Foreign Direct Investment in South America:

Does foreign ownership improve firm performance?

Firm-level evidence from Argentina, Brazil, Chile, Colombia and Peru

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CONTENTS

Abstract

This study asks the question: "If a firm's performance is measured by how productively it uses its labor and capital resources (total factor productivity) or by its overall profitability, does foreign ownership in South American firms improve their performance?"

Using firm-level financial data from 180 publicly-traded companies operating in fifteen industries in Argentina, Brazil, Chile, Colombia and Peru from 1997 to 2001, a series of tests are performed to measure the effects that levels of foreign ownership—disaggregated by region of origin and as a whole—have on total factor productivity and net income in US$ (profitability).

The study finds little evidence that foreign ownership increases the total factor productivity or improves the profitability of South American firms, on an aggregate and industry-specific level.

Foreign ownership as a whole decreases total factor productivity on an aggregate level as well as in the electrical, transportation equipment, banking, and retail trade industries. Only in the agriculture industry does foreign ownership increase total factor productivity.

In the banking industry, North American ownership increases firms' total factor productivity, and in the agriculture industry European ownership increases firms' total factor productivity. In all other industries, regional foreign ownership variables decrease total factor productivity.

With the exception of the chemicals industry, in which foreign ownership as a whole considerably increases profitability, both regional foreign ownership variables and foreign ownership as a whole do not significantly affect profitability in the electrical, banking, retail trade, financial services, construction, transportation, and wholesale industries.

With little evidence that foreign ownership increases the total factor productivity or the profitability of South American firms, this study's evidence suggests that in light of the OLI paradigm, overseas disadvantages may still outweigh the ownership advantages foreign owners exploit to enhance productivity and profitability.

Introduction

Studies of foreign direct investment (FDI) and multinational enterprises are numerous, most frequently examining the characteristics of both on an aggregate and country-specific level. Of those that have treated the South American economies, many have explored salient topics, ranging from technology spillovers (Aitken and Harrison [1999]) to structural changes created by FDI (Blomstrom [1989]). Others have examined host-country characteristics as a determinant of FDI (Nunnenkamp and Spatz [2003]) or whether the integration of host-country economies is a determinant of FDI (Motta and Norman [1996]). Still others have examined specific forms of FDI, such as export platform FDI, and assessed their effects on MNE performance (Ekholm, Forslid and Markusen [2003]). There is a great lack, however, of studies that examine foreign direct investment in South America by industry using firm-level financial data. Those that do exist are almost always limited to the study of firms in one country.

This study asks the question: "If we measure a firm's performance by how productively it uses its resources (total factor productivity), or by its overall profitability, does the presence of foreign ownership in South American firms improve their performance?"

Using firm-level financial data from 180 publicly-traded companies operating in fifteen industries in Argentina, Brazil, Chile, Colombia and Peru from 1997 to 2001, a series of tests are performed to measure the effects that levels of foreign ownership—disaggregated by region of origin and as a whole—have on total factor productivity and net income in US$.

The study is divided into six sections. Section one provides an overview of the trends in foreign direct investment flows to the Andean Community and MERCOSUR during the 1990s. A review of the literature on economic and management theory of multinational firms is presented in section two. Section three describes the dataset used as well as the methods employed by the author to obtain ownership information. Section four illustrates the methodology used for the study's tests of performance. The results of the empirical analysis are presented in section five and the author offers his conclusions as well as suggestions for future research in section six.

I. Trends in Foreign Direct Investment in South America

While the early to mid-1990s ushered in great increases in the flows of FDI to South America, the years from 2000 until present have been marked by a steady decline. In the early 1990s, rapid privatization of government-owned enterprises, coupled with liberalization of policies regarding foreign capital, fueled the growth of FDI flows to the region. Governments throughout the Andean Community, of which Colombia and Peru are members, and MERCOSUR, of which Argentina, Brazil and Chile are members, pushed for a new, more favorable outlook on foreign direct investment, while foreign investors saw great opportunities in privatizing industries.

Recent instability in the financial and currency markets, especially in light of the Argentinean crisis, and the decline in the number of privatizations occurring throughout the region have all been cited as causes for the recent decreases in FDI flows.

Table 1
FDI, net inflows (millions of current US$)

	1990-1996	1997	1998	1999	2000	2001	Variation (1997/2001)
Argentina	3,956	9,160	7,291	23,988	10,418	2,166	-76%
Brazil	3,511	19,650	31,913	28,576	32,779	22,457	14%
Chile	1,996	5,275	4,806	8,989	3,639	4,477	-15%
Colombia	1,167	5,562	2,829	1,508	2,299	2,509	-55%
Peru	1,433	2,139	1,644	1,940	810	1,144	-47%

Source: World Bank (2002).

Table 1 shows net inflows of foreign direct investment from 1990 to 2001 in the countries considered in this study. It also shows the variation in net inflows between 1997 and 2001, the years from which all of the financial data we test are collected. All five countries had larger inflows of FDI in 1997 than their average flows from 1990 to 1996, with Argentina, Brazil, Chile and Colombia showing drastic increases between the two periods and Peru a more moderate increase. We see that the years covered by our data,

1997 to 2001, are characterized by decreases in net FDI inflows. During this period all countries but Brazil saw double-digit net decreases in FDI, and in Brazil, net FDI flows increased a relatively modest 14% over the four-year span.

Where early and mid-1990s FDI flows to MERCOSUR countries were driven by market-seeking investors in the telecommunications and financial services industries, these investments lost their appeal in recent years, with parent corporations declaring corporate shutdowns and emergencies in many of their South American subsidiaries.

Table 2
South America: Net Inflows of FDI, by Subregion, 1990-2002 [a]: (Millions of dollars)

	1990-1994 [b]	1995-1999 [b]	1999	2000	2001	2002 [c]	Variation 2002/2001 (%)
South America	8956	45375	70236	57320	39555	26649	-33%
MERCOSUR plus Chile	6114	35590	61881	48468	30723	19420	-37%
Andean Community	2843	9786	8355	8852	8832	7229	-18%

Source: ECLAC (2003), p.12.

[a] Equal to net inflows of direct investment in the reporting economy minus capital outflows from the same foreign firms
[b] Annual average
[c] Estimates

Table 2 shows net inflows of FDI by South American subregion. According to ECLAC (2003), the Andean Community has attracted 13% of the total FDI that entered Latin America between 1990 and 2001. Most of this FDI originates in the United States and Spain and most of the exports generated as a result are destined for the United States. Natural resource-seeking FDI is most common in the Andean community, whose countries are rich in natural resources. The Andean countries, however, remain less competitive than other South American countries in other industries. While FDI in services grew significantly during this decade, FDI in services has not led to significant exports in these countries. In the Andean Community as a whole, net inflows were less in 2001 than in 1995-1999.

In the case of MERCOSUR, net inflows were also less in 2001 than in 1995-1999, but with interim years showing a spike in FDI flows, particularly 1999. The proportion of FDI in the service sector in Brazil has declined, while the flow of FDI to the financial sector in both Brazil and Argentina has been significantly reduced. Chile ended the period from 1997 to 2001 with 15% less net inflows of FDI than it began, but during the time did have one year, 1999, in which FDI flows temporarily increased rather drastically. In Chile, FDI is primarily directed towards the financial services industry; electricity, gas and water; and mining (ECLAC 2003).

Throughout the 1990s, FDI in the financial services sector increased significantly, not just in MERCOSUR and the Andean Community, but also across Latin America. These increased flows owe themselves to the growth in competition in international financial markets. MNEs, especially banks, search for new markets and take advantage of national policies easing the restrictions on foreign ownership of banks.

While MNEs in South America have traditionally been characterized by market-seeking and natural resource-seeking FDI, a trend has developed with FDI geared towards manufacturing for export outside South America, probably in response to the recessionary markets in the region.

With the recent landscape of foreign direct investment in South America now laid out, section two explores the literature on theories of multinational enterprise activity.

II. Literature Review

The literature on Multinational Enterprises (MNEs) is extensive. Theories of Multinational Enterprise Activity can be divided into two schools: the transaction-

cost/internalization approach and the multinational management approach. The transaction-cost/internalization approach is compatible with contemporary economics, while the management approach is more akin to what one might find in business management texts.

Transaction-cost/Internalization Approach

Internalization theory begins with the assumption that firms are established because they can perform certain tasks—"the deployment of discrete, yet complimentary, resources and capabilities"—at a lower cost than the external market (Dunning 2000)[1].

In perfect competition, the transaction costs of using the external market to perform these tasks are zero. Internalization theory assumes that markets are imperfect, and therefore, the transaction costs associated with the tasks are positive. In the case of this study, multinational enterprises establish and invest capital in subsidiaries where "they can undertake the transactional and coordinating functions of economic activity more efficiently than can arm's length markets."[2] The multinationals we examine have chosen to establish subsidiaries in South America at least in part because they recognize imperfect markets and believe they can perform specific tasks at a lower cost than the external market.

The OLI Paradigm

A prominent iteration of internalization theory is the OLI Paradigm (Dunning [2000]). OLI is an acronym whose components are Ownership (O), Location (L) and Internalization (I). Dunning suggests that "the extent, ownership and pattern of MNE

[1] Dunning 2000, p. 25
[2] Ibid., p. 25-26

activity" depends on the advantages of ownership that MNEs hold relative to domestic competitors, the features of a particular country or region (in this case South America) that make it more attractive than others and the benefits a firm can reap from internalizing these advantages.

OLI theory suggests that for MNEs to harness their ownership (O) advantages they must exhibit the three following characteristics: a) the ability to "access, meld and leverage locally-bound and context-dependent knowledge from throughout the world"; b) the ability to acquire assets from beyond their national boundaries and coordinate them efficiently with their existing core competencies; and c) the ability to effectively collaborate with foreign institutions and partner-firms, gaining the maximum utility from these arrangements.

Locational advantages, in Dunning's opinion, have increased significantly in recent years. As national governments identify their unique resources and capabilities, they make efforts to promote these resources to foreign investors and provide assistance to MNEs through "provision of infrastructure…human resource development, technology, trade and investment policies"[3].

In addition to the efforts of national governments, MNEs are benefiting from what have become known as "clusters", areas where groups of related firms are positioned to engage in linked activities. Clusters attract investors who clearly see these arrangements as potentially lowering transaction costs and providing easier access to skilled labor. Fiscal policies and incentives provided to investors can fuel the development of clusters and the countries examined in this study are no exception,

[3] Ibid., p.34.

though none have yet developed clusters as well-known and successful as Silicon Valley, Detroit and Geneva to name a few.

The final component of OLI theory, internalization, considers transaction costs. It has been established that the firms examined in this study are operating in imperfect markets. Simply assessing transaction costs, however, may not paint a reliable picture of the grounds for a MNE's decision to establish or invest in a subsidiary. For example, externalities generated in the creation of the firm may be greater than the transaction costs incurred. Using the cluster example, one would reason that the exchange of knowledge and technology is an externality that might outweigh transaction costs.

It has been suggested that the internalization decision—i.e. the choice by a multinational firm to establish a subsidiary because it believes it can perform certain tasks at a lesser cost than the external market—relies on four factors (Buckley and Casson [1976]). These factors are industry specific, region specific, nation specific and firm specific. Nation-specific characteristics, particularly of a fiscal and social nature, are significant as Dunning (2000) indicated in the (L) component of OLI theory. But this study is more concerned with industry-specific and primarily, firm-specific factors in the internalization decision.

The goal of any firm is to internalize to the point where the costs and benefits of internalization are equilibrated. Buckley and Casson (1976) identify five benefits arising from internalizing the market for an intermediate good. These are: creation of internal futures markets, imposition of a discriminatory pricing system, avoidance of the costs of bilateral bargaining, elimination of buyer uncertainty, and minimization of the impact of government interventions through transfer pricing. The four costs they identify, on the

other hand, are: (i) the resource cost that may arise from fragmenting a particular market (i.e. an imperfect market might become even more imperfect), (ii) the additional communication cost, which they identify as a cost arising from geographical and social distances (linguistic and cultural differences), (iii) the cost of political discrimination against foreign direct investment (should there be contention between the host country and investor's country), and (iv) the administrative cost of the internal market.

For the purposes of this study, we must assume that each of the firms with foreign ownership in this study has considered the benefits and costs that Buckley and Casson (1976) identify and has made the decision to internalize, calculating that ownership advantages exceed the potential costs.

Multinational Management Approaches

While the school of economists like Dunning, Buckley and Casson propone theories concerned with both macro and micro variables and which analyze firm decisions from a cost-benefit perspective, management scholars push theories of MNEs that rely on analyses of sustainable competitive advantage. Their theories concentrate on firm specific, industry level and business-level characteristics rather than macro influences, as they seek to explain the performance of MNEs. Our focus is on one in particular, resource-based theory.

Resource-based theory

Resource-based theory is the product of management scholars, who have focused on firm-specific characteristics rather than country-specific characteristics. These scholars are concerned with the ability of a firm to "generate unique and non-imitable

assets," coordinate the development of resources with other firms, and the ability of a firm to execute strategies to most effectively deploy its resources.

According to resource-based theory, competitive advantage is derived from scarce, firm-specific resources that are superior in use relative to other firms (Peteraf and Barney [2003]). Rent differentials, which arise from the different levels of efficiency of various resources, dictate a firm's performance. Resource-based theory analyzes a firm's efficiency and the maximum gains it derives from each dollar spent.

When considering competitive advantage, resource-based theory suggests that differences in efficiency explain firm performance, rather than market power or collusive behavior (Peteraf and Barney [2003]). Other forms of analysis (industry-level, etc.) attribute performance to external factors rather than internal factors (e.g. market structure, institutional factors or strategic interactions).[4]

Resource-based theory assumes that product market conditions are frictionless, that other external forces are exogenous and that interactions among other actors in a market do not affect a firm's sustainable competitive advantage. These parameters are significant to our analysis, as its calculations of total factor productivity are not constrained by external conditions or interactions among other actors.

Competitive advantage is often defined as "superior financial performance" (Peteraf and Barney [2003]). Our dataset allows for consideration of superior financial performance, since we have observations of net profit for 158 firms.

Peteraf and Barney (2003) also write that resource-based theory is only applicable when superior financial performance is the result of utilization of superior resources.

[4] Peteraf and Barney, 2003, p. 312

So we must naturally ask, what are strategic resources? They are "those attributes of a firm's physical, human and organizational capital that…enable a firm to conceive of and implement strategies that improve its efficiency and effectiveness."[5]

As we will discuss shortly, the *A* component of the Cobb-Douglas Production Function, Total Factor Productivity, can be understood as the attributes suggested above, and as we study the effects of ownership on *A*, we can observe how much foreign ownership is affecting productivity and thus potentially efficiency-enhancing strategies.

Earning "superior financial returns within [an] industry (or strategic group)" is often described as enjoying a competitive advantage over rival firms.[6] Thus, we also study the effects of ownership on net income (profitability) to observe whether South American MNEs are more profitable than their domestic rivals as a result of foreign ownership.

The next section describes the dataset we use to perform these tests.

III. Data

Total Factor Productivity

The dataset used to test foreign ownership's effects on total factor productivity consists of the financial and ownership data of 180 publicly-traded companies in South America, all of whom are incorporated in one of five countries: Argentina, Brazil, Chile, Colombia or Peru. Using Disclosure, Inc.'s WorldScope Global database, we recorded observations of the change in total capital, change in total employment and change in sales for each company. Each of these observations is recorded in a percentage value.

[5] Barney, 1991, p.102.
[6] Ghemawat and Rivkin, 1999, p.49.

While change in total employment is presented as a percentage value in WorldScope, change in total capital and change in total sales are not. We calculated percentage change in each of the two using their yearly values, which WorldScope records in the domestic currency of each company's country in nominal terms. The data range from 1997 to 2001 and for 116 of these 180 companies, change in total capital, change in total employment and change in sales were recorded for two periods.

Table 3 shows the other components of the total factor productivity dataset in addition to sales, total capital and employment data. While WorldScope records firm owners and their share of total capital, it does not indicate whether they are foreign or domestic owners and further, where these owners are established. Therefore, to ascertain the origins of the owners recorded in WorldScope, a number of resources were consulted. These included: Dun & Bradstreet (2001); ECLAC (2003); Economist Intelligence Unit (2003) and (2004); individual company websites; Wright Investors' Service's: www.corporateinformation.com; amarillas.com; and the International Directory of Company Histories (2004). As a result, our ownership data are incomplete—obtaining complete information for the 1582 total owners recorded in the dataset was beyond the scope of our resources.

Table 3
Total Factor Productivity:
Variable names, definitions, and summary statistics

Variable	Definition	Mean	Std. dev.
DSALES	Percent change in firm sales from year one to year two	15.352	37.465
LNDSALES1	Natural log of percent change in firm sales plus one	0.087	0.422
DTOTALCAPITAL	Percent change in firm total capital from year one to year two	15.151	39.875
LNDTOTALCAPITAL1	Natural log of percent change in firm total capital plus one	0.092	0.324
DEMPLOY	Percent change in firm employment from year one to year two	5.096	36.353
LNDEMPLOY1	Natural log of percent change in firm employment plus one	0.009	0.280
%DOM	Percent of firm shares owned by domestic owners	42.911	33.054
LNDOM	Natural log of percent domestic ownership plus one	0.330	0.234
%NOAM	Percent of firm shares owned by North American owners	4.413	13.179
LNNOAM	Natural log of percent North American ownership plus one	0.037	0.101
%SOAM	Percent of firm shares owned by South American owners	2.664	13.825
LNSOAM	Natural log of percent South American ownership plus one	0.020	0.100
%EUR	Percent of firm shares owned by European owners	8.404	20.588
LNEUR	Natural log of percent European ownership plus one	0.067	0.158
%ASIA	Percent of firm shares owned by Asian owners	0.198	1.527
LNASIA	Natural log of percent Asian ownership plus one	0.002	0.014
%FOR	Percent of firm shares owned by aggregate foreign owners	15.679	26.502
LNFOR	Natural log of percent aggregate foreign ownership plus one	0.124	0.197
MIN	1 if firm is in Mining Industry, 0 otherwise	0.095	0.293
UTIL	1 if firm is in Utilities Industry, 0 otherwise	0.267	0.443
FOOD	1 if firm is in Food Industry, 0 otherwise	0.101	0.302
CHEM	1 if firm is in Chemicals Industry, 0 otherwise	0.074	0.263
METL	1 if firm is in Metal Industry, 0 otherwise	0.115	0.319
MACH	1 if firm is in Machinery Industry, 0 otherwise	0.017	0.129
ELEC	1 if firm is in Electrical Industry, 0 otherwise	0.051	0.220
TRNE	1 if firm is in Transportation Equipment Industry, 0 otherwise	0.061	0.239
WHOL	1 if firm is in Wholesale Industry, 0 otherwise	0.101	0.302
BANK	1 if firm is in Banking Industry, 0 otherwise	0.115	0.319
FINR	1 if firm is in Financial Services Industry, 0 otherwise	0.152	0.360
AGRI	1 if firm is in Agriculture Industry, 0 otherwise	0.051	0.220
CNST	1 if firm is in Construction Industry, 0 otherwise	0.034	0.181
TRAN	1 if firm is in Transportation Industry, 0 otherwise	0.024	0.152
RTLT	1 if firm is in Retail Trade Industry, 0 otherwise	0.061	0.239

[a] Industry dummies compiled according to U.S. Chamber of Commerce: Bureau of Economic Analysis classification system using four-digit SIC codes.

With the ownership data we were able to obtain and with sales, total capital and employment data, 296 total firm observations resulted. Of the 296 observations, 258 contain domestic ownership data, and 145 contain foreign ownership data. The foreign

ownership can be further disaggregated into 79 instances of North American ownership; 21 instances of South American (non-domestic), Central American and Caribbean ownership; 77 instances of European ownership; and 7 instances of Asian ownership.

Each of the 180 companies was also classified by industry of operation (with any single company classified into a maximum of three different industry headings) based on the four-digit Standard Industrial Classification codes listed for the company in WorldScope Global's database. The fifteen different industry headings listed in Table 3 are based on the Bureau of Economic Analysis's classification system, which organizes all four-digit SIC codes into fifteen different industry headings.[7]

Of the 180 companies we observe, foreign ownership is most heavily concentrated in the utilities, financial service, banking, and mining sectors with 17, 15, 12 and 12 firms containing foreign ownership in these industries, respectively. This is not surprising, as much of the net inflow of foreign direct investment in the 1990s was indeed to companies operating in these three sectors. The food, wholesale, metal and retail trade industries all have between 7 and 10 firms with foreign ownership, and these are all industries in which natural resource-seeking and export-platform investment occur.

Argentina provides the smallest sample of companies in our dataset with only six companies, three of which have foreign ownership, and in all three the foreign ownership is a controlling interest of 25% or more of the total capital. The three companies are classified under the industry headings of machinery, transportation equipment, wholesale, banking, agriculture, construction, and retail trade.

For Brazil we observe 62 companies, 13 of which have foreign ownership and in five of which foreign owners have a controlling interest. Here, foreign ownership is most

[7] For a table showing the classification system, see U.S. Chamber of Commerce (1995).

heavily concentrated in the metal and utilities industries, with four and five firms containing foreign ownership in these two industries, respectively. As we mentioned in section one, the 1990s ushered in great amounts of FDI in telecommunications, an industry that falls under the utilities industry heading. In Brazil, we also observe companies in the mining, transportation equipment, wholesale, banking, transportation and retail trade industries.

Chile is our largest country sample with 70 companies, 42 of which have foreign ownership and in 13 of which foreign owners have a controlling interest. The heaviest concentration of foreign ownership in Chile in our dataset is in the utilities, food and financial services industries, with ten, nine and eight companies respectively. Again, this is not surprising given that great participation in utilities and financial services occurred during the 1990s and firms in the food industry are often invested in with the intention of exporting goods. In Chile, we also observe companies in all other industries except for machinery.

Our data for Colombia consist of 13 companies, six of which have foreign ownership and in three of which foreign owners have a controlling interest. Foreign ownership is evenly distributed among firms in the mining, banking, construction and retail trade industries with two instances of foreign ownership in the wholesale industry.

There are 29 companies in our dataset from Peru, 20 of which have foreign ownership and in 12 of which foreign owners have a controlling interest. In Peru, foreign ownership is most concentrated in the financial services and mining industries, with seven and five companies, respectively. Three or more companies are also in the banking and utilities industries. During the 1990s, as we described in section one, natural-resource

seeking FDI was directed to the Andean Community, so the number of companies in the mining industry is not surprising. With other industries not as competitive as natural-resource utilizing industries relative to the rest of South America, it is surprising that we see relatively high levels of foreign participation in the financial services, banking and utilities industries.

For further information about this dataset, including tables with the specific numbers of firms and observations disaggregated industry by country, see Appendix A.

Profitability

The dataset used to test for foreign ownership's effects on profitability is described in Table 4. The dataset is based on the total factor productivity dataset, so ownership data and industry classification for all firms remain the same. WorldScope Global was consulted to record net income (in US$) for the firms in the previous dataset from the same years in which we recorded net sales values in nominal terms.

The profitability data also range from 1997 to 2001. There are data for 158 companies and for 123 of the 158, net income in US$ is recorded for two periods. Of these data, which total 281 observations, 245 contain domestic ownership data, and 154 contain foreign ownership data. The foreign ownership can be further disaggregated into 85 instances of North American ownership; 20 instances of South American (non-domestic), Central American and Caribbean ownership; 83 instances of European ownership; and 10 instances of Asian ownership.

Table 4
Profitability:
Variable names, definitions, and summary statistics

Variable	Definition	Mean	Std. dev.
PROFIT$	Firm Net Income in US$	28,739.114	106,615.412
%DOM	Percent of firm shares owned by domestic owners	42.658	33.967
%NOAM	Percent of firm shares owned by North American owners	4.830	13.487
%SOAM	Percent of firm shares owned by South American owners	2.667	14.010
%EUR	Percent of firm shares owned by European owners	8.713	20.783
%ASIA	Percent of firm shares owned by Asian owners	0.300	1.988
%FOR	Percent of firm shares owned by aggregate foreign owners	16.512	26.831
MIN	1 if firm is in Mining Industry, 0 otherwise	0.117	0.323
UTIL	1 if firm is in Utilities Industry, 0 otherwise	0.253	0.435
FOOD	1 if firm is in Food Industry, 0 otherwise	0.125	0.331
CHEM	1 if firm is in Chemicals Industry, 0 otherwise	0.093	0.290
METL	1 if firm is in Metal Industry, 0 otherwise	0.096	0.295
MACH	1 if firm is in Machinery Industry, 0 otherwise	0.018	0.132
ELEC	1 if firm is in Electrical Industry, 0 otherwise	0.050	0.218
TRNE	1 if firm is in Transportation Equipment Industry, 0 otherwise	0.039	0.194
WHOL	1 if firm is in Wholesale Industry, 0 otherwise	0.107	0.309
BANK	1 if firm is in Banking Industry, 0 otherwise	0.117	0.323
FINR	1 if firm is in Financial Services Industry, 0 otherwise	0.160	0.367
AGRI	1 if firm is in Agriculture Industry, 0 otherwise	0.050	0.218
CNST	1 if firm is in Construction Industry, 0 otherwise	0.043	0.203
TRAN	1 if firm is in Transportation Industry, 0 otherwise	0.025	0.156
RTLT	1 if firm is in Retail Trade Industry, 0 otherwise	0.057	0.232

[a] Industry dummies compiled according to U.S. Chamber of Commerce: Bureau of Economic Analysis classification system using four-digit SIC codes.

IV. Methodology

Total Factor Productivity

The model we use to measure foreign ownership's effects on total factor productivity is based on the Cobb-Douglas Production function:

$$Y = AL^{a}K^{b} \tag{1.1}$$

The value *A* in the Cobb-Douglas Production function above is known as total factor productivity (TFP), the efficiency with which a firm utilizes its factor inputs: labor and capital. Our derivation is based on Solow (1957), in which Solow presents a model to

measure changes in the aggregate production function over time. Our model solves for the effects of foreign ownership on *A* over time, using the natural log of the percent change in output plus one as the dependent variable.

From Eq. (1.1) the following steps are taken:

$$Y_2 - Y_1 = A_2 L_2^{\,a} K_2^{\,b} - A_1 L_1^{\,a} K_1^{\,b} \tag{1.2}$$

$$\frac{Y_2 - Y_1}{Y_1} = \frac{A_2}{A_1}\left(\frac{L_2}{L_1}\right)^{a}\left(\frac{K_2}{K_1}\right)^{b} - 1 \tag{1.3}$$

$$\frac{Y_2 - Y_1}{Y_1} = \left(\frac{A_2 - A_1}{A_1} + 1\right)\left(\frac{L_2 - L_1}{L_1} + 1\right)^{\alpha}\left(\frac{K_2 - K_1}{K_1} + 1\right)^{\beta} + 1 \tag{1.4}$$

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = \log\left(\frac{A_2 - A_1}{A_1} + 1\right) + a\,\log\left(\frac{L_2 - L_1}{L_1} + 1\right) + b\,\log\left(\frac{K_2 - K_1}{K_1} + 1\right) \tag{1.5}$$

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = \log(\Delta Y\% + 1) \qquad \text{and} \qquad \log\left(\frac{L_2 - L_1}{L_1} + 1\right) = \log(\Delta L\% + 1)$$

$$\log\left(\frac{K_2 - K_1}{K_1} + 1\right) = \log(\Delta K\% + 1)$$

In order for this study's hypothesis to be tested, the value *A* must be a dependent variable controlled by the ownership composition of a firm. Therefore, the value *A* is understood to be equal to the natural log of percent change in *A* plus one, because total capital and labor have been measured as the natural log of percentage changes in their stocks as well.

The natural log of percent change in *A* plus one is determined by the percent of a firm's ownership in each type of owner's hands, and thus, ultimately ownership type serves our complete model's control variable.

In order to preserve one to one elasticity, ownership percentages have been converted into the natural log of percent ownership plus one:

$$\log\left(\frac{A_2 - A_1}{A_1} + 1\right) = b_0 + b_1 \log(\%\, DOM + 1) + b_2 \log(\%\, NOAM + 1) + b_3 \log(\%\, SOAM + 1) + b_4 \log(\%\, EUR + 1) + b_5 \log(\%\, ASIA + 1) \quad (1.6)$$

Ownership composition in our model consists of five variables, which are: %DOM, the percent of a firm's total capital owned by domestic shareholders; and %NOAM, %SOAM, %EUR and %ASIA, the percent of a firm's total capital in the hands of owners established in each of those regions: North America, South America, Europe and Asia.

To preserve ß$_0$ as the symbol for the constant in our model, a$_2$ has been substituted for ß as the coefficient on the log of percent change in total capital plus one in all subsequent equations, 1.7 through 3.4.

Substituting Eq. (1.6) into Eq. (1.5) we obtain Eq. (1.7):

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = a_1 \log\left(\frac{L_2 - L_1}{L_1} + 1\right) + a_2 \log\left(\frac{K_2 - K_1}{K_1} + 1\right) + b_0 + b_1 \log(\%\, DOM + 1) + b_2 \log(\%\, NOAM + 1) + b_3 \log(\%\, SOAM + 1) + b_4 \log(\%\, EUR + 1) + b_5 \log(\%\, ASIA + 1) \quad (1.7)$$

Using the variable labels presented in Table 3, Eq. (1.7) can be formally written as:

$$\begin{aligned}\log(\Delta Y\%+1) &= a_1 \log(\Delta L\%+1) + a_2 \log(\Delta K\%+1) \\ &+ b_0 + b_1 \log(\%\, DOM+1) + b_2 \log(\%\, NOAM+1) \\ &+ b_3 \log(\%\, SOAM+1) + b_4 \log(\%\, EUR+1) \\ &+ b_5 \log(\%\, ASIA+1) + e\end{aligned} \qquad \textbf{(1.8)}$$

Eq. (1.8) is our first total factor productivity model.

Our second model is a variation on the first, and omits the variable %DOM as a determinant of *A*. Since %DOM is omitted in the second model, β_0, the constant term, is understood to represent the effects of domestic ownership plus other unmeasured ownership on the dependent variable *A*. For only six of the 180 firms that we observe in the total factor productivity tests does all ownership data sum to 100%; in fact, with all 296 firm observations we test, the mean total ownership percentage of the firm for which we have accounted is 58.6%. One would expect, therefore, that the value of the constant here, assuming that unmeasured ownership is domestic, might provide a more accurate representation of domestic ownership's effects on *A* than just the coefficient on the variable %DOM. As in the first model, one to one elasticity is preserved. The second model is derived below:

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = \log\left(\frac{A_2 - A_1}{A_1} + 1\right) + a \log\left(\frac{L_2 - L_1}{L_1} + 1\right) + b \log\left(\frac{K_2 - K_1}{K_1} + 1\right) \qquad (2.1)$$

Ownership composition without %DOM:

$$\begin{aligned}\log\left(\frac{A_2 - A_1}{A_1} + 1\right) &= b_0 + b_1 \log(\%\, NOAM+1) + b_2 \log(\%\, SOAM+1) \\ &+ b_3 \log(\%\, EUR+1) + b_4 \log(\%\, ASIA+1)\end{aligned} \qquad (2.2)$$

Substituting 2.2 into 2.1:

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = a_1 \log\left(\frac{L_2 - L_1}{L_1} + 1\right) + a_2 \log\left(\frac{K_2 - K_1}{K_1} + 1\right) + b_0 + b_1 \log(\%\, NOAM + 1) + b_2 \log(\%\, SOAM + 1) + b_3 \log(\%\, EUR + 1) + b_4 (\%\, ASIA + 1) \quad (2.3)$$

Using the variable labels in Table 3, Eq. (2.3) can be formally written as:

$$\log(\Delta\%Y + 1) = a_1 \log(\Delta\%L + 1) + a_2 \log(\Delta\%K + 1) + b_0 + b_1 \log(\%\, NOAM + 1) + b_2 \log(\%\, SOAM + 1) + b_3 \log(\%\, EUR + 1) + b_4 \log(\%\, ASIA + 1) + e \quad \mathbf{(2.4)}$$

Eq. (2.4) is our second model, measuring foreign ownership's effects on total factor productivity without domestic ownership as a control variable.

The third model for total factor productivity is a variation of Eq. (2.4). In the third model, the variable %FOR was substituted for the regional ownership variables %NOAM, %SOAM, %EUR and %ASIA.

The new variable %FOR is the sum of the values of the four regionally classified foreign ownership variables for each company, or the total percentage of foreign ownership in each company. The variable %DOM was excluded from the third model, because the constant is understood, as in Eq. (2.4) to represent effect of domestic ownership plus other unmeasured ownership on the dependent variable *A.* The third model is derived below:

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = \log\left(\frac{A_2 - A_1}{A_1} + 1\right) + a \log\left(\frac{L_2 - L_1}{L_1} + 1\right) + b \log\left(\frac{K_2 - K_1}{K_1} + 1\right) \quad (3.1)$$

Substituting %FOR for the four regional ownership variables:

$$\log\left(\frac{A_2 - A_1}{A_1} + 1\right) = b_0 + b_1 \log(\%\, FOR + 1) \tag{3.2}$$

Substituting Eq. (3.2) into Eq. (3.1):

$$\log\left(\frac{Y_2 - Y_1}{Y_1} + 1\right) = a_1 \log\left(\frac{L_2 - L_1}{L_1} + 1\right) + a_2 \log\left(\frac{K_2 - K_1}{K_1} + 1\right) + b_0 + b_1 \log(\%\, FOR + 1) \tag{3.3}$$

Using the variable labels in Table 3, Eq. (3.3) can be formally written as:

$$\log(\Delta\%Y + 1) = a_1 \log(\Delta\%L + 1) + a_2 \log(\Delta\%K + 1) + b_0 + b_1 \log(\%\, FOR + 1) + e \tag{3.4}$$

(3.4)

Eq. (3.4) is our third model, which observes aggregate foreign ownership's effects on total factor productivity.

We also use one variation of Eq. (3.4), in which we test only firms whose total foreign ownership is greater than or equal to 25% of the company's total capital (commonly referred to as maintaining a controlling interest in a firm). We use this variation to see if controlling interests appear to have any different effect on TFP than smaller ownership levels.

Profitability

To test foreign ownership's effects on profitability we use a model in which a firm's net income in US$ is the dependent variable and, like in our TFP model, foreign ownership as a percentage of total capital is the control variable.

We construct three variations of the model and they are described below.

$$NetIncomeUS\$ = b_0 + b_1\%DOM + b_2\%NOAM + b_3\%SOAM + b_4\%EUR + b_5\%ASIA + e \quad \textbf{(4.1)}$$

Eq. (4.1) observes profitability as a function of foreign ownership by region and includes domestic ownership as one of the control variables.

$$NetIncomeUS\$ = b_0 + b_1\%NOAM + b_2\%SOAM + b_3\%EUR + b_4\%ASIA + e \quad \textbf{(5.1)}$$

In the profitability dataset, 10 of the 281 observations record ownership that sums to 100%; the mean total ownership percentage of the firm for which we have accounted is 59.2%. Therefore, testing regional foreign ownership variables alone, as we do in Eq. (5.1) should not produce significantly different coefficients on the control variables than Eq. (4.1); we simply use Eq. (5.1) as model for comparison.

$$NetIncomeUS\$ = b_0 + b_1\%DOM + b_2\%FOR + e \quad \textbf{(6.1)}$$

Eq. (6.1) substitutes the variable %FOR—total foreign ownership as a percentage of total capital in each company—for all regional ownership variables. Like in Eq. (4.1) we include the %DOM variable to compare foreign ownership's effects with domestic ownership's effects.

We also use one variation of Eq. (6.1), in which we test only firms whose total foreign ownership is a controlling interest, or greater than or equal to 25% of the company's total capital. We include the %DOM variable in this variation as well.

All of our six models, Eq. (1.8) – Eq. (6.1), are tested using the aggregate WorldScope dataset described in the previous section and on an industry-specific level. The industry-specific tests are based on the fifteen industry headings assigned to companies by the Bureau of Economic Analysis using four-digit SIC codes. Thus, sixteen total regressions are performed for each of the six models—one aggregate and fifteen industry-specific. For complete regression results, consult Appendix B.

In order to interpret the results in Appendix B, one further step is necessary. The models generate coefficients for each of the regional ownership and total foreign ownership variables assuming all other variables are held constant. We must understand, however, that an increase in one form of ownership in a firm (or a change in one control variable) requires an equivalent decrease in another form of ownership. The sum of all ownership types cannot exceed 100%.

$$\sum(\%DOM + \%NOAM + \%SOAM + \%EUR + \%ASIA) = 100\%$$

and

$$\sum(\%DOM + \%FOR) = 100\%$$

With Eq. (2.4), and Eq. (3.4), total factor productivity tests which omit the variable %DOM, we use the value of β_0 in place of %DOM, because β_0 is understood to be the sum of %DOM plus all other unmeasured ownership. For all other tests, of both total factor productivity and profitability, we use %DOM, with the exception of Eq. (5.1), where no value representing domestic ownership or other unmeasured ownership is generated.

Thus, to complete the analysis we constructed matrices using the coefficients on each of the control variables generated by our tests. The matrices measure the resultant

change in total factor productivity and profitability when a one percent change in one form of ownership is combined with a one percent decrease in another. Matrices with statistically significant results, organized by industry, are presented in Appendix C and their results are reported in the next section.

V. Results

Total Factor Productivity

Our results for tests of total factor productivity are summarized in Table 5 and discussed in depth in the pages that follow.

Table 5
Total Factor Productivity:
10% exchange out of non-foreign hands and into other form of ownership

Industry	Ownership type	Effect	Amount
Aggregate	Controlling Foreign	decrease	4.93%
Electrical	Asian	decrease	30.20%
Electrical	European	decrease	8.78%
Electrical	Foreign	decrease	3.68%
Transportation Equipment	European + Foreign	decrease	10.80%
Banking	North American	increase	15.02%
Banking	Controlling Foreign	decrease	14.87%
Agriculture	European	increase	13.80%
Agriculture	Foreign	increase	11.19%
Retail Trade	European + Foreign	decrease	4.77%
Retail Trade	Controlling Foreign	decrease	10.74%
Financial Services	South American	decrease	2.72%
Food	North American	decrease	9.42%

On an aggregate level, our results do not indicate that foreign ownership has a significant effect on a firm's total factor productivity (TFP). Aggregate level regressions of Eq. (1.8), Eq. (2.4), and Eq. (3.4) show no regional foreign ownership variables with coefficients significantly different from zero at the $p<0.10$ level.

A variation of Eq. (3.4), which reduces the sample size by testing only those firms with a controlling interest, or total foreign ownership greater than or equal to 25% of the

total capital (n=66), shows foreign ownership as a whole leading to a modest decrease in productivity, with a ten percent increase in foreign ownership above the controlling interest of 25%, coupled with a ten percent decrease in non-foreign ownership, decreasing total factor productivity by 4.93% ($p<0.10$).

Our study consists of observations drawn from 180 firms operating in fifteen different industries, which range from agriculture to financial services to wholesale. Some of these industries are more labor intensive—others more capital intensive. The aggregate regression assumes the same production function exists in all, a single model encapsulating all the variations in industry-specific uses of the factor inputs. As a result, it was unlikely that firm level data from such an assortment of industries would exhibit significant results on an aggregate level.

On an industry-specific level, we see more revealing results. Five industries show both foreign ownership as a whole and foreign ownership disaggregated by region of origin having significant effects on total factor productivity. These five industries are the electrical industry, the transportation equipment industry, banking, agriculture, and retail trade. In two industries, food and financial services, we see regional foreign ownership variables, but not foreign ownership as a whole, having a significant effect on total factor productivity. We see from these seven industries that the Cobb-Douglas model can capture industry-specific variations in the use of factor inputs quite nicely.

In the electrical industry, we find South American, European and Asian ownership all decreasing total factor productivity. Asian ownership shows the greatest negative effect on TFP, with a ten percent increase in Asian ownership, coupled with a ten percent decrease in non-foreign ownership, decreasing TFP by 30.20% ($p<0.05$). We

also see that shifting ownership (a ten percent exchange) out of non-foreign hands and into European hands decreases total factor productivity by 8.78% ($p<0.05$); the same shift to South American hands decreases TFP by a more modest 3.81% ($p<0.10$).

When we observe only foreign ownership as a whole in the electrical industry we see a small negative effect on TFP, with a ten percent increase in foreign ownership, coupled with a ten percent decrease in non-foreign ownership, decreasing TFP by 3.68% ($p<0.10$). Our results indicate that if foreign ownership is shifted out of Asian hands and into European or South American hands, or if European ownership is shifted into South American hands, we would see foreign ownership increasing productivity.

In the transportation equipment industry, we see European ownership and foreign ownership as a whole decreasing total factor productivity. A ten percent shift of ownership from non-foreign owners to European owners decreases TFP by 10.79% ($p<0.05$). Almost identical is a shift from non-foreign to foreign ownership, with a ten percent shift leading to a 10.81% ($p<0.05$) decrease in TFP.

Our results indicate that North American ownership appears to be increasing productivity in South American banks. Here, a ten percent increase in North American ownership, coupled with a ten percent decrease in non-foreign ownership, increases TFP by 15.02% ($p<0.10$). When coupled with a ten percent decrease in South American ownership, which our results indicate has a negative effect on TFP, we see a ten percent increase in North American ownership increasing TFP by 17.38% ($p<0.10$). These results are confounded, however, by the results of Eq. (3.4) when foreign ownership is greater than or equal to 25% of the firm's total equity. In this case, we see a ten percent increase in foreign ownership, coupled with a ten percent decrease in non-foreign ownership,

decreasing TFP by 14.87%. Not surprisingly, though, a closer look shows that of the fourteen observations of banking industry firms with foreign ownership greater than or equal to 25% only one has North American ownership greater than 25%, while thirteen have European or South American ownership greater than 25%. A shift in this dynamic towards more North American controlling ownership could enhance the productivity of South American banks and show a positive relationship between foreign ownership as a whole and total factor productivity.

European ownership appears to increase total factor productivity in the agriculture industry. A ten percent increase in European ownership in the agriculture industry, coupled with a ten percent decrease in non-foreign ownership, increases TFP by 13.80% ($p<0.05$). The results of Eq. (3.4) bolster the evidence, indicating that a ten percent increase in foreign ownership, coupled with a ten percent decrease in non-foreign ownership, increases TFP by 11.19% ($p<0.10$). While North American ownership shows no effect on TFP, we are led to believe that foreign ownership, European in particular, enhances productivity in this industry.

In the retail trade industry, we see that European ownership decreases total factor productivity. A ten percent shift out of non-foreign, North American or South American hands and into European hands decreases TFP by 4.76% ($p<0.10$). Results from Eq. (3.4) and Eq. (3.4) with foreign ownership greater than 25% also indicate that foreign ownership as a whole decreases total factor productivity, with a ten percent shift out of non-foreign hands into foreign hands decreasing TFP by 4.77% ($p<0.10$) and 10.74% ($p<0.10$) respectively. In this case, our results indicate that a controlling foreign

ownership interest more than doubles the decrease in total factor productivity caused by solely the presence of foreign ownership.

A ten percent increase in South American ownership, coupled with a ten percent decrease in non-foreign ownership in the financial services industry, leads to a 2.72% decrease ($p<0.10$) in total factor productivity. While not particularly large, the effect of South American ownership in this industry is almost identical to that of South American ownership in the banking industry, mainly because many banks in our study are also classified as financial services firms.

In the food industry, we see North American ownership leading to decreased total factor productivity. Here, a ten percent increase in North American ownership, coupled with a ten percent decrease in non-foreign ownership, decreases total factor productivity by 9.42% ($p<0.10$).

We have seen, with the exception of the agriculture industry, that foreign ownership as a whole decreases total factor productivity in these seven industries and on an aggregate level, with the exception of the agriculture industry. We have also seen that regional foreign ownership variables decrease total factor productivity, with exceptions in the banking and agriculture industries.

Profitability

Our results for tests of profitability are summarized in Table 6 and discussed in depth in the pages that follow.

Table 6
Profitability:
10% exchange out of domestic hands and into other form of ownership

Industry	Ownership type	Effect	Amount	Percent of median industry net income
Aggregate	North American	increase	$8,630	0.10%
Electrical	South American	increase	$1,310	0.01%
Banking	European	increase	$5,300	0.04%
Banking	Foreign	decrease	$2,850	0.02%
Retail Trade	South American	increase	$112,990	1.10%
Financial Services	South American	increase	$1,170	0.01%
Chemicals	Foreign	increase	$358,740	29.30%
Construction	European	decrease	$2,020	0.04%
Transportation	Foreign	increase	$156,400	2.30%
Wholesale	Controlling Foreign	decrease	$494,700	5.70%

On an aggregate level, we see evidence of foreign ownership leading to increased profitability. Our results indicate that a ten percent increase in North American ownership, coupled with a ten percent decrease in domestic ownership, will increase net income by US$8,630. This is a minuscule effect, however, as it is only 0.10% of the median net income of all firms in this sample, US$8,747,000.

Of the seven industries in which we found significant results in our tests of total factor productivity, four yielded significant results in tests of foreign ownership's effects on profitability: the electrical, banking, retail trade, and financial services industries. In addition to these four, four other industries in which we did not observe significant foreign ownership effects on total factor productivity yielded statistically significant profitability results: the chemicals, construction, transportation, and wholesale industries.

In the electrical industry, where we find negative effects caused by domestic ownership and South American ownership, a ten percent increase in South American ownership, coupled with a ten percent decrease in domestic ownership, would increase net income by US$1310 ($p<0.10$). This figure is also minuscule, only 0.014% of the median net income in this industry for our sample, US$9,422,000.

A ten percent increase in European ownership, coupled with a ten percent decrease in domestic ownership in the banking industry, would decrease net income by US$5,300 ($p<0.05$). A ten percent increase in foreign ownership as whole decreases net income by US$2850 ($p<0.10$). These are incredibly small figures, 0.04% and 0.02% respectively, of the median net income in the banking industry for our sample, US$13,367,000.

In the retail trade industry, we see more pronounced positive effects, with a ten percent increase in South American ownership, coupled with a ten percent decrease in domestic ownership, increasing net income by US$112,990 ($p<0.05$). However this is still a very small figure—only 1.1% of the median net income in the retail trade industry for our sample, US$10,383,000.

South American ownership increases profitability in the financial services industry, where our results show a ten percent increase in South American ownership, coupled with a ten percent decrease in domestic ownership, increasing net income by US$1170 ($p<0.10$). Again, this figure is minuscule, 0.009% of the median net income in an industry for our sample, US$13,367,000.

In the chemicals industry, a ten percent increase in foreign ownership, coupled with a ten percent decrease in non-foreign ownership, leads to an increase in net income of US$358,740 ($p<0.10$). With the median net income in the chemicals industry for our sample being US$1,224,000, an increase of US$358,740, therefore is equal to a 29.3% increase in net income, certainly a substantial effect.

While the sample size is very small in the other three industries, the transportation and wholesale industries show evidence of strong effects on profitability caused by

foreign ownership. The construction industry, however, shows a very small effect, with a ten percent exchange of ownership from non-foreign to European hands decreasing net income by US$2,020 ($p<0.10$), or 0.04% of the median net income of US$5,203,000 in the construction industry for our sample.

In the transportation industry a ten percent increase in foreign ownership, coupled with a ten percent decrease in non-foreign ownership, leads to an increase in net income of US$156,400; in the wholesale industry, Eq. (6.1)—where foreign ownership is a controlling interest—indicates a ten percent exchange from domestic ownership to foreign ownership leading to a decrease in net income of US$494,700. In both cases however, these figures are still small percentage changes, 2.3% and 5.7% respectively, relative to the median net incomes in our sample for the two industries, US$6,804,000 and US$8,692,000.

With the one exception of the chemicals industry, our profitability results indicate that both regional foreign ownership variables and foreign ownership as a whole do not lead to significantly increased profitability in the other seven industries and on an aggregate level.

VI. Conclusions

This study has sought to answer the question: "If we measure a firm's performance by how productively it uses its resources (total factor productivity), or by its overall profitability, does the presence of foreign ownership in South American firms improve their performance?" By using the firm-level data of 180 companies in five South American countries we have found little evidence that regional foreign ownership variables or foreign ownership as a whole improve performance, both on an aggregate and industry-specific level.

In the banking industry, we did see North American ownership increasing total factor productivity. We also saw European ownership increasing total factor productivity in the agriculture industry. All other regional foreign ownership variables led to decreases in total factor productivity in the electrical, transportation equipment, food, financial services, and retail trade industries.

Only in the agriculture industry did foreign ownership as a whole increase total factor productivity and even so, by a very modest amount. On an aggregate level and in the electrical, transportation equipment, banking, and retail trade industries, foreign ownership as a whole decreased total factor productivity.

With the exception of the chemicals industry, in which foreign ownership as a whole increased profitability considerably, both regional foreign ownership variables and foreign ownership as a whole did not significantly affect profitability in the electrical, banking, retail trade, financial services, construction, transportation, and wholesale industries. We did see effects in these industries, but when the effects are considered relative to the actual net income of firms in the industry, the results are too small to

suggest that regional foreign ownership variables or foreign ownership as a whole exhibit any significant effects on profitability.

Perhaps with more complete ownership information for all the firms we tested—the mean total ownership percentage of the firm for which we have accounted in all tests is about 59%—we might have found different or more pronounced results. Until the resources to locate detailed information for all companies internationally, public and private, are easily accessible to individual scholars, such analysis may not be possible.

In section two we established the motivations behind firms entering markets using OLI theory. Our results suggest that in the case of South America, the overseas disadvantages foreign owners face may still outweigh the ownership advantages they seek to exploit to improve firm performance under the OLI paradigm.

This is not to say that foreign owners are making the wrong decision to enter South American markets or that their presence is disadvantageous to firms and industries in the host countries. On the contrary, foreign owners and their investments may be generating technology spillovers and creating structural changes that ultimately benefit the industries in which they operate and the host countries in which they are located. Only with adequate data for research and development expenditure by the firms we have studied could we have determined whether or not this was the case. Unfortunately, our data did not permit such analysis but if obtained could be the foundation for future research.

The OLI paradigm remains silent on profitability as a motivation for entering a market, focusing instead on transaction costs; we used resource-based theory to illustrate, with profitability measurements, whether or not there is any evidence of foreign

ownership increasing competitive advantage. Again, with the exception of the chemicals industry, we did not see any evidence that this was the case.

For a deeper analysis of the motivations behind the entry of foreign owners into South American markets by investing in the firms we have studied—beyond the motivations suggested in sections one and two of this study—data and research well beyond the resources used for this study would be required. A study of the foreign owners themselves, and not the firms in which they have invested, which would delve into analysis of the operations of foreign parent companies could serve as the framework for future research detailing the motivations for entry into South America.

Given the bleak forecast for foreign direct investment in South America presented by the current world economy, we are left awaiting the results of the future activities of foreign owners in Argentina, Brazil, Chile, Colombia and Peru, in order to discover whether their ownership presence in multinational enterprises in these countries may ultimately lead to enhanced productivity and profitability.

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Appendix A
WorldScope Dataset Characteristics:
Total Factor Productivity Test

Table 1A
Total Observations by Country

Country	Number of Observations	Number with Foreign Ownership	Number with Foreign Ownership >25%
Argentina	11	5	5
Brazil	95	21	9
Chile	116	73	23
Colombia	21	10	6
Peru	53	36	23
Total:	296	145	66

Table 2A
Total Observations By Industry

Industry	Number of Observations	Number with Foreign Ownership
Mining	28	17
Utilities	79	30
Food	30	18
Chemicals	22	2
Metal	34	16
Machinery	5	1
Electrical	15	6
Transportation Equipment	18	6
Wholesale	30	17
Banking	34	22
Financial Services	45	27
Agricultural	15	7
Construction	10	7
Transportation	7	3
Retail Trade	18	13

Table 3A
Total Companies By Country

Country	Number of companies	Number with Foreign Ownership	Number with Foreign Ownership >25%
Argentina	6	3	3
Brazil	62	13	5
Chile	70	42	13
Colombia	13	6	3
Peru	29	20	12
Total:	180	84	36

Appendix A

Table 4A
Total Companies By Industry (Argentina, Brazil, Chile, Colombia, Peru)

Industry	Number of companies	Number with Foreign Ownership
Mining	19	12
Utilities	47	17
Food	18	10
Chemicals	15	2
Metal	20	10
Machinery	4	1
Electrical	9	3
Transportation Equipment	10	3
Wholesale	18	9
Banking	21	12
Financial Services	26	15
Agricultural	9	4
Construction	6	4
Transportation	5	2
Retail Trade	10	7

Table 5A
Argentina Total Companies By Industry

Industry	Number of companies	Number with Foreign Ownership
Mining	0	0
Utilities	2	0
Food	0	0
Chemicals	1	0
Metal	1	0
Machinery	1	1
Electrical	0	0
Transportation Equipment	1	1
Wholesale	1	1
Banking	1	1
Financial Services	0	0
Agricultural	1	1
Construction	1	1
Transportation	0	0
Retail Trade	1	1

Appendix A

Table 6A
Brazil Total Companies By Industry

Industry	Number of companies	Number with Foreign Ownership
Mining	3	1
Utilities	19	4
Food	1	0
Chemicals	6	0
Metal	9	5
Machinery	2	0
Electrical	3	0
Transportation Equipment	8	1
Wholesale	5	1
Banking	7	1
Financial Services	4	0
Agricultural	3	0
Construction	0	0
Transportation	2	1
Retail Trade	2	1

Table 7A
Chile Total Companies By Industry

Industry	Number of companies	Number with Foreign Ownership
Mining	7	5
Utilities	22	10
Food	13	9
Chemicals	6	2
Metal	5	3
Machinery	1	0
Electrical	4	1
Transportation Equipment	1	1
Wholesale	6	3
Banking	4	4
Financial Services	13	8
Agricultural	4	3
Construction	4	2
Transportation	3	1
Retail Trade	5	3

Appendix A

Table 8A
Colombia Total Companies By Industry

Industry	Number of companies	Number with Foreign Ownership
Mining	1	1
Utilities	0	0
Food	2	0
Chemicals	1	0
Metal	1	0
Machinery	0	0
Electrical	0	0
Transportation Equipment	0	0
Wholesale	2	2
Banking	3	1
Financial Services	1	0
Agricultural	1	0
Construction	1	1
Transportation	0	0
Retail Trade	1	1

Table 9A
Peru Total Companies By Industry

Industry	Number of companies	Number with Foreign Ownership
Mining	8	5
Utilities	4	3
Food	2	1
Chemicals	1	0
Metal	4	2
Machinery	0	0
Electrical	2	2
Transportation Equipment	0	0
Wholesale	4	2
Banking	5	4
Financial Services	8	7
Agricultural	0	0
Construction	0	0
Transportation	0	0
Retail Trade	1	1

Appendix B
Results of All Regressions: Aggregate and Industry-Specific

Table 1B
Aggregate: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.062	-	-	-	-0.213	-	-0.233	0.160
	(0.121)	-	-	-	(0.164)	-	(0.164)	(0.625)
North American	-0.181	-0.229	-	-	0.703[b]	0.863[a]	-	-
	(0.252)	(0.234)	-	-	(0.377)	(0.357)	-	-
South American	-0.196	-0.236	-	-	-0.084	0.043	-	-
	(0.250)	(0.237)	-	-	(0.357)	(0.344)	-	-
European	0.092	0.058	-	-	-0.238	-0.111	-	-
	(0.166)	(0.152)	-	-	(0.252)	(0.233)	-	-
Asian	-0.460	-0.556	-	-	-0.070	0.299	-	-
	(1.675)	(1.662)	-	-	(2.439)	(2.426)	-	-
Foreign	-	-	-0.073	-0.318[b]	-	-	-0.014	-0.027
	-	-	(0.120)	(0.205)	-	-	(0.207)	(0.531)
? K	0.095	0.094	0.086	0.393[a]	-	-	-	-
	(0.073)	(0.073)	(0.073)	(0.100)	-	-	-	-
? L	0.444[a]	0.445[a]	0.434[a]	0.118	-	-	-	-
	(0.085)	(0.085)	(0.084)	(0.159)	-	-	-	-
Constant	0.060	0.085[a]	0.085[a]	0.175[b]	148.041[a]	136.616[a]	150.203[a]	143.834[a]
	(0.058)	(0.029)	(0.029)	(0.099)	(10.451)	(5.659)	(10.385)	(38.064)
R^2	0.098	0.097	0.091	0.255	0.028	0.022	0.009	0.002
N	296	296	296	66	281	281	281	65

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 2B
Agriculture: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.377	-	-	-	0.612	-	0.630	-
	(0.244)	-	-	-	(0.755)	-	(0.690)	-
North American	-0.082	-0.637	-	-	0.079	1.532	-	-
	(1.263)	(1.292)	-	-	(6.649)	(6.302)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	1.478[a]	1.380[a]	-	-	-0.481	-0.577	-	-
	(0.539)	(0.571)	-	-	(2.219)	(2.181)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	1.119[b]	-	-	-	-0.448	-
	-	-	(0.574)	-	-	-	(2.084)	-
? K	0.732[a]	0.731[a]	0.739[a]	-	-	-	-	-
	(0.131)	(0.140)	(0.148)	-	-	-	-	-
? L	0.220	0.149	0.076	-	-	-	-	-
	(0.148)	(0.151)	(0.150)	-	-	-	-	-
Constant	0.168	0.018	0.010	-	95.593[b]	130.085[a]	95.134[a]	-
	(0.109)	(0.051)	(0.054)	-	(49.080)	(24.069)	(46.520)	-
R^2	0.871	0.837	0.801	-	0.075	0.014	0.074	-
N	15	15	15	-	14	14	14	-

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 3B
Banking: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.268	-	-	-	-1.183[b]	-	-0.995[b]	-2.467[a]
	(0.243)	-	-	-	(0.639)	-	(0.587)	(1.088)
North American	1.276[b]	1.502[b]	-	-	-2.415	-0.306	-	-
	(0.771)	(0.746)	-	-	(2.102)	(1.839)	-	-
South American	-0.462[b]	-0.292	-	-	-1.023	-0.222	-	-
	(0.275)	(0.229)	-	-	(0.687)	(0.556)	-	-
European	-0.121	0.083	-	-	-1.713[a]	-0.877[b]	-	-
	(0.297)	(0.233)	-	-	(0.685)	(0.536)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.008	-1.010[a]	-	-	-1.280[a]	-1.612[b]
	-	-	(0.184)	(0.433)	-	-	(0.582)	(0.927)
? K	0.469[a]	0.458[a]	0.423[a]	0.527[a]	-	-	-	-
	(0.097)	(0.097)	(0.107)	(0.191)	-	-	-	-
? L	-0.032	0.021	0.116	-0.285	-	-	-	-
	(0.300)	(0.297)	(0.258)	(0.372)	-	-	-	-
Constant	0.0148	-0.085	-0.043	0.477[b]	230.584[a]	149.457[a]	213.810[a]	256.701[a]
	(0.135)	(0.062)	(0.068)	(0.226)	(48.135)	(20.776)	(42.143)	(74.810)
R^2	0.542	0.521	0.361	0.597	0.185	0.085	0.139	0.303
N	34	34	34	14	33	33	33	15

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 4B
Chemicals: Result s by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.131	-	-	-	0.064	-	0.041	-
	(0.246)	-	-	-	(0.536)	-	(0.518)	-
North American	2.413	-2.525	-	-	74.822	71.878	-	-
	(28.079)	(25.935)	-	-	(74.284)	(68.585)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	1.148	1.293	-	-	15.827	15.917	-	-
	(16.062)	(15.718)	-	-	(41.443)	(40.538)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.180	-	-	-	35.874[b]	-
	-	-	(6.607)	-	-	-	(19.773)	-
? K	0.639[a]	0.612[a]	0.612[a]	-	-	-	-	-
	(0.201)	(0.189)	(0.184)	-	-	-	-	-
? L	0.396	0.361	0.361	-	-	-	-	-
	(0.273)	(0.260)	(0.253)	-	-	-	-	-
Constant	0.089	0.138[a]	0.137[a]	-	111.737[a]	114.591[a]	113.493[a]	-
	(0.106)	(0.052)	(0.050)	-	(30.110)	(18.017)	(28.731)	-
R^2	0.409	0.398	0.398	-	0.145	0.145	0.143	-
N	22	22	22	-	26	26	26	-

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 5B
Construction: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	42.605	-	-	-	14.715	-	0.408	-
	(53.265)	-	-	-	(13.189)	-	(0.881)	-
North American	-93.747	-0.874	-	-	-40.375	-0.344	-	-
	(116.120)	(1.384)	-	-	(35.837)	(2.634)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	10.056	-0.291	-	-	1.420	-2.020[b]	-	-
	(12.953)	(0.640)	-	-	(3.265)	(1.125)	-	-
Asian	-6.821	-0.719	-	-	3.162	3.373	-	-
	(7.919)	(2.026)	-	-	(3.152)	(3.196)	-	-
Foreign	-	-	-0.377	-	-	-	-0.758	3.238
	-	-	(0.474)	-	-	-	(0.760)	(2.348)
? K	1.921	0.297	0.300	-	-	-	-	-
	(2.054)	(0.301)	(0.224)	-	-	-	-	-
? L	0.136	2.184	2.037[b]	-	-	-	-	-
	(2.860)	(1.218)	(0.920)	-	-	-	-	-
Constant	-4.069	0.279	0.254[b]	-	19.900	182.860[a]	170.164[a]	-69.957
	(5.439)	(0.172)	(0.128)	-	(147.908)	(26.970)	(32.037)	(138.838)
R^2	0.630	0.5513	0.522	-	0.405	0.298	0.149	0.488
N	10	10	10	-	12	12	12	4

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 6B
Electrical: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.008	-	-	-	-1.416[a]	-	-0.992[b]	-
	(0.170)	-	-	-	(0.607)	-	(0.560)	-
North American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
South American	-0.215	-0.211[b]	-	-	-1.285[b]	-0.649	-	-
	(0.160)	(0.125)	-	-	(0.605)	(0.649)	-	-
European	-0.707[a]	-0.708[a]	-	-	-0.579	-0.654	-	-
	(0.250)	(0.234)	-	-	(1.091)	(1.310)	-	-
Asian	-2.881[b]	-2.851[a]	-	-	-12.475	-5.706	-	-
	(1.394)	(1.169)	-	-	(7.675)	(8.535)	-	-
Foreign	-	-	-0.252[b]	-	-	-	-0.903	-0.646
	-	-	(0.150)	-	-	-	(0.554)	(2.256)
? K	0.329[a]	0.327[a]	0.353[a]	-	-	-	-	-
	(0.134)	(0.123)	(0.154)	-	-	-	-	-
? L	-0.216	-0.218	-0.117	-	-	-	-	-
	(0.164)	(0.152)	(0.183)	-	-	-	-	-
Constant	0.173[b]	0.170[a]	0.116[b]	-	251.462[a]	187.875[a]	221.486[a]	187.581
	(0.080)	(0.046)	(0.053)	-	(36.435)	(29.013)	(31.856)	(178.078)
R^2	0.706	0.706	0.429	-	0.447	0.114	0.285	0.039
N	15	15	15	-	14	14	14	4

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 7B
Financial Services: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.026	-	-	-	0.357	-	0.256	0.489
	(0.114)	-	-	-	(0.473)	-	(0.475)	(2.313)
North American	-0.038	-0.015	-	-	2.135	1.772	-	-
	(0.315)	(0.295)	-	-	(1.529)	(1.443)	-	-
South American	-0.287[b]	-0.272[b]	-	-	1.170[b]	0.984[b]	-	-
	(0.172)	(0.158)	-	-	(0.672)	(0.622)	-	-
European	0.083	0.093	-	-	-0.052	-0.220	-	-
	(0.128)	(0.118)	-	-	(0.560)	(0.510)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.027	-0.142	-	-	0.467	1.358
	-	-	(0.099)	(0.290)	-	-	(0.484)	(1.239)
? K	0.382[a]	0.381[a]	0.362[a]	-0.091	-	-	-	-
	(0.090)	(0.089)	(0.089)	(0.176)	-	-	-	-
? L	-0.048	-0.048	-0.048	0.105	-	-	-	-
	(0.092)	(0.091)	(0.093)	(0.271)	-	-	-	-
Constant	0.024	0.014	0.021	0.095	117.420[a]	135.333[a]	124.527[a]	57.216
	(0.051)	(0.029)	(0.029)	(0.152)	(28.447)	(15.573)	(27.781)	(90.627)
R^2	45	0.358	0.294	0.086	0.102	0.089	0.630	0.119
N	0.359	45	45	12	45	45	45	12

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 8B
Food: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.071	-		-	-0.581	-	-0.661	-0.444
	(0.215)	-		-	(0.477)	-	(0.438)	(0.936)
North American	-0.689	-0.796[b]		-	0.720	1.691	-	-
	(0.537)	(0.419)		-	(1.420)	(1.185)	-	-
South American	-0.100	-0.192		-	0.588	1.444	-	-
	(0.463)	(0.360)		-	(1.239)	(1.029)	-	-
European	-0.132	-0.190		-	0.103	0.585	-	-
	(0.323)	(0.267)		-	(0.810)	(0.712)	-	-
Asian	-	-		-	-	-	-	-
	-	-		-	-	-	-	-
Foreign	-	-	-0.287	0.211	-	-	0.230	-0.422
	-	-	(0.218)	(0.326)	-	-	(0.745)	(1.152)
? K	0.905[a]	0.900[a]	0.946[a]	1.089[b]	-	-	-	-
	(0.303)	(0.297)	(0.291)	(0.590)	-	-	-	-
? L	-0.002	-0.003	0.012	0.003	-	-	-	-
	(0.135)	(0.133)	(0.132)	(0.236)	-	-	-	-
Constant	0.110	0.146[a]	0.120[a]	-0.078	182.946[a]	143.604[a]	190.616[a]	222.0497[a]
	(0.121)	(0.054)	(0.051)	(0.125)	(35.926)	(15.921)	(31.659)	(62.930)
R^2	0.435	0.433	0.384	0.558	0.149	0.107	0.142	0.035
N	30	30	30	9	35	35	35	10

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 9B
Machinery: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-	-	-	-	7.425	-	-7.425	-
	-	-	-	-	(4.035)	-	(4.035)	-
North American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	-	0.765	-	-	-14.477	-0.024	-	-
	-	(0.427)	-	-	(7.914)	(1.295)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	0.580	-	-	-	-10.241	-
	-	-	(0.323)	-	-	-	(5.598)	-
? K	-	-0.598	-0.598	-	-	-	-	-
	-	(0.277)	(0.277)	-	-	-	-	-
? L	-	0.307	0.307	-	-	-	-	-
	-	(0.067)	(0.067)	-	-	-	-	-
Constant	-	0.287[b]	0.287[b]	-	856.078	153.667[a]	856.078	-
	-	(0.049)	(0.049)	-	(382.871)	(39.818)	(382.872)	-
R^2	-	0.960	0.960	-	0.629	0.000	0.629	-
N	-	5	5	-	5	5	5	-

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 10B
Metal: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.403	-	-	-	0.386	-	0.008	-
	(0.258)	-	-	-	(0.644)	-	(0.616)	-
North American	-0.326	-0.052	-	-	1.488[b]	1.270[b]	-	-
	(0.339)	(0.298)	-	-	(0.779)	(0.679)	-	-
South American	-0.284	-0.025	-	-	0.710	0.523	-	-
	(0.291)	(0.246)	-	-	(0.639)	(0.549)	-	-
European	1.209	2.824	-	-	16.376[b]	14.478[b]	-	-
	(2.824)	(2.697)	-	-	(8.724)	(7.979)	-	-
Asian	-0.368	-0.267	-	-	5.597	5.668	-	-
	(2.018)	(2.070)	-	-	(5.847)	(5.760)	-	-
Foreign	-	-	-0.055	-1.892	-	-	0.660	0.661
	-	-	(0.195)	(2.586)	-	-	(0.556)	(1.022)
? K	-0.114	-0.078	-0.071	0.440	-	-	-	-
	(0.121)	(0.122)	(0.117)	(2.352)	-	-	-	-
? L	0.708[a]	0.617[b]	0.552[b]	2.222	-	-	-	-
	(0.333)	(0.336)	(0.314)	(0.967)	-	-	-	-
Constant	0.283[a]	0.126[a]	0.135[a]	1.270	53.170	70.043[a]	86.890[a]	79.782
	(0.117)	(0.062)	(0.055)	(1.728)	(34.192)	(19.168)	(30.475)	(85.620)
R^2	0.217	0.144	0.106	0.772	0.233	0.220	0.076	0.123
N	34	34	34	6	27	27	27	5

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 11B
Mining: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.245	-	-	-	-0.466	-	-0.613	-
	(0.933)	-	-	-	(0.546)	-	(0.517)	-
North American	-0.456	-0.625	-	-	0.317	0.658	-	-
	(1.040)	(0.799)	-	-	(0.822)	(0.715)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	12.050	10.734	-	-	7.823	10.977	-	-
	(9.791)	(8.228)	-	-	(10.326)	(9.600)	-	-
Asian	3.360	3.148	-	-	-14.732	-14.235	-	-
	(15.356)	(15.007)	-	-	(13.056)	(12.982)	-	-
Foreign	-	-	-0.705	-	-	-	0.215	4.497
	-	-	(0.795)	-	-	-	(0.793)	(2.061)
? K	-2.580[a]	-2.616[a]	-2.548[a]	-	-	-	-	-
	(0.605)	(0.576)	(0.573)	-	-	-	-	-
? L	0.045	-0.092	-0.223	-	-	-	-	-
	(1.015)	(0.852)	(0.846)	-	-	-	-	-
Constant	0.004	0.089	0.165	-	132.565[a]	110.277[a]	139.110[a]	-204.063
	(0.383)	(0.199)	(0.189)	-	(33.252)	(20.537)	(28.8645)	(148.383)
R^2	0.499	0.498	0.453	-	0.134	0.111	0.068	0.704
N	28	28	28	-	33	33	33	4

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 12B
Retail Trade: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.111	-	-	-	-1.450	-	-0.825	1.177
	(0.240)	-	-	-	(0.909)	-	(1.000)	(1.680)
North American	0.083	0.003	-	-	3.048[b]	2.394	-	-
	(0.440)	(0.391)	-	-	(1.778)	(1.840)	-	-
South American	0.520	0.285	-	-	7.595	11.299[a]	-	-
	(1.207)	(1.056)	-	-	(5.148)	(4.895)	-	-
European	-0.394	-0.476[b]	-	-	-2.333[b]	-1.259	-	-
	(0.319)	(0.256)	-	-	(1.080)	(0.901)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.386[b]	-0.834[a]	-	-	-1.847	-3.198
	-	-	(0.229)	(0.209)	-	-	(1.210)	(3.276)
? K	0.232[b]	0.231[b]	0.296[a]	0.465[a]	-	-	-	-
	(0.138)	(0.133)	(0.120)	(0.048)	-	-	-	-
? L	-0.031	-0.053	-0.079	-0.397[b]	-	-	-	-
	(0.142)	(0.129)	(0.124)	(0.149)	-	-	-	-
Constant	0.029	0.068	0.091[b]	0.240[a]	169.869[a]	108.072[a]	192.256[a]	222.014
	(0.103)	(0.058)	(0.053)	(0.070)	(47.245)	(29.127)	51.243	(165.254)
R^2	0.568	0.560	0.499	0.992	0.622	0.534	0.154	0.504
N	18	18	18	7	16	16	16	6

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 13B
Transportation: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.211	-	-	-	-1.662	-	-1.189	-
	(1.078)	-	-	-	(0.960)	-	(0.800)	-
North American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	4.883	4.710	-	-	10.439	17.549	-	-
	(3.853)	(2.702)	-	-	(8.635)	(9.301)	-	-
Asian	-0.431	-0.468	-	-	21.415[b]	17.690	-	-
	(4.342)	(3.125)	-	-	(9.048)	(10.760)	-	-
Foreign	-	-	2.453	-	-	-	15.640[b]	-
	-	-	(2.032)	-	-	-	(6.460)	-
? K	1.411	1.215[b]	1.890[a]	-	-	-	-	-
	(1.448)	(0.752)	(0.519)	-	-	-	-	-
? L	-0.116	0.103	-0.405	-	-	-	-	-
	(1.529)	(0.754)	(0.659)	-	-	-	-	-
Constant	-0.108	0.004[b]	-0.121	-	203.974[a]	120.250[a]	179.068[a]	-
	(0.619)	(0.169)	(0.140)	-	(57.474)	(38.017)	(49.955)	-
R^2	0.936	0.933	0.887	-	0.778	0.555	0.714	-
N	7	7	7	-	7	7	7	-

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 14B
Transportation Equipment: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	-0.325	-	-	-	1.740[b]	-	1.503	-
	(0.283)	-	-	-	(0.992)	-	(0.962)	-
North American	-1.207	-0.533	-	-	5.832	1.925	-	-
	(1.837)	(1.761)	-	-	(6.453)	(6.798)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	-1.215[a]	-0.909[a]	-	-	-0.225	-1.563	-	-
	(0.445)	(0.361)	-	-	(1.199)	(1.039)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.907[a]	-	-	-	-0.484	-
	-	-	(0.349)	-	-	-	(1.170)	-
? K	0.014	0.016	0.016	-	-	-	-	-
	(0.099)	(0.100)	(0.097)	-	-	-	-	-
? L	0.397	0.545[b]	0.541[b]	-	-	-	-	-
	(0.324)	(0.301)	(0.290)	-	-	-	-	-
Constant	0.310[a]	0.170[a]	0.174[a]	-	40.990	126.174[a]	63.248	-
	(0.136)	(0.061)	(0.056)	-	(55.440)	(30.032)	(50.697)	-
R^2	0.582	0.536	0.535	-	0.481	0.252	0.407	-
N	18	18	18	-	11	11	11	-

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix B

Table 15B
Utilities: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.187	-	-	-	-0.233	-	-0.239	-4.846
	(0.186)	-	-	-	(0.304)	-	(0.301)	(7.896)
North American	-0.155	-0.229	-	-	0.762	0.909	-	-
	(0.707)	(0.703)	-	-	(1.571)	(1.554)	-	-
South American	-57.005	-56.693	-	-	109.474	110.890	-	-
	(47.145)	(47.489)	-	-	(119.518)	(119.138)	-	-
European	0.292	0.207	-	-	0.070	0.177	-	-
	(0.239)	(0.223)	-	-	(0.539)	(0.519)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	0.081	1.103	-	-	0.312	-12.759
	-	-	(0.200)	(0.748)	-	-	(0.459)	(11.915)
? K	0.216[a]	0.224[a]	0.220[a]	0.192	-	-	-	-
	(0.098)	(0.097)	(0.097)	(0.182)	-	-	-	-
? L	0.736[a]	0.737[a]	0.723[a]	0.220	-	-	-	-
	(0.101)	(0.101)	(0.100)	(0.280)	-	-	-	-
Constant	0.050	0.134[a]	0.130[a]	-0.402	164.020[a]	150.310[a]	165.089[a]	1081.864
	(0.093)	(0.043)	(0.042)	(0.351)	(20.956)	(10.958)	(20.511)	(940.942)
R^2	0.446	0.438	0.426	0.247	0.036	0.027	0.023	0.306
N	79	79	79	14	71	71	71	11

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Table 16B
Wholesale: Results by Region

	OLS with Domestic Eq. (1.8)	OLS without Domestic Eq. (2.4)	OLS without Domestic Eq. (3.4)	OLS without Domestic Eq. (3.4) where %FOR = 25%	OLS for Profit with Domestic Eq. (4.1)	OLS for Profit without Domestic Eq. (5.1)	OLS for Profit with Domestic Eq. (6.1)	OLS for Profit with Domestic Eq. (6.1) where %FOR = 25%
Domestic	0.151	-	-	-	0.232	-	0.454	52.421[a]
	(0.204)	-	-	-	(0.514)	-	(0.557)	(15.187)
North American	0.063	-0.072	-	-	1.509[a]	1.332[a]	-	-
	(0.261)	(0.186)	-	-	(0.655)	(0.518)	-	-
South American	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
European	-0.013	-0.163	-	-	-0.217	-0.445	-	-
	(0.268)	(0.175)	-	-	(0.731)	(0.521)	-	-
Asian	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Foreign	-	-	-0.121	-0.261	-	-	0.845	2.951[a]
	-	-	(0.138)	(0.222)	-	-	(0.662)	(0.905)
? K	0.028	0.034	0.040	0.581[a]	-	-	-	-
	(0.088)	(0.087)	(0.084)	(0.113)	-	-	-	-
? L	0.338[a]	0.360[a]	0.364[a]	0.115	-	-	-	-
	(0.155)	(0.151)	(0.148)	(0.186)	-	-	-	-
Constant	-0.007	0.070[b]	0.069[b]	0.130	122.101[a]	136.779[a]	106.375[a]	-91.518
	(0.111)	(0.041)	(0.040)	(0.111)	(36.231)	(15.760)	(39.239)	(69.728)
R^2	0.249	0.232	0.227	0.831	0.249	0.243	0.058	0.674
N	30	30	30	10	30	30	30	10

[a] = Significant at 5% level
[b] = Significant at 10% level
Standard errors (denoted in parentheses)

Appendix C
Significant Matrices, By Industry

AGGREGATE

Eq. (3.4) where %FOR ≥ 25%
(n=66, r^2=0.255)

		-1%	
		Constant	Foreign
+1%	Constant	0	0.493[b]
	Foreign	-0.493[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (4.1)
(n=281, r^2=0.028)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	-0.703[b]	0	0	0
	North American	0.703[b]	0	0.703[b]	0.703[b]	0.703[b]
	South American	0	-0.703[b]	0	0	0
	European	0	-0.703[b]	0	0	0
	Asian	0	-0.703[b]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (5.1)
(n=281, r^2=0.022)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	0.863[a]	0.863[a]	0.863[a]
	South American	-0.863[a]	0	0	0
	European	-0.863[a]	0	0	0
	Asian	-0.863[a]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

AGRICULTURE

Eq. (1.8)
(n=15, r^2=0.871)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	0	-1.478[a]	0
	North American	0	0	0	-1.478[a]	0
	South American	0	0	0	-1.478[a]	0
	European	1.478[a]	1.478[a]	1.478[a]	0	1.478[a]
	Asian	0	0	0	-1.478[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (2.4)
(n=15, r^2=0.837)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0	0	-1.380[a]	0
	North American	0	0	0	-1.380[a]	0
	South American	0	0	0	-1.380[a]	0
	European	1.380[a]	1.380[a]	1.380[a]	0	1.380[a]
	Asian	0	0	0	-1.380[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

AGRICULTURE (CONTINUED)

Eq. (3.4)
(n=15, r^2=0.801)

		-1% Constant	-1% Foreign
+1%	Constant	0	-1.119[b]
	Foreign	1.119[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

BANKING

Eq. (1.8)
(n=34, r^2=0.542)

		-1% Domestic	-1% North American	-1% South American	-1% European	-1% Asian
+1%	Domestic	0	-1.276[b]	0.462[b]	0	0
	North American	1.276[b]	0	1.738[b]	1.276[b]	1.276[b]
	South American	-0.462[b]	-1.738[b]	0	-0.462[b]	-0.462[b]
	European	0	-1.276[b]	0.462[b]	0	0
	Asian	0	-1.276[b]	0.462[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (2.4)
(n=34, r^2=0.521)

		-1% Constant	-1% North American	-1% South American	-1% European	-1% Asian
+1%	Constant	0	-1.502[b]	0	0	0
	North American	1.502[b]	0	1.502[b]	1.502[b]	1.502[b]
	South American	0	-1.502[b]	0	0	0
	European	0	-1.502[b]	0	0	0
	Asian	0	-1.502[b]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (3.4) where %FOR ≥ 25%
(n=14, r^2=0.597)

		-1% Constant	-1% Foreign
+1%	Constant	0	1.487[b]
	Foreign	-1.487[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (4.1)
(n=33, r^2=0.185)

		-1% Domestic	-1% North American	-1% South American	-1% European	-1% Asian
+1%	Domestic	0	-1.183[a]	-1.183[a]	0.530[a]	-1.183[a]
	North American	1.183[a]	0	0	1.713[a]	0
	South American	1.183[a]	0	0	1.713[a]	0
	European	-0.530[a]	-1.713[a]	-1.713[a]	0	-1.713[a]
	Asian	1.183[a]	0	0	1.713[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

BANKING (CONTINUED)

Eq. (5.1)
(n=33, r^2=0.185)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	0	0.877[b]	0
	South American	0	0	0.877[b]	0
	European	-0.877[b]	-0.877[b]	0	-0.877[b]
	Asian	0	0	0.877[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (6.1)
(n=33, r^2=0.139)

		-1%	
		Constant	Foreign
+1%	Constant	0	0.285[b]
	Foreign	-0.285[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (6.1) where %FOR ≥ 25%
(n=15, r^2=0.303)

		-1%	
		Constant	Foreign
+1%	Constant	0	-0.855[b]
	Foreign	0.855[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

CHEMICALS

Eq. (6.1)
(n=26, r2=0.143)

		-1%	
		Constant	Foreign
+1%	Constant	0	-35.874[b]
	Foreign	35.874[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Appendix C

CONSTRUCTION

Eq. (5.1)
(n=12, r^2=0.298)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	0	2.020[b]	0
	South American	0	0	2.020[b]	0
	European	-2.020[b]	-2.020[b]	0	-2.020[b]
	Asian	0	0	2.020[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

ELECTRICAL

Eq. (1.8)
(n=15, r^2=0.706)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	0	0.707[a]	2.881[b]
	North American	0	0	0	0.707[a]	2.881[b]
	South American	0	0	0	0.707[a]	2.881[b]
	European	-0.707[a]	-0.707[a]	-0.707[a]	0	2.174[b]
	Asian	-2.881[b]	-2.881[b]	-2.881[b]	-2.174[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (2.4)
(n=15, r^2=0.706)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0.170[a]	0.381[b]	0.878[a]	3.02[a]
	North American	-0.170[a]	0	0.211[b]	0.708[a]	2.85[a]
	South American	-0.381[b]	-0.211[b]	0	0.497[b]	2.639[b]
	European	-0.878[a]	-0.708[a]	-0.497[b]	0	2.142[a]
	Asian	-3.020[a]	-2.85[a]	-2.639[b]	-2.142[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (3.4)
(n=15, r^2=0.429)

		-1%	
		Constant	Foreign
+1%	Constant	0	0.368[b]
	Foreign	-0.368[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (4.1)
(n=14, r^2=0.447)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	-1.416[a]	-0.131[b]	-1.416[a]	-1.416[a]
	North American	1.416[a]	0	1.285[b]	0	0
	South American	0.131[b]	-1.285[b]	0	-1.285[b]	-1.285[b]
	European	1.416[a]	0	1.285[b]	0	0
	Asian	1.416[a]	0	1.285[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Appendix C

FINANCIAL SERVICES

Eq. (1.8)
(n=45, r^2=0.359)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	0.287[b]	0	0
	North American	0	0	0.287[b]	0	0
	South American	-0.287[b]	-0.287[b]	0	-0.287[b]	-0.287[b]
	European	0	0	0.287[b]	0	0
	Asian	0	0	0.287[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (2.4)
(n=45, r^2=0.358)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0	0.272[b]	0	0
	North American	0	0	0.272[b]	0	0
	South American	-0.272[b]	-0.272[b]	0	-0.272[b]	-0.272[b]
	European	0	0	0.272[b]	0	0
	Asian	0	0	0.272[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (4.1)
(n=45, r^2=0.102)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	-1.170[b]	0	0
	North American	0	0	-1.170[b]	0	0
	South American	1.170[b]	1.170[b]	0	1.170[b]	1.170[b]
	European	0	0	-1.170[b]	0	0
	Asian	0	0	-1.170[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (5.1)
(n=45, r^2=0.089)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	-0.984[b]	0	0
	South American	0.984[b]	0	0.984[b]	0.984[b]
	European	0	-0.984[b]	0	0
	Asian	0	-0.984[b]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

FOOD

Eq. (2.4)
(n=30, r^2=0.433)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0.942[b]	0.146[a]	0.146[a]	0.146[a]
	North American	-0.942[b]	0	-0.796[b]	-0.796[b]	-0.796[b]
	South American	-0.146[a]	0.796[b]	0	0	0
	European	-0.146[a]	0.796[b]	0	0	0
	Asian	-0.146[a]	0.796[b]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Appendix C

METAL

Eq. (4.1)
(n=27, r^2=0.233)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	-1.488[b]	0	-16.376[b]	0
	North American	1.488[b]	0	1.488[b]	-14.888[b]	1.488[b]
	South American	0	-1.488[b]	0	-16.376[b]	0
	European	16.376[b]	14.888[b]	16.376[b]	0	16.376[b]
	Asian	0	-1.488[b]	0	-16.376[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (5.1)
(n=27, r^2=0.220)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	1.270[b]	-13.208[b]	1.270[b]
	South American	-1.270[b]	0	-14.478[b]	0
	European	13.208[b]	14.478[b]	0	14.478[b]
	Asian	-1.270[b]	0	-14.478[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

RETAIL TRADE

Eq. (2.4)
(n=18, r^2=0.560)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0	0	0.476[b]	0
	North American	0	0	0	0.476[b]	0
	South American	0	0	0	0.476[b]	0
	European	-0.476[b]	-0.476[b]	-0.476[b]	0	-0.476[b]
	Asian	0	0	0	0.476[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (3.4)
(n=18, r^2=0.499)

		-1%	
		Constant	Foreign
+1%	Constant	0	0.477[b]
	Foreign	-0.477[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (3.4) where %FOR is ≥ 25%
(n=7, r^2=0.992)

		-1%	
		Constant	Foreign
+1%	Constant	0	1.074[a]
	Foreign	-1.074[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (4.1)
(n=16, r^2=0.622)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	-3.048[b]	0	2.333[b]	0
	North American	3.048[b]	0	3.048[b]	5.381[b]	3.048[b]
	South American	0	-3.048[b]	0	2.333[b]	0
	European	-2.333[b]	-5.381[b]	-2.333[b]	0	-2.333[b]
	Asian	0	-3.048[b]	0	2.333[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

RETAIL TRADE (CONTINUED)

Eq. (5.1)
(n=16, r^2=0.534)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	-11.299[a]	0	0
	South American	11.299[a]	0	11.299[a]	11.299[a]
	European	0	-11.299[a]	0	0
	Asian	0	-11.299[a]	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

TRANSPORTATION

Eq. (4.1)
(n=7, r^2=0.778)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	0	0	-21.415[b]
	North American	0	0	0	0	-21.415[b]
	South American	0	0	0	0	-21.415[b]
	European	0	0	0	0	-21.415[b]
	Asian	21.415[b]	21.415[b]	21.415[b]	21.415[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (6.1)
(n=7, r^2=0.714)

		-1%	
		Constant	Foreign
+1%	Constant	0	-15.640[b]
	Foreign	15.640[b]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

TRANSPORTATION EQUIPMENT

Eq. (1.8)
(n=18, r^2=0.582)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	0	0	1.215[a]	0
	North American	0	0	0	1.215[a]	0
	South American	0	0	0	1.215[a]	0
	European	-1.215[a]	-1.215[a]	-1.215[a]	0	-1.215[a]
	Asian	0	0	0	1.215[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (2.4)
(n=18, r^2=0.536)

		-1%				
		Constant	North American	South American	European	Asian
+1%	Constant	0	0.170[a]	0.170[a]	1.079[a]	0.170[a]
	North American	-0.170[a]	0	0	0.909[a]	0
	South American	-0.170[a]	0	0	0.909[a]	0
	European	-1.079[a]	-0.909[a]	-0.909[a]	0	-0.909[a]
	Asian	-0.170[a]	0	0	0.909[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

TRANSPORTATION EQUIPMENT (CONTINUED)

Eq. (3.4)
($n=18, r^2=0.535$)

		-1%	
		Constant	Foreign
+1%	Constant	0	1.081[a]
	Foreign	-1.081[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level

WHOLESALE

Eq. (4.1)
($n=30, r^2=0.249$)

		-1%				
		Domestic	North American	South American	European	Asian
+1%	Domestic	0	-1.509[a]	0	0	0
	North American	1.509[a]	0	1.509[a]	1.509[a]	1.509[a]
	South American	0	-1.509[a]	0	0	0
	European	0	-1.509[a]	0	0	0
	Asian	0	-1.509[a]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (5.1)
($n=30, r^2=0.243$)

		-1%			
		North American	South American	European	Asian
+1%	North American	0	1.332[a]	1.332[a]	1.332[a]
	South American	-1.332[a]	0	0	0
	European	-1.332[a]	0	0	0
	Asian	-1.332[a]	0	0	0

[a] = Significant at 5% level
[b] = Significant at 10% level

Eq. (6.1) where %FOR ≥ 25%
($n=10, r^2=0.674$)

		-1%	
		Domestic	Foreign
+1%	Domestic	0	49.470[a]
	Foreign	-49.47[a]	0

[a] = Significant at 5% level
[b] = Significant at 10% level