FS 00-16 August 2000

Profitability Adjustment Patterns in International Food and Consumer Products Industries

YVONNE J. ACHEAMPONG
JAMES E. EPPERSON
TIMOTHY A. PARK
LEWELL F. GUNTER

FS 00-16 August, 2000

Profitability Adjustment Patterns in International Food and Consumer Products Industries

YVONNE J. ACHEAMPONG
JAMES E. EPPERSON
TIMOTHY A. PARK
LEWELL F. GUNTER

The authors are graduate research assistant, professor, associate professor, and professor, respectively, at the Department of Agricultural and Applied Economics, University of Georgia, Athens, GA 30602-7509. The contact author is James E. Epperson, 706-542-0766, fax 706-542-0739, jepperson@agecon.uga.edu.

Dept. of Agricultural & Applied Economics
College of Agricultural & Environmental Sciences
University of Georgia

Profitability Adjustment Patterns in International Food and Consumer Products Industries

YVONNE J. ACHEAMPONG
JAMES E. EPPERSON
TIMOTHY A. PARK
LEWELL F. GUNTER

Department of Agricultural and Applied Economics

University of Georgia

Athens, GA 30602-7509

jepperson@agecon.uga.edu.

ABSTRACT---The study encompasses an analysis of the variation in speeds of profitability adjustment and accounting bias by developed country and firm size for two important agribusiness industries. Evidence of speeds of profitability adjustment and accounting bias varying by firm size was found in the beverage and tobacco industry and by country in the food and consumer products industry. This suggests that the competitive pressures of integrated international markets are less of a factor in the food and consumer products industry[L100, L150, L660].

-----KEY WORDS-----
economic profit, profit persistence half-life, return on equity, investment indicator, market power measure.

Profitability Adjustment Patterns in International Food and Consumer Products Industries

1. INTRODUCTION

Firm profitability and adjustment patterns in profit levels are critical issues for shareholders and firm management. Shareholders are particularly interested in profitability and its adjustments because in the long run these affect the value of the firm and the returns to investing in the firm. The management of firms, on the other hand, is faced with the responsibility of maximizing the value of firms in the long run through increasing profits. Feedback on profitability and its adjustment is the kind of information that management needs in order to keep firms competitive. McGahan and Porter (1999) emphasize the importance of understanding the persistence of firm profitability and adjustment patterns in profits due to industry, corporate-parent, and business-specific effects.

Shareholders and management are increasingly concerned with how the global economy can affect market competition in terms of the speed of profitability adjustment. Guynn (1998) noted that international market competition has intensified due to globalization. The International Monetary Fund (IMF) defines globalization as the growing economic interdependence of countries through increasing volume and variety of cross-border transactions in goods and services, freer international capital flows, and more rapid widespread diffusion of technology (*Globalization Opportunities and Challenges*, 1997). Because of globalization, firms in industrialized countries face similar threats and opportunities and consequently should tend to earn similar rates of profit (Guynn 1998; Stigler, 1963, p.54). Comparing the profitability of firms in Germany, Japan, and the United States, Blaine (1994) observed that although there were some statistical differences in profitability, firms within the same industry in general earned roughly equivalent rates of profitability.

This study focuses on global firms in the beverage and tobacco (B&T) industry and the food and consumer products(F&CP) industry. For these two industries, the forces of global integration appear to be strengthening, driven among other forces by the growing proliferation of regional and global brands (Ghoshal and Nohria, 1993). We use an approach for analyzing profitability adjustments which was initially developed for the banking industry (Levonian, 1994).

Two other prominent approaches that involve partial adjustment estimation of firm profitability are the works of Fama and French (2000) and Mueller (1986). Both studies, as with ours, start with the same proposition in economic theory as stated by Stigler (1963) – the rate of return for firms tends toward equality in a competitive market. Both studies encompass large sample sizes with small firms truncated across all U.S. industries. Our study is international in scope, encompassing Global 1000 firms and is narrowly focused on two agribusiness industries. Mueller's (1986) linear model was used to explain the relative change in the accounting rate of return on investment, while the recursive, nonlinear model of Fama and French (2000) was used to explain the change in the accounting rate of return on investment. As pointed out by Fama and French (2000) and Lev (2001), the accounting rate of return is a "noisy" proxy for true economic profitability. The measure of profitability in our model is the true economic rate of return on equity. The nonlinear model explains the deviation of economic profits from zero (Levonian, 1994).

Our model has been further developed to account for spatial and size effects. The research examines whether the speed of profitability adjustment varies across internationally separate markets and across firm size within an industry in light of an increasingly global economy.

An important consideration is the impact of globalization and, thus, international market competition (Guynn, 1998). Globalization reflects the degree of openness of a country to trade with other countries. The speeds of profitability adjustment across country are expected to be similar because of international market competition.

Openness to trade can be measured as the ratio of trade to Gross Domestic Product (GDP). Five of the countries considered here (Britain, Canada, Denmark, the Netherlands, and the United States) have shown an increase in openness to trade (Otsubo, 1996).

Another important consideration is the effect of monopoly rents. The number and size of firms in an industry largely determine the structure of the industry as reflected in price and profit levels (Varian, 1992). Of course, extremely large firms can fall victim to bureaucracy and organizational slack leading to lower profits. But in the main, large firms are expected to capitalize on their market power, benefitting from economies of size in product innovation, promotion, and advertising resulting in a continuous flow of new or improved products from which to garner monopoly rents for a time. Mueller (1986) found that firms with persistently high profits and, thus, slower speeds of profitability adjustment tended to have high market shares. We expect to verify Mueller's findings for the B&T and F&CP industries in developed countries.

The paper is organized as follows. The theoretical background is presented, followed by the econometric model, a description of the data, and empirical results. The paper ends with a discussion of the results, a summary, concluding remarks, and implications.

2. PROFITABILITY ADJUSTMENT AND MARKET EXPECTATIONS

A basic tenet of economic theory is that in competitive equilibrium all assets, risk aside, must earn the same rate of return, else there would be opportunities for arbitrage. An important assumption undergirding the theory of a competitive market is that there are no barriers to the flow of resources (Varian, 1992), an indispensable component of a global economy. Theory suggests that even in an imperfectly competitive setting, the forces of competition push the rates of economic profit toward some common value. Even so, the economic rate of return can vary across firms because of varying levels of risk and differences due to monopoly rents (Fama and French, 2000; Varian, 1992). Put differently, the economic rate of return for a given firm can vary from the breakeven rate, or firm profit levels can vary positively or negatively from zero (Varian, 1992). Not only can firm profit levels differ from zero, they can persist beyond the short run depending on market share and/or risk. Greater persistence of positive profit levels means that the adjustment of profit levels toward zero or the breakeven rate of return is relatively slow (Mueller, 1986; Levonian, 1994).

Levonian (1994) explained that profits diverge from zero to positive levels because of the skill of management or unanticipated circumstances that cause a firm to have abnormal profits. Some of the competitive forces that can drive profits toward zero are entry or the threat of entry by competitors, interfirm rivalry, the shift of demand to substitute products, and a change in factor prices in an imperfectly competitive market for inputs to capture part of the rents inherent in abnormal profits. Firms with abnormal profits therefore go through an adjustment process toward zero.

Firms may also have negative economic profits. This could be caused by unsuccessful product innovation, overestimation of demand, failure of process experimentation, and the relative success of competitors. Negative profits are also a deviation from the long-run equilibrium which leads to a process of adjustment towards zero. Exits from the market facilitates this adjustment process and can take the form of abandonment of unsuccessful products, reduction of capacity, or the disappearance of firms from the market.

The speed of profitability adjustment is reflected in market expectations. Stock market investors implicitly believe that competitive forces operate within industries and that profits tend toward zero over time. Capital market efficiency suggests that market prices of financial assets reflect available information and adjust to any new information. Thus, the stock market efficiently reflects implied adjustment speeds which carry important information about an industry.

Economic profits are based on two measures, the accounting rate of return or the return on equity, ROE, versus the required rate of return k_i. The required rate of return, k_i, is specified here as the sum of the ratio of the estimated value of next year's dividend to the current market price and the five-year percentage average growth rate of dividends (Cornell, Hirshleifer, and James, 1997).

Shareholders invest in the assets of firms and expect at least the required rate of return, k_i, on the firm's shares purchased in the secondary market. It is assumed that though capital markets are efficient, the market for goods and services may not be, resulting in observed differences between R_{it}, the expected value of return on equity for firm i in period t, and the required rate of return, k_i, at any point in time. In efficient markets, share prices adjust such that R_{it}, in a secondary market, is always equal to k_i. Adjustments in markets for goods and services produced by a firm are necessary if R_{it} is to be driven to k_i. Market power or other constraints to the adjustment process in the B&T and F&CP industries could lead to differences between R_{it} and k_i.

3. ACCOUNTING AND ECONOMIC PROFITS

Return on equity (ROE) is an accounting return and cannot be accurately used as a proxy for economic profits (Fisher and McGowan, 1983). By making plausible assumptions about how markets form expectations about the value of the economic rate of return on equity, *R*, a relationship can be established between *ROE*, the accounting return, and *R*, the economic rate of return on equity, an economic profit measure.

Assume that R_i can deviate from ROE_i for two reasons, captured by the parameters, α and ϵ_i. Let α represent an unobserved industry-wide bias in reporting earnings incorporating distortions because of the failure of accounting practices to reflect economic realities and a cross-sectional mean of transitory shocks to rates of return. Unobserved firm-specific deviations are denoted by ϵ_i and are the result of events with dissimilar impacts across firms. The random shocks are drawn from a normal distribution with a zero mean and unknown variance. The relationship between R_i and ROE_i, therefore, is given as:

(1) $$R_i = ROE_i - \alpha - \epsilon_i.$$

When economic profits differ from zero, the expected value of return on equity differs from the investor's required return on equity. A spread exists between R_{it} and k_i for any specific time period *t*. Competition tends to move R_{it} toward k_i which implies that in perfectly competitive equilibrium, $R_{it} = k_i$.

Assume that R_{it} follows a partial adjustment process with an adjustment speed of λ, where the adjustment speed is a proportion of the difference between last period's economic rate of return, R_{it-1}, and the required rate of return, k_i. The relationship is given as:

(2) $$R_{it} = R_{it-1} - \lambda(R_{it-1} - k_i)$$

which simplifies to

(3) $$(R_{it} - k_i) = (1 - \lambda)(R_{it-1} - k_i).$$

When $\lambda = 1$, there is an instantaneous adjustment to zero profits in the next period which means that competitive equilibrium is attained in which case $R_{it} - k_i$ is zero. If $\lambda = 0$, it implies no adjustment to zero profits, and $R_{it} - k_i$ is equal to $R_{it-1} - k_i$. This means that the spread between R_{it} and k_i always persists. Recursive substitution in (3) yields an expression for the spread ($R_{it} - k_t$) in terms of the current spread between R_{i0} and k_i, and t number of past periods from the current period:

(4) $$R_{it} = (1 - \lambda)^t(R_{i0} - k_i) + k_i$$

where at $t = 0$, the expected and actual returns are identical and equal to R_{i0}.

4. MODEL SPECIFICATION

The market to book ratio, *M/E*, is the ratio of market price of a share to its book value, such that:

$$\frac{M_i}{E_i} = (R_i - k_i)\left[\frac{(1 - \lambda)}{k_i - g_i + \lambda(1 + g_i)}\right] + 1 \tag{5}$$

where g_i is the annual growth rate of equity, E_i. This ratio describes the divergence between the market value of equity and the book value of equity. A ratio greater than or equal to 1 implies an increase in the market value of the firm, an increase in the share price, and an increase in the equity of shareholders. The positive relationship between the ratio of market value and contributed equity (M_i/E_i) for firm *i* and the spread for the actual economic rate of return on equity and the required rate of return (R_i - k_i) is expressed in equation (5). Thus, when $R_i = k_i$ and $M_i/E_i = 1$, a firm is at competitive equilibrium. If a company does not have a positive spread, it does not have surplus value – higher equity value – to pass along to shareholders.

The relationship between the market to book ratio, M_i/E_i, and R_i - k_i, the spread between the economic rate of return and the required rate of return depends on the speed of adjustment, λ. Faster speeds of adjustment to equilibrium imply less persistence in profits. An instantaneous speed of adjustment, $\lambda = 1$, means that $M_i/E_i = 1$. Values of λ closer to zero or slower speeds of adjustment suggest that differences between R_i and k_i can be maintained for longer periods. Persistent abnormal returns raise the market value of equity relative to E_i .

When the expected return, R_i in (1) is substituted into (5), the resulting equation is

(6) $$\frac{M_i}{E_i} = \frac{(ROE_i - \alpha - \epsilon_i - k_i)(1 - \lambda)}{k_i - g_i + \lambda(1 + g_i)} + 1.$$

This relationship is assumed to hold in cross-section at any point in time for statistical estimation of α and λ. There may be variation in sign and magnitude of the accounting bias coefficient α across sample dates since shocks that cause ROE_i to differ from R_i may vary over time. There may also be variation in the adjustment speed λ because at any point in time it reflects the market's expectation of the future path of profits conditional on available information. Accounting for time in the variables and solving for ROE_i - k_i in (6) gives

(7) $$(ROE_{it} - k_{it}) = \left[\frac{M_{it}}{E_{it}} - 1\right]\left[\frac{k_{it} - g_{it} + \lambda_t\,(1 + g_{it})}{1 - \lambda_t}\right] + \alpha_t + \epsilon_{it}$$

where M_i is the market capitalization value, E_i is the book value of equity, g_i is the annual growth rate of E_i, ROE_i is the accounting return on equity, and k_i is the required return to equity for firm i. Equation (7) describes the persistence of economic profits from stock market and financial accounting data. Economic profits are represented by the term ROE_{it} - k_{it}. Persistence is measured by the speed of adjustment of economic profits, λ. The longer profits persist or the slower the adjustment process, the further the market or industry is away from the perfectly competitive equilibrium.

A positive spread between ROE_{it} and k_{it} indicates that there are nonzero or abnormal profits. Such profits do not necessarily reflect a lack of competition. Persistence of profits or the extent to which nonzero profits in one period tend to be sustained in future periods might be considered as an indicator of market competitiveness. Srinivasan (1997) explained the significance of positive and negative profits to an investor. The market value of the firm increases with increasing positive spreads between ROE_{it} and k_{it} and this increases investor wealth. Also, the persistence of negative profits causes the market value of a firm to decrease and decreases investor wealth.

The duration of the adjustment process for profits is critical. Peles and Schneller (1989) note that the duration of the adjustment process depends on two parameters. The first factor accounts for the relative benefits and costs to the firm of the adjustment process and is linked to the competitive nature of the industry in which the firm operates. The second is the time needed for responding to adjustments by market forces operating in the industry and the firm.

Other factors affect the speed of adjustment including the cost of acquiring and using information and the rate at which producers and consumers respond to new information. The conduct of market participants also influences adjustment patterns. For instance, firms with abnormal profits could ensure that information about the market is not readily available or could put impediments in the way of potential entrants. Government policies could either encourage or prevent adjustment in certain industries.

The term, $(1-\lambda)$ can be used to determine the number of years, d, or the duration of the adjustment process, required for any initial spread between R_{i0} and k_i to fall by a proportion, δ, of the spread. The number of years is derived by setting $(1-\lambda)^d$ equal to δ and taking logs:

(8) $$d \times \log(1-\lambda) = \log(\delta).$$

We compute the number of years required for any initial spread between R_{i0} and k_i to fall by half by setting $(1-\lambda)^d$ equal to ½ and rearranging to solve for d. The duration and speed of adjustment describes the persistence of profits and is useful information regarding industry dynamics. Shareholders and managers benefit from this information because as profits persist, the market value of the firm increases and the value of equity for the shareholder increases.

5. ESTIMATION

Nonlinear least squares estimation was used to estimate the coefficients of the two models used. The model used in empirical estimation for two agribusiness industries is a modification of equation (7):

$$\textbf{(9)} \qquad (ROE_{it} - k_{it}) = \left[\frac{M_{it}}{E_{it}} - 1\right]\left[\frac{k_{it} - g_{it} + \lambda_{C_t}(1+g_{it}) + \lambda_{F_t}(1+g_{it})}{1 - \lambda_{C_t} - \lambda_{F_t}}\right] + \alpha_t + \gamma_t C_t + \phi_t F_t + \epsilon_{it}$$

where C_t and F_t are dummy variables which allow α_t and λ_t to vary by country and firm size. To test for country and size-of-firm effects, an F-test is used. Results from the Chow test determine if the models should be pooled, that is, whether each of the agribusiness industries should be analyzed separately or together as one common entity. In order to test for the significance of country effects, a restricted model is estimated which omits the dummy variables for countries. To test for the significance of firm-size effects, the restricted model deletes the dummy variables for firm size.

6. DATA

The sources of data for the analysis were the *Business Week* Global 1000 ranking of firms from various July issues of *Business Week* from 1988 to 1996 and "The Global Researcher Worldscope Database" (1998) by Disclosure Incorporated. Data for all variables, except the annual and five-year average growth rates for dividends and book value, were obtained from *Business Week*. The annual and five-year average growth rates for dividends and book value were obtained from Disclosure Incorporated.

Panel data used for this study covered 11 firms in the B&T industry from Britain, Canada, Denmark, Japan, and the United States. In the F&CP industry, 18 firms from Britain, Japan, the Netherlands, and the United States were included. The total number of observations for the B&T industry was 99 and for the F&CP industry, 162. Firms were included in the sample if they ranked among the Global 1000 and if there were observations for all of the sample years.

Panel data were used to investigate profit persistence consistent with market beliefs across cross-sectional units over time. The data are balanced, meaning that the data include observations for each firm for all years of the data set. The use of the same period for all firms across all countries ensures that all firms experienced the same global events at the same time. The definitions of the variables used in the model are given in Table 1. Glick and Ehrbar (1990) confirmed that the length of time needed to test for persistence of profits need not be a long period. Noting "disappointingly small" gains from lengthening the time period for estimation, they concluded that profit persistence can endure in the long run and can be measured with a relatively short-period panel data model.

7. RESULTS AND DISCUSSION

The descriptive statistics for the variables used in the analyses are presented in table 1 for the B&T and F&CP industries, respectively. The estimates of the speed of adjustment and accounting bias under various circumstances for hypotheses testing are presented for both agribusiness industries.

The Chow test for differences in the two industries is presented first. The purpose here is to determine if the two agribusiness industries can be analyzed in separate models or if the two industries should be pooled. Using equation (7) unrestricted models are estimated for the B&T and F&CP industries along with pooled or restricted models of the two industries. The F value calculated at the 5 % significance level is 23.64 which is greater than the critical value of 3.00. Thus, it appears that the two agribusiness industries are sufficiently different to allow unrestricted analyses by industry.

7.1. Firm-Size Effects

Estimates of the speed of adjustment (λ) and accounting bias (α) with firm-size effects are given in Table 2. The speed of adjustment can vary between 0 and 1, where 0 represents no adjustment towards zero economic profit in the long run and 1 indicates a state of frictionless perfect competition with no long-run economic profit.

The speed of adjustment coefficients for the largest firms (first quartile) were almost 0.64 for the B&T industry and 0.61 for the F&CP industry. The coefficients are similar for both industries; however, only the F&CP coefficient is significant at the 0.05 level. Profit adjustment occurs but is not instantaneous.

These results are somewhat different from previous findings on trends in profit levels. Waring (1996) measured the persistence of firm-specific returns for U.S. firms from 1970 to 1989. For the 128 U.S. manufacturing industries considered, the firm-specific profit rates of adjustment averaged about 45 percent which compares to 64 and 61 percent in the international B&T and F&CP industries, respectively. The speed of adjustment was found to be even less by Fama and French (2000) which was an estimated 38 percent, in general, for U.S. firms across all industries from 1964-1996. They also found asymmetrical differences in adjustment rates with respect to varying rates of return on investment.

In general, there is a pattern of decreasing speeds of adjustment (λ) with increasing firm size; however, only the profitability adjustment speeds (λ) for the second and third quartiles for the F&CP industry are significantly different from that for the largest firms. Possibly, larger firms have higher positive profits with slower rates of profitability adjustment. Mueller (1986) showed evidence of this phenomenon for 600 companies from various industries in the United States.

Starting with the largest firm, the half-lives by firm-size quartile for the profitability speeds of adjustment (λ) for the B&T industry are 0.68, 1.25, 0.40, and 0.32 years and for the F&CP industry are 0.73, 0.51, 0.48, and 0.73 years. Generally, the computed half-lives tend to decrease with decreasing firm size implying that profits persist longer for larger firms. Thus, larger firms would appear to face less competition than smaller firms in both agribusiness industries.

The first quartile accounting bias coefficient (α) for the B&T industry is significantly different from zero but not for the F&CP industry. The coefficients for the second and fourth quartiles were not significantly different from the first quartile. Firms in the third quartile had accounting bias coefficients that were significantly different from those in the first quartile. The coefficients for all firm sizes are negative, except for the largest F&CP firms, implying that accounting returns understate economic returns, especially for smaller firms. Thus, the accounting bias masks the need for increasing returns to risk for smaller firms.

7.2. Country Effects

Estimates of the speed of adjustment (λ) and accounting bias (α) with country effects are given in table 3. The British speed of adjustment coefficients are about 0.34 and 0.73, respectively, for the B&T and F&CP industries. None of the countries have adjustment coefficients significantly different from that for Britain in the B&T industry. For the F&CP industry the adjustment coefficients for Japan and the Netherlands are significantly different from that for Britain. The adjustment coefficient for Japan falls below zero which is consistent with uncompetitive market behavior. This is associated with the macroeconomic stagnation that has persisted in Japan over the latter part of the study period (Masasuke, 1996). The Netherlands have a speed of adjustment of just over 0.10 less than that for Britain, or about 0.63.

The B&T half-life for profit persistence is 1.66 years without significant differences by country, while that for the F&CP industry is only 0.52 years for Britain and the United States with significant differences for Japan with uncompetitive market behavior and the Netherlands with a profit persistence half-life of 0.70 years.

In general, the country effects appear to be much less important than the difference in competitiveness between the two agribusiness industries. The results for the B&T industry without regard to firm size are very similar to that found by Fama and French (2000) for U.S. firms across all industries. The results for the F&CP industry indicate much greater competitiveness for Britain, the United States, and, to a lesser extent, the Netherlands.

Accounting bias coefficients (α) were found to differ by country. All but one coefficient, that for Denmark, are negative for the B&T industry indicating that, in general, accounting returns understate economic returns for this industry. The accounting biases for the F&CP industry are to understate economic returns in Britain and the United States and to overstate in Japan and the Netherlands.

8. CONCLUSIONS AND IMPLICATIONS

Test results indicated that it was appropriate to analyze the two industries (B&T and F&CP) separately because of significant differences with respect to speeds of profitability adjustment and accounting bias. Some important conclusions are drawn regarding speeds of profitability adjustment and accounting bias among the different countries and firm sizes.

Accounting practices play a role in the reporting of returns for firms. In the B&T industry, the accounting bias coefficients for all firm sizes were negative, implying that accounting returns understate economic returns. The coefficients became more negative as firm size decreased, reflecting real increasing returns to risk for smaller firms. Accounting bias across country also was evident for the B&T industry, though generally understating economic returns.

Further, for the F&CP industry, accounting bias with respect to country also was found. Accounting returns were found to understate economic returns in Britain and the United States, while the positive bias for Japan and the Netherlands implies that the market behaved as though accounting returns overstate the actual case in these two countries. Accounting bias across firm size also was detected for all but the largest firms in the F&CP industry.

The fact that country effects for speeds of profitability adjustment were not significant in the B&T industry is consistent with the expected impact of integrated international markets. However, at less restrictive levels of significance, in general, there appears to be some evidence of a pattern for decreasing speeds of adjustment with increasing firm size. It may be that larger firms have higher positive profits with slower rates of profitability adjustment. As another measure, generally, half-lives increased with increasing firm size implying that profits persist longer for larger firms.

In the F&CP industry, speeds of adjustment and industry-wide bias varied across country. Coefficients for accounting bias were significant for Britain, Japan, and the Netherlands. In summary, it appears that integrated international markets have influenced the B&T industry more than the F&CP industry. These results are not surprising in that Traill (1997) observed that although most of the trade for processed foods is between developed countries, no conclusion can be reached that processed food markets are globally connected. Consumer preferences are prominent in the food industry, and as Traill notes, it is simplistic to assume that all consumers have the same preferences. Moreover, cultural differences magnify these effects.

Accounting bias across country appears evident. Our results underscore the need to establish uniform international accounting standards across country (AlHashim and Arpan, 1988).

Studies on market structure, and concomitantly, degree of market power, for agribusiness industries have typically used abstract measures of social welfare. The methodology employed in this study is concrete and the parameters can be easily estimated.

The methodology herein measures market power but with a different slant – one that is highly useful for investment and management decisions. Two useful measures are provided for an industry across country and firm size -- accounting bias, which measures the degree to which the reported accounting return deviates from the true value, and the speed of profitability adjustment, which in essence, quantifies the level of market power on a scale of zero to one. From the speed of profitability adjustment, the half-life of profit persistence is computed which provides the actual duration that profits can be extended.

With such tangible and easily measurable means of assessing market power and profit persistence across industries and across country and firm size within an industry, investors and managers can better gauge the correctness of alternative decisions and strategies. In summary, the methodology demonstrated in this study provides concrete measures for investment opportunities, the critical path to competitive advantage for managers, as well as prudent oversight by government.

REFERENCES

AlHashim, D., & Arpan, J. (1988). International dimensions of accounting. Boston, MA: PWS-KENT Publishing Company.

Blaine, M. (1994). Comparing the profitability of firms in Germany, Japan, and the United States. Management International Review, 34,2, 125-148.

Business Week. (1988-1996). The Business Week global 1000. Business Week (July 15, 17, 16, 11, 13, 12, 11,10, and 8 issues, respectively).

Cornell, B., Hirshleifer, J., & James, E. (1997). Estimating the cost of capital. Contemporary Finance Digest, 1,1, 5-26.

Disclosure Incorporated. (1998). The global researcher worldscope database. Bethesda, MD: Disclosure Incorporated.

Fisher, F.M., & McGowan, J.J. (1983). On the misuse of accounting rates of return to infer monopoly profits. American Economic Review, 73, 82-97.

Ghoshal, S., & Nohria, N. (1993). Horses for courses: organizational forms for multinational corporations. Sloan Management Review 34, 23-25.

Glick, M., & Ehrbar, H. (1990). Long-run equilibrium study of monopoly and competition. Economic Inquiry 28, 151-162.

Guynn, J. (1998). The role of economic policy in current economic performance. Business Economics 33, 18-20.

International Monetary Fund. (1997). Globalization opportunities and challenges. Washington DC: The International Monetary Fund, May.

Lev, B. (2001) Intangibles: management, measurement, and reporting. Washington, DC: Brookings Institution Press.

Levonian, M. E. (1994). The persistence of bank profits: what the stock market implies. Economic Review, Federal Reserve Bank of San Francisco, 2, 1-17.

Masasuke, I. (1996). Corporate profitability and stock valuation in Japan. Financial Analysts Journal, 52, 40-55.

McGahan, A.M. & Porter, M.E. (1999). The persistence of shocks to profitability. Review of Economics and Statistics, 81, 143-153.

Mueller, D.C. (1986). Profits in the long run. Cambridge, MA: Cambridge University Press.

Otsubo, S. (1996). Globalization: a new role for developing countries in an integrated world. Policy research working paper 1628, The World Bank, International Economics Department, International Economic Analysis and Prospects Division, Washington, DC.

Papaioannou, M. & Duke, L.K. (1993). The internationalization of emerging equity markets. Finance and Development, 30, 36-39.

Peles, Y.C., and Schneller, M.I. (1989), The duration of the adjustment process of financial ratios. Review of Economics and Statistics, 71, 527-532.

Srinivasan, M. (1997). Applying the economic profit concept in pricing a target. Mergers & Acquisitions, 32, 29-33.

Stigler, G.J. (1963). Capital and rates of return in manufacturing industries. Princeton, NJ: Princeton University Press.

Traill, B. (1997). Globalization in the food industries? European Review of Agricultural Economics, 24, 390-410.

Varian, H.R. (1992) Microeconomic analysis. Third ed. New York: W.W. Norton and Company.

Waring, G.F. (1996). Industry differences in the persistence of firm-specific returns. American Economic Review. 5, 1253-1265.

White, H. (1980). A heteroscedasticity-consistent covariance matrix estimator and a direct test of heteroscedasticity. Econometrica, 48, 817-838.

Table 1. Variable Definitions and Descriptive Statistics for Profitability Adjustment Model

		Beverage & Tobacco		**Food & Consumer Products**	
Variable	**Definition**	**Mean**	**Std. Dev**	**Mean**	**Std. Dev**
(M/E)-1	Market value to equity minus one[a]	2.767	3.211	3.274	5.165
k	Required rate of return	0.137	0.076	0.124	0.064
ROE-k	Return on equity minus required rate of return[b]	0.022	0.102	0.087	0.247
g	Annual growth rate of book value per share	0.089	0.151	0.059	0.133

[a]A measure of market expectations.

[b]A measure of economic return.

Table 2. Profitability Adjustment Model with Firm-Size Effects

Industry Coefficient	Beverage & Tobacco Estimate[a] (Robust Std Error)[b]	Food & Consumer Estimate[a] (Robust Std Error)[b]
Intercept(α)[c]	-0.0286* (0.0089)	0.0170 (0.0217)
Firm Size		
Second Quartile	-0.0288 (0.0207)	-0.0939* (0.0249)
Third Quartile	-0.0556* (0.0146)	-0.0539* (0.0258)
Fourth Quartile	-0.0972* (0.0259)	-0.0539* (0.0321)
Slope (λ)	0.6378 (0.5167)	-0.6110* (0.2160)
Firm Size		
Second Quartile	-0.2129 (0.3660)	0.1346* (0.0588)
Third Quartile	0.1847 (0.2725)	0.1561* (0.0812)
Fourth Quartile	0.2501 (0.3690)	0.0036 (0.1686)
R-squared	0.69	0.91
N	99	162

[a] Asterisk indicates significance at the 5 percent level.
[b] Robust Standard Errors (White, 1980).
[c] The largest firms, those in the first quartile, are captured in the intercept.

Table 3. Profitability Adjustment Model with Country Effects

Industry **Coefficient**	**Beverage & Tobacco** **Estimate[a]** **(Standard Error)**	**Food & Consumer** **Estimate[a]** **(Standard Error)**
Intercept(α)[b]	-0.0776*	-0.0493*
	(0.01044)	(0.0159)
Country Effects		
Canada	-0.0559	
	(0.0825)	
Denmark	0.1190*	
	(0.0576)	
Japan	-0.0314*	0.0746*
	(0.0184)	(0.0182)
United States	–0.0626*	-0.0248
	(0.0156)	(0.0504)
The Netherlands		0.0840*
		(0.0194)
Slope (λ)	0.3419*	0.7340*
	(0.1633)	(0.0924)
Country Effects		
Canada	0.1516	
	(3.1182)	
Denmark	-0.0675	
	(123.57)	
Japan	0.1385	-1.1593*
	(204.25)	(0.2760)
United States	0.1628	-0.0985
	(0.1643)	(0.0839)
The Netherlands		-0.1039*
		(0.0389)
R-Squared	0.68	0.93
N	99	162

[a]Asterisk indicates significance at the 5 percent level.

[b]Firms in Britain are captured in the intercept.