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# Agency Theory Issues in the Food Processing Industry

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The objective is to identify significant determinants of performance for food processing firms over the 1992 to 2003 time period, focusing particularly on the issue of family control. Variables measuring firm effects such as asset size, governance, income distribution, and risk are used to explain return on equity. This study builds upon previous research by including a measure of income distribution in the food processing industry. Governance variables are found to be significant determinants of return on equity. The results found no evidence of agency problems in family-controlled firms during this time period.

*Key Words:* agribusiness, institutional economics, organizational economics

**JEL Classifications:** D23, G34, Q13, Q14

Food processing firms have a long history of ownership structures that include family ownership (e.g., Campbell Soup, Cargill, Pilgrim's Pride, Tyson Foods). Many of these family-owned companies developed governance structures that enabled them to control the company through their bylaws (e.g., one share of family-owned stock in Smucker's Foods had different voting rights than one share of nonfamily owned stock; the Coors family owns the preferred stock which is the only voting stock in the firm) or by the founding

family's ownership of a majority of stock (e.g., Wrigley).

A recent study by Anderson and Reeb (2003) found that founding-family ownership resulted in higher performance over the 1992 to 1999 time period for firms in the Standard & Poor's top 500 (S&P500). This study was widely cited in the popular press, such as *Business Week*, as evidence that family ownership is an effective organizational structure. However, the study's results contradicted most management theory on this topic, which has long suggested that there are inherent agency problems when insiders such as management control a firm. Over one-third of the firms in the S&P500 are family-controlled in their study.<sup>1</sup>

New regulations have been passed that make it more difficult for families to control a business. The U.S. Congress passed the Sarbanes-Oxley Act in 2002. This act established new rules for companies that are

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<sup>1</sup> Family-controlled is used to denote firms that are controlled by family members through the governance structure of the firm.

publicly traded and report to the U.S. Securities and Exchange Commission (SEC). Concerns over insider trading and perceived lack of independence of directors were reasons cited for passage of this legislation. This Act has implications for the governance of family-controlled firms. For example, this Act requires firms to change their governance to enable all stock to have the same vote. Families can still control a business through majority ownership of equity (e.g., Pilgrim's Pride and Tyson Foods). However, it cannot change its governance to enable the family to exert control without having the equity, such as the case of Smucker's.

The objective of this research is to identify significant determinants of performance for food processing firms over the 1992 to 2003 time period, focusing particularly on the role of family control. Variables measuring firm effects such as asset size, governance, income distribution, and risk are used to explain return on equity. This study builds upon previous research by including a measure of income distribution in the food processing industry.

### **Background Literature on Agency Theory**

Jensen and Meckling described the classic principal-agent relationship. The agency problem is one aspect of this relationship. Agency problems arise when 1) the objectives of the principal and agent are different and 2) asymmetric information exists that makes it difficult for the principal to monitor the agent's actions. These problems exist for the relationship between outside shareholders and managers. Agency theory suggests that when an owner-manager allows outside equity to enter the firm and its governance structure (e.g., ownership and control are separated), the value of the firm will decline (Demsetz, Fama, and Jensen).

Schulze, Lubatkin, and Dino argue that family-controlled organizations present different agency problems. Altruism and kinship enable families to reduce agency problems but in general, the literature suggests that agency costs are higher in family-controlled firms.

The behavioral economics literature has suggested that monitoring costs are higher in family-controlled firms because private ownership is not subject to market discipline. Exit costs are also higher for family-controlled firms because family members cannot liquidate all of their stock shares at the same time because the price would decline. Family members who exit are also thought to lose emotional status and special privileges that come from being an owner. Family-controlled firms have higher agency costs due to greater conflict resolution costs. The following literature review highlights some of the more important papers on the importance of ownership structure in agency theory.

#### *Ownership Structure as an Agency Problem*

Monsen, Chiu, and Cooley analyzed the separation of ownership and control in large firms and investigated the possible effect of such separation upon the performance of such firms. They found that owner-controlled firms performed better financially than other firms. Their results showed that the control type (owner versus manager) was significant for all industries.

Ware compared the performance of manager (e.g., nonfamily owned) and owner-controlled (e.g., family owned) firms in the food and beverage industry. These data allowed Ware to maintain some homogeneity (e.g., food and beverage industry), which ensured a more sensitive test of the ownership hypothesis. Ware used four performance measures including profitability, efficiency, earnings retention, and external debt management. He found that owner-controlled firms did not earn a higher rate of return than manager-controlled firms and found that owner-controlled firms had a higher average product of labor, implying that owner-controlled firms tended to be less efficient.

Fama and Jensen suggested that ownership control (e.g., as in the family-owned firm) could allow their shareholders to receive economic rents in lieu of corporate profits. Demsetz's classic paper in this literature showed that owners who controlled the

company could choose to pursue nonprofit maximizing objectives and not invest in profitable assets. Demsetz and Lehn examined the causes and consequences of the structure of corporate ownership. They identified firm size, instability of profit rate, and industry effects (e.g., regulated utility, financial institution, mass media, or sports industry) as variables that significantly impacted ownership structure. However, they did not find a significant relationship between ownership concentration and profit rates.

Stein showed that shareholders (e.g., such as family members) who have longer investment horizons have a better business strategy because they are more likely to undertake decisions that benefit the firm in the long run rather than short run. Casson and James suggest that family-controlled firms invest more conservatively because they seek to pass their wealth onto succeeding generations rather than consume all of their wealth in their generation. Furthermore, family control may result in the family using more debt financing because the family develops a network of relationships with lenders and other service providers over time. Anderson, Mansi, and Reeb attribute debt financing to the firm's desire to maintain a positive reputation and share information regarding its business strategy.

Anderson and Reeb (2003) analyzed the relationship between founding-family ownership and firm performance in the S&P500. They found that family ownership is both prevalent and substantial and that family firms outperform nonfamily firms. They also found that the relationship between family holdings and firm performance is nonlinear and that when family members serve as CEO, performance is better than with outside CEOs. Their results were inconsistent with the idea that minority shareholders are adversely affected by family ownership, suggesting that family ownership is an effective organizational structure. Overall, their results implied that, in well-regulated, transparent markets, family ownership of public firms reduced agency problems without leading to severe losses in decision-making efficiency.

### *Role of Monitoring as an Agency Problem*

Shleifer and Vishney developed a theoretical model to determine the impact of monitoring the performance of management by a large minority shareholder. Their research suggested that there was an incentive to increase ownership concentration and corporate versus personal investment choices. Burkart, Panuzi, and Shleifer examined the costs and benefits of large shareholders and their monitoring of firm management. They found that tight control by shareholders increased firm efficiency, but created an expropriation threat that reduced managerial initiative and non-contractible investments. They also showed that ownership concentration, which implies monitoring, might conflict with performance-based incentive schemes.

Pagano and Roell analyzed the influence of agency costs and monitoring on the choice of stock ownership structure. They argued that the optimal ownership structure for a firm's controlling shareholder includes some measure of dispersion to avoid excessive monitoring. This dispersion can be achieved by taking the firm public, but this decision involves costs. Thus, the owner faced a tradeoff between the cost of providing a liquid market and over-monitoring. They found that the listing decision was affected by the amount of external funding required, the strictness of disclosure rules for public versus private firms, and the legal limits on bribes aimed at limiting shareholder monitoring.

Ang, Cole, and Lin examined small firms to provide measures of absolute and relative equity agency costs for firms under a wide variety of ownership and management structures. Jensen and Meckling's zero agency-cost firm was utilized for the base case in relative comparisons. Ang, Cole, and Lin calculated agency costs related to the separation of ownership and control by comparing the efficiency of firms managed by shareholders to the efficiency of firms managed by outsiders. Multivariate regressions were estimated using ownership structure, external monitoring, capital structure, industry effects, annual

sales, and age of firm as explanatory variables. They found that agency costs, as measured by the ratio of operating expenses to annual sales, are significantly higher when an outsider rather than an insider manages the company. In their sample, agency costs were inversely related to the manager's ownership share and were positively related to the number of nonmanager shareholders. Agency costs were found to be lower with increased bank monitoring.

#### *Income Distribution as an Agency Problem*

Johnson et al. focused on "tunneling," which is defined as the transfer of assets and profits out of firms for the benefit of those who control the firms. Using legal case history, they found that tunneling can be substantial even in developed countries. In addition, they found that much of the tunneling is consistent with both statutes and basic principles followed by judges and that this legal tunneling was done in a variety of ways.

Faccio, Lang, and Young examined the incidence of insider shareholder expropriation of outside shareholders by comparing dividend payments across corporations in two regions where firms are predominantly family-owned—East Asia and Western Europe. They found significant differences between dividend payments among East Asian and Western European companies. Western European corporations had significantly higher mean dividends. Their results implied that corporate managers for tightly controlled firms had to pay higher dividends to offset investor concerns about expropriation. The authors concluded that there was a significant difference in the dividend behaviors of corporations that are group affiliated. Investors appear to perceive a greater threat to expropriation within tightly controlled corporations relative to corporations falling into the loosely affiliated groups. Therefore, through higher dividend payments, capital markets are largely successful in policing expropriation within tightly controlled groups but are not as successful within loosely affiliated groups.

#### *Summary of the Literature*

In general, the literature has found that firm structure, monitoring, and income distribution lead to agency problems and insider control of a firm has resulted in less than optimal performance. The original theoretical papers did not distinguish between control by family members who may be management and control by management who are not family members. The theory is beginning to note that family-controlled businesses may not exhibit agency theory issues because the empirical literature (i.e., Anderson and Reeb 2003) is finding evidence of better performance rather than poorer performance. However, agency theory issues may be more likely to arise with control being exhibited by managers (e.g., short-term time horizon) who do not have the long-term time horizon that a family might have with regard to control.

Until recently, much of the information regarding governance was not publicly available or costly to obtain. Thus, with the exception of Anderson and Reeb (2003) and Ang, Cole, and Lin, the literature has been primarily theoretical in nature. Consequently, explicit hypothesis tests of specific agency variables and their relationship with performance are derived from these two papers.

The concept of agency theory has been described in the agricultural economics literature (e.g., most recently by Cook and Barry) but empirical tests of the theory have not been done on agribusinesses or food businesses. This study contributes to that literature with an empirical study of agency theory as applied to a homogeneous industry (e.g., food processing) and focuses on the impact of organizational forms (e.g., family controlled and nonfamily controlled).

#### **Agency Theory and the Food Processing Industry**

The previous section describes the literature on agency theory and discusses why it is important. This section discusses reasons why the food processing industry is a unique sector for analysis.

### *Vertical Coordination between Food Processors and Producers*

Agency theory has been used to explain the relationship between tenants and land owners (Allen and Leuck), poultry producers and slaughter and processing plants (Knoeber; Martinez; Menard), and orchard fruits and pollinating services run by beekeepers (Cheung). James, Klein, and Sykuta argue that the nature of the relationships between pork, poultry, and soybean farmers and the respective processors of these products (e.g., pork and poultry processors and oilseed crushers) helps explain the dramatic growth in organizational form in these industries. Dorsey and Boland show that most vertical integration has occurred at stages beyond the producer and that some industries such as processing have premiums from integration and others such as restaurants have discounts.

### *Policy Makers and Industrial Organization of Food Processing Sector*

Understanding the nature of industrial organization in the food economy industry has been identified as a top priority by policy makers in the U.S. Congress as evidenced by the fact that more than \$17 million has been appropriated since 2000 to study the food economy beyond the farm gate (e.g., not production agriculture). These funds have been used in at least 14 departments of agricultural economics in land grant universities and have been included in annual appropriations funding. This is more money than has been appropriated for economics of production agriculture research not including Hatch Act funds. The food processing industry is far bigger than the food wholesaling and food retailing industry with regard to asset size and consumer brands (Schumacher and Boland).

### *Food Processing Sector has Unique Organizational Structures*

Cooperatives are a unique organizational form in agriculture. Producers who are

vertically integrated through processing cooperatives control the governance of the cooperative by special legislation passed by Congress in the Capper-Volstead Act and featured in many state incorporation statutes that are unique to agriculture (Baarda). In addition, cooperatives have access to cooperative extension service resources as noted by Boyd et al. Boland provides numerous examples of cooperatives that have changed their organizational form in recent years but maintained control by producers. He also suggests that many cooperatives are analyzing how family-owned companies transitioned from equity provided by family members to issuing public securities and yet devising a governance mechanism to ensure family control. Chaddad and Cook provide a typography for better understanding these organizational forms but it should be noted that most cooperatives that have restructured do so for a combination of reasons.

### *Agency Theory in the Food Processing Sector*

These facts suggest that family-controlled food processors may have some characteristics that suggest they are more profitable than nonfamily controlled firms. Agency theory suggests that the control function through governance is crucial in explaining performance. There has been no study that has sought to analyze whether these unique features of the food processing sector (e.g., family control) have led to better performance. The literature review on agency theory would suggest that performance would be less but the fact that family control has remained such a key organizational form in the food processing industry would suggest that this is not the case. This research addresses this issue.

Finally, previous research has not studied the effect of cash dividends (as opposed to stock splits) on performance. This is an important variable because most firms choose to use retained income to finance the organization rather than pay cash dividends (Mayer). However, agency theory would suggest that family firms would pay cash

dividends because the descendants of the founding family have their wealth tied up in the company's equity. Thus, the family would prefer cash payments over time. None of the previous literature has measured income distribution as an agency variable. Thus, this research uses variables used in the empirical literature (Anderson and Reeb 2004; Ang, Cole, and Lin;) and adds an additional variable for cash dividends.

### Description of the Data

Data for this study are obtained from the Standard and Poor's Compustat Business Segment Reports for firms in the food processing sector for the period of 1992 to 2003.<sup>2</sup> A total of 40 firms were identified including 15 nonfamily-controlled firms and 25 family-controlled firms. There are 12 years of data for these 40 firms, or 480 total observations.

The identification of family-controlled firms is critical for this analysis. Corporate histories are used from Hoovers, The Corporate Library, and individual company records including SEC documents to determine whether a business is family controlled and to construct the variables used in this study. The variable for family control is the same as that used in the literature. Namely, a family-controlled business is one where the founder or descendants continue to hold positions as CEO, chairman of the board of

directors, or are the largest equity holders in the company. Financial performance is measured by the return on equity (ROE), which is calculated as earnings before interest and taxes divided by equity.<sup>3</sup> ROE is the most common theoretical measure of performance in the literature.

### Variable Descriptions

The theoretical model used in this research to identify significant determinants of performance for food processing firms is the following:

$$ROE = f(\text{Firm effects, industry effects, time}).$$

Firm effects are measured using variables from two principal empirical pieces of research (Anderson and Reeb 2003; Ang, Lin, and Cole). ASSETS measures the relative asset size of a firm and a positive relationship between ROE and assets has been found in the literature. FIRM RISK is measured as the standard deviation of ROE. Ruefli, Collins, and Lacugna showed this variable to be the most common measurement of firm risk in over 100 studies.

Governance variables are also considered firm effects. The theoretical literature suggests that the greater control exhibited by family members or other insiders would lead to lower performance. INSIDER is measured as the percentage of equity held by all officers (typically members of management and family members). These officers monitor the performance of the firm on behalf of their own equity as well as the equity of other stockholders. Anderson and Reeb (2003) found a positive relationship between the amount of equity owned by insiders and performance, which was contrary to much of the theoretical literature.

OUTSIDE is measured as the ratio of directors considered independent divided by the total number of directors. This variable measures the influence of outside directors on the firm. These directors are also hypothesized to monitor the performance of the firm on behalf of the stockholders. Anderson and

<sup>2</sup>At the beginning of this time period, the data included 54 firms; at the end of this time period the data included only 45 firms. Although not discussed in this study, models were estimated with the 1992 to 1999 data, which would have included these additional nine firms. However, this did not change the results so the 45 firms through the 2003 time period were used.

<sup>3</sup>Other dependent variables that we considered were return on assets and  $q$  (inverse of Tobin's  $q$ ). Return on assets was not chosen because the theoretical foundation of agency theory is built around the wealth of the company, which is equity, and other studies have made similar arguments.  $Q$  is measured in the Compustat data, but it has many missing values. There is one study in the finance and strategy literature that has used this variable, but McGahan was forced to discard almost one-third of the observations because of missing values.

**Table 1.** Definitions, Mean, and SD for Variables Used in the Models

Variable	Mean	SD
ROE, % <sup>a</sup>	19.14	30.98
ASSETS, hundred million \$	46.40	76.61
FAMILY <sup>b</sup>	0.63	0.48
INSIDER, % <sup>c</sup>	21.31	35.84
OUTSIDE, % <sup>d</sup>	62.51	22.72
BLOCKHOLDERS, % <sup>e</sup>	21.17	16.76
FIRMRISK <sup>f</sup>	16.93	19.24
INCOMED <sup>g</sup>	0.33	0.47

<sup>a</sup> ROE is earnings before interest and taxes as a percentage of total equity.

<sup>b</sup> FAMILY is a binary variable where 1 is family-controlled and 0 is otherwise.

<sup>c</sup> INSIDER is the equity held by inside directors as a percentage of total equity.

<sup>d</sup> OUTSIDE is the number of directors outside the company as a percentage of total directors.

<sup>e</sup> BLOCKHOLDERS is the number of unaffiliated directors with more than 5% block ownership as a percentage of total directors.

<sup>f</sup> FIRMRISK is a five-year moving average of the standard deviation of ROE.

<sup>g</sup> INCOMED is a binary variable where 1 indicates the firm paid a cash dividend and 0 is otherwise.

Reeb (2004) found that the more independent a board of directors, the better performance that can be expected, which agrees with the theoretical literature.

BLOCKHOLDERS measures the percentage of directors with blocks of equity greater than 5% who are not family members (i.e., pension funds, etc.) and is another measure of independence. This hypothesis is the same as OUTSIDE. Namely, an increase in the percentage of equity held by blockholders who are not affiliated with the family leads to improved performance. However, Anderson and Reeb (2003) found a significant and negative relationship between this variable and profitability. FAMILY is a binary variable that measures whether a firm is family-controlled. The theoretical literature suggests that a family-controlled firm has lower performance whereas Anderson and Reeb (2003) found improved performance.

An additional governance variable measuring income distribution is constructed for this research. This variable, INCOMED, which

**Table 2.** Means of Selected Variables by Type of Business

Variable	Controlled By	
	Nonfamily	Family
ROE, %	19.03	19.21
ASSETS, hundred million \$	59.45	38.70
INSIDER, %	1.70	32.88
OUTSIDE, %	76.57	54.22
BLOCKHOLDERS, %	7.95	28.97
FIRMRISK	26.28	11.42
INCOMED	0.00	0.52

has not been used in any previous studies in the literature, measures whether a firm paid a cash dividend. Many firms have typically retained all of the net income and issued stock or stock splits in lieu of cash dividends or repurchased shares (Fama and French). The rationale is that this income is taxed twice; once at the corporate level and once at the shareholder level. The literature has shown that family members may prefer seeing cash dividends for consumption purposes. Finally, Mayer has noted that internal retention of income is the most common method of financing growth in many firms.

*Industry and Time Fixed Effect*

Industry effects are measured by the use of a three-digit SIC code that is a binary variable (SIC) corresponding to whether a firm is categorized in that classification code. Industry effects (e.g., “Fama–French industry variables”) have been shown to be important components of profitability in the food economy (Schumacher and Boland). A binary variable for year (YEAR) is included for each year in the data. Table 1 provides the means and standard deviations for the data. Table 2 provides information about the means based on ownership structure.

**Estimation Issue and Model Diagnostics**

The literature review has identified different variables from theory for measuring firm performance. The empirical model estimated



in this study is:

$$\begin{aligned}
 ROE = & \beta_0 + \beta_1 * ASSETS + \beta_2 * FAMILY \\
 & + \beta_3 * INSIDER + \beta_4 * OUTSIDE \\
 & + \beta_5 * BLOCKHOLDERS + \\
 & \beta_6 * FIRM RISK + \beta_7 * INCOMED \\
 & \sum_{i=8}^{23} \beta_i * SIC + \sum_{j=24}^{34} \beta_j * YEAR.
 \end{aligned}$$

The betas are parameters to be estimated and the variables were defined previously. Panel data regression techniques are employed and the statistical software SAS is used to estimate these equations.<sup>4</sup>

#### *Autocorrelation and Heteroscedasticity Diagnostics*

The panel data has a time-series component, which suggests the possibility of correlated errors. In the presence of autocorrelation the ordinary least squares (OLS) estimator will be unbiased but will be inefficient. The Durbin-Watson bounds test is often used to detect the presence of an autoregressive error structure. Based on Greene, the Durbin-Watson statistic for a model with multiple cross-sections can be estimated as the simple average of the Durbin-Watson statistic for the individual cross-sections. For the purpose of this analysis, individual cross-sections are based on the Department of Commerce Standard Industrial Classification (SIC) code. The calculated Durbin-Watson statistic for the model is 1.081. The upper and lower critical bounds are 0.171 and 3.149 respectively. The calculated statistics fall in the inconclusive region. Since the OLS estimator is unbiased and correcting for autocorrelation by imposing inappropriate temporal dependencies may

generate greater inefficiencies, no correction for autocorrelation was made to the model.

The temporal component suggests that model efficiency might be enhanced by the inclusion of yearly binary variables in the model specification. The model was estimated with yearly binary variables. An F test failed to reject the null hypothesis, that as a group the parameter estimates on the yearly binary variables were equal to zero ( $p$ -value = 0.4179 and F-value = 1.03). The implication is that the yearly effects may not be significant. However, several of the individual parameter estimates were statistically significant. Following the example of Anderson and Reeb (2004), yearly binary variables were included in the model estimation as fixed effects.

The data also consists of cross-sectional (three-digit SIC codes) components. The presence of groupwise heteroscedasticity poses problems for inference based on OLS estimation. Green proposes a Lagrange multiplier (LM) test as a means of testing for the presence of groupwise heteroscedastic errors. Based on the OLS model estimation, the LM statistic was calculated as 493.15 with a chi squared critical value of 27.587. Based on these statistics the null hypothesis of homoskedastic errors is rejected and the model needs correction for the heteroscedasticity. The feasible generalized least squares (FGLS) estimation technique proposed by Green was used to correct the heteroscedasticity problem.

#### *Endogeneity Diagnostics*

Himmelberg, Hubbard, and Palia and Anderson and Reeb (2003) suggest that firm performance and family ownership might be simultaneously determined, which would result in estimation bias due to endogeneity. Specifically, endogeneity may exist because families that own profitable firms may maintain control, while those owning less profitable firms may sell their controlling interest. However, this argument is problematic in that it implies that family firms would have to be exceptionally farsighted in predicting performance and require special insights into future firm performance not available to nonfamily-

<sup>4</sup>Anderson and Reeb (2003) suggest that firm performance is determined nonlinearly by the percentage ownership of the officers and directors. Natural log and quadratic variations of this variable were tested against the linear version. There is no evidence to suggest that nonlinear ownership structure impacts firm performance when all ownership structures are considered in these data. These results are available from the authors upon request.

**Table 3.** Parameter Estimates, SEs, and *p*-Value for the Estimated Equation

Variable	FGLS ROE <sup>a</sup>	2SLS ROE <sup>a</sup>
Intercept	-0.026 (0.030)	-0.042 (0.036)
ASSETS	0.065 <sup>b</sup> (0.015)	0.050 <sup>b</sup> (0.018)
FAMILY	-1.586 (3.826)	1.517 (5.110)
INSIDER	0.139 <sup>b</sup> (0.052)	0.113 <sup>b</sup> (.053)
OUTSIDE	0.069 (0.074)	0.107 (0.068)
BLOCKHOLDERS	-0.054 (0.111)	-0.039 (0.115)
FIRMRISK	0.748 <sup>b</sup> (0.162)	0.781 <sup>b</sup> (0.184)
INCOMED	10.631 <sup>b</sup> (1.439)	10.481 <sup>b</sup> (1.369)
R Square	0.684	0.686
RMSE	0.086	0.085

<sup>a</sup> Fixed effects are not reported but were used in the regression model.

<sup>b</sup> Denotes significance at the 0.10 level. SEs are in parentheses.

owned firms. It is important to consider endogeneity.

While estimating the ownership variable with appropriate instrumental variables and using the estimate as a proxy for the ownership variable is intuitively pleasing, it is not without pitfalls. Natural instruments, those characteristics that may predict ownership, are typically already included as determinants in the firm performance equation. That is, it is possible to argue that any variable that is a reasonable determinant of family ownership (FAMILY) is also a determinant of firm performance. Nevertheless, similar to Himmelberg, Hubbard, and Palia and Anderson and Reeb (2003), a two stage least squares (2SLS) estimation technique is used for the endogeneity problem. The same instruments used by these authors are used here. Namely, FAMILY is estimated as a function of ASSETS, the square of ASSETS, FIRMRISK and control for the SIC fixed effects. These variables are highly significant in explaining ownership structure.

The Spencer and Berk test is used to determine if endogeneity exists between family and firm performance (Greene). A Wald statistic was constructed as a function of the differences in the feasible generalized least squares (FGLS), parameter estimates developed in the preceding section and two-stage least squares (2SLS) parameter estimates and their associated estimated variances. The FGLS estimates treat *FAMILY* as exogenous,

while the 2SLS estimates treat the variable as endogenous. The Wald statistic is 0.1023. The critical value is 3.841. This suggests that the null hypothesis of the exogenous nature of *FAMILY* is not rejected. This test should not be construed as a statement that ownership structure and firm performance may not be simultaneously determined, but rather a statement that after industry effects are accounted for endogeneity may not be a major problem. This finding is consistent with those of Himmelberg, Hubbard, and Palia. Table 3 reports regression results for both the FGLS and 2SLS estimation. Parameter estimates for the FGLS and 2SLS are comparable indicating that parameter estimates are robust and relatively invariant to estimation technique.<sup>5</sup>

## Results

Results for both the FGLS and 2SLS are shown in Table 3. However, only the results of the 2SLS are discussed. The coefficient of determination was 0.686. ASSETS, INSIDER, FIRMRISK, and INCOMED were statistically significant variables in explaining ROE. An increase in size as measured by ASSETS led to an increase in ROE. A similar finding in the literature suggests that larger firms, as measured by asset size, may be able

<sup>5</sup> The regression results for the instrumental variables regression are available from the authors upon request.

to capture economies of size or scale. *ASSETS* is measured in hundred-million-dollar units, and the parameter estimate of 0.05 implies that an increase of one hundred million dollars results in an increase in ROE of 0.05%, or an increase of \$1.71 million in annual earnings before interest and taxes.

As the amount of equity held by inside directors (*INSIDER*) increased, this led to an increase in ROE. A parameter estimate of 0.113 implies that a 1% increase in *INSIDER* increases ROE by 0.113%, or an increase of \$3.866 million in annual earnings before interest and taxes. The result of this hypothesis test does not provide evidence for problems related to agency theory because an increase in the equity held by management insiders or family members would result in more board leadership positions within the company. For example, the chair of the board of directors is often the largest shareholder in the company. The chair has many important responsibilities including setting the agenda (often in cooperation with the CEO) for the board meeting and often having the most frequent contact with the CEO and upper management. A good principle of boards is that the board and CEO have the same vision and strategy for a company. More frequent contact and interaction between the chair and CEO, who are often related in many family-controlled firms, leads to more communication and agreement about the overall direction of a firm.

An increase in the variability of ROE (*FIRMRISK*) led to an increase in ROE. A 1% increase in *FIRMRISK* led to a 0.781% increase in ROE, or an increase of \$26.71 million in annual earnings before interest and taxes. This suggests that an increase in risk led to an increase in performance. Empirical work often finds a positive or negative sign on this variable depending upon the industry being measured. However, economic theory would suggest that this variable has a positive sign such as found here.

One of the main variables of interest is *FAMILY*. Family-controlled firms (*FAMILY*) had greater ROE than nonfamily controlled firms, but the parameter estimate was not statistically significant. This would suggest

that this variable by itself is not a significant measure of agency theory.<sup>6</sup>

The amount of income distributed in the form of cash dividends was significant and positive with a 1% increase in *INCOMED* leading to a 10.481% increase in ROE. This relatively large magnitude suggests that this variable is important in explaining performance.

### Implications

There are several implications of this research for food processing firms. A greater percentage of equity held by insiders such as management and family members leads to greater performance. Management exerts an important monitoring function on an organization, and the fact that an insider such as management is allowed to own stock and be represented on the board of directors leads to better performance is an important finding for food processing firms.

However, other governance variables were not found to be significant determinants of profitability in this research. These results do not support the Sarbanes-Oxley Act of 2002 requiring independent directors on the board, implying that directors that are not under the control of insiders, such as management or family members, lead to decision making that is best for the firm's performance and avoids agency problems. This result does not agree with the agency literature on ownership and monitoring and suggests that this problem may not have been an issue for these family-controlled firms during the time period being studied.

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<sup>6</sup>The correlation coefficients between *INSIDER* and *FAMILY*, and *INCOMED* and *FAMILY* are 0.53 and 0.57, respectively. These are not high enough to warrant concerns about multicollinearity. However, when *INSIDER* or *INCOMED* is deleted from the model, *FAMILY* becomes significant at the 0.10 level of significance and positive. Thus, interpretation of the *FAMILY* variable is ambiguous by itself. Because no food processing firms that were not family-controlled paid cash dividends during this time period, it was not possible to construct an interaction term between this variable (*INCOMED*) and *INSIDER* or *FAMILY*.

A second implication is that family-controlled firms have greater performance than nonfamily owned firms in the food processing sector during the time period being analyzed. This result suggests that the perceived agency problems associated with family ownership may not have led to inferior performance in food processing firms during the time period studied. This implication reinforces the fact that no variables measuring agency problems were found to be significant.

Income distribution was found to be significantly correlated with better performance. That is, cash dividends helped explain better performance. This result is new since this variable has not been used in any previous empirical studies. The U.S. Congress passed a law that reduced the tax on corporate dividends to the same rate as capital gains (i.e., 15%) in 2003. A survey of 384 chief financial officers found that an increase in earnings and better corporate governance demanded by institutional investors were cited as reasons for this increase (Brav et al.). Future research could analyze the impact of income distribution after implementation of the Sarbanes-Oxley Act.

Agency theory is commonly used to explain the relationship between principals and their agents. Agency problems may exist in any organization. The Sarbanes-Oxley Act of 2002 was enacted into law because of the corporate scandals involving Enron, Worldcom, and other businesses. A board of directors controls a company and hires an agent in a CEO. Family members who have different goals can result in a family-controlled firm performing less efficiently than firms where agency problems are not prevalent. However, agency problems were not found in the data of food processing firms for this time period.

The food processing sector is an important sector for analysis because of its interest by policy makers and researchers. There are more family-owned firms in this sector than all but one sector of the U.S. economy. This study suggests that agency problems may not have existed among these family-controlled food processing firms during the time period being

studied. Indeed, performance was found to be better for firms with greater levels of equity held by insiders and those who paid cash dividends, which is consistent with other empirical studies on other industries.

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