Market Imperfections and Import Pricing Behavior by Multinational Enterprises*

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I. Introduction

Recent analysis of trade within the multinational enterprise (MNE) has focused on the ability of the firm to overcome market imperfections. Internationalization of transactions can lead to a more efficient allocation of resources within the firm and allows the MNE to set prices on intrafirm trade to, theoretically, maximize global profits. Incentives to alter transfer prices arise from market imperfections caused by government regulations or "natural" externalities in the transfer of knowledge and information.

This paper links the degree of variation in import prices paid on commodities by MNEs with some of these market imperfections in the setting of a developing nation. It uses data on the import transactions of 100 MNEs which operated subsidiaries in 18 Brazilian manufacturing industries during 1979. Hypotheses concerning the relationship between import (transfer) prices and market imperfections are tested as is the extent to which MNE import (transfer) prices differed from those prices (market-based) paid by Brazilian firms for the same products.

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argue that rising costs of production entitled them to price increases. Limits on the official repatriation of profits and a desire to reduce profits taxes are also incentives to overprice imports. On the other hand, a desire to reduce tariff payments and avoid credit controls should have encouraged MNEs to underprice imported goods in those industries where tariffs were not already prohibitive (e.g. most consumer goods). The desire to avoid credit controls, however, was likely lower during 1979 than in earlier periods when growth was more sustained and investment demand stronger.

The Brazilian setting also offers evidence on the relationship between firm profitability and transfer pricing. Two recent studies of manufacturing in Brazil analyzed the impact of ownership on profitability (Newfarmer and Marsh; Mooney). Regardless of which ownership measure or model was used, the results indicated that Brazilian firms were more profitable than foreign firms and domestic-led industries were more profitable than foreign-led industries.

Possible explanations for these relationships are that MNEs are less efficient firms and that industries led by MNEs are more competitive than domestically led ones. Newfarmer and Marsh conclude that the efficiency and competition arguments are not convincing and suggest the negative influence of foreign ownership on profitability may reflect transfer price manipulation. This study will test whether MNEs paid higher prices for imported goods and will either support or refute the Newfarmer and Marsh view.

III. The Model

The model of MNE behavior used here is profit maximization on a global scale subject to constraints imposed by internal (managerial) and external sources (e.g. government agencies, joint venture partners, competitors). Payments to these outside agents may be viewed by the MNE as reducing their revenues and profits. This, however, is only a first approximation. Individual subsidiaries may make higher tax payments than in the absence of altered transfer pricing, for example, but the MNE's global profits may increase as other subsidiaries face reduced tax payments to their host government.

tralized structures prefer not to alter transfer prices often. When prices do not accurately reflect scarcity, resource allocation is distorted, management control may be weakened, and profit figures do not contain the information necessary to evaluate and reward management performance. Centralized management structure makes it easier to implement rapid changes in transfer prices without any loss of information. Therefore, centralized management systems are more likely successful at a transfer pricing strategy to maximize global profits.

Other factors influencing transfer pricing behavior are restrictions on capital or profit repatriation, price controls, and the MNE's perceived political, legal, or market risk. These factors, however, are most important when comparisons are made across nations. As this study looks solely at one nation, these factors will not be considered further.

IV. Data and Sampling

Data on import prices in 1979 were collected for 141 manufacturing firms, both privately owned domestic ones and MNEs, from the Brazilian trade authority. Two measures of import pricing are used. TPRICE is a unit price (U.S. dollars FOB) per kilo of weight. The TPRICE which Brazilian firms pay are assumed to reflect world market prices and are used as a proxy for them. The prices which MNEs pay are treated as transfer prices on intrafirm trade since earlier studies have indicated that a high proportion of subsidiary trade comes from within the parent organization.[4] To measure both the direction and magnitude of MNE pricing policies when compared to world market prices, an index price was calculated. INDEX is the ratio of TPRICE to the mean Brazilian TPRICE for the product category expressed as a percentage:

[4] Helleiner estimated that intrafirm trade accounts for 25-33 percent of all international trade. Helleiner and Lavergne noted that 54 percent of manufactured goods imported to the United States in 1977 were intrafirm transactions. Newfarmer and Mueller estimated from a sample of 197 MNEs operating in Brazil that almost 74 percent of their imports were with firms related by ownership. It is this last study which serves as the basis for the assumption used here.

V. Simple Test of Overpricing

The basic hypothesis is that MNEs will overprice imports to lower their tax liability, avoid exchange depreciations and transfer funds to avoid restrictions on profit repatriation. Two factors bias the predicted relationship downward. First, some limited portion of MNE trade is not intrafirm so the price may be a world market price. Second, the transfer price may be understated to achieve goals other than transferring funds abroad. Import prices of MNEs should also exhibit greater variability as some MNEs consistently overprice imports while others underprice.

A paired means test by ownership group was performed for each of the samples for the INDEX variable. The strength of the INDEX measure lies in allowing direct comparisons across products, aggregation, and measurement of the degree of over- and underpricing. Table 1 reveals that for each sample MNEs paid higher prices than Brazilian firms with the degree of overpricing ranging from 21 to 32 percent. Only the larger sample, however, yields results which are significant.

This is not strong evidence of transfer price manipulation by MNEs. The outcome of the first sample, significant overpricing by

Table 1

COMPARISON OF MEAN INDEX PRICES BY OWNERSHIP GROUP

Ownership Group	N	Mean	Standard Deviation	T-statistic	Probability of equal means
48-Product Sample[1]					
MNE	379	132.20	259.64	2.36	0.019
BRAZILIAN	232	100.00	44.81		
26-product Sample[2]					
MNE	265	121.23	296.34	1.14	0.254
BRAZILIAN	174	100.00	48.55		

1 a minimum of 2 observations in each ownership group (MNE or Brazilian) for each product category.

2 a minimum of 3 observations in each ownership group (MNE or Brazilian) for each product category.

manipulation to shift funds out of Brazil is one explanation for MNEs reporting lower profit levels than comparable Brazilian firms.

VI. Regression Model and Results

If MNEs are faced with market imperfections their efficient response is to internalize trade transactions and then manipulate transfer prices to redistribute the efficiency gains. A regression equation developed along the lines suggested in the model section above tests these linkages between transfer prices and measures of market imperfection.

The market imperfection variables and their expected influence on INDEX are:

ADVERT = firm advertising expenditures to sales ratio; a measure of market competition and product differentiation. (+)

EXRISK = foreign exchange risk as measured by the average monthly percentage change in the exchange rate (cruzeiro to dollar) weighted by the subsidiary percentage of trade to each nation. (+)

FOROWN = the percentage of foreign-owned stock; firms with 25 percent or greater foreign ownership are considered MNE; a measure of local participation in joint ventures. (?)

TARIFF = the average nominal tariff on the eight-digit product category. (-)

TAXDIF = the percentage difference in corporate profit tax rates; the rate in the parent firm's nation minus Brazil's rate (-)

Higher tariffs are expected to reduce import prices. Tariffs on the sample's product ranged from 0 to 76 percent. Many of the products chosen for this study are intermediate goods enjoying lower tariff rates so the strength of the relationship should be weakened.

A higher tax rate differential should lower import prices as

not the most direct method MNEs have to avoid depreciation losses, it interferes with optimal allocation of resources within the MNE, and complicates evaluation of management performance. Expectations may, therefore, play a major role in interpreting these results.

Tariffs also exert a significant influence on MNE import prices. As expected, products facing higher nominal tariffs have lower prices, presumably to reduce the firm's payments to the host government. These tariffs range from less than one percent to 76 percent and, given the coefficient's size, can substantially influence the import price.

The only other variable to exert a significant influence on pricing is the corporate income tax rates. However, the coefficient takes on an unexpected positive sign. A possible explanation is that the variable reflects the "official" tax rate in each nation while the "effective" tax rate, which MNEs use for decision making, may be substantially different. Limitations on the repatriation of profits from Brazilian subsidiaries, for instance, raises the "effective" tax rate in Brazil and encourages other methods for transferring funds (e.g. transfer price manipulation).

None of the other independent variables exert a statistically significant influence on import pricing. The influence of foreign ownership is perhaps dissipated by opposite forces: local supervision reducing INDEX versus the desire by MNEs to appropriate profits by overpricing imports. The poor performance of ADVERT suggests that measures of market competition (or product differentiation) are not important or that a better proxy variable is needed. A four-firm concentration ratio was substituted in the model without success. Many manufacturing industries in Brazil are highly concentrated and dominated by MNEs, so the four-firm ratio may not exhibit sufficient variation to be a powerful explanatory variable.

VII. Summary

Examination of sample data showed that MNEs paid higher prices on imported products than Brazilian firms. Using an indexed set of prices with the mean Brazilian price in each product category as the base, import prices for MNE subsidiaries were 21

directions. Increased local ownership may encourage some MNEs to overprice imports to siphon some local profits toward the parent firm. On the other hand, MNEs are less likely successful in transfering profits when strong local ownership exists.

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