The Role of Economic Freedom in Explaining Penetration of Consumer Durables

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This study examines the link between economic freedom (a measure of government intervention) and the penetration of three durable goods (televisions, radios and automobiles) across countries. After controlling for the influence of income, there is a significant relationship between greater amounts of economic freedom and durable penetration for these three products. Practical implications are provided for both governments and global marketers.

From an international business perspective, there is little doubt that the development of an explanatory model for global product penetration is a worthwhile goal. The delivery of such a model, however, is a daunting task due to the problems inherent in getting comparable, timely and relevant data from a wide range of countries (Jain, 1996). In order to create such a penetration model, it is necessary to utilize variables which affect all of the countries included in a similar way with regard to penetration of consumer durables. This is difficult since variables like energy consumption might affect different countries in different ways.[1] As Terpstra and Sarathy (1997) point out, most of the attempts aimed at modeling penetration have focused on the use of limited geographic areas with data that is out of date. International economists have tried to build on the work of Leontif (1966) with a series of Input-Output tables and models which attempt to analyze the industrial structure within different countries and their impact on product penetration. Other international economists have focused on the work of Rostow (1971) to compartmentalize countries into different levels of economic development and to analyze the potential impact on consumption patterns. International marketers have tried to focus on consumers in different countries using such focii as

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purchase intention and diffusion of innovation (e.g., Takada & Jain, 1991). What appears to be missing from the literature is an explanatory model which attempts to tie product consumption to certain key determinant variables over a wide range of countries.

The Heritage Foundation has identified a new variable, economic freedom, which has been shown to correlate significantly with long-term development (Holmes, Johnson, & Kirkpatrick, 1996). This measure indicates the openness of an economy, both from the production side as well as from the consumption side. It is the contention of this paper that this variable should also influence consumption of products across countries. The greater the economic freedom of a country, the greater will be the competition experienced by its businesses. This, in turn, should lead to greater consumer choice and/or lower prices. Consumers, then, would be expected to increase purchases of those products where consumer choice had increased and/or prices had decreased relative to those products where neither of these changes had occurred.

The goal of this paper is to examine whether or not economic freedom has an impact on the penetration of durable goods across countries. In order to do this it is necessary to identify other variables that should influence penetration of consumer durables and to control for their effect. Economic freedom and these other consumption variables will then be incorporated into a model which will be tested using regression. This model deals with such a complex set of relationships, it is our purpose to both keep the number of variables to a minimum and to ensure that the variables included are consistent across the countries involved. If the effect of a variable varies significantly across countries, then it should not be included in our model.

The paper will be organized as follows: (1) A discussion of the relevance of economic freedom as a determinant of penetration of consumer durables; (2) An explanation of the other variables (both independent and dependent) that will be included in the model; (3) A discussion of the penetration model in greater detail, the data to be gathered for the model, and the methodology for analyzing the data; (4) A presentation of the results of the model analysis; and (5) Conclusions, limitations and suggestions for future research.

Economic Freedom as a Determinant of Penetration of Consumer Durables

A relatively new variable to the international business literature which could have a major impact on penetration of consumer durables is the construct known as *economic freedom*. As the Heritage Foundation defines it, economic freedom is the "absence of government coercion or constraint on the production, distribution, or consumption of goods and services" (Holmes et al., 1996, p. 33). The Index of Economic Freedom is a composite score of the openness of a country's economy based on average scores over a group of ten economic factors (Holmes et al., 1996). These factors are as follows: trade policy, taxation policy, govern-

ment intervention in the economy, monetary policy, capital flows and foreign investment, banking policy, wage and price controls, property rights, regulation, and black market.

1. Trade Policy. The Heritage Foundation measures trade policy (factor #1) using the average tariff rate on a score of 1 to 5 with 1 representing a very low level of protectionism (average tariff rates less than 4% and/or very low non-tariff barriers) and 5 a very high level of protectionism (average tariff rates 20% or more and/or very high non-tariff barriers that virtually close the market to importers).[2]

2. Taxation. (Factor #2) involves the scoring of income and corporate taxes. The income and corporate tax scales range in value from 1 representing very low tax rates (no income taxes or 10% or less flat rate; limited or no taxes on corporate profits) to 5 representing very high tax rates (top income tax rate above 50%, tax rate on average income between 20% and 25%, or a tax rate on average income of 25% or more regardless of top rate; cumbersome progressive tax system with top corporate tax rates above 46%). These scores are then averaged to get a single taxation score.

3. Government Intervention in the Economy. The first step in measuring this involves an examination of government consumption as a percent of GDP. This is then followed by an assessment of the size of the state-owned sector of the particular economy. The scale used ranges from 1 representing a very low level of government intervention (less than 10% of GDP—virtually no government-owned enterprises) to 5 for very high intervention (46% or above of GDP—few private companies).

4. Monetary Policy. The scoring for this measure is based on the average inflation rate. The grading scale used ranges from 1 representing a very low level of inflation (below 6%) to 5 for very high inflation (over 30%).

5. Capital Flows and Foreign Investment Policy. For this measure the country's foreign investment policies are examined to assess the overall investment climate. The scale ranges from 1 representing no barriers to foreign investment and 5 representing very high barriers to foreign investment.

6. Banking. Here the determination is made as to the openness of the country's banking system. The scale utilized in this case runs from 1 representing a very low level of bank restriction to 5 representing a very high level of bank restriction.

7. Wage and Price Controls. This measure involves an assessment of the extent to which the country lets the market or the government actually set wage and price levels. The relative level of government control over wages and prices is determined using a scale with 1 representing very low wage and price controls and 5 representing very high wage and price controls.

8. Property Rights. This measure assesses the extent to which private property is protected by the government and free from expropriation. The score here involves the use of a scale from 1 representing very high protection of personal property to 5 representing no protection of private property.

9. Regulation. This measure is determined by the level of ease involved in opening a business and keeping it open. In this case the scale used ranges from 1 representing a very low level of regulation (corruption free; straight-forward regulations applied uniformly to all businesses) to 5 representing a very high level of regulation (government discourages new business creation; bribes are mandatory; regulations are applied randomly).

10. Black Markets. This measure is determined through assessing the size of the black market operating within the country. The determination here involves a scale from 1 representing very low levels of black market activities in the country (less than 10% of GDP) to 5 representing very high levels of black market activity (30% or more of GDP; black market larger than the formal economy).

The higher the score, the greater the amount of government interference, and as a result, the lower the economic freedom. The authors of the Heritage Foundation study found that high levels of economic freedom equate with high living standards (Holmes et al., 1996).

The individual components of the Index of Economic Freedom can be interpreted in the context of the "Production vs. Diversion" arguments provided by Hall and Jones (1997). Factors contributing to the Index of Economic Freedom can be conceptualized as either encouraging production or encouraging diversion of resources and talent. For example, policies resulting in low government intervention, greater capital flows, more open banking systems, and protection of property rights encourage production, while policies such as high taxation, high wage and price controls, and regulation of business would result in the diversion of resources.

The first composite scores for 101 different countries appeared in "1995," and subsequent scores were reported for "1996" and "1997." In the most recent scoring, there were 150 countries included, and 72 were identified as either being mostly free or free and 78 were identified as being mostly unfree or repressed (Holmes et al., 1996). It is not surprising to note that the Heritage Foundation's categorizations put most of the world's freest economies in either Europe or North America while the most repressed economies were identified as either in Africa or the Middle East. The Index of Economic Freedom ranges from 1.00 (representing the greatest level of freedom) to 5.00 (representing the least level of economic freedom). The five most economically free countries in the "1997" index scores were: Hong Kong (a score of 1.25), Singapore (1.30), Bahrain (1.60), New Zealand (1.75), and Switzerland (1.90). The bottom five were identified as: North Korea (a score of 5.00), Laos (5.00), Cuba (5.00), Iraq (4.90), and Vietnam (4.70). The mean score was 3.10, and the mode was 2.80.

To understand the theoretical underpinnings of economic freedom, it is best to look back to the classic works of Adam Smith and David Ricardo who raised important questions about how some countries' economies grow and prosper while others do not. Adam Smith developed the notion of absolute

advantage which suggested that a nation would export an item if it is a low-cost producer of that item (Smith, 1937), while Ricardo is credited with the theory of comparative advantage, which suggests that it is actually market forces which allocate a country's resources to those industries where it is relatively most productive (Ricardo, 1951). Inherent limitations of these original theories have led to the development of a series of attempts to link specific economic growth rates to policy variables. A number of studies have attempted to correlate long-term growth with governmental policies on foreign trade and investment (e.g., Gould & Ruffin, 1993; Levine & Renelt, 1990). The indication from these works is that long-term economic growth is fostered by a lessening of restraints on foreign trade and investment. In fact, a study by Baldwin (1989) found that prior economic development theories were not able to adequately explain the magnitude of gains possible from free trade. He found that old theories and models significantly underestimated the impact of free trade.

Other cross-country studies have also shed light on this subject. A series of studies have attempted to show that long-term economic growth will be negatively impacted by excessive governmental spending (Grier & Tullock, 1989; Landau, 1986; Marlow, 1986). The effect of taxes on economic growth served as the basis for a study by King and Rebelo (1990), and they concluded that traditional approaches to modeling economic growth significantly underestimated the long-term impact of taxes. Another study by Fischer (1993) found that long-term GDP growth has been negatively affected by high levels of inflation. King and Levine (1993) discovered that there was a significant relationship between an open banking and financial system and long-term economic growth. Finally, a study by Knack and Keefer (1995) found a linkage between long-term economic growth and governmental adherence to a legal structure, particularly with respect to contracts and property rights.

The results of the research points out that there are a series of impacting variables which should be included in any effective measure which attempts to explain long-term economic growth. The Index of Economic Freedom developed by the Heritage Foundation builds these variables into its composite scoring, and should, therefore, be able to explain more effectively why certain national economies have grown and thrived while others have not.

As the Index of Economic Freedom is relatively new, there has been little use of it in the International Business literature. There are only a handful of articles identified which actually referenced the Index, and they all fall into the practitioner publications. The first of these was a description of the 1995 Index which appeared in *The Economist* (1995) which introduced the Index as an emerging-market indicator, and it reported that Hong Kong and Singapore were the freest economies in the world at the time of the report. The second article discussed the 1996 Index, and it reported that only ten countries provide a degree of freedom similar to America's with 65 of the 142 countries studied rated as

free or mostly free (Esquenazi-Shaio, 1996). An interesting evaluation of the 1996 Index of Economic Freedom was presented in *Business Africa* (1996) which noted the conservative political orientation of the Heritage Foundation but also said that while one could criticize the political leanings of the Foundation, it was far harder to find fault with the findings of the researchers. This article focused on the connection found between economic freedom and standards of living, and it also discussed the findings of the Heritage Foundation's researchers that the richest countries actually tended to fall back down the scale of liberalization (Holmes et al., 1996). The authors argued that the best value of the Index was to rank countries for the purpose of foreign investment potential. This point was reiterated in a later article which appeared in *The Chief Executive* (Donlon, 1996) which also discussed the ranking of the United States as the seventh most free country. It would have been ranked higher if not for the tax and regulatory burdens on the private sector (Holmes et al., 1996).

Another approach to economic freedom can be found in the work of the Fraser Institute (Gwartney et al., 1996). This approach provides a composite measure of the degree to which governments interfere with prices and the extent to which they attenuate private ownership rights. High values of this index measure indicate that the citizens of a country are relatively freer to pursue their economic objectives than are citizens of other countries. In a recent study using 52 countries, Easton and Walker (1997) examined economic freedom from the perspective of public and private ownership, and reliance on the market utilizing the Index developed by the Fraser Institute. This approach is conceptually similar to the Heritage Foundation; however, the number of countries analyzed by the Heritage Foundation is larger and thus make it more desirable to use.

It is also relevant to address any problems identified from the literature pertaining to the Heritage Foundation's Index of Economic Freedom. In a recent critique, Scott (1997) highlighted some of the potential shortcomings of the Index. He contends that a high level of economic growth today is more likely to be the result of good economic performance in preceding decades than to be the cause of that good performance. Another concern focuses on the potential inequity of the rankings with China ranked at 125th, lower than countries like Algeria (59th) and Zambia (89th), and the relatively high ranking of Japan (11th).

As with any study, it is possible to argue with the composition of the index and/or how each factor was measured. In the Heritage Foundation's Index, it would be possible to raise questions about several of the factors that were included. Examples would include factors 3 (government intervention in the economy) and 9 (regulation). There are clearly other ways to define and measure these concepts. It is not our purpose here to refine or redevelop the Index of Economic Freedom. Our contention is that this Index is more applicable than others which have appeared

in the literature due to the richness of its composition and the wide range of countries involved.

The purpose of this study is to determine the impact of economic freedom (as measured by the Index of Economic Freedom) on penetration of consumer durables across countries. There are several approaches which one could take to draw a link between economic freedom and penetration of durable goods. The first approach would stress that, in general, increased economic freedom would be associated with greater levels of consumer satisfaction. Greater levels of economic freedom would allow more markets to clear (Easton & Walker, 1997) which would give consumers lower prices due to a lessening of trade barriers and government restrictions (e.g., governmental policies that limit production of certain agricultural goods). In addition, economic freedom should increase consumer choice as more foreign products and even more domestic products are made available and thereby increasing value to consumers. In summary, greater economic freedom should result in lower prices and more consumer choices and hence greater consumer satisfaction, resulting in higher levels of penetration. However, the impact on penetration should differ across product categories. Presumably the increase in penetration would be greater for those products that are traded (e.g., durables) due in part to the presence of foreign goods than for those products that are not heavily traded (e.g., health care, legal services or education, see Easton & Walker, 1997).

A second approach to linking economic freedom and penetration of durable goods would suggest that higher levels of economic freedom would in general be associated with increased levels of consumer willingness to spend money. Curtin (1992) argues that consumer demand depends on both the ability of consumers to spend (their income) *and* their willingness to spend. If consumers are optimistic about the future, they are more likely to consider purchasing durables than if they were pessimistic about the future. Pessimism would lead consumers to avoid spending on unnecessary items and save money due to the possibility that hardships may occur in the future. It is our contention that, in general, high levels of current economic freedom would be correlated with optimism about the future and hence increased willingness to spend on consumer durables.

In summary, it is our belief that the Heritage Foundation's Index of Economic Freedom is an important determinant of durable penetration in global markets, and the scoring is based on the fact that the more open the market is (the greater the amount of economic freedom), the greater the product choices (both domestic as well as foreign products), the lower the prices, and the greater the satisfaction of the consumer, resulting in relatively higher levels of consumption of that product category.[3] Therefore, we expect a negative relationship (lower scores of economic freedom mean greater economic freedom) between the Index of Economic Freedom and penetration of consumer durables.

Other Variables for Inclusion in the Model

Independent Variable

Our focus for the study is to determine the explanatory power of economic freedom in penetration of consumer durables across countries; therefore, we justify the inclusion of other independent variables primarily as a control mechanism. It should also be remembered that we are trying to span as many countries as possible, and we are trying to maximize the differences between countries. As a result of the scope of the research and the difficulty inherent in finding comparable data, we were forced to choose a model with few variables. There are a number of variables which can impact penetration of consumer durables. Terpstra and Sarathy (1997) suggest such variables as GNP/GDP per capita, purchasing power parity, literacy rates, income distributions, age distributions, population density figures, energy consumption, and economic growth rates. Many of these variables were examined for inclusion in the model; however, there were two problems inherent in the data: (1) high intercorrelations among the variables and (2) great variations in the numbers of countries for which the data is available. Therefore, the only additional independent variable chosen was GDP per capita (a measure of market potential and/or the ability to spend, Curtin, 1992). GDP per capita was chosen as a result of the importance given to it by the literature and due to the breadth of countries from which comparable data was available. Gross Domestic Product (GDP) in U.S. dollars is an effective measure of market potential (Czinkota & Ronkainen, 1995; Jain, 1996; Onkvisit & Shaw, 1997; Terpstra & Sarathy, 1997). Gross Domestic Product is defined as the Gross National Product (the total domestic and foreign value added claimed by residents) less net factor income from abroad. When this is translated to a U.S. dollar basis, there is an effective standardization for comparative purposes. This data is both readily available and reliable, and the recentness of the data makes it appropriate for a model of present consumption. We expect that GDP per capita will be positively related to penetration.

Dependent Variables

The dependent variables included in the penetration models are the number of products in use per capita for each of the countries for three types of consumer durable products: televisions, radios and automobiles. These figures for penetration in essence become cumulative measures of consumption over time. They represent the penetration of the product into the country, which is an appropriate basis for examining consumption behavior (Kotler, 1997). It should be noted here that figures for actual annual sales for each of the product groups were not available; therefore, the number of products in use on a per-capita basis was the closest measure that was attainable.

In terms of the appropriateness of consumer durables as a product class, it should be noted that prior research has indicated that consumer durables are easier to get reliable information across a variety of countries than most other types of products (Clarke & Soutar,

1982; Freedman, 1970; Medina, Beatty, & Saegert, 1996; Pickering, 1975). Also as suggested by Samli, Still, and Hill (1993), durables represent a class of products where increased consumer choice (as well as price reductions) would be expected to be relatively more pronounced than for non-traded items (particularly under the case of economic freedom). It was, therefore, felt that durables would be appropriate for study in the consumption model, and three different types of consumer durables were chosen.

Televisions, cars, and radios were chosen for this study because: (1) we wanted to have products with a wide range of prices; and (2) most importantly, data had to be available for a large number of countries.

Data and Methodology

Model

The variation in the penetration of televisions, radios, and cars across countries is explained by per capita GDP and the Index of Economic Freedom for the country. Three different models are estimated for explaining the variation in penetration of the three products. In Model 1, per capita GDP was used as an explanatory variable. In Model 2, the Index of Economic Freedom was utilized as an explanatory variable. Finally, in Model 3, per capita GDP and the Index of Economic Freedom served as explanatory variables. Equations (1), (2), and (3) correspond to Models 1, 2, and 3, respectively for television (radio and car) penetration and are specified below:

$$Y_{ij} = \alpha_0 + \alpha_1 * GDP_j + \varepsilon_j \quad (1)$$

$$Y_{ij} = \beta_0 + \beta_1 * EFI_j + \delta_j \quad (2)$$

$$Y_{ij} = \gamma_0 + \gamma_1 * GDP_j + \gamma_2 * EFI_j + \theta_j \quad (3)$$

where,

j = Country
I = 1 for televisions
= 2 for radios
= 3 for cars
Y_{ij} = penetration of consumer durable I for country j
GDP_j = Per capita GDP for country j
EFI_j = Economic Freedom Index for country j

The above equations were estimated using ordinary least squares (OLS). The data for the estimation is discussed next.

Data

The data for the use (penetration) of televisions, radios, and cars were obtained from the 1997 editions of the *International Marketing Data and Statistics* and the *European Marketing Data and Statistics*. The data for televisions and radios is for 1993 and was converted to per capita penetration by simply dividing by the population estimate for 1993. The statistics for car usage were obtained from the same two sources and represent data from 1994. This data on car usage was already specified on a per capita basis.

Information (exchange rates, local GDP, and population) to calculate per capita GDP in dollars for 1993 was collected from the January 1997 edition of the *International Financial Statistics*.

As previously stated, the data for economic freedom were obtained from the *1997 Index of Economic Freedom*. In some cases 1996 data was used to estimate the score for a particular factor (taxation), and in other cases the data used was older. For example, ten year inflation rates were used in the calculation of the monetary policy factor. Therefore, it is not possible to associate the scores from the *1997 Index of Economic Freedom* with a particular year of consumption data. As a compromise (balancing between older and more recent data) we have chosen to use the "1997" economic freedom data with data for penetration and income for the period 1993-1994.

RESULTS

The first part of this section presents a correlation analysis of all of the independent and dependent variables. In the second part of the section, results of model estimation using regression analysis are presented.

Correlation Analysis

Table 1 provides a matrix of Pearson Correlation Coefficients for the independent (1993 per capita GDP in dollars and "1997" score of economic freedom) and dependent (television penetration, radio penetration, and car penetration) variables.[4] Also included in the table are the corresponding significance levels and the number of observations between each pair of variables.

All of these correlation coefficients are highly significant (at the .0001 level). The correlations between the dependent variables range from .77 for car penetration and radio penetration to

Table 1
Pearson Correlation Coefficients

	TV	Radio	Car	GDP$/Cap	Econ Free
TV	—	.831	.846	.694	−.588
		.0001	.0001	.0001	.0001
		129	122	113	130
Radio	.831*	—	.771	.746	−.581
	.0001**		.0001	.0001	.0001
	129***		128	118	136
Car	.846	.771	—	.835	−.603
	.0001	.0001		.0001	.0001
	122	128		113	137
GDP$/Cap	.694	.746	.835	—	−.632
	.0001	.0001	.0001		.0001
	113	118	113		119
Econ Free	−.588	−.581	−.603	−.632	—
	.0001	.0001	.0001	.0001	
	130	136	137	119	

Notes: *Pearson Correlation Coefficient.
**Probability > |R| under H_0: Rho = 0.
***Number of observations.

.85 for car penetration and television penetration. Clearly countries with high penetration for any of these three variables have high penetration for the other two.

The correlations between the independent and dependent variables are also high. The absolute value of these coefficients range between −.58 (radio penetration and the score on economic freedom) and .83 (car penetration and per capita GDP). The coefficients suggest a strong association between any of the two independent variables and any of the three dependent variables.

The correlation between the two independent variables also shows a significant association (−.63). It should be noted that this high correlation indicates the possibility of multicollinearity. The extent of multicollinearity was assessed using the condition number.[5] The condition number was slightly over 13 for those models with both per capita GDP and economic freedom and were well within the limit of 30 for moderate to severe multicollinearity (Kleinbaum, Kupper, & Muller, 1988).

Regression Analysis

Panels A, B, and C of Table 2 present the regression results for television, radio and car usage. Parameter estimates and their significance levels, F-statistics, and adjusted R^2 are given for three different specifications for each of the three dependent variables. The first two specifications correspond to a model with only one independent variable while the third includes both independent variables.

All of the regressions are highly significant (the F-statistics are all significant at the .0001 level). The adjusted R^2 are generally around .6. All of the coefficients have the predicted sign and are significant at the .01 level. The sample sizes for the regressions range from a low of 113 to a high of 137. It should be noted that the differences in sample sizes were a result of the fact that complete data were not available for all of the variables across all of the countries included in this study. A complete listing of countries can be found in the Appendix.

The regression results indicate that economic freedom has a significant impact on television, radio and car penetration. In particular, the smaller the Index of Economic Freedom, the greater will be the penetration of all three products. A unit decrease in the Index of Economic Freedom (which represents a sizeable improvement in economic freedom) will cause approximately a .0857 increase per capita in television penetration (see Model 3 from Panel A in Table 2). In other words, if the Index of Economic Freedom decreases one unit, there will be an additional penetration of approximately 85,700 televisions per million people, a sizeable increase. For radios and cars, this increase in penetration would amount to 102,900 and 48,500 units per million people respectively (similarly derived using the coefficients for economic freedom from Model 3 in Panels B andC in Table 2).

In addition, per capita GDP strongly influences penetration of these three products. As expected, greater per capita GDP is associated with greater television, radio, and car penetration. The coefficients for per

Table 2
Estimation Results for Televisions, Radios, and Cars

Variable		Model 1	Model 2	Model 3
Panel A: ***Estimation Results for Televisions***				
Per Capita GDP	a	1.67×10^{-5}	—	1.24×10^{-5}
	b	.6940		.5149
	c	(.0001)		(.0001)
Economic Freedom Index		—	−.1586	−.0857
			−.5877	−.2879
			(.0001)	(.0008)
F		103.15	67.55	62.64
p		.0001	.0001	.0001
adjusted R^2		.4770	.3403	.5240
Panel B: ***Estimation Results for Radios***				
Per Capita GDP	a	3.05×10^{-5}	—	2.52×10^{-5}
	b	.7456		.6153
	c	(.0001)		(.0001)
Economic Freedom Index		—	−.2708	−.1029
			−.5806	−.2037
			(.0001)	(.0107)
F		145.20	68.16	79.55
p		.0001	.0001	.0001
adjusted R^2		.5521	.3322	.5731
Panel C: ***Estimation Results for Cars***				
Per Capita GDP	a	1.58×10^{-5}	—	1.34×10^{-5}
	b	.835		.7075
	c	(.0001)		(.0001)
Economic Freedom Index		—	−.121	−.0485
			−.6029	−.2051
			(.0001)	(.0018)
F		255.53	77.11	143.54
p		.0001	.0001	.0001
adjusted R^2		.6944	.3588	.7179

Notes: a. Figures in first row for each variable represent the raw regression coefficients.
b. Figures in the second row for each variable represent the standardized regression coefficients.
c. Figures in the third row in parentheses represent the p-value.

capita GDP for the six models range from 1.24×10^{-5} to 3.05×10^{-5}. In other words, for a $1,000 increase in per capita GDP, there would be an approximate increase in penetration of 12,400 (25,200 and 13,400) units of televisions (radios and cars) per million people.

The Index of Economic Freedom has an impact over and above the impact of per capita GDP. Not only is the coefficient for the Index of Economic Freedom significant in model 3 for all three durables, the adjusted R^2s increase when the Index of Economic Freedom is added to the model. For example, for

Televisions, the adjusted R^2s increase from .4770 (model 1) to .5240 (model 3). For the other two durable products the increases in adjusted R^2s are slightly lower.

In order to illustrate the implications of the model coefficients on total penetration (as opposed to per capita penetration), we carried out additional analyses across countries to show the effect of a 10% increase in the two predictor variables on total penetration (given that the coefficients obtained from the regression analysis indicate the effect of per capita GDP and the Index of Economic Freedom on pene-

Table 3
Increase in Total Penetration of Televisions, Radios, and Cars

Country	Population in millions	Per capita GDP in dollars	Economic Freedom Index	Increase in penetration for a 10% increase in	
				per capita GDP	Economic Freedom Index
A. Televisions					
Australia	17.66	16007.70	2.15	350543	325394
Finland	5.07	16448.77	2.30	103410	99935
Greece	10.38	8158.87	2.85	105014	253526
Indonesia	187.60	833.11	2.85	193801	4582036
Kenya	28.11	167.09	3.05	5824	734753
Pakistan	122.79	362.76	3.10	55233	3262162
Peru	22.64	1678.53	2.90	47122	562672
Poland	38.46	1897.70	3.15	90502	1038247
Romania	22.76	690.42	3.40	19485	663181
Spain	39.08	10964.15	2.60	531314	870781
B. Radios					
Australia	17.66	16007.70	2.15	712394	390701
Finland	5.07	16448.77	2.30	210156	119992
Greece	10.38	8158.87	2.85	213417	304409
Indonesia	187.60	833.11	2.85	393854	5501651
Kenya	28.11	167.09	3.05	11836	882218
Pakistan	122.79	362.76	3.10	112249	3916878
Peru	22.64	1678.53	2.90	95765	675600
Poland	38.46	1897.70	3.15	183924	1246623
Romania	22.76	690.42	3.40	39599	796281
Spain	39.08	10964.15	2.60	1079767	1045546
C. Cars					
Australia	17.66	16007.70	2.15	378813	184150
Finland	5.07	16448.77	2.30	111750	56556
Greece	10.38	8158.87	2.85	113483	143478
Indonesia	187.60	833.11	2.85	209431	2593101
Kenya	28.11	167.09	3.05	6294	415817
Pakistan	122.79	362.76	3.10	59688	1846148
Peru	22.64	1678.53	2.90	50923	318432
Poland	38.46	1897.70	3.15	97801	587573
Romania	22.76	690.42	3.40	21057	375312
Spain	39.08	10964.15	2.60	574162	492799

tration for televisions, radios, and cars). For example, the effect of per capita GDP on per capita television penetration is 1.24×10^{-5}. Australia has a per capita GDP of 16007.70 dollars and a population of 17.66 million. Therefore, for a 10% increase in per capita GDP or a 1600.77 dollar increase in per capita GDP, per capita television penetration would go up by 1.24×10^{-5} times 1600.77 or .0198, and the total television penetration in Australia would go up by .0198 times 17.66 million or 349,695 televisions. The effects of a 10% increase in per capita GDP and the Index of Economic Freedom on total penetration of televisions, radios, and cars is shown in Table 3 for ten "random" countries representing different regions of the world. The table suggests that there would be large increases in total penetration as a result of a 10% increase in any of the predictor variables.

Implications and Suggestions for Future Research

There are several practical implications which result from this study which indicate the potential importance of these findings. First of all, it is clear that moderate variable increases for economic freedom have a profound effect on penetration figures. Governments can implement policies which can impact economic freedom and result in a significant increase (over time) in the penetration of consumer durable products. As an example, changes can be enacted in taxes or tariff laws in a relatively short period of time which could have a profound impact on product penetration. This is not, however, possible when attempting to make changes in such variables as GDP per capita.

Another implication from this research is that international marketers can use economic freedom when assessing market potential since changes in country policies relative to the Index of Economic Freedom measure should lead to significant increases in product penetration. If international marketers can identify changes occurring in economic freedom, there may be tremendous opportunities for increased penetration of products which their companies market to global customers. This might be an excellent additional assessment vehicle for global marketing expansion.

A third implication deals with foreign direct investment. If marketers find significant product penetration potential for certain global markets, this will have an effect upon marketing expenditures and investment in that potential country market. This will have a potential impact on where the corporation will be willing to put its marketing efforts, manpower, sales force, warehousing facilities, or even production facilities. This potential for foreign direct investment should provide an incentive for foreign governments to market their countries as good locations for foreign direct investment.

Since this study is really a first step in what should prove to be an important research stream in the international business literature, it would seem that the following are areas which could be addressed by academics and practitioners: (1) the impact of economic freedom on other variables besides product

penetration (i.e., economic development and level of foreign direct investment); (2) the impact over time of economic freedom on product penetration using longitudinal data (it would be interesting to test for predicted levels of penetration based on historical data—obviously this represents a limitation of the Index of Economic Freedom from the Heritage Foundation since it only goes back to 1995); (3) the impact of individual dimensions of economic freedom on product penetration (i.e., monetary policy and level of protectionism); and (4) consistency of results across product and service categories. Certainly more needs to be done examining the relationship between economic freedom and economic development. Are they integrally linked? Is economic freedom a predictor of economic development? Clearly more needs to be done in this vital area.

CONCLUSIONS

Economic freedom has been acknowledged by the international business press as potentially providing a conceptually rich economic measure. As defined by the Heritage Foundation, economic freedom is the measure of government intervention in a country_s production, distribution or consumption of goods and services (Holmes et al., 1996). The international business press has linked economic freedom with economic growth and development, standards of living, foreign direct investment, and it has been suggested as an emerging-market indicator.

The purpose of this paper was to see whether there is a link between economic freedom and penetration of consumer durable goods. The results indicate that there is indeed a significant explanatory relationship between the Index of Economic Freedom and product penetration. The regression results show that an increase in economic freedom (or a decrease in the Index of Economic Freedom) results in a significant increase in penetration of consumer durables. Also, per capita increases in GDP will cause an increase in penetration of particular goods.

APPENDIX

List of Countries Included in the Study

Albania
Algeria
Angola
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bolivia
Botswana
Brazil
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Cape Verde
Chad
Chile
China (PRC)
China (ROC-Taiwan)
Colombia
Congo
Costa Rica
Croatia
Cuba
Cyprus
Czech Republic
Denmark
Djibouti
Dominican Republic
Ecuador
Egypt
Egypt
El Salvador
Estonia
Ethiopia
Fiji
Finland
France
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Guatemala
Guinea
Guyana
Haiti
Honduras
Hong Kong
Hungary

List of Countries (continued)

Iceland
India
Indonesia
Iran
Iraq
Ireland
Israel
Italy
Ivory Coast
Jamaica
Japan
Jordan
Kenya
Korea, North
Korea, South
Kuwait
Laos
Latvia
Lebanon
Lesotho
Libya
Lithuania
Luxembourg
Madagascar
Malawi
Malaysia
Mali
Malta
Mauritania
Mexico
Moldova
Mongolia
Morocco
Mozambique
Myanmar
Namibia
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Romania
Russia
Rwanda
Saudi Arabia
Senegal
Sierra Leone
Singapore
Slovak Republic
Slovenia
Somalia
South Africa
Spain
Sri Lanka
Sudan
Suriname
Swaziland
Sweden
Switzerland
Syria
Tanzania
Thailand
Trinidad and Tobago
Tunisia
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
Venezuela
Vietnam
Western Samoa
Yemen
Zaire
Zambia
Zimbabwe

NOTES

1. Energy consumption is tied to uses of air conditioning/heating. Our concern is that countries in Northern climates might use more oil to heat, but would not necessarily be heavier users of consumer durable goods. Also, oil producing countries might be expected to use more per capita energy because of greater availability and lower prices. The inconsistencies would eliminate the use of the variable in a model of durable penetration across a wide variety of countries.
2. These scores were derived from reports from both GATT (the General Agreement on Tariffs and Trade) and the IMF (the International Monetary Fund). If the average tariff rate was not available, the analysts looked at the revenue from tariffs and duties as a percent of total imports. They also assessed the existence of non-tariff barriers, and if they were significantly high, the score was increased by a point indicating lesser economic freedom.
3. We assume that durables are tradeable products, and therefore consumer satisfaction will increase more for these products due to free and open markets than for products that are non-tradeable.
4. A number of other independent variables were also examined. In particular, data for GNP growth, literacy, and income distribution were all collected and analyzed. None of these variables appeared to provide any incremental benefit to the two selected independent variables. The correlations between GNP growth, literacy, and income distribution and the dependent variables were weaker than those of the selected independent variables, and, in the case of income distribution, the number of observations was considerably smaller.
5. In a principal component analysis of the predictor variables, the condition number is defined as the square root of the ratio of the highest eigen value to the lowest eigen value (Kleinbaum, Kupper, & Muller, 1988, p. 213). With high collinearity, the highest eigen value would be a lot greater than the lowest eigen value, and therefore the condition number would be high.

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