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# International Variation in Return on Equity in the Food and Beverage Industries

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## ABSTRACT

The objective is to analyze the effects of country- and firm-specific factors on the return on equity in the beverage and tobacco and food and consumer-products industries for 11 industrialized nations. The results indicate that country- and firm-specific factors are important in explaining variation in return on equity within countries but not generally across countries or time.

**Key Words:** *beverage and tobacco industry, country- and firm-specific factors, food and consumer-products industry, globalization, unbalanced panel data, variation in return on equity.*

Analysts have resorted to the use of derived ratios from a firm's financial statements as indices of how well a firm is doing. Return on equity (ROE) is one of the most popular of such indices (Hergert). It is widely used as a comparative measure of profitability and financial performance of firms in industrialized countries (Teitelbaum). For example, ROE is used widely by investors in appraising common stock purchases and by corporate planners in evaluating corporate performance.

In a world characterized by global markets and competition, investors face a maze of risky prospects. Hence the need for organized and relevant information concerning the financial performance of firms in a global environment. Investors use ROE, a measure of prof-

itability, in comparative analysis to help investors make informed investment decisions. However, a more in-depth analysis is possible by studying the forces that shape ROE within countries, across countries, and over time. Knowledge of the impacts of these forces facilitates more accurate management decisions and enables firms to mount a competitive edge in a global setting.

Interest in the variation in financial ratios, and consequently ROE, dates back to the turn of the 20th century. Studying seven ratios of 981 firms, Wall stratified firms by industry and geographical location. He found great variation in the ratios between geographical areas and types of businesses. Since then other studies on ROE have been conducted to explain the variation of ROE across countries and time. At the close of the century substantial changes in the business environment took place, resulting in markets becoming more integrated due to the effects of globalization. It is important to examine how these changes are affecting the variation in ROE across countries and time.

This study undertakes an investigation of

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whether a significant difference exists in ROE in different countries over time. It also explores country- and firm-specific factors that could influence ROE in these countries. The focus industries in this study are the beverage and tobacco and food and consumer-products industries. In these two industries the forces of global integration are strengthening, driven by the growing proliferation of regional and global brands and other forces (Ghoshal and Nohria).

The rest of this paper is organized as follows. The study provides a literature review and theoretical basis, followed by the data description and empirical model and the method of analysis and results. Finally, the paper derives conclusions and implications.

## **Literature Review**

Among other objectives, studies undertaken on this subject aim at determining factors that cause variation in ROE over time within a given country because business environments have been thought to be different for each country (Hirschey and Koch). Hirschey and Koch have emphasized the importance of evaluating the impact of differences in accounting and business practices in comparative studies of firm performance, and consequently ROE. Research in this vein yields different results. Some results indicate differences in ROE across countries and time. Geringer, Beamish, and daCosta revealed large differences in the average ROEs of various firms in different countries from 1977 to 1981. For 1979 to 1983 Soenen and Van den Bulke compared the performance of foreign and domestic firms within a single national market (Belgium) and concluded that differences in ROE existed among the American, European, and domestic Belgian firms. Lee and Blevins examined the profitability, based on ROE, of 400 firms in the United States, Japan, the Republic of Korea, and Taiwan. They found that variation in firms' ROE in each country was due to firm-specific measures during 1980 to 1987. In the above studies ROE was not adjusted for differences in accounting and tax practices, that is, the rate of corporate taxation

was not taken into account. The rate of corporate taxation affects the indicators used to measure firm performance and consequently ROE.

While the preceding arguments are compelling, they are predicated on the assumption that most firms and industries are not global in nature. The International Monetary Fund (IMF) defines globalization as, "the growing economic interdependence of countries worldwide through increasing volume and variety of cross-border transactions in goods and services, freer international capital flows, and more rapid and widespread diffusion of technology" (International Monetary Fund, 45). Two factors, technological advances and changing trade policies, have played important roles in the growing integration of the world economy (Geringer, Beamish and daCosta). While technological advances have facilitated the efficient flow of goods, information, and communications; various policies have led to the lowering of artificial barriers to the movement of goods, services, and capital; resulting in multilateral trade liberalization.

Thus, due to increasing globalization firms in the same industries in industrialized nations face similar environmental threats and opportunities and consequently earn similar rates of return (Ghohal and Nohria). Comparing the profitability of firms in Germany, Japan, and the US, Blaine observed that although there were some statistical differences in profitability firms in general earned roughly equivalent rates of return across countries.

Previous literature includes studies concerning the relationship between rates of return and various economic variables and firm-specific variables. In a discussion of the determinants of ROE, interest rates, inflation, and other risk factors determined the returns on shareholders' equity (*Public Utilities Fortnightly*). A factor that influences the operations of firms is the political risk of doing business. This risk thus influences ROE. Fuller and Petry stated that a relationship existed between ROE and each of the following factors: cost of capital, corporate tax rates, and productivity. The exchange rate of a country affects the profitability and thus the ROE of

firms that trade with other countries. Firms that are largely dependent on the export market tend to fare better when their country's currency is weak because their goods are more competitive in a global market (Bahmani-Oskooee and Ltaifa). The gross domestic product, an indicator of the level of economic activity in a country, affects the profitability and hence the ROE of firms. Teitelbaum stated that the profit margin of a firm affects its ROE, and Leovonian explained that a firm's market value influences its ROE.

### Theoretical Framework

The Arbitrage Pricing Theory (APT) and Dupont Formula derive the theoretical underpinnings for this study. The following presents these frameworks in turn.

According to the APT, rates of return can be specified as a function of general factors impacting all firm returns, but in different ways, and factors pertaining to firm-specific risks (Varian). The rate of return  $R$ , therefore, is a function of general factors,  $f_1, f_2, \dots, f_n$ , and some

$$R = b_{0a} + b_{1a}f_1 + b_{2a}f_2 + \dots + b_{na}f_n + \epsilon_a$$

for  $a = 1, \dots, A$ ,

firm-specific risks,  $\epsilon_a$ .

The vector of factors ( $f_1, f_2, \dots, f_n$ ) are regarded as "macroeconomic," economy, or countrywide factors that influence returns. Each asset has a particular sensitivity  $b_{ia}$  to factor  $i$ , and  $\epsilon_a$  is independent of the country-specific factors. Thus, from the APT, country-specific factors influence returns.

A look at the Dupont Formula illustrates the composite nature of ROE (Teitelbaum) and

$$ROE = PMAG \times AT \times EM$$

reveals the factors pertaining to firm-specific risks. The ROE formula is given as (Brigham):

where Profit Margin (PMAG) = Profits/Sales,  
Total Assets Turnover (AT) = Sales/Assets,  
Equity Multiplier (EM) = Assets/Equity.

Equation 2 shows that the ROE of a firm is directly influenced by firm-specific factors.

### Data and Empirical Model

From the APT and Dupont Formula it can be inferred that both country- and firm-specific risk factors influence ROE. Panel data used for this study covered 129 firms in the beverage and tobacco industry and 258 firms in the food and consumer-products industry from 1989 to 1995 in 12 industrialized countries including Australia, Britain, Canada, Denmark, France, Germany, Japan, the Netherlands, Switzerland, Singapore, and the United States. West Germany, which is also included in the sample, became Germany after the German reunification.

A major data source for the analysis was the Business Week Global 1000 (*Business Week*) ranking of firms. Other sources of data were two annual publications of the International Monetary Fund, 1996 and 1997 editions; International Financial Statistics Yearbook; various issues of the Political Risk Yearbook; and various issues of a Price Waterhouse publication, *Corporate Taxes. A Worldwide Summary*.

The data are unbalanced, meaning that data were not available for some firms for all years. In other words, not all firms rank among the Global 1000 for all years.

Estimates from three models—ordinary least squares (OLS), OLS with fixed effects (FEM), and generalized least squares (GLS) with random effects (REM)—were used in analyzing the influence of country- and firm-specific effects on ROE within and across countries and time. Greene gives a detailed description of these models. The firm-specific factors specified in the model are profit margin and market value. The country-specific factors specified in the model are the rate of inflation, cost of capital, cost of labor, political risk of doing business in a country, nominal exchange rate, gross domestic product, corporate tax rate, and industrial productivity.

The empirical model for ROE, is given as

$$ROE_{ct} = \beta_t + \psi_c + Q_{ct}\phi + v_{ct}$$

where  $\beta_t$  and  $\psi_c$  are time and country effects respectively, the vector  $Q_{ct}$  is a  $[1 \times k]$  set of time-varying country and firm-level economic variables, and the error term  $v_{ct}$  represents the factors that influence return on equity but which are unobservable to the financial analyst.

The variables for the empirical model are defined below. The expected impacts of the explanatory variables on ROE and the basis for such impacts are also presented.

ROE, the dependent variable, represents the profitability of firms. It measures the return on shareholder's investment. This after-tax measure of return on equity is the latest 12-month earnings per share as a percentage of the most recent book value per share (*Business Week*).

IFLATN is the rate of inflation for the relevant country measured as the annual percentage change in the consumer price index with 1990 as the base year (*International Financial Statistics Yearbook*; *The MIT Dictionary of Modern Economics*). Teitelbaum explained that an increase in the rate of inflation causes ROE to increase. Sales increase due to higher prices. However, assets recorded on the balance sheet are replaced gradually over time and lag in nominal amounts. The result is an increase in turnover and an increase in ROE.

WAGES is a proxy for the cost of labor in a country. Labor costs are measured as the hourly earnings in dollars-per-worker employed (*International Financial Statistics Yearbook*). Lower wages reduce costs resulting in higher profits, all else equal. Thus, wages are inversely related to ROE.

PRDTVY is the industrial productivity in each country. Industrial productivity is measured by dividing industrial production by amount of labor employed. Industrial production and employment are measured as indices with 1990 as the base year (*International Financial Statistics Yearbook*). Productivity is expected positively relate to profitability since increasing productivity increases profit margin (Fuller and Petry) and, consequently, ROE.

COSTCAP represents the cost of capital or the interest rate in percentage in a country (*International Financial Statistics Yearbook*). It

is the bank-lending rate to meet short- and medium-term financing needs of the private sector. Lower interest rates lead to lower costs and increased profitability. Thus, an inverse relationship is expected between the cost of capital and ROE.

FINTRA is the political risk of doing business. This is represented by a dummy variable—one if low risk and zero if otherwise. It is a rating of the ease with which financial instruments can move across the borders of countries (*Political Risk Yearbook*). The greater the political risk of investing in a country, the lower is the profitability of firms in that country. Thus, ROE is inversely related to FINTRA.

The income of each country is represented by Gross Domestic Product (GDP). It is measured as the nominal value in billions of U.S. dollars of the total output of goods and services the country's economy produced in a year, regardless of its allocation to domestic or foreign factors (*Political Risk Yearbook*). With an increase in economic activity, economies of size and agglomeration (large industries that attract specialized resources) are achieved leading to increased profitability. Thus, GDP is expected to directly relate to ROE.

MKTVAL is the market value of each firm. It is measured as the share price on May 31st for the year multiplied by the latest available number of shares outstanding and converted into U.S. dollars at May with month-end exchange rates in millions of U.S. dollars (*Business Week*). Market value may include several classes of stock; price and yield data are based on the company's most widely held issue. The Efficient Market Hypothesis suggests a positive relationship between market value and ROE (Emery and Finnerty).

PMAG is the ratio of the profits to sales of each firm. The sales of each firm are measured as the net sales reported by the firm in dollars (*Business Week*). The profits of the firm are the latest after-tax earnings available to common shareholders in dollars and are from companies' continuing operations before extraordinary items (*Business Week*). From the Dupont Formula (Equation 2) profit margin is directly related to ROE. The effect of profit

**Table 1.** Descriptive Statistics for the Beverage and Tobacco Industry

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
FINTRA	0.88	0.32	0.00	1.00
IFLATN	3.75	2.01	1.00	9.50
GDP	3258801.70	2540.01	129120.00	7245799.80
PMAG	0.09	0.06	0.0035	0.33
WAGES	109.18	16.25	91.10	180.00
PRDTVTY	1.02	0.04	0.89	1.21
COSTCAP	8.98	2.79	4.41	14.75
MKTVAL	12242.17	14653.50	1749.00	78629.00
EXRATE	22.46	56.43	0.74	191.21
CORPTAX	0.35	0.02	0.31	0.40
ROE	19.71	15.84	1.20	105.40

margin on ROE can further be determined by the trend of profits and sales. Teitelbaum observed that when growth in profits outstrips growth in sales, profit margins increase, causing a subsequent increase in ROE.

CORPTAX represents the corporate tax rate of each country. It is measured in percentage form and is levied on varying amounts of taxable income determined by the government (*Corporate Taxes. A Worldwide Summary*). High tax rates are thought to increase costs and lower profitability. Therefore, the corporate tax rate is expected to inversely relate to ROE.

EXRATE (International Financial Statistics) is the nominal effective exchange rate index of the different countries. This index represents the ratio (base of 1990=100) of an index of the period average exchange rate of the currency in question to a weighted geo-

metric average of exchange rates for the currencies of selected countries. The selected countries encompass 22 industrialized nations selected by the International Monetary Fund. A high-valued currency inhibits export sales and thus profitability (Bahmani-Oskooee and Ltaifa). The exchange rate, then, is expected to negatively relate to ROE.

Tables 1 and 2, respectively, present summary statistics for the beverage and tobacco industry and the food and consumer products industry.

### Method of Analysis

Five models were estimated for each of the two agribusiness industries in a common approach for panel data: OLS, one- and two-factor fixed effects models (FEM), and one- and

**Table 2.** Descriptive Statistics for the Food and Consumer Products Industry

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
FINTRA	0.83	0.37	0.00	1.00
IFLATN	3.63	1.72	1.00	9.50
GDP	4200915.70	2297.82	177520.00	7245799.80
PMAG	0.05	0.03	-0.0004	0.17
WAGES	107.48	14.03	91.10	180.00
PRDTVTY	1.01	0.04	0.89	1.13
COSTCAP	8.29	2.49	4.41	14.75
MKTVAL	6503.47	6245.19	1822.00	49405.00
EXRATE	35.52	69.41	0.74	191.21
CORPTAX	0.35	0.05	0.10	0.56
ROE	20.61	13.42	1.20	107.90

two-factor random effects models (REM) (*Limdep Version 7.0 User's Manual*).

Dummy variables in panel data, in this case one- and two-factor models, are used to account for factors unique to various parts of the panel which cannot be explained by the regressors. The one-factor model includes dummies to represent countries, while the two-factor model includes dummies to represent countries and time. Each of these models can be estimated in a FEM or REM framework.

The REM differs from the FEM in that for the REM the dummies or individual specific constant terms are randomly distributed across cross-sectional units. In the analysis of firms the dummies can be viewed as the collection of factors not in the regression that are specific to a firm. Also, GLS is necessary to estimate the REM (*Limdep Version 7.0 User's Manual*). Both OLS in the FEM and GLS in the REM are consistent, but OLS is inefficient. This is under the null hypothesis that the two estimates should not differ systematically. The Hausman's (H) Test is used to test this null hypothesis.

The remaining question addresses the actual necessity for the dummy variables. That is, do indicator variables representing countries and time add significant information to the ROE model? A Lagrange Multiplier (LM) Test for the REM, developed by Breusch and Pagan, can be used for this purpose (*Limdep Version 7.0 User's Manual*). The LM Test for the REM is based on OLS residuals to check for evidence suggesting that the error-components model (REM) is favored.

## Results

### *Beverage and Tobacco Industry*

The results, shown in Table 3, for the one- and two-factor models were the same. The FEM and REM were not found to be significantly different according to the H statistic. Further, the LM Test was not significant for the REM. This indicates that the dummy variables for country and/or time did not add explanatory power to the model. Therefore the OLS model

without dummy variables appears sufficient to explain ROE.

The significant coefficients for the OLS model were for the following variables: GDP, profit margin (PMAG), market value (MKTVAL), exchange rate (EXRATE), and corporate tax rate (CORPTAX). All had the expected signs except for the corporate tax coefficient.

The CORPTAX coefficient was expected to be negative, indicating the penalty of high tax rates on ROE. However, tax rates may only opaquely reflect actual taxes. Moreover, WAGES were found to be negatively correlated ( $-0.357$ ) with tax rates. Thus, the positive sign for the tax-rate coefficient could indicate that a combination of low wages and some level of taxes—not necessarily as high as indicated by the tax rate—are relatively profitable.

### *Food and Consumer Products Industry*

Results regarding the appropriate model for this industry were identical to those for the beverage and tobacco industry. Again, the OLS model without dummy variables appears sufficient to explain ROE, Table 4.

The significant coefficients for the OLS model were GDP, profit margin (PMAG), and exchange rate (EXRATE). All had the expected sign.

## Conclusions and Implications

Previous studies (Geringer, Beamish, and daCosta; Soenen and Van den Bulke; Lee and Blevins) conducted from 1977 to 1987 indicated that return on equity varied across countries. These studies used paired tests and analysis of variance to determine if differences existed between countries. Dissimilar accounting practices caused the differences across countries. This study shows that though no significant variation of return on equity across countries occurred, explainable variation within countries was present for the two industries observed. The analysis in this study went beyond analysis of variance, encompassing an econometric procedure for panel data. The

**Table 3.** Regression Coefficients for the Beverage and Tobacco Industry<sup>a</sup>

Variable	OLS	One Factor		Two Factor	
		FEM	REM	FEM	REM
Intercept <sup>b</sup>	-130.05 (-2.78)		-179.55 (-3.42)	-269.58 (-2.38)	-183.33 (-2.95)
FINTRA	-3.83 (-1.18)	-5.74 (-1.03)	-5.64 (-1.51)	-3.99 (-0.50)	-5.11 (-1.26)
IFLATN	0.43 (0.48)	-0.19 (-0.13)	0.18 (0.16)	-0.99 (-0.51)	0.14 (0.12)
GDP	0.0013 (2.47)	0.0017 (0.40)	0.002 (1.12)	-0.90 (-0.51)	0.14 (0.12)
PMAG	149.68 (9.58)	146.82 (9.34)	147.54 (9.43)	145.74 (9.03)	147.10 (9.20)
WAGES	0.03 (0.42)	0.036 (0.53)	0.32 (0.49)	0.70 (0.76)	0.04 (0.61)
PRDTVTY	-0.59 (-0.02)	14.38 (0.31)	13.38 (0.48)	63.57 (0.79)	17.23 (0.51)
COSTCAP	-0.79 (-1.02)	-0.39 (-0.33)	-0.59 (-0.50)	0.67 (0.39)	-0.41 (-0.43)
MKTVAL	0.002 (3.09)	0.0002 (3.14)	0.0002 (3.16)	0.0002 (3.12)	0.002 (3.12)
EXRATE	-0.11 (-3.76)	-0.05 (-0.15)	-0.11 (-1.29)	-0.18 (-0.38)	-0.10 (-1.17)
CORPTAX	398.07 (4.40)	519.35 (4.50)	488.76 (4.88)	584.60 (3.05)	475.71 (4.32)
AUSTRALIA		-203.37 (-2.18)		-29.14 (-0.65)	
BRITAIN		-186.04 (-2.31)		0.09 (0.003)	
DENMARK		-206.74 (-2.31)		-29.22 (-0.71)	
FRANCE		-185.65 (-2.30)		-1.17 (-0.05)	
JAPAN		-203.92 (-3.63)		8.56 (0.12)	
NETHERLANDS		-186.76 (-2.17)		-5.82 (-0.17)	
W. GERMANY		-191.54 (-2.28)		-8.76 (-0.29)	
UNITED STATES		-190.25 (-2.86)		1.93 (0.08)	
1989				0.73 (0.08)	
1990				0.18 (0.02)	
1991				-1.21 (-0.31)	
1992				-1.71 (-0.40)	
1993				4.30 (0.77)	
1994				-0.69 (-0.05)	
1995				-3.56 (-0.16)	
N	129				
R <sup>2</sup>	0.63	0.66	0.59	0.67	0.60
F	20.05	12.77		8.66	
H statistic <sup>c</sup>			0.00		2.03
LM statistic			0.67 <sup>d</sup>		1.89 <sup>e</sup>

<sup>a</sup> t statistics are in parenthesis.<sup>b</sup> No intercept for the one factor FEM model (*Limdep Version 7.0 User's Manual*, p.289).<sup>c</sup> Chi square statistic for 10 degrees of freedom at the 0.95 probability level is 18.31.<sup>d</sup> Chi square statistic for 1 degree of freedom at the 0.95 is 3.84.<sup>e</sup> Chi square statistic for 2 degrees of freedom at the 0.95 probability level is 5.99.



**Table 4.** Regression Coefficients for the Food and Consumer Products Industry<sup>a</sup>

Variable	OLS	One Factor		Two Factor	
		FEM	REM	FEM	REM
Intercept <sup>b</sup>	-7.09 (-0.276)		-3.71 (-0.12)	99.35 (0.92)	-4.28 (-0.13)
FINTRA	2.16 (0.91)	-2.11 (-0.56)	1.78 (0.65)	-4.32 (-0.61)	2.07 (0.72)
IFLATN	-0.67 (-0.77)	-0.36 (-0.27)	-0.81 (-0.68)	0.14 (0.07)	-0.83 (-0.68)
GDP	0.0008 (1.96)	0.0005 (1.49)	0.0006 (0.42)	-0.0009 (-0.13)	0.0005 (0.29)
PMAG	89.61 (3.17)	82.75 (2.90)	86.37 (3.04)	83.39 (2.90)	86.62 (3.02)
WAGES	0.06 (1.00)	0.04 (0.63)	0.05 (0.86)	0.02 (0.24)	0.06 (0.88)
PRDTVTY	10.91 (0.46)	-48.26 (-1.12)	9.50 (0.37)	-119.61 (-1.29)	9.52 (0.34)
COSTCAP	1.05 (1.49)	0.41 (0.42)	0.99 (1.17)	0.86 (0.56)	1.02 (1.18)
MKTVAL	0.00008 (0.69)	0.00007 (0.59)	0.00008 (0.59)	0.00006 (0.46)	0.00007 (0.56)
EXRATE	-0.06 (-3.22)	0.38 (1.54)	-0.02 (-0.24)	0.67 (1.56)	-0.02 (-0.28)
CORPTAX	-11.49 (-0.57)	-41.36 (-0.37)	-16.43 (-0.40)	-30.35 (-0.20)	-15.52 (-0.38)
BRITAIN		71.27 (1.08)		22.88 (0.75)	
FRANCE		65.10 (0.99)		20.26 (0.68)	
GERMANY		67.09 (0.83)		5.33 (0.11)	
JAPAN		-20.51 (-0.47)		-110.78 (-1.77)	
NETHERLANDS		83.52 (1.21)		32.48 (0.83)	
SWITZERLAND		61.95 (1.21)		28.77 (0.75)	
W. GERMANY		66.00 (0.86)		17.06 (0.43)	
UNITED STATES		48.78 (0.85)		28.45 (1.46)	
1989				-18.00 (-1.53)	
1990				-9.01 (-1.16)	
1991				-3.96 (-1.12)	
1992				-0.52 (-0.21)	
1993				-6.70 (-1.25)	
1994				33.22 (1.56)	
1995				37.31 (1.42)	
N	258				
R <sup>2</sup>	0.29	0.32		0.33	
F	10.26	6.65		4.72	
H statistic <sup>c</sup>			0.00		5.27
LM statistic			0.98 <sup>d</sup>		3.04 <sup>e</sup>

<sup>a</sup> t statistics are in parenthesis.<sup>b</sup> No intercept for the one factor FEM model (*Limdep Version 7.0 User's Manual*, p.289).<sup>c</sup> Chi square statistic for 10 degrees of freedom at the 0.95 probability level is 18.31.<sup>d</sup> Chi square statistic for 1 degree of freedom at the 0.95 is 3.84.<sup>e</sup> Chi square statistic for 2 degrees of freedom at the 0.95 probability level is 5.99.

**Table 5.** Test for Country and Time Effects, Beverage and Tobacco Industry

Item	Unrestricted		
	Re- stricted	Country Effects	Country and Time Effects
SSE	12248	10892.2	10636
Observations	129	129	129
Parameters (K)		18	25
Restrictions (J)		8	15
F	—	1.72 <sup>a</sup>	1.05 <sup>b</sup>

<sup>a</sup> F(8,111) at 0.95 Probability Level is 1.94.  
<sup>b</sup> F(15,104) at 0.95 Probability Level is 2.21.

analysis included country and time dummy variables to determine their effects on return on equity—a measure of profitability. Although the two-factor, fixed-effects model for the food and consumer-products industry showed that differences existed between some countries, the general specification tests used in the analysis showed that country and time-specific variables were not important in explaining variation in return on equity. The general specification tests used in the analysis served as a means of checking for differences among countries as they interacted in a global market.

The basis for this study is found in economic theory, which states that for competitive markets rates of return will tend to equilibrate. Evidence from the Arbitrage Pricing Theory and the Dupont Formula shows that in various countries return on equity is influenced, respectively, by country- and firm-specific factors. Blame’s study in 1984 to 1990 asserts that firms in different countries appeared to earn roughly equivalent rates of return during the latter half of the 1980s. In a study on corporate performance of firms across various industries in an improving economy, Hergert concluded that certain macroeconomic and firm-specific factors were imperative in the analysis of a firm’s return on equity.

The results of this study and Blaine’s differ from previous studies perhaps due to the increasing intensity of globalization in recent years. The IMF’s publication, the *World Eco-*

**Table 6.** Test for Country and Time Effects, Food and Consumer-Products Industry

Item	Unrestricted		
	Re- stricted	Country Effects	Country and Time Effects
SSE	33247.5	31754.7	30873.9
Observations	258	258	258
Parameters (K)		8	15
Restrictions (J)	—	18	25
F	—	0.65 <sup>a</sup>	0.53 <sup>b</sup>

<sup>a</sup> F(8,111) at 0.95 Probability Level is 1.94.  
<sup>b</sup> F(15,104) at 0.95 Probability Level is 2.21.

*nomie Outlook*, reports that the globalization process was intensified after World War II by the Bretton Woods institutions. Lubbers believes that 1989 was the year in which the effects of globalization actually became manifest, which coincides with the beginning of our study period. Further, Ghoshal and Nohria, emphasizing that the forces of global integration were strengthening, stated that firms in the same industries tend to adopt similar organizational responses (strategies and structures). They went on to say that since performance is a function of the “fit” between a firm’s structure and its environmental context, firms that adopt similar organizational responses should also tend to earn similar rates of return. Our study confirms these assertions for two agribusiness industries.

In conclusion, the findings of this study reflect the significance of the effects of globalization and country-specific economic factors on the profitability of agribusiness firms. For the food and consumer-products industry, gross domestic product, the exchange rate, and profit margin were important in explaining the variation in return on equity. For the beverage and tobacco industry, market value was also important.

This study has delineated the important factors, in the face of intensifying globalization, that firms in two of the largest agribusiness industries should consider in investment decisions in developed countries. These important factors impacting return on equity tend to be comparable across developed countries.

As globalization unfolds other risk factors for investment undoubtedly will emerge. This, of course, creates a rich environment for continued research.

## References

- Bahmani-Oskooee, M., and N. Ltaifa. "Effects of Exchange Rate Risk on Exports: Cross-country Analysis." *World Development* 20(1992):1173–1181.
- Blaine, M. "Comparing the Profitability of Firms in Germany, Japan, and the United States." *Management International Review* 34,2(1994): 125–148.
- Brigham, E.F. *Fundamentals of Financial Management*. 7th ed. Fort Worth: The Dryden Press, 1995.
- Business Week. "The Business Week Global 1000." *Business Week* July 17, 16, 15, 13, 12, 11, and 10 issues of 1989–1995, respectively.
- Emery, D.R. and J.D. Finnerty. *Corporate Financial Management* New York: Prentice Hall, 1997.
- Fuller, R.J., and G.H. Petry. "Inflation, Return on Equity, and Stock Prices." *Journal of Portfolio Management* 7,4(1981):19–25.
- Geringer, M., P. Beamish, and R. daCosta. "Diversification Strategy and Internationalization: Implications for MNE Performance." *Strategic Management Journal* 10(1989):109–119.
- Ghoshal, S., and N. Nohria. "Horses for Courses: Organizational Forms for Multinational Corporations." *Sloan Management Review* 34,2 (1993):23–25.
- Greene, W.H. *Limdep Version 7.0 User's Manual*. Plainview: Econometric Software, Inc., 1995.
- Hergert, M. "Will Corporate Performance Decline in an Improving Economy?" *Journal of Business Strategy* 3,4(1983):101–105.
- Hirschey, M., and P.K. Koch. "The Global Variation In Financial Ratios." *Advances in Financial Economics* 1(1995):17–35.
- International Monetary Fund. "Globalization Opportunities and Challenges." *World Economic Outlook*, May 1997.
- International Monetary Fund. *International Financial Statistics*. IMF, Washington DC, May 1997.
- Lee, J., and D.E. Blevins. "Profitability and Sales Growth in Industrialized Versus Newly Industrializing Countries." *Management International Review* 30(1990):87–100.
- Levonian, M.E. "The Persistence of Bank Profits: What the Stock Market Implies." *Economic Review*. Federal Reserve Bank of San Francisco 2(1994):3–17.
- Lubbers, R.F.M. "The Globalization of Economy and Society." *Articles by R.F.M. Lubbers*. Unpublished paper, J.F. Kennedy School of Government, Harvard University (1997). Online. Available <http://www.globalize.org/globview.htm>.
- Political Risk Services. *Political Risk Yearbook*. PRS, New York. Asia and the Pacific, Europe, EU, North America and Central America issues, 1989–1996.
- Price Waterhouse. *Corporate Taxes. A Worldwide Summary*. Price Waterhouse, New York. 1989–1995 issues.
- Public Utilities Fortnightly. "ROE determinants—Risk factors" *Public Utilities Fortnightly* 133,5(March 1, 1995):45.
- Soenen, L., and D. Van den Bulke. "Belgium's Largest Industrial Companies: A Comparison of Size and Financial Performance between Foreign and Belgian Owned Firms." *Management International Review* 28(1)(1988):51–63.
- Teitelbaum, R.S. "What's Driving Return On Equity?" *Fortune* 133,8(April 29, 1996):271–276.
- The MIT Dictionary of Modern Economics*. 4 ed. Cambridge: The MIT Press, 1992.
- Varian, H.R. *Microeconomic Analysis*. 3rd. ed. New York: W. W. Norton and Company, 1992.
- Wall, A. "Study of Credit Barometrics." *Federal Reserve Bulletin* (March, 1919):229–243.