), and that linking insights from the strategic management and transfer pricing literatures should provide a fruitful direction for new research.

LITERATURE REVIEW

The hypothesis that TPM depends on the characteristics of fiscal systems in different countries (the first half of the Buckley and Casson quote) has been analyzed from both theoretical and empirical perspectives. The theoretical literature is consistent and strongly supportive (see, for example, Horst (1971), Eden (1985) and the literature reviews in Caves (1996), Eden (1998) and UNCTAD (2000b)). The empirical literature, on the other hand, is scarce and much more mixed.

First, there are a few studies that used either foreign direct investment (FDI) flows or profit-based measures to test whether MNEs shift income to locations with lower corporate income tax (CIT) rates (e.g., Bartlesmann and Beetsma, 2000; Grubert and Slemrod, 1998; Grubert and Mutti, 1991; Harris et al., 1993; Hines and Rice, 1990).[1] Harris et al. (1993), based on a sample of 200 US manufacturing firms over 1984-88, found that US MNEs with subsidiaries in low-tax countries paid less US tax, and those with subsidiaries in high-tax countries paid relatively more US tax, per dollar of assets or sales. Income shifting by the largest MNEs was, they argued, primarily responsible for these results (p.301). These studies provide, however, only *indirect* evidence of transfer price manipulation. For example, Harris et al.'s (1993) results can be explained by MNEs shifting income from high- to low-tax locations, but also by cross-country differences in the MNE subunits' intrinsic location-specific profitability.[2]

Second, there have been two types of studies that *directly* searched for evidence of TPM. First, some researchers have compared intrafirm prices for selected imports directly to world or domestic prices for the same products. Vaitsos (1974), for example, concluded that foreign MNEs overinvoiced intrafirm

imports into Colombia in order to avoid Colombia's foreign exchange controls. Natke (1985) found MNEs were overinvoicing imports into Brazil to avoid Brazil's extensive regulations, which included price and credit controls, profit repatriation restrictions, and high CIT rates. Lecraw (1985) concluded that tariffs, relative tax rates, price and foreign exchange controls, and country risk were significant variables explaining transfer-pricing behavior in ASEAN. Rugman (1985), on the other hand, concluded there was no TPM in Canadian oil import prices in the 1970s. More recently, Pak and Zdanowicz (1994) used US monthly merchandise export and import prices to look for outliers, estimating that the US government lost $33.1 billion dollars in tax revenues due to unreported taxable income. Unfortunately, the authors could not identify individual transactions as arm's length or intrafirm so they could not (but did) attribute the tax loss to TPM. Lastly, Swenson (2001) used annual US import data from the US Census, at the TSUSA product level, by country, to test for evidence of TPM over 1981-86. Prices were constructed by dividing reported customs values by quantities. She found that a five percent fall in foreign CIT rates caused a tiny rise in US import prices. However, Swenson was unable to separate intrafirm from arm's length trade so her study suffers from the same problem as Pak and Zadanowicz (1994).

The second direct route has been to test for TPM on a dataset that includes both arm's length and intrafirm international transactions. Such datasets are rare. Bernard and Weiner (1990, 1992, 1996), using confidential transaction-level data on US and Canadian crude petroleum imports in the 1970s, found very weak evidence of TPM in US and Canadian import prices, which might have been partly related to CIT differentials. Clausing (2003) tested the links between corporate income tax differentials and TPM using confidential monthly export and import price data from the US Bureau of Labor Statistics (BLS) for January 1997-December 1999. She found a strong relationship indicating tax avoidance: a "tax rate 1% lower in the country of destination/origin is associated with intrafirm export prices that are 1.8% lower and intrafirm import prices that are 2.0 % higher, relative to non-intrafirm goods" (p. 16).[3] Lastly, Eden and Rodriguez (forthcoming) also use monthly import price data from the BLS to assess the impact of intrafirm trade on international price indexes, arguing that TPM should widen the gap between unit value indexes and price specification indexes. Their empirical work shows that a 10 percent increase in the

intrafirm trade share of US imports widens the gap between the two indexes by 1.3 percent, with TPM strengthening the relationship.

While little empirical work has been devoted to the second half of Buckley and Casson's quote, even less attention has been paid to the first half: "exploitation of transfer pricing depends not only on the *nature of the product* and *the structure of the external market*…." (1976, p. 44; italics added). The general presumption is that TPM is greater in markets where there are no external market prices and where high-profit intangibles are important, such as in pharmaceuticals (Eden, 1998). Where markets are imperfect or missing, firms and governments are less likely to have reference (i.e., external) prices on which to base their transfer prices. Therefore, MNEs should be more likely to engage in TPM (Rugman and Eden, 1985). However, almost no research, other than industry case studies (e.g., autos, petroleum, pharmaceuticals), has tested this hypothesis. Moreover, we know very little about what affects MNE aggressiveness in using transfer prices. One exception is Harris et al. (1993), who showed that presence in a high-tax (low-tax) location raised (lowered) US taxes, but only for MNEs with large amounts of past spending on intangible assets (proxied by R&D and advertising) or intercompany debts.

We conclude that empirical evidence for transfer price manipulation exists but is not overwhelming, and that most evidence has been by inference from income-shifting studies. The small number of empirical studies is perhaps not surprising given the fine-grained (individual transactions identified as related party or arm's length) and highly confidential nature of the data needed to test the internalization benefits of transfer price manipulation.

THEORY DEVELOPMENT

Buckley and Casson (1976) argue that transfer price manipulation is one of the key benefits of internalization because it enables MNEs to avoid government regulations, specifically, tariffs, income and profit taxes, and exchange controls (pp. 38, 108). At the same time, the MNE's ability to manipulate transfer prices depends on product characteristics and market structure. We focus first on the links between TPM and markets and then between TPM and government policies.

Markets and Transfer Price Manipulation

Markets are more likely to be internalized, and therefore to provide the opportunity for TPM, when they are characterized by natural monopoly, bilateral monopoly, buyer uncertainty, and public goods characteristics (Buckley and Casson, 1976). We therefore hypothesize that three market factors provide opportunities or constraints on the MNE's ability and willingness to manipulate transfer prices. First, the type of markets where internalization is likely to occur are also markets where external market prices are unlikely to exist or difficult to find, which should encourage transfer price manipulation. Second, certain product characteristics, such as knowledge intensity, are more likely to provide opportunities for TPM. Third, the degree of concentration in the market may provide an opportunity for big MNEs to exercise market power and engage in TPM.

External Prices. The existence of external market prices, we hypothesize, is likely to discourage transfer price manipulation, for three reasons. First, Hirshleifer (1956, 1957) was perhaps the first economist to suggest that MNEs would maximize global profits by setting the transfer price equal to the external market price, if the external price existed and if there were no interdependencies in demand or supply within the MNE network (see also, Diewert (1985), Eden (1998)). In the reverse situation (differentiated products lacking external market prices or in the presence of strong interdependencies), one would therefore expect more TPM. Second, to the extent that governments have access to external market prices for products comparable to the MNE's intrafirm transactions, the arm's length standard, which has been adopted by all OECD tax authorities, requires MNEs to use these external prices as transfer prices (Eden, Dacin and Wan, 2000). Both arguments suggest that if external prices exist, they are likely to be adopted by the MNE, which should discourage TPM.

New support for this view comes from Rauch's (1999) networks explanation for international trade patterns. He argued that homogeneous products were likely to have organized exchanges with posted prices that were well understood by buyers and sellers (e.g., the London Metal Exchange). The more differentiated the product, the less likely that external reference prices existed. As a result, search barriers to trade would be higher for differentiated than homogeneous products. Rauch proposed, and found

empirical support for, the argument that geographic proximity and pre-existing cultural ties encouraged the formation of trading networks that affected international trade patterns.

Rangan (2000) has linked Rauch's theory to MNE networks, arguing that MNEs through internalization could reduce the search and deliberation costs that characterized differentiated product markets. Markets with differentiated products and no reference prices should therefore be more likely dominated by intrafirm trade. Rangan also hypothesized that MNEs should have larger and faster responses to exogenous economic shocks than firms trading at arm's length. Using BEA data for 1977-94, he found that US MNEs in four industries (food, chemicals, machinery, electric) had greater and faster responses to exchange rate shocks than non-MNEs. A networks view therefore suggests that internalization should be more prominent in markets without organized exchanges, and that MNEs should have greater opportunities for TPM.

H1: Transfer price manipulation should be more frequent where external markets do not have organized exchanges or reference prices, ceteris paribus.

Product Characteristics. Buckley and Casson (1976, pp. 39-41) argued that there were certain markets that were highly likely to be internalized; e.g. knowledge, perishable agricultural products, capital-intensive manufacturing and geographically concentrated raw materials. The most likely were markets in knowledge because of such markets were typically plagued by natural monopoly, bilateral monopoly, buyer uncertainty, and public goods characteristics. In addition, because knowledge is difficult to value, it provides "an excellent basis for transfer pricing" (p. 40). Since MNEs cluster in knowledge-intensive manufacturing industries producing differentiated products (Caves, 1996), we argue that:

H2: The higher the knowledge-intensity of the product, the greater the incentive to engage in transfer price manipulation, ceteris paribus.

Firm Size. Firm size can be seen from two perspectives: (1) how important the product is to the firm, and (2) how important the firm is to the market. From microeconomic theory, we know that the greater the importance of an input to a firm, the more elastic should be the firm's derived demand for that input, and thus the smaller the firm's price response in an arm's length market to any exogenous shock

that shifts supply. Rangan (1998) has shown that MNEs respond more flexibly to exchange rate shocks than non-MNEs because they can shift production and sales among affiliates, as an alternative to price changes. This suggests that MNE price responses should be more elastic than those for non-MNEs; that is, as the importance of the product to the firm rises, the price elasticity of import demand should be higher for intrafirm trade than for arm's length transactions. In addition, the fact that most intrafirm transactions are priced on a cost basis (Eden, 1998) suggests that a higher price elasticity (more stable prices) for intrafirm transactions than for arm's length trade.

H3a: The more important the product is to the firm, the greater the elasticity of import demand; price elasticity should be higher for intrafirm trade than arm's length transactions, ceteris paribus.

In terms of the importance of the firm to the market, microeconomics tells us that large firms are more likely to exert market power through manipulating prices than small firms; monopsony buyers, for example, should pay lower prices than in competitive markets. Buckley and Casson (1976) hypothesized that structural market imperfections such as bilateral monopoly and monopsony provided incentives to internalize markets, generating multinational enterprises. Since MNEs cluster in oligopolistic markets dominated by strong interfirm rivalry (Caves, 1996), relative firm size is likely to be an important predictor of price behavior. We therefore expect large MNEs to engage in discriminatory pricing behavior, but such opportunistic behavior should be more prevalent in arm's length transactions with rival firms rather than in intrafirm transactions with sister subsidiaries. Thus suggests that greater price variability should occur when large MNEs engage in arm's length trade compared to small MNEs.

On the other hand, manipulating prices in intrafirm transactions can be a joint reaction to opportunities for cross-border arbitrage. Large MNEs have more opportunities to engage in TPM with their affiliates than small MNEs because they trade in higher transaction volumes, with more frequency, across more country boundaries. Harris et al. (1993) provided empirical evidence that large MNEs engaged in more income-shifting behavior than small MNEs. Rangan (2000) hypothesized that large MNEs could more readily afford switching and search costs associated with frequent price changes, although he argued this was less likely in industries with large economies of scale. TPM in this case is not

opportunistic behavior against one's trading partner, but rather taking joint advantage of opportunities for cross-border arbitrage in semiglobalized markets (Ghemawat, 2003).

We therefore expect that firm size should lead to greater price variability for MNEs, for both intrafirm and arm's length transactions, although the motives in arm's length transactions (firm rivalry, opportunism) are different from those in intrafirm transactions (jointly pursuing opportunities such as cross-border arbitrage).

H3b: Firm size is positively related to TPM; that is, large MNEs are more likely than small MNEs to engage in TPM, ceteris paribus.

Government Policy and Transfer Price Manipulation

Buckley and Casson (1976) argued that transfer price manipulation was one of the key benefits of internalization because it enabled MNEs to avoid government regulations, specifically, taxes, tariffs and exchange controls (pp. 38, 108). We examine these three differences in fiscal systems and also a fourth general category: political risk. The arguments are well known so we only briefly review them here (see Eden, 1998, for a more thorough review).

Corporate Income Taxes. If there were no tax deferral or foreign source income were taxed as it was earned instead of when repatriated, the effective CIT rate on foreign source income would be the home country rate (assuming it were higher than the host rate). Then, there would be no advantage to TPM. However, most home governments allow tax deferral, which encourages MNEs to shift profits to lower taxed locations (Horst, 1971; Eden, 1985, 1998). Most governments also levy withholding taxes on intracorporate income that leaves the host country, ranging from 10 to 30 percent, to encourage MNEs to reinvest profits in the host country. Empirical tests show that withholding taxes affect the size, timing and type of repatriated income and discourage inward FDI (Hines, 1999). The key question is whether the host country's tax rate, including withholding taxes, exceeds or is less than the home tax rate.[4]

H4: If the corporate income tax rate in the exporting country is lower (higher) than in the importing country, the MNE should over (under) invoice intrafirm exports and under (over) invoice intrafirm imports in order to shift profits to the lower taxed location, ceteris paribus.

Ring Fencing. Most countries offer tax incentives for inward FDI, ranging from locational subsidies to tax holidays for limited periods. Some governments set up tax-free zones for FDI, such as offshore financial centers and export processing zones. *Ring fencing* describes a preferential tax regime that is limited to nonresidents or otherwise isolated from the domestic economy (OECD, 1998). Ring fencing means that the effective statutory CIT rate for the MNE subsidiary depends upon its activities since the maximum tax rate (the rate on non-preferred or onshore activities) could differ substantially from the minimum rate (the rate on preferred or offshore activities). The greater the difference, the more incentive the MNE has to shift its activities offshore.

H5: The greater the extent of ring fencing in a country, the greater the incentive to use transfer price manipulation to shift profits to the ring-fenced zone, ceteris paribus.

Double Tax Treaties. In 1997, there were 1,794 double tax treaties (DTTs) covering 178 countries; almost a 50 percent increase over 1990 levels (UNCTAD, 2000a, p.83). Blonigen and Davies (2000) find a positive relationship between DTTs and US bilateral FDI flows for 1966-1992. They conclude that DTTs "reduce investment frictions which inhibit FDI activity" (p. 7). Similarly, UNCTAD (2000a, p.81) states that tax treaties provide "stability, transparency and certainty of treatment".

Tax treaties require national tax authorities to adopt consistent transfer pricing regulations, following the arm's length standard[5], which should discourage TPM. Al-Eryani, Alam and Akhter (1990), for example, found that MNEs used market-based methods more intensively when they were concerned about legal requirements. DTTs also encourage exchange of tax information between governments, increasing the risks associated with TPM.

On the other hand, since both governments follow the arm's length standard, the probability of crossborder tax disputes should fall. If disputes occur, DTTs also include a bilateral dispute settlement mechanism. This mechanism also provides the MNE with protection against double taxation, using secondary adjustments.[6] In addition, home governments typically assume income earned in treaty-partner countries is active income, exempt from tax haven or passive income legislation that would deny them tax deferral benefits. The combination of a low CIT rate plus a DTT might therefore encourage more, not

less, transfer price manipulation.

Our arguments suggest that the incentive to manipulate transfer prices, in response to a double tax treaty, could go either way, with one exception: where the foreign country is a low-tax location (particularly a tax haven with tax treaty status) we anticipate more, not less, TPM.

H6: The presence of a double tax treaty has confounding effects on transfer price manipulation, except when the foreign country is a low-tax location; in this case, we expect more income shifting through TPM, ceteris paribus.

Tariffs. Underinvoicing imports in order to avoid paying *ad valorem* tariffs is perhaps the best known motivation for TPM. Horst (1971) was the first economist to recognize that MNEs should over/underinvoice depending on the comparison between the tariff rate (τ) and the tax differential ($t_m - t_x)/(1 - t_m)$, where t_m is the importing country's CIT rate and t_x is the exporting country's CIT. Where the tax differential is higher (lower) than the tariff rate, MNE global after-tax profit is higher with overinvoicing (underinvoicing).

H7: Ad valorem tariffs encourage underinvoicing of intrafirm imports, ceteris paribus, but the effect is reduced if the foreign CIT rate is lower than the importing country's rate.

Political Risk. Political risk involves "act[s] of government that have unfavorable consequences for the MNE" (Kobrin, 1979, pp.68-69). Lecraw (1985) found that perceived country risk caused MNEs to cut intrafirm export prices and raise import prices in ASEAN. Harris et al. (1993) found that presence in a high political risk country raised the US tax, indicating the shifting of income from these countries to MNE headquarters. We therefore hypothesize that:

H8: High levels of political risk should cause MNEs to under (over) underinvoice intrafirm exports (imports) in order to shift profits to safer locations, ceteris paribus.

Foreign Exchange Controls. Foreign exchange (FX) controls can motivate TPM (Buckley & Casson, 1976; Eden, 1998). Natke (1985) found that MNEs overinvoiced imports to avoid FX controls in Brazil. Lecraw (1985) found that MNEs reduced export prices and raised import prices in ASEAN countries with FX controls. FX exchange controls are usually one of two types: either the MNE affiliate is

prohibited from or pays a tax on remitted profits to its parent, or the MNE must pay a higher rate for international currency transactions than local firms. In the first case, FX controls act like a profit tax, encouraging TPM as a way to repatriate profits instead of through dividends (Vaitsos, 1974; Natke, 1985). In the second case, however, FX controls are a tax on crossborder transactions, encouraging underinvoicing. If each time a foreign affiliate engages in intrafirm transactions with its US parent, it pays a tax (the difference between the official and actual foreign exchange rate) to the host government, the incentive would be to underinvoice intrafirm exports so as to reduce the tax.

H9: If a host country imposes FX controls restricting profit remittances, the MNE should underinvoice outbound transactions and overinvoice inbound transactions as an alternative means of repatriating profits; however, if the government applies FX controls as a tax on all crossborder transactions, the MNE should underinvoice both in- and out-bound transactions, ceteris paribus.

METHODOLOGY

In summary, we argue that the ability to manipulate transfer prices is an internalization benefit for MNEs. TPM is a strategic response to arbitrage opportunities from incomplete globalization. These opportunities are of two types: differences in government policies and differences in product characteristics and industry structures. Our model with its hypotheses is outlined in Figure 1.

(Figure 1 goes about here)

Our empirical test of these hypotheses is modeled by equation (1) below, where P_{ijkt} is the transaction price of product i imported by firm j from country k at time t.

$$P_{ijkt} = \alpha\,\text{CONTROLS} + \beta\ \text{IFT} + \theta\,\text{MARKET} + \phi\,\text{POLICY} + \gamma\,\text{IFT} * \text{MARKET} + \psi\,\text{IFT} * \text{POLICY} + \varepsilon \quad (1)$$

Our specification assumes that IFT (intrafirm trade dummy variable), MARKET (a vector of product characteristics and market structure variables) and POLICY (a vector of government policy variables) each directly affects the transaction price P_{ijkt} and that IFT moderates the relationship between POLICY, MARKET and P_{ijkt}. All variables except dummy variables are in natural log form. As a result, the

regression coefficients are elasticities, showing the responsiveness (percentage change) in the import price to a percentage change in the independent variables.

The BLS Import Price Data

Our basic dataset is confidential price data for US merchandise import transactions from the US Bureau of Labor Statistics, for June 1998 to March 2000. The data come from a voluntary survey of approximately 8,000 companies engaged in US trade (Alterman, Diewert & Feenstra, 1999; BLS, 1997). Each item (an import or export transaction by a firm) in the dataset has a unique identifier number. Items aggregate into classif groups that correspond to TSUSA product-level codes, and classif groups aggregate into three-digit SITC Revision 3 groups. Thus, items are nested in classif groups, which are nested in 3-digit SITC groups. Firms report actual import prices for the item, by month, identifying the country of export and whether the transaction was at arm's length or between related parties.[7] Our dataset consists of 260,079 US import transactions for 116 foreign countries, involving 19,434 items, 3,652 companies and 2,942 classification codes.

Variables

Dependent Variable. Because BLS price data are designed for measuring month-over-month changes in transaction prices, we use LNPX, the natural log of the import price P_{ijkt} of item i imported by company j from country k at time t, as our dependent variable.

Control Variables. First, we need to control for pricing adjustments the BLS makes to the dataset. The Bureau takes quality adjustments and changes in product features into account through the creation of a link price to the transaction price so we also include a dummy variable LINK (0=no link; 1=link). In addition, in any given month, 30 percent of BLS items do not have prices reported through surveys so the BLS imputes a price based on the average price movement of other transactions in the same classif group. We use PXFLAG as a dummy variable for imputed prices (0=no imput, 1=imput).

Second, we include LNEXRATE, the natural log of US-dollar-equivalent exchange rate on a monthly basis; our data are from IMF (2001).[8] A rise in the foreign exchange rate should increase the US dollar price of exports from that country, unless the exporting firm is pricing to market in the United

States. Clausing (2003) found that a rise in the US exchange rate (fall in foreign rates) caused both US export and import prices to fall, suggesting a positive relationship between LNEXRATE and LNPX.

The BLS also collects data on the invoicing currency used in a particular transaction. Almost 90 percent of US imports are invoiced in US dollars, the rest almost entirely in the exporter's home currency. Reflecting this, Mirus and Yeung (1987) found that the preferred currency in intrafirm transactions was the importer's currency, particularly when foreign exchange exposure was taken into account. To the extent that imports are invoiced in US prices, we should expect to see less price sensitivity to exchange rate movements. We include a dummy variable INVOICEUS (1=invoiced in US currency; 0=all others) to test this hypothesis.

Third, we control for transportation costs between countries. Feenstra's (1996) CD ROM reported FOB and CIF import prices by three-digit SITC Revision 3 (SITC R3). We calculated average insurance and freight rates as a percent of the CIF import price, by 3-digit SITC and by country and used 1 minus this variable, in log form (LNCIF), as a proxy for distance costs; that is LNCIF = ln(1 – d) where d is the cost of distance.[9] We expect that as distance costs rise, US import prices increase so the sign on LNCIF should be negative. In addition, we add dummy variables for the four largest US trading partners: Canada, Mexico, China and Japan (US Census, 2000). We also include dummy variables for the top five imported products in US trade flows at the 2-digit SITC level: apparel (84), motor vehicles (78), electrical machinery (77), office equipment (75) and telecommunications equipment (76).

Intrafirm Trade. The BLS codes each transaction as either intrafirm or arm's length trade. We include IFT as a dummy variable (0 = arm's length trade or ALT; 1 = trade between related firms). IFT will be a key variable in our analysis.

Market Variables. We have three hypotheses about the linkages between market structure and transfer price manipulation. H1 argues that TPM should be more likely in markets without organized exchanges or reference prices. Rauch (1999) coded product markets, using a five-digit SITC Revision 2 (SITC R2) classification, as 0 (organized exchange), 1 (reference prices) or 2(differentiated products). We develop a concordance between Rauch's scales and the BLS three-digit SITC R3 classification and

generate the variable RAUCH, ranging from 0 to 2, to proxy for the increased probability that external market prices exist.[10] We expect the sign on RAUCH to be positive; that is, transfer price manipulation should be more likely where product markets are differentiated.

Second, we hypothesized in H2 that TPM would be more likely for knowledge-intensive products. UNCTAD (2002) categorizes traded products, using the three-digit SITC Revision 2 classification, as one of five categories: (1) primary commodities, (2) labor- and resource-intensive manufactured goods, (3) low skill/technology manufactures, (4) medium skill/technology manufactures and (5) high skill/technology manufactures. We develop a concordance with the BLS data and group imports into one of three categories: primary products (group 1), low-medium tech manufactures (groups 2, 3 and 4), and high-tech manufactures (group 5). We drop primary products and include dummy variables MFGLMT (low-medium tech manufacturing) and MFGHT (high-tech manufacturing) to test whether knowledge-intensity is related to transfer price manipulation.

Third, we hypothesized in H3a and H3b that firm size might affect TPM. The BLS data set includes several interesting measures of size. WTITEM is the dollar value of US imports of item i by firm j in classif group m from all countries in 1995 (the base year). WTITEM therefore is an absolute size measure of how much the firm imported of item i in classif m in the base period. WTCOMP is the 1995 dollar value of all imports in classif m by firm j (that is, WTCOMP is WTITEM summed over items in the same classif group). From these two numbers we create WTITCO, the ratio of WTITEM to WTCOMP, as a measure of the relative importance of item i to company j in classif group m. We use LNWTITEM (log of WTITEM) as a proxy for the absolute size, and LNWTITCO (log of WTITEM/WTCOMP), as a proxy for the relative size, of firm j within the market for item i. The greater the importance of item i to firm j, the more elastic should be the firm j's derived demand for item i, and thus, the smaller the price response in an arm's length market to any exogenous shock. H3a hypothesizes that price elasticity should be higher for intrafirm than arm's length trade, as the importance of the product to the firm increases.

The third weight measure is WTCLASS, the 1995 dollar value of all US imports in classif m by all companies from all countries. (WTCLASS is WTCOMP summed over all firms importing products in

classif m.) From WTCOMP and WTCLASS we create WTCOCLS, the ratio of WTCOMP to WTCLASS, which measures the relative importance of firm j as an importer in classif m.[11] The larger j's imports as a share of all imports of classif m, the greater should be j's monopsony bargaining power. One expect that large buyers, in an arm's length situation, to exercise their monopsony power by demanding and obtaining lower import prices.[12] We hypothesize that large MNEs in comparison with small MNEs, in intrafirm transactions, should be more likely to use TPM to take advantage of cross-border arbitrage opportunities, as suggested by H3b.

Policy Variables. We include three tax and three general policy variables in our analysis. Our annual tax rate data, for 1998-2000, were hand collected from various accounting, legal and tax sources. First, we use LNTXMIN, the natural log of 1 minus the minimum statutory foreign corporate tax rate, $\ln(1 - t_x)$, where t_x is the exporting country's CIT rate. We expect MNEs to overinvoice US intrafirm imports from low tax countries so the sign on LNTXMIN should be positive, based on H4.

Second, we measure LNTXGAP, the extent of ring fencing in the foreign country by the gap between the minimum and maximum CIT rates, $\ln(t_x^{max} - t_x^{min})$, where the maximum rate also includes the withholding rate on repatriated dividends. Since we take the minimum CIT as our basic host CIT rate, our ring fencing variable measures the likelihood that the MNE will have to pay a foreign tax rate that is higher than the minimum rate. The greater that likelihood, the less should be the MNE's incentive to engage in TPM. We therefore expect the sign on LNTXGAP to be negative, based on H5.

Our third tax variable is TREATY, a dummy variable identifying whether the foreign country has a double tax treaty with the United States (1=yes, 0=no). This variable was constructed from the US Treasury's website list of US tax treaties. We expect a DTT to discourage TPM, except where low-tax countries are involved, following H6.

Our first general policy variable is the tariff rate by SITC and country. We computed these rates using Feenstra's (1996) CD ROM. The 1994 US import data reports customs duties and CIF import prices, by 3-digit SITC R3 code and country. These were used to create average tariff rates, by item and country; our LNTARIFF variable is in the form $\ln(1 - \tau)$ where τ is the tariff rate. We hypothesize in H7

that MNEs will underinvoice US imports so the sign on LNTARIFF should be positive.

Political risk may also affect transfer pricing. Using the monthly composite risk rating from the International Country Risk Guide (ICRG), we construct LNPOLRSK, the natural log of the ICRG ratings (our data are reversed since ICRG gives a high rating to a low-risk country). We expect underinvoicing of US intrafirm imports from high-risk countries so LNPOLRSK should be negative, based on H8.

Lastly, FXCNTRL is a dummy variable identifying whether the foreign country imposes foreign exchange controls; the data were hand collected from various tax, accounting and legal sources. Because many countries have minimal FX controls, we adopt a three-level format: (0=no controls, 1=minimal controls, 2=high controls). We expect MNEs to underinvoice US intrafirm imports to avoid FX controls when either the controls are on profit remittances or act a tax on all FX transactions. As a result, FXCNTRL should be negative for intrafirm transactions, following H9.

Regression Methods

Because we have cross-section, time-series data with a large dummy-variable set, we use AREG, ROBUST regression technique with White-corrected standard errors in STATA 6.0. AREG has an advantage in that it permits a categorical variable to be "absorbed" in the regressions as if it were specified by a series of dummy variables, without reporting the coefficients on the dummies (STATA 6.0 Manual, Volume 1 A-G, pp. 106-10). Our absorbed variable is COMPANY, which creates a vector of 3,652 dummy variables, enabling us to control for the key variable influencing product price. In addition, AREG allows us to "cluster" a second variable where the observations are independent across groups, but not necessarily independent within groups. Because our observations are prices of particular items, we use ITEM (n=19,434) as a cluster variable. We also use 21 monthly time dummies to control for variation across time periods (dropping the first month). The impact of clustering by item i with dummy variables for j – 1 firms is to create item-company pairs, recognizing that transactions are not independent; firms buy the same product repeatedly from the same suppliers in the same markets.[13] All regressions in the paper are clustered on ITEM and include dummy variables for COMPANY and MONTH.

EMPIRICAL RESULTS

Table 1 provides descriptive statistics for our variables. The pairwise correlations between LNPX and our independent variables are generally as hypothesized. The signs on IFT and the dummy variables for high-tech and differentiated products are positive; the signs on the weight variables are negative. The tax, political risk and exchange control measures have negative signs, whereas the signs on the treaty and tariff variables are positive. None of the correlations are high enough that multicollinearity is an issue.

(Table 1 goes about here)

Overall Relationships

We use moderated multiple regression and follow a hierarchical approach to testing equation (1). Table 2 summarizes the predicted signs from our hypotheses and shows the results of our moderated multiple regressions for LNPX.[14] First, we regress the dependent variable LNPX against the vector of CONTROL variables (column 1 in Table 2). Our second set of equations adds the vector of MARKET variables (column 2M), the vector of POLICY variables (column 2P), and both sets of variables (column 2MP).[15] To test whether IFT moderates the relationship between LNPX, MARKET and POLICY, we introduce interaction terms between IFT and MARKET (column 3M), IFT and POLICY (column 3P), and IFT and both sets of variables (column 3MP). We adopt the conservative two-tailed t test for significance, and report the change in F distribution as we add new variables along with the Chow test for the significance of the interaction terms.

The adjusted R squared ranges from .7306 to .7367 across the seven regressions in Table 1. A comparison of the change in F distribution statistics shows that adding in the Market and Policy variables is a significant improvement over regression 1 (22.92 for the addition of the Market variables, and 5.81 for the Policy variables). The combination in equation 2MP is superior to either Market or Policy variables alone. In the third group of regressions, we add interaction effects with IFT. Again, there is significant improvement over the second set of regressions. Our model therefore suggests that IFT is an important moderator of the relationship between US import prices, market structure and government

policy variables. We also report Chow tests of significance for the interaction effects in the 3M, 3P and 3MP regressions, which demonstrate that IFT is an important moderator of the relationship between import prices and our independent variables.

(Table 2 goes about here)

Control Variables. Across all seven regressions, LNEXRATE is consistently positive and significant, as expected. As foreign currencies appreciate relative to the US dollar, US import prices rise. At the same time, the coefficient on INVOICEUS is negative so that products invoiced in US dollars rise more slowly than products in other currencies, also as expected.

The sign on LNCIF, the distance measure, is positive in four cases, contrary to our prediction. An economic explanation for this anomaly suggests itself from international trade theory. Due to the large size of the US market, foreign exporters must price to market. Given a fixed US price, higher transport costs must be absorbed by the exporter, generating a lower FOB price. Since BLS prices are typically reported as FOB prices, higher transport costs would be reflected in lower FOB import prices.

In terms of product categories, apparel and electric prices are consistently negative relative to autos, office and telecommunications equipment. Our country dummy variables show consistently lower price increases from Canada and China and higher price increases from Japan. Lastly, in four of the seven regressions, the IFT variable is positive, suggesting a general tendency for US import prices to rise faster for intrafirm trade than arm's length transactions, suggesting that MNEs are overinvoicing in order to shift income out of the United States.

Market Variables. The coefficient on RAUCH is positive in the 2M and 2MP runs, suggesting that prices of differentiated imports have risen faster than prices of imports from markets with organized exchanges or reference prices. When an interaction term with IFT is introduced (runs 3M and 3MP), the sign on RAUCH loses its significance, but the coefficient on IFT*RAUCH is strongly positive. This suggests that intrafirm imports are more likely to be overinvoiced when there are no external reference prices to act as comparables, providing support for H1.

Our dummy variables for low-medium and high-tech manufactured products have positive signs in

runs 2P and 2MP; that is, prices of high-tech imports have risen relative to primary imports over the 1998-2000 period. When these variables are interacted with IFT, the direct variables retain their significance, but the interaction terms are not significant in run 3M and negative in run 3MP. This suggests that either there is no difference between intrafirm and arm's length transactions (both prices tend to rise the greater the knowledge-intensity of the product) or that there is some tendency for transfer prices to rise more slowly than arm's length prices as knowledge-intensity increases.

Turning to our firm size variables, the sign on LNWTITEM is positive in all four runs, implying that the larger is the dollar value of firm j's initial purchases of item i from all countries, the greater the price increase over the time period. We give less credence, however, to the absolute measure as it may be an artifact of the way the BLS constructed the sample; our relative measure of firm weight should be a more accurate proxy variable. In terms of relative weight (LNWTITCO), however, the sign is the opposite: the more important item i is to firm j, the slower is the rise in prices. This accords with the microeconomic argument that the more important an input is in total cost, the higher should be its elasticity (that is, the smaller should be the price change for any given quantity change). Our last weight measure is LNWTCOCLS, the importance of firm j in classif m, which is positive in all regressions, contrary to our expectation that larger buyers would exercise monopsony power, generating lower price increases.

When the three weight variables are interacted with IFT, the interactions are all significant and the direct variables retain their significance and signs. Prices rise even more slowly for intrafirm transactions than for arm's length transactions, as LNWTITCO (the importance of the product to the firm) increases; this provides additional support for H3a. Prices also rise more slowly for IFT than ALT, as LNWTCOCLS (the importance of the firm in the classif group) increases. This suggests that MNEs are either exerting monopsony power or that large MNEs are more likely to use cost-based transfer pricing methods, which rise more slowly than market-based prices. In either situation, we find support for H3b. We conclude that market structure is an important predictor of import prices (H3a), and that larger MNEs are more likely to engage in TPM than smaller MNEs, in accordance with H3b.

Policy Variables. The signs on the government variables also provide strong support for our transfer

pricing hypotheses. The two tax rate variables, LNTXMIN and LNTXGAP, both have the expected signs -- when the foreign rate is below the US rate, the incentive is to shift profits to the foreign country. When the tax variables are interacted with IFT in runs 3P and 3MP, the direct variables lose their significance but the interaction terms are significant and in the direction predicted by H4 and H5.

Our third tax variable, TREATY, is positive in all four regressions, which suggests a general tendency for higher import prices from countries that have tax treaties with the United States. The interaction with IFT is positive, suggesting that MNEs are more likely to overinvoice imports coming from tax treaty countries. Given the general bias towards overinvoicing reflected in the positive coefficient on IFT, we conclude that the presence of a tax treaty accentuates the incentive to manipulate transfer prices. We had hypothesized in H6 that tax treaties have confounding effects on the incentive to manipulate prices; on the one hand, they provide more protection against aggressive tax authorities; on the other hand, they require MNEs to use the arm's length standard, which should constrain TPM. Our data suggests that the former effect outweighs the latter; that is, MNEs see tax treaties as providing security against aggressive governments (and the Internal Revenue Service is widely perceived to be the world's most aggressive tax authority).

Turning now to our three general policy measures, we find that the tariff variable is not significant in any of the four runs. The interaction effect with IFT, however, is negative, implying that intrafirm transactions tend to be underinvoiced, relative to arm's length transactions, when tariffs exist, which provides support for H7.

The sign on LNPOLRSK is negative in all regressions, suggesting that import prices rise more slowly when they come from higher-risk countries. The interaction with IFT, however, is not significant, contrary to H8. We had expected related parties to be more likely than arm's length parties to shift income out of high-risk locations; our data suggests both groups have similar income-shifting incentives.

Lastly, the sign on FXCNTRL is positive in all four regressions, suggesting that US import prices have risen faster from countries with exchange controls than from countries without controls. When the variable is interacted with IFT, the sign is negative, suggesting that intrafirm imports are more likely to be

underinvoiced than arm's length imports when they come from countries with FX controls, which supports the income-shifting response found by earlier researchers. This results also fits with the argument that FX controls act as a tax. Both arguments provide support for H9.

Subgroup Analysis

Interaction effects are useful to show the differing impacts of intrafirm versus arm's length trade on US import prices. Another way to parse out the differences is through subgroup analysis. Table 3 presents the results of several different subgroup tests, which were run using the variables in equation 2MP from Table 1. Plus (minus) signs indicate a positive (negative), significant coefficient at the 10% level using a two-tailed t test. We report the number of observations and the adjusted R squared and F test results. In addition, we tested for the change in F tests on four groups of independent variables: Product (M1 = RAUCH, MFGLMT, MFGHT), FIRM (M2 = LNWTITEM, LNWTITCO, LNWTCOCLS), Tax (P1 = LNTXMIN, LNTXGAP, TREATY) and General Policy (P2 = LNTARIFF, LNPOLRSK, FXCNTRL). These results are reported in the last four lines of Table 3.

(Table 3 goes about here)

Column 1 in Table 3 reports the results from the 2MP run in Table 2, for comparison. Columns 2 and 3 divide the data set into intrafirm trade (IFT) and arm's length trade (ALT). Clear differences emerge from this comparison. Prices of IFT transactions respond more – and in the hypothesized direction -- to exchange rate changes, the invoicing method, differentiated products, and the CIT rate differential between the US and the exporting country. The signs for FXCNTRL and LNTARIFF, however, for IFT are the opposite to that predicted (higher tariffs and exchange controls appear to encourage overinvoicing of IFT). In addition, prices of knowledge-intensive manufactured imports rise faster for ALT than for IFT. The change in F statistics clearly show that IFT responses are larger than those for ALT; in fact, the change in F is not significant for the tax variables in the ALT regression.

In columns 4 and 5, we compare transactions by MNEs with transactions by non-MNEs.[16] Prices of MNE transactions respond more – and in the direction we predicted – to exchange rate changes, RAUCH, knowledge-intensive products, the CIT rate differential, and tax treaties. Non-MNE prices respond more

negatively to political risk, and more positively to the relative weight of the firm within the classif group. In addition, the change in F statistics are much stronger for MNEs than for non-MNEs; in fact, for non-MNEs, the prices appear not to be responsive to the M1 (product characteristics) or P 1 (tax) variables.

Columns 6 and 7 report the results of dividing firms into two groups based on WTCOMP (the 1995 dollar imports in a particular classif code). Big firms appear to have larger price responses to the method of invoicing and differentiated products (RAUCH); whereas small firms have greater price responsiveness to ring fencing. Big firms exhibit greater change in F statistics than small firms; in particular, price responses by small firms appear not to be sensitive to the knowledge-intensity of imports.

Columns 8 and 9 test Rauch's (1999) hypothesis that price responses should be greater when organized exchanges and reference markets do not exist. What is perhaps most interesting about this subgroup analysis is that none of the four change in F statistic tests is significant for the Rauch OE and REF group; where they are all highly significant for the Rauch DIF group. Clearly, prices of differentiated products respond more to market structure and government policy variables than do prices of products where there are organized exchanges or reference prices. Even within the knowledge-intensive group (RAUCH DIF), there is a positive, significant sign, suggesting that the higher the skill/technological intensity, the greater the price responsiveness. Prices of differentiated products are negatively affected by high foreign CIT rates, political risk and firm size (LNWTITCO), as hypothesized.

We next focus on comparing the three groups of imports, separated into high-tech manufacturing, low- and medium-tech manufacturing and primary imports. Again, we see the price responsiveness to government policies and market structure in the high-tech group, but missing from the low-medium and primary commodity groups.

Our last subgroup comparison takes all the intrafirm trade transactions – all the transfer pricing observations – and separates them into three groups. The first is a high-tax group, where the minimum foreign CIT rate is above the US statutory rate (35%). The second group is a low-tax group, where the maximum foreign CIT rate is below the US statutory rate. The third group (not reported) includes the remaining observations. The most interesting differences are three. First, the sign on LNTXGAP is

positive for the high-tax IFT group. This means that even in high-tax countries where one would expect the MNE to engage in underinvoicing to shift profits to the United States, any ability to engage in ring fencing provides incentives for overinvoicing. Thus, tax preferences in OECD countries (e.g., Ireland) are likely to lead to overinvoicing of intrafirm exports to the United States.

Second, the sign on LNTARIFF is negative for low-tax IFT. We hypothesized that MNEs should engage in overinvoicing in order to shift income to low-tax locations. Overinvoicing, however, raises tariff costs. Thus, there is a tradeoff between the tariff and the CIT differential, as hypothesized by Horst (1971), when imports come from low-tax locations. This does not occur in high-tax locations where both the tariff and the CIT differential work to encourage underinvoicing of IFT. The sign on LNTARIFF in this subgroup analysis is, therefore, a nice confirmation of Horst's original proposition comparing the tariff to the tax differential.

Lastly, the sign on FXCNTRL is positive for high-tax, but insignificant for low-tax, locations. We hypothesized that underinvoicing of US intrafirm imports should occur in the presence of FX controls, and the interaction term in regressions 3P and 3MP in Table 2 both support this hypothesis. However, our subgroup analysis in Table 3 shows a positive sign on FXCNTRL in several MNE-related regressions, including column 14 (IFT & HIGH-TAX). Why foreign exchange controls appear to encourage overinvoicing of US imports in some situations and not others therefore seems to be a conundrum that may need more investigation.

DISCUSSION AND CONCLUSIONS

While previous researchers have investigated the effects of government policies on transfer prices, to our knowledge, our paper is the first to examine the relationship between market structure, product characteristics and transfer pricing. Our theory development is grounded in Buckley and Casson's (1976) work, but also builds on Caves (1996), Harris et al. (1993), Rangan (2000) and Rauch (1999). Our empirical results show that Buckley and Casson were right – the ability to manipulate transfer prices in response to government regulation can be a powerful motive for internalizing crossborder markets.

Governments *and* markets together generate internalization benefits of transfer price manipulation.

In terms of markets, our results support the hypothesis that TPM is more likely where organized exchanges and reference prices do not exist; that is, when products are differentiated. Second, TPM is more likely for knowledge-intensive products such as high-tech manufactured goods. Third, the more important the input is to the buyer, the greater is the import price elasticity for intrafirm transfers compared to arm's length transfers. And, lastly, size matters; large MNEs are more likely than small MNEs to engage in TPM.

In terms of governments, we find strong support for Horst's (1971) insight that tax differentials encourage transfer price manipulation. Where foreign CIT rates are lower than US rates, the MNE underinvoices US imports in order to shift profits offshore, and the US tariff simply accentuates this underinvoicing. On the other hand, where foreign CIT rates are higher than US rates, the MNE is faced with a tradeoff: overinvoicing reduces overall tax payments but increases tariff costs. We also found that tax treaties provide security against aggressive tax authorities, and therefore encourage overinvoicing of US intrafirm imports. Our political risk variable was negative and significant for all transactions, as expected, but the interaction terms with IFT were not significant in Table 2. In the subgroup analyses in Table 3, political risk appears to be an important negative influence on prices for arm's length transactions, non-MNEs, and for differentiated and knowledge-intensive products. Lastly, foreign exchange controls appear to encourage higher US import prices. While the negative interaction terms with IFT in Table 2 do suggest that MNEs underinvoice intrafirm transfers in order to shift profits out of countries with foreign exchange controls, the results from our subgroup analysis are more mixed.

Given the clear, direct evidence that MNEs regularly engage in transfer price manipulation in response to market and government imperfections, what are the implications of our study for international management and international business scholars? What is the "next frontier" in transfer pricing research?

Ghemawat (2003) theorized that firms can add value through cross-border operations under incomplete integration in one of two ways: arbitrage (exploiting differences across countries) and integration (exploiting similarities across countries). Horizontally integrated MNEs tend to emphasize

integration (economies of scale and scope), whereas vertically integrated MNEs emphasize arbitrage (differences in factor costs and product demands). Since transfer price manipulation is arbitrage (exploiting differences in policies and markets across countries), based on Ghemawat's thesis, TPM should provide value to the cross-border operations of multinationals, particularly for large multinationals that can take advantage of multiple markets and multiple borders. A hint that this is a fruitful direction comes from Harris et al. (1993). Their empirical work showed that income shifting reduced MNE tax burdens significantly, but only for large multinationals with operations in more than five countries. Presumably, these MNEs had developed the dynamic capabilities needed to take advantage of the arbitraging opportunities provided by semiglobalization.

Since organizational and managerial processes are key to building the MNE's dynamic capabilities (Teece, Pisano and Shuen, 1997), we argue that *managing* transfer pricing decisions should be seen as a dynamic capability for the MNE. Multinationals with more expertise at managing intrafirm transactions and transfer pricing within the network should achieve better performance than MNEs without these managerial capabilities. Building on Teece, Pisano and Shuen (1997), we suggest three different capabilities are needed to develop an effective transfer pricing strategy: information gathering, balancing internal and external motivations for setting transfer prices, and handling agency problems in implementing a transfer pricing strategy across the MNE's network of affiliates worldwide. We conclude that linking the dynamic capabilities approach with the transfer pricing literature suggests a fruitful research direction for strategic management and international business scholars to pursue.

Our research could be extended in several ways. First, our analysis is restricted to 22 months' of BLS pricing data for US imports. Adding more recent time periods [17], and redoing the analysis for US exports are (relatively) straightforward extensions. It is also possible to redo the analysis for particular countries (e.g., US-China and US-Japan trade could be particularly interesting) or industries (e.g., automotives, steel). If it were possible (which, at present, it is not) to link the BLS's firm ID-code numbers with firm ID-code numbers from the US Bureau of Economic Analysis, the Internal Revenue Service's tax file code, and/or CUSIP numbers from Compustat, researchers would have much better measures of firm

characteristics and resources (e.g., firm size, R&D intensity, international diversification, product diversification) than we do here. This would enable more sophisticated and robust testing of the ways in which firm characteristics and resources affect transfer pricing aggressiveness. Researchers could also test more directly our argument that strategic transfer pricing leads to improved firm performance.

In conclusion, we have examined the effects of governments and markets on the MNE's incentive to internalize transactions in order to manipulate transfer prices. Using monthly BLS transaction-level data for US merchandise imports, together with a large country-level database, we showed that both markets and governments can induce TPM. This suggests that managing transfer pricing can be a dynamic capability for the MNE. S*trategic transfer pricing* -- transfer pricing through the "lens" of strategic management theory – should be the next step down the research path laid out by Buckley and Casson (1976) for analyzing the internalization benefits of transfer price manipulation.

ENDNOTES

[1] See Hines (1997, 1999) and Caves (1996) for excellent surveys. Recent articles include Clausing (1998), Grubert and Slemrod (1998), Conover and Nichols (2000), and Bartelsman and Beetsma (2001).

[2] Harris et al. (1993) were aware of this possibility, but showed evidence not supporting this.

[3] There are some problems with Clausing's (2003) analysis. Her test period may underestimate TPM because the BLS did not include non-market-based transfer prices until April 1998 (see endnote 9). Her dataset includes only 54 countries. The CIT rate is used is not the theoretically preferred rate for TPM (the statutory rate adjusted for tax preferences, see Eden, 1998, and Grubert and Slemrod, 1998). The paper does not examine other TPM-inducing policies such as foreign exchange controls. Our work in this paper builds on Clausing (2003) by fixing these problems and extending her research to focus on other market and government imperfections that could induce transfer price manipulation.

[4] If t_x is the statutory CIT rate and w_d the withholding rate, the total statutory tax rate on remitted profits is $t_x + w_d (1 - t_x)$ compared to t_x on retained earnings.

[5] The arm's length standard requires the MNE to set transfer prices as if the same transaction were between unrelated parties under the same circumstances (Eden, 1998).

[6] DTTs also lower withholding taxes. Since they are included above this link is taken into account.

[7] Before 1994, the BLS collected transfer prices only if they trended with the market price. All other transfer prices were considered out of scope and discarded. From 1994 on, the BLS collected all transfer prices were collected but did not use phase them in until February 1998. Since June 1998, all transfer prices are fully incorporated into BLS price data; therefore, our dataset starts in June 1998.

[8] We also tried lagging the exchange rate one period, with similar results.

[9] There are significant holes in this data, for example, FOB prices are often missing for imports from former USSR countries. Where data were missing, we imputted transportation rates based on the nearest country, by 3-digit SITC where possible. In some cases, only country-average rates could be calculated. We also tried using Great Circle Distance data but the results were stronger with the estimated CIF rates.

[10] Using a concordance from 5-digit to 3-digit codes meant that our scales vary from 0 to 2. Products with Rauch numbers between 0 and .667 were classified as organized exchanges, between .667 and 1.34 as referenced markets and over 1.34 as differentiated markets.

[11] Our measures are from the importer's side of the market; there is no information on exporters.

[12] The difference between LNWTITCO and LNWTCOCLS is that the former measures the relative importance of the product to the firm, and the latter the relative importance of the firm to the market. Multiplying WTITCO by WTCOCLS gives us the ratio of firm j's imports of item i as a share of imports of all items in classif m by all importing firms.

[13] Clustering and absorption also reduce the size of the t-statistics and raise the adjusted R squared. Given the huge size of our sample, without clustering and absorption, all variables are significant at the .001 level, but the overall regression has little power.

[14] We adopt the convention of identifying a variable's coefficient as either positive or negative only if it is statistically significant; otherwise, the coefficient is assumed and reported to be zero.

[15] To save space we include IFT in our original regression, although it is not a control variable.

[16] An MNE was defined as any firm that engaged in at least one intrafirm trade transaction over the period; a non-MNE as a firm that engaged only in arm's length transactions.

[17] Going backward in time is inappropriate due to the way the BLS handled transfer prices.

Figure 1: The Internalization Benefits of Transfer Price Manipulation

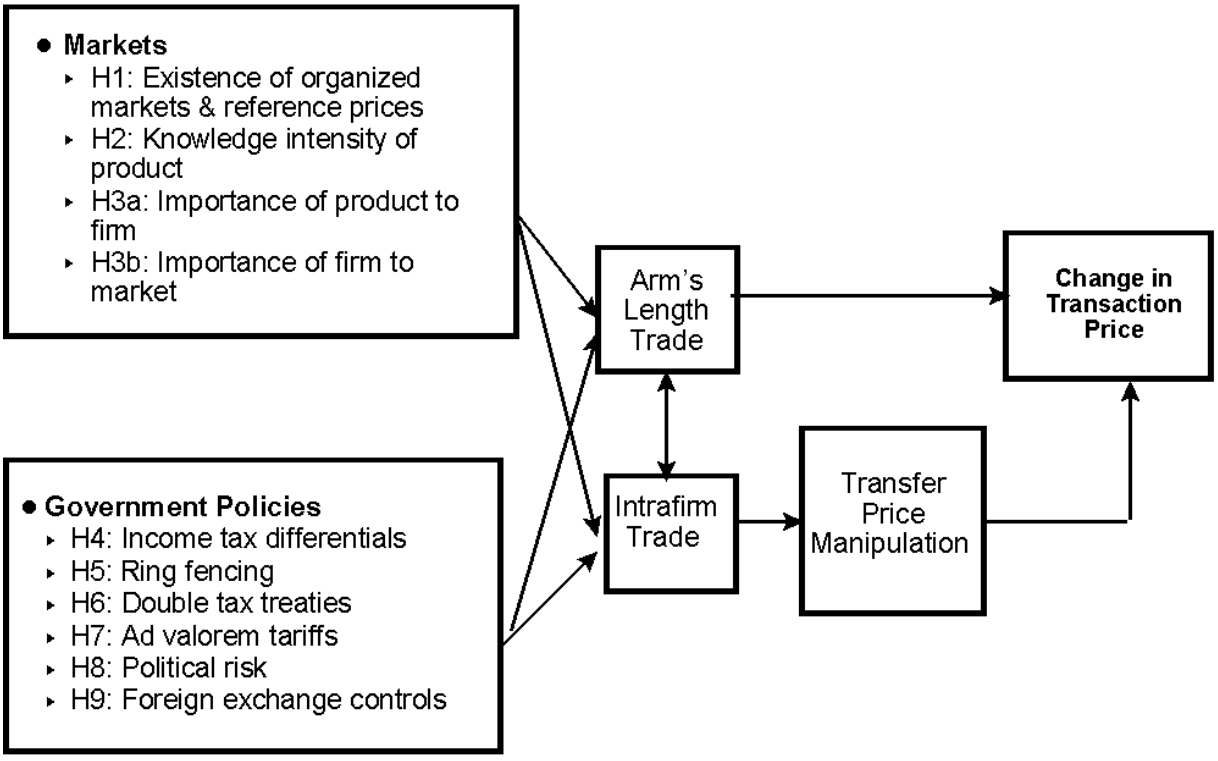

Table 1: Descriptive Statistics

	Variable	Mean	SD	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	216	27	28
1	LNPX	3.45	3.35																											
2	LINK	0.00	0.05	0.01																										
3	PXFLAG	0.69	0.87	-0.02	-0.04																									
4	LNEXRATE	-2.92	2.32	0.06	0.00	-0.01																								
5	INVOICEUS	0.91	0.29	-0.08	-0.00	0.10	-0.08																							
6	LNCIF	0.48	0.03	0.14	0.00	-0.02	0.07	-0.07																						
7	CANADA	0.07	0.26	0.05	0.01	-0.02	0.31	0.02	0.08																					
8	MEXICO	0.06	0.23	-0.05	0.00	0.04	0.07	0.08	0.13	-0.07																				
9	CHINA	0.09	0.29	-0.12	0.01	0.02	0.11	0.08	-0.13	-0.09	-0.08																			
10	JAPAN	0.18	0.38	0.13	-0.00	-0.04	-0.37	-0.05	0.15	-0.13	-0.11	-0.15																		
11	APPAREL	0.06	0.24	-0.06	-0.00	0.06	-0.06	0.07	-0.01	-0.07	0.04	0.08	-0.11																	
12	AUTO	0.06	0.24	0.11	0.01	-0.03	0.02	-0.02	0.05	0.11	0.02	-0.07	0.093	-0.06																
13	ELECTRIC	0.10	0.31	-0.16	0.01	0.01	-0.04	0.03	0.16	-0.08	0.04	-0.02	0.08	-0.09	-0.09															
14	OFFICE	0.06	0.24	0.12	0.00	0.02	-0.00	0.06	0.13	-0.05	-0.01	-0.02	0.07	-0.06	-0.06	-0.09														
15	TELECOM	0.06	0.23	0.05	-0.01	0.02	-0.03	0.05	0.11	-0.06	0.07	0.06	0.05	-0.06	-0.06	-0.08	-0.06													
16	IFT	0.41	0.49	0.16	0.01	-0.01	0.03	-0.04	0.17	-0.03	0.08	-0.20	0.22	-0.13	0.08	0.08	0.10	0.07												
17	RAUCH	1.77	0.47	0.14	0.01	-0.02	-0.06	-0.05	0.27	-0.13	-0.02	0.11	0.14	0.12	0.12	0.17	0.12	0.12	0.11											
18	MFGLMT	0.05	0.22	0.03	-0.01	-0.02	-0.04	-0.00	0.01	-0.05	-0.02	0.01	0.05	0.21	-0.06	-0.08	-0.06	-0.06	-0.01	0.12										
19	MFGHT	0.82	0.38	0.11	0.01	0.00	-0.03	-0.05	0.26	-0.14	-0.04	0.07	0.11	-0.04	0.12	0.16	0.12	0.11	0.14	0.47	-0.51									
20	LNWTITEM	-0.27	1.23	-0.01	0.00	-0.02	0.02	0.01	-0.07	0.02	0.04	-0.00	-0.04	0.03	-0.09	-0.08	-0.07	-0.06	0.02	-0.13	0.00	-0.09								
21	LNWTITCO	-0.96	1.07	-0.05	-0.00	0.03	-0.01	-0.02	-0.01	-0.02	-0.06	0.01	0.05	0.03	-0.01	0.03	0.00	-0.02	-0.02	0.01	0.03	0.00	0.11							
22	LWTCOCLS	-17.77	4.46	-0.15	0.01	0.03	-0.03	0.02	0.04	-0.04	-0.03	-0.05	0.01	-0.06	-0.14	0.41	-0.21	-0.04	0.03	-0.04	-0.06	0.03	0.14	-0.08						
23	LNTXMIN	-0.37	0.16	-0.20	-0.01	0.04	0.11	0.18	-0.15	-0.13	-0.10	0.41	-0.32	0.14	-0.11	0.03	0.05	0.07	-0.21	0.07	0.00	0.03	0.00	0.00	0.01					
24	LNTXGAP	0.05	0.04	-0.15	-0.00	0.02	0.05	0.09	-0.15	0.08	-0.28	0.50	-0.19	0.12	-0.08	-0.00	0.02	0.02	-0.18	0.07	0.02	0.01	0.00	0.02	-0.02	0.74				
25	TREATY	0.80	0.40	0.17	0.01	-0.03	-0.07	-0.13	0.10	0.14	0.12	0.16	0.23	-0.13	0.07	-0.07	-0.09	-0.03	0.15	-0.02	-0.02	0.02	0.01	-0.00	-0.05	-0.48	-0.20			
26	LNTARIFF	-0.04	0.04	0.09	0.00	-0.02	0.14	0.02	0.06	0.24	0.12	-0.20	0.02	-0.56	0.08	0.145	0.15	0.02	0.14	-0.17	-0.19	-0.08	-0.04	-0.06	0.13	-0.15	-0.13	0.05		
27	LNPOLRSK	3.05	0.32	-0.19	-0.00	0.06	-0.31	0.21	-0.20	-0.21	0.31	0.20	-0.26	0.21	-0.09	-0.02	-0.08	0.07	-0.22	-0.10	0.00	-0.10	0.06	-0.04	0.00	0.18	0.03	-0.09	-0.08	
28	FXCNTRL	0.76	0.78	-0.12	0.00	0.03	-0.23	0.15	-0.12	-0.28	-0.24	0.51	0.14	0.10	-0.05	0.04	0.05	0.05	-0.20	0.11	0.04	0.08	-0.02	0.04	0.02	0.20	0.30	-0.22	-0.18	0.26

All coefficients greater than (absolute value) .004 are significant at the 5 percent level.

Table 2: The Impacts of Market and Policy Variables on LNPX

LNPX	Hyp	Sign	1	2M	2P	2MP	3M	3P	3MP
CONSTANT			2.023 **	1.252	3.013 ***	2.231 *	2.066 *	2.729 **	2.771 **
LINK			0.102	0.085	0.1	0.082	0.076	0.097	0.07
PXFLAG			0.022 *	0.025 *	0.024 *	0.026 **	0.023 *	0.024 *	0.025 *
LNEXRATE			0.044 ***	0.04 **	0.043 **	0.04 **	0.04 ***	0.04 **	0.036 **
INVOICEUS			-0.331 *	-0.346 *	-0.311 *	-0.325 *	-0.358 *	-0.306 *	-0.336 *
LNCIF			3.323 *	2.609 †	3.001 †	2.308	2.332	2.813 †	1.74
CANADA			-0.403 *	-0.386 *	-0.401 *	-0.382 *	-0.368 *	-0.342 *	-0.293 †
MEXICO			0.046	0.017	0.035	0.013	0.009	-0.049	-0.056
CHINA			-0.246 ***	-0.232 ***	-0.608 ***	-0.601 ***	-0.23 ***	-0.554 ***	-0.559 ***
JAPAN			0.46 ***	0.476 ***	0.297 **	0.316 **	0.492 ***	0.335 **	0.352 **
APPAREL			-0.252 *	-0.329 **	-0.225 †	-0.333 *	-0.346 ***	-0.159	-0.271 *
AUTO			1.201 ***	1.24 ***	1.198 ***	1.233 ***	1.185 ***	1.201 ***	1.171 ***
ELECTRIC			-0.979 ***	-1.013 ***	-0.968 ***	-0.995 ***	-1.016 ***	-0.944 ***	-0.983 ***
OFFICE			0.812 ***	0.859 ***	0.822 ***	0.881 ***	0.818 ***	0.891 ***	0.927 ***
TELECOM			1.068***	1.033 ***	1.096***	1.063***	1.004 ***	1.108 ***	1.04 ***
IFT			0.207 *	0.164 †	0.194 *	0.152 †	-1.282 ***	0.987	-0.244
RAUCH	H1	+		0.372 **		0.368 **	0.06		0.03
MFGLMT	H2	+		0.811 *		0.783 *	1.131 **		1.192 **
MFGHT	H2	+		0.672 **		0.642 *	0.864 **		0.9 **
LNWTITEM	H3a	-		0.13 ***		0.129 ***	0.074 **		0.073 **
LNWTITCO	H3a	-		-0.204 ***		-0.207 ***	-0.124 ***		-0.123 ***
LNWTCOCLS	H3b	-		0.016 *		0.016*	0.029 **		0.028 **
LNTXMIN	H4	+			1.000 **	1.005 **		0.392	0.417
LNTXGAP	H5	-			-2.024 †	-1.897 †		-0.182	-0.045
TREATY	H6	+			0.466 ***	0.47 ***		0.345 ***	0.341 ***
LNTARIFF	H7	+			-0.093	-0.576		0.973	0.785
LNPOLRSK	H8	-			-0.261 **	-0.256 **		-0.21 *	-0.192 *
FXCNTRL	H9	-			0.111*	0.105*		0.128 **	0.125 **
IFT*RAUCH	H1	+					0.677 ***		0.765 ***
IFT*MFGLMT	H2	+					-0.588		-0.877 *
IFT*MFGHT	H2	+					-0.309		-0.5 *
IFT*LNWTITEM	H3a	-					0.115 **		0.116 **
IFT*LNWTITCO	H3a	-					-0.159 ***		-0.166 ***
IFT*LNWTCOCLS	H3b	-					-0.022 *		-0.018
IFT*LNTXMIN	H4	+						1.909 **	2.037 **
IFT*LNTXGAP	H5	-						-6.543 **	-6.769 **
IFT*TREATY	H6	+						0.359 *	0.447 **
IFT*LNTARIFF	H7	+						-4.63 *	-5.866 **
IFT*LNPOLRSK	H8	-						-0.042	-0.118
IFT*FXCNTRL	H9	-						-0.171 †	-0.153 †
NO OF OBS			260079	260079	260079	260079	260079	260079	260079
ADJ R SQ			0.7306	0.7346	0.7311	0.7352	0.7355	0.7316	0.7367
F			7.35 ***	9.38 ***	7.32 ***	9.06 ***	9.03 ***	7.02 ***	8.51 ***
Δ F DIST				22.92 ***	5.81 ***	6.08 ***	5.41 ***	4.51 ***	5.64 ***
				2Mv1	2Pv1	2MPv2M	3Mv2M	3Pv2P	3MPv2MP
						22.95 ***			5.53 ***
						2MPv2P			3MPv3M
									6.13 ***
									3MPv3P
CHOW TEST							4.97 ***	4.97 ***	5.62 ***

Significance levels (two-tailed test): *** p < .001, ** p < .01, * p < .05, † < .01 .

Table 3: Subgroup Comparisons

	ALL (1)	IFT ONLY (2)	ALT ONLY (3)	MNES (4)	NON-MNES (5)	BIG FIRMS (6)	SMALL FIRMS (7)	RAUCH DIF (8)	RAUCH OE-REF (9)	HIGH TECH MFG (10)	LW-MD TECH MFG (11)	PRIM-ARY (12)	IFT & HIGH TAX (13)	IFT & LOW TAX (14)
LINK			+		+		+	+	-					
PXFLAG	+		+		+					+	+	+		-
LNEXRATE	+	+		+		+		+	+	+		+		
INVOICEUS	-	-		-	-	-		-		-		+		
LNCIF						+		+		+			+	+
CANADA	-			-		-			-			-	-	d
MEXICO		+									-	-	d	+
CHINA	-	-		-		-	-	-		-			d	d
JAPAN	+		+	+	+	+			+			+	-	d
APPAREL	-						-	-	d	-		d	+	
AUTO	+	+		+		+	+	+	d	+	d	d	+	
ELECTRIC	-	-	-	-		-	-	-	d	-	d	d	-	-
OFFICE	+	+		+	+			+	d	+	d	d	+	
TELECOM	+	+	+	+	+		+	+	d	+	d	d	+	
IFT	+	d	d		d			+		+			d	d
RAUCH	+	+		+		+		+		+	d	-	+	+
MFGLMT	+		+	+				+	d	d	d	d		
MFGHT	+		+	+				+		d	d	d		
LNWTITEM	+	+	+	+		+		+	+	+			+	+
LNWTITCO	-	-	-	-	-	-	-	-		-			-	-
LWTCOCLS	+		+		+	+		+		+				
LNTXMIN	+	+		+		+	+	+	+	+				
LNTXGAP	-						-	-		-			+	
TREATY	+	+	+	+		+	+	+		+			d	
LNTARIFF		-	+							-	+			-
LNPOLRSK	-		-		-	-	-	-		-				
FXCNTRL	+	+		+		+	+	+		+			+	
OBS	260079	107809	152270	137564	122515	130056	130023	210221	49858	213823	13786	32470	57158	24229
ADJ RSQ	.7352	.7155	.7941	.6809	.8145	.8116	.7470	.7400	.7560	.7322	.8701	.8181	.6965	.8176
F	9.06***	8.00***	4.82***	8.46***	6.66***	6.04***	4.29***	9.98***	2.22***	9.73***	2.67***	2.37***	5.46***	4.05***
M1: Product	5.57***	5.29**	3.99**	6.44***	n.s.	8.41***	n.s.	7.72***	n.s.	2.79†	d	3.31†	n.s.	2.95*
M2: Firm	40.09***	23.25***	11.03***	36.80***	13.85***	14.40***	4.71**	53.34***	n.s.	37.78***	n.s.	n.s.	12.12***	12.73***
P1: Tax	8.78***	12.36***	n.s.	9.78***	n.s.	4.19**	5.32**	10.43***	n.s.	9.00***	n.s.	n.s.	4.55*	n.s.
P2: General	5.77***	6.65***	3.51*	6.28***	3.89**	5.01**	4.65**	5.71***	n.s.	9.29***	n.s.	n.s.	4.69**	2.14†

Only the signs of variables significant at the 10% level or better (two-tailed test) are reported; d = dropped from regression.

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