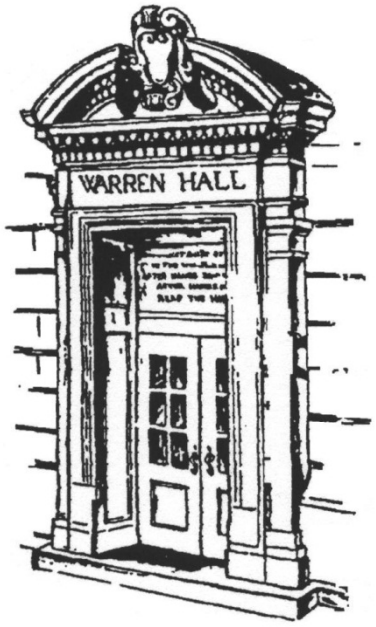
WP 2012-11
June 2012



Working Paper

The Charles H. Dyson School of Applied Economics and Management
Cornell University, Ithaca, New York 14853-7801 USA

An Estimate of Socioemotional Wealth in the Family Business

Jonathan B. Dressler and Loren W. Tauer

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Jonathan B. Dressler*

Loren W. Tauer*

ABSTRACT

Family members often accept lower than market returns for their contributions to the family business because the family business provides additional socioemotional wealth. The value of that socioemotional wealth as an annualized return is derived for a group of family farm managers by estimating the implied return from their contributions and comparing those estimates to market returns of farm managers. In the process an objective and financially sustainable compensation structure for small family businesses is developed. Estimates of socioemotional wealth for farm managers range from an average of $22K to $33K per year on New York family farms over the period 1999-2008.

KEYWORDS: Net Income; Family Business; Socioemotional Wealth

INTRODUCTION

How and at what value owners, managers, and other employees are compensated is a sensitive subject for family businesses. Thus, determining an appropriate compensation structure can be a difficult task while avoiding family conflict and maintaining long-term financial sustainability (Slaughter, 2010; Davis, 2007; Murak, 2001). Typically within family businesses each family member possesses a unique set of skills that align with unequal contributions of equity, labor, and management. These unequally distributed shares of equity, labor, and management between family members are often observed within generational family businesses as the elder generations maintain a greater share of equity and/or management relative to labor when compared to the younger generation(s) (Gersick et al., 1997). The unequal share of equity, labor, and management across family members poses a challenge to objectively determine a fair and

*Dressler is a PhD student in Applied Economics and Management, Cornell University.
Tauer is a Professor, Charles H. Dyson School of Applied Economics and Management, Cornell University.

financially sustainable compensation allocation that aligns with the family business strategy. In addition, ample evidence from family businesses suggests that compensation may be comprised of both pecuniary and non-pecuniary returns (Stockmanns, Lybaert, and Voordeckers, 2010; Chrisman et al., 2010; Distelberg and Sorenson, 2009; Astrachan and Jaskiewicz, 2008; Gómez-Mejía et al., 2007; Stafford et al., 1999). The non-pecuniary components of the family business compensation have more recently been referred to as socioemotional wealth, or the affective endowment of family owners (Gómez-Mejía et al., 2011, Gómez-Mejía et al., 2007), and have been identified as a key driver of managerial decisions when considering organizational choices (Gómez-Mejía et al., 2011).

Socioemotional wealth represents the tradeoffs family members make within an industry to work in the family business rather than an alternative business, and as a consequence family members often accept lower than market returns for their equity, labor, and management contributions within family businesses. To date, to the best of the authors' knowledge, no attempt has been made to quantify the returns associated with socioemotional wealth within family businesses. Quantifying the returns of socioemotional wealth within family businesses will advance the understanding of the socioemotional wealth-financial performance relationship that has recently been identified as a research topic in the family business literature (Berrone et al., 2012). Therefore, the objective of this paper is to determine an estimate of the implied returns associated with socioemotional wealth for managers within the family business. Family businesses within the study are defined as family operated farm partnerships with more than one identified partner. In order to determine an estimate of the implied returns to socioemotional wealth an objective and financially sustainable compensation structure for small family businesses is also developed.

The remainder of this article proceeds as follows. The next section contains an overview of past research related to family business compensation. The third section discusses the definitions of market value and implied compensation and relates the difference to an implied value of socioemotional wealth within small family businesses. The fourth section discusses the empirical method we propose to arrive at an estimate of implied compensation net of any socioemotional wealth, and the fifth section describes the data. The final two sections discuss the empirical results including an estimate of the farm manager implied value of socioemotional wealth, and finishes with concluding remarks.

RESEARCH ON FAMILY BUSINESS COMPENSATION

Deriving a method to equitably divide family partnership net income begins with an understanding of the small family business objective function. Empirical evidence suggests that the small business financial objective function includes pecuniary and non-pecuniary components (Zellweger et al., 2011; Stockmanns, Lybaert, and Voordeckers, 2010; Chrisman et al., 2010; Distelberg and Sorenson, 2009; Zellweger and Astrachan, 2008; Astrachan and Jaskiewicz, 2008; Gómez-Mejía et al., 2007; Stafford et al., 1999). The non-pecuniary components of the small business financial objective function have more recently been referred to as socioemotional wealth (Gómez-Mejía et al., 2011, Gómez-Mejía et al., 2007). Family firms defined by Chau et al. (1999) may pursue non-financial goals such as control (Ward, 1997), harmony and trust (Sharma and Manikutty, 2005), or even pride (Zellweger and Nason, 2008) among others. Empirical evidence of the existence of non-economic returns associated with compensation have been observed where the mean risk adjusted return to business ownership is less than the mean risk adjusted return to investing in equities (Moskowitz and Vissing-

Jørgensen, 2002), and the median small business owner earns less than a wage worker (Hamilton, 2000). These empirical observations suggest that family businesses associate positive value with socioemotional wealth because the tradeoffs of staying in the family business result in foregone opportunity of real economic return. Some have argued that the small business objective function should include more than just returns, and should account for liquidity, diversification, control, accountability, flexibility, and transferability (LeCornu et al. 1996; McMahon and Stanger, 1995). It is true that some small businesses pursue a lifestyle rather than a revenue growth structure, but on average in the long-run all businesses must be profitable for continued viability (Danes et al., 2009), else agency costs may lead to bankruptcy (Steijvers, Voordeckers, and Vanhoof, 2010; Steijvers and Voordeckers, 2009). Therefore, any objective measure of family partner compensation used to determine an empirical compensation structure will be constrained by the necessary long-term profitability conditions. A well-known framework that inherently accounts for long-term financial sustainability is profit maximization. McMahon and Stanger (1995), Ang (1992), and Kao (1985) have found evidence supporting the profit maximization for all or part of the small business financial objective function considering either short- or long-term expectations.

Few studies exist to date that empirically investigate the compensation structure of family business net income, most likely due to a lack of available data. Agency theory (Jensen and Meckling, 1976) is one theoretical framework that has been chosen to address the compensation process within family business; however, much of this research has concerned executive level pay (Gómez-Mejía, Larraza, and Makri, 2003) or nonfamily pay (Block, 2011) within large family businesses. Within the agricultural industry, Tauer (1997) used generalized linear models to assess an equitable division of farm partnership income and suggests compensation should be

determined with respect to the relative opportunity costs associated with each contribution of equity, labor, and management. Others have used generalized linear models to assess the determinants of compensation between family and nonfamily managed firms (Carrasco-Hernandez and Sánchez-Marin, 2007) and found employee compensation differs between firms. One study even displays a method to assess divisional profits within firms using a residual income measure when compared to return on investment (Frigo and Ciecka, 1995). In the end, professional guidance is often suggested as to how one may determine a compensation structure within family businesses (Spector, 2001). Most of the suggestions directed towards family businesses regarding compensation involve ways to avoid family conflict associated with compensation, and predominantly, it's advised that market equivalent measures of compensation should be sought from own family research or industry consultants (Slaughter, 2010; Davis, 2007; Spector, 2001).

This paper develops an empirical measure of family compensation that allows for an estimate of the implied returns associated with socioemotional wealth within family businesses. The results are useful for both academics and practitioners for a better understanding of the socioemotional wealth-financial performance relationship.

METHODS

An Empirical Measure of Family Business Compensation

Determining an estimate of the implied returns associated with socioemotional wealth, or the tradeoffs family members make within an industry to work within the family business rather than an alternative business, requires an empirical estimate of family business compensation. Once determined, the empirical compensation estimates may be compared to market compensation

estimates to arrive at an implied return for socioemotional wealth. Recall that within this study family businesses are defined as family member partnerships with more than one identified partner. Tax jurisdictions typically allow income allocation based upon sound business principles, and suggest reimbursing income relative to a fair market value. In the U.S. the issue with compensation allocation for small family businesses is how to interpret what "fair market value compensation" or "reasonable compensation" represents when considering "performed services" (U.S. Dept. Treasury, 2010; Ricketts and Tunnell, 2006). Some have suggested forming committees, boards, or even hiring consultants to solve the family business compensation dilemma (Spector, 2001). Any estimate of owner, manager, or other employee compensation, whether it is internally or externally obtained, will be conditional on how "fair market value compensation" is defined.

An objective strategy for determining compensation among family business partners might be to determine the implied economic value generated by equity, labor and management contributions. An implied compensation estimate can be obtained empirically by determining the opportunity costs, or implied returns, associated with equity, labor and management. In addition, implied compensation estimates are unbiased, and are empirically tractable from firm level data. Opportunity costs are unbiased in the sense that they represent an implied economic return, unlike market compensation estimates. The firm level data required to determine an implied estimate of compensation includes measures of income, firm size, and quantities of equity, labor, and management.

For smaller sized family businesses, the previously discussed empirical evidence suggests that implied compensation estimates are expected to be observed below market compensation estimates due to the socioemotional wealth associated with family business compensation. The

tradeoffs that family businesses make imply that family owners, managers, and other employees associate positive value with socioemotional wealth as often times lower financial returns ensue as a result of poorer performance relative to their larger market competitors. Thus, an estimate of the implied economic value of the annual socioemotional wealth for family businesses may be represented by the magnitude of the difference between market and implied compensation estimates, as the difference between market and implied compensation estimates represent an estimate of the value of the tradeoffs that result in foregone opportunity of real economic return for family businesses. Therefore, valuing the tradeoffs of foregone opportunity as the magnitude of the difference between market and implied compensation estimates represents an estimate of the implied return, which capitalized over time, produces socioemotional wealth.

Comparing Market and Implied Compensation Estimates

Before an implied return of socioemotional wealth can be determined the market and implied compensation estimates must be estimated. Consideration must be taken when selecting a sample to obtain market compensation estimates to ensure an appropriate comparison is made to the implied compensation estimates. An appropriate market compensation estimate can be obtained from compensation data that best reflects the opportunities a family members', or in the case of this study, a managers' skills would present in a competitive setting should they search for new employment outside the family business. In other words, the market estimate should be determined from the representative industry and position a manager would most likely be employed within given their current skill set.[1]

[1] Note that the market sample my contain observations from family and/or non-family businesses.

Once the appropriate samples have been identified, market and implied compensation estimates may be obtained and their group means compared to test for statistical evidence of implied economic value associated with manager socioemotional wealth within family businesses. Specifically, letting $\overline{\theta}_{MTM}$ represent the mean market manager compensation estimate, and $\overline{\theta}_{FV}$ represent the mean implied manager compensation estimate, the following hypothesis may be tested.

Hypothesis I:

$$H_0 : \overline{\theta}_{MTM} \leq \overline{\theta}_{FV}$$
$$H_a : \overline{\theta}_{MTM} > \overline{\theta}_{FV} .$$

Hypothesis I is a one-tailed test of the difference in group sample means between manager market and implied compensation estimates. Rejecting the null hypothesis would provide statistical evidence that the magnitude of the difference between manager market and implied compensation estimates is statistically significant providing evidence that positive economic value is associated with socioemotional wealth for managers within family businesses. In addition, the difference $\overline{\theta}_{MTM} - \overline{\theta}_{FV}$ may be viewed as an approximation to the implied return associated with socioemotional wealth for managers within family businesses.

Determining an Implied Compensation Estimate

Profit maximization would be the natural choice to provide a framework to isolate economic returns from which implied compensation estimates may be determined. Implied compensation estimates from a profit maximization framework inherently account for long-term financial sustainability as they are measures of the opportunity costs with respect to each contribution type, i.e. management, labor, or equity. Within the context of compensation, opportunity costs

represent the implied compensation estimates that each contribution has earned relative to net income. Therefore, implied compensation estimates may be obtained from a profit maximization framework by isolating net income that is allocated to equity, labor, and management. How the implied compensation estimates are determined is described next.

To begin we start with total revenue from the sale of output that is allocated to the input costs of the factors of production. Taking total revenue minus total costs leaves profits that may be distributed to equity, labor, and management. Depending on what expenses are included within total costs determines what profit represents. Within this study, profits represent net income resulting from total revenue minus total costs that exclude unpaid labor. Unpaid labor is excluded in order to achieve a net income measure from which implied compensation estimates for equity, labor, and management may be determined. Therefore, each contribution of management, labor, and equity receives a share of net income according to the following relationship:

$$(1) \quad \begin{aligned} Net\ Income\ &= Management\ Return \times Quantity\ Management + wage \times Quantity\ Labor \\ &+ Rate\ of\ Return \times Quantity\ Equtiy \end{aligned}$$

To implement equation (1), econometric panel regression methods may be used to empirically estimate the opportunity costs associated with equity, labor, and management (i.e. the rate of return, wage, and management return in equation (1)). Specifically, the estimated coefficients on the quantities of equity, labor, and management would be the implied rates of return that each of equity, labor, and management contributed to net income that lead to unbiased implied compensation estimates. This presumes that family members provide equity, labor, and management considering the socioemotional return as further payments.

The net income relationship in equation (1) may be estimated through fixed effects or random coefficient panel regression models. Either method can evaluate dynamic relationships

between variables, control for unobserved heterogeneity, and incorporate relevant dependent and independent variables. Using the coefficient estimates from the regressions with the sample data provides within sample predictions that are used to determine predicted implied compensation estimates for each quantity of equity, labor, and management. The manager implied compensation estimates will then be compared to manager market compensation estimates to arrive at the implied value of manager socioemotional wealth.

The general form fixed effects model (FEM) is:

(2) $$y_{it} = (\mu) + \mathbf{x}'_{it}\boldsymbol{\beta} + u_{it}\text{, } i=1,\ldots,\text{N, } t=1,\ldots,\text{T,}$$

where y_{it} represents the firm *i*, year *t* dependent variable, μ represents an intercept term, $\mathbf{x}'_{it}$ represents a row vector of independent variables for firm *i*, year *t* , $\boldsymbol{\beta}$ represents a column vector of coefficients, and $u_{it} = \begin{cases} \gamma_i + \varepsilon_{it} \text{ if fixed cross-section effects} \\ \delta_t + \varepsilon_{it} \text{ if fixed time effects} \\ \gamma_i + \delta_t + \varepsilon_{it} \text{ if both} \end{cases}$ where ε_{it} represents an error term for firm *i*, year *t* that is assumed to be distributed $N\left(0, \sigma_\varepsilon^2\right)$.[2] The other assumptive features of the FEM include (strict) exogeneity, non-autocorrelation, and achieving the full rank condition. In addition, either balanced or unbalanced panels may be used for estimation purposes as unbalanced panels pose no estimation difficulties (Wooldridge, 2002),

The random coefficient model (RCM) is more general than the FEM because parameter heterogeneity can be modeled as stochastic variation across subjects (Greene, 2003; Swamy, 1970). This allows the estimate of socioemotional return to differ among family businesses. The RCM has been extended to accommodate panel data and can be described as:

[2] Note equation (3) includes the intercept in parenthesis to indicate that the model may or may not include an estimate for the intercept.

(3) $$y_{it} = (\mu + \gamma_t) + \mathbf{x}'_{it}\boldsymbol{\beta}_i + (\mu_i + \varepsilon_{it}),\ i=1,\ldots,N,\ t=1,\ldots,T,$$

where y_{it} represents the firm *i*, year *t* dependent variable, μ represents an intercept term, γ_t represents a time fixed effect, μ_i represents a random intercept term for firm *i*, $\mathbf{x}'_{it}$ represents a row vector of independent variables for firm *i*, year *t* , $\boldsymbol{\beta}_i = \boldsymbol{\beta} + \mathbf{v}_i$ represents a column vector of unit coefficients, and ε_{it} represents an error term for firm *i*, year *t* which is assumed to be distributed $N(0, \sigma_\varepsilon^2)$. The addition of μ_i in equation (3) permits estimates of implied compensation, or indirectly, socioemotional wealth to differ among family businesses. The RCM adjoins to equation (3) the assumption that the $\boldsymbol{\beta}_i$ are all related and typically has $\boldsymbol{\beta}_i$ distributed as $N(\boldsymbol{\beta}, \boldsymbol{\Gamma})$ where $\boldsymbol{\Gamma}$ is a matrix of variance and covariance terms to be estimated that represent the degree of heterogeneity of the unit coefficients implying $\mathbf{v}$ is distributed $N(\mathbf{0}, \boldsymbol{\Gamma})$. Thus, equation (3) can be rewritten as

(4) $$y_{it} = (\mu + \gamma_t) + \mathbf{x}'_{it}\boldsymbol{\beta} + [\mu_i + \mathbf{x}'_{it}\mathbf{v}_i + \varepsilon_{it}],\ i=1,\ldots,N,\ t=1,\ldots,T,$$

where the term in brackets represents a composite error term. An important restrictive assumption of the RCM is that the stochastic process that generates $\boldsymbol{\beta}_i$ is independent of the error process, and is also uncorrelated with the vector of independent variables $\mathbf{x}'_{it}$ ensuring the $\mathbf{x}'_{it}$ are uncorrelated with the complicated composite error term within brackets in equation (4). The complication of the error term causes the conditions of the Gauss-Markov theorem to not hold, and therefore methods of Maximum Likelihood or other iterative methods must be used to obtain coefficient estimates. The other assumed features of the RCM in equation (4) are the same as those for the FEM presented in equation (2) (Beck and Katz, 2007).

DATA AND DESCRIPTIVE STATISTICS

Panel Regression Data

The data used for panel regression estimation are from the New York Dairy Farm Business Summary (DFBS) (Knoblauch et al., 2009) collected by Cornell University. The sample consists of an unbalanced panel of 230 dairy farm businesses (1,165 observations) over the ten year period 1999-2008. The 230 dairy farms included within the sample are considered full-time operations that primarily produce milk, and were identified as businesses having more than one identified partner. Pooled summary statistics for the period covering 1999-2008 for each of the four variables are reported in Table 1.

Farms are a very suitable family business in which to estimate socioemotional wealth. Detailed financial data for 10 years on a large number of farms is not available for most other types of farm family businesses. Many farms have been in the family for numerous generations and there exists the strong goal of keeping the farm in the family for many more generations, generating a socioemotional value, but at the cost of possibly lower earned financial returns. This continuity, although nurtured in many other types of family businesses, is especially strong in agriculture given that the family members' homes are typically located on the farm where children clearly bond and form an identity with the business. In the case of the dairy farm often times the children are integrated within the family business at an early age through activities such as caring for the calves.

"Insert Table 1 Here"

Variables

Four variables are included within the panel regressions that include measures of net income, equity, labor, and farm size. Income and equity are presented in real terms by adjusting to base

year 2008 dollars using the Consumer Price Index (CPI) (U.S. Dept. of Labor 2010a).[3] In addition, the real measures of income, equity, and the measure of labor are normalized by the yearly average number of cows to permit farm comparison on a per cow basis.

Net income is defined as accrual net farm income without appreciation with unpaid family labor removed. Over the ten year period 1999-2008 net farm income averaged $564 per cow in real terms base 2008. Net farm income per cow was notoriously variable across each of the ten years, ranging from a low $179 per a cow in 2006 to a high of $1,188 per cow in 2007. In addition, net farm income per cow displayed a high degree of heterogeneity within each year, as for four out of ten years the standard deviation in net income was greater than the mean net income.

Equity is based on the average difference between total farm assets market value and the average total farm liabilities book value from the beginning and ending balance sheets reported by each farm in the DFBS. Average equity per cow was $6,038 in real terms for 1999-2008 and varied little year to year. However, within year variation of equity signaled a high degree of heterogeneity between farms. Operators' labor months is defined as the summation of the full time months worked by each operator, including up to six operators. On average, the farms within the DFBS recorded 30 full time months between 2.4 operators over 1999-2008. Not surprisingly, operator labor months per cow trended downward over 1999-2008 as farms acquired and implemented technology to replace labor. The natural logarithm of the average annual herd size was included as a control variable representing returns to management that

[3] $real\ price_t = current\ price_t \left(\frac{Base\ CPI}{Current\ CPI} \right)$

account for the unobserved heterogeneity between farms attributed to differing levels of management quality and efficiency.[4]

Market Compensation Data

Market compensation estimates are required to test Hypothesis I. For this particular study, management market and implied management compensation estimates covering 1999-2008 will be compared to test for evidence of positive implied economic value associated with socioemotional return. The most appropriate representative market sample for farm managers would be from the Bureau of Labor Statistics (BLS) Occupational Employment Statistics, New York farmers, ranchers, and other agricultural managers' compensation data (U.S. Department of Labor, 2010b). The BLS dataset best represents the management position a partner at a New York dairy farm would most likely be employed in farm management. New York BLS data were selected to be consistent with the DFBS dataset. Yearly medians and descriptive statistics for the BLS dataset for 1999-2008 are reported in Table 3.

Unfortunately, there is currently no publically traded equity in farm businesses to compare to the implied compensation estimates for equity within dairy farms. The indices that are currently available track the agricultural oriented firms that either provide inputs to farmers or process agricultural products. The businesses currently within agricultural indices are also much larger than the typical farm, and are not considered a representative comparison to dairy farm family businesses. Once a comparable index exists, future studies may asses the market vs. implied compensation estimates of equity returns using this analysis.

[4] The natural log of average herd size was included as a control variable because larger dairy herds traditionally incur larger returns, and return growth displays diminishing marginal returns.

EMPIRICAL RESULTS

One fixed effects, and two random coefficient panel regression models were estimated to determine the implied returns associated with equity, labor, and management within farm family businesses. Since preliminary data analysis suggested a high degree of sample heterogeneity between cross-sections and across time, a two-way fixed effects, a one parameter random coefficient, and two parameter random coefficient panel regressions were selected. These three methods are flexible when considering controlling for unobserved heterogeneity but their results should be similar. Predicted values from the three models representing manager implied compensation estimates are based on the sample medians of the DFBS data for1999-2008.

Fixed Effects Model

The two-way fixed effects model over time and farms is estimated as:

(7) $nfipcow_{it} = \left(\beta_0 + \delta_i + \gamma_t + \beta_3 logcow_{it}\right) + \beta_1 equitypcow_{it} + \beta_2 oplaborcow_{it} + \varepsilon_{it}$. Within equation (7) the coefficient β_1 represents the implied rate of return earned by equity per cow, and β_2 represents the implied return per month of operators' labor per cow. The parameters within the parenthesis in equation (7) represent the implied returns to management. The intercept term β_0 can be considered a common portion of the residual return to management. The fixed firm effects δ_i are included to control for unobserved heterogeneity attributed to differences between management skills, and the fixed time effects γ_t are considered to be exogenous bonuses to

management in a given year.[5] The final portion of management compensation is returns relative to farm size represented by β_3.

The two-way fixed effects panel regression results are reported in Table 2. The F-statistic for testing the hypothesis of no fixed effects is highly significant indicating fixed effects should be included within the model, and an adjusted-R^2 of 0.62 suggests a reasonable fit to the data. Eight of the nine year fixed effects are significant at the α=0.05 level indicating that net income varies annually. The firm fixed effects estimates (not reported) range from -417 to 1,771 with 134 significant at the α=0.05 level indicating a high degree of heterogeneity between farms as expected. Coefficient estimates on equity, labor, and management indicate that in the long-run equity earns an implied real annual return of approximately 6 percent per year, operator labor earns an implied real return of $259 per labor month per cow, and management earns the implied real return from the sum of $-\$2,685 + \delta_i + \gamma_t + 346 * logcow_{it}$ for a given firm in a given year.

A 6 percent annual real return on equity per year may seem low; however, equity owners also accrue any capital appreciation, which over the ten year period 1999-2008 averaged approximately 10 percent per year in real terms for a total average annual return to equity of approximately 16 percent for the farms within this study.[6] Given the two-way fixed effects regression results, on the average 413-cow farm from the data set over 1999-2008, operator 12 month implied compensation estimate would be $42,787.[7] The average management implied

[5] Any bonuses associated with a given sample year are allocated to management since management assumes responsibility for risk taking behavior.
[6] Capital appreciation is determined from balance sheet estimates provided by each family business.
[7] $259*413 cows = $106,967/2.5 years = $42,787. The 2.5 years is the average operator labor months per farm over 1999-2008.

compensation estimate for a 413-cow farm would be $330 per year.[8] With an average of 2.4 operators per farm, the average management implied compensation estimate would be $138 per operator per year. At first glance the management implied compensation estimate seems low but on most New York dairy farms it is very likely that the management and operator roles are coupled. Therefore, for this paper it is assumed that manager implied compensation estimates are defined as the sum of the predicted implied returns to management and operators labor resulting from panel regression estimation.

Random Coefficient Models

Two random coefficient panel regression models were estimated to allow for a more flexible control of the unobserved heterogeneity between farms: one model controls for farm and management unobserved heterogeneity, the other model controls for only farm unobserved heterogeneity. The random coefficient model that controls for farm and management unobserved heterogeneity is estimated as:

$$nfipcow_{it} = \left(\mu + \gamma_t + \beta_3 logcow_{it}\right) + \beta_1 equitypcow_{it} + \beta_2 oplaborcow_{it} + \left[\mu_i + v_3 logcow_{it} + \varepsilon_{it}\right] \quad (8)$$

Interpretation of the coefficients in equation (8) are the same as equation (7), the only difference being that $\left[\mu_i + v_3 logcow_{it} + \varepsilon_{it}\right]$ represents a composite complicated error term that includes random coefficients for firm effects and herd size. Therefore, management implied returns are augmented to incorporate the random farm and herd size coefficients and are defined as $\left(\mu + \mu_i\right) + \gamma_t + \left(\beta_3 + v_3\right) logcow_{it}$. The stochastic farm and herd size effects, μ_i and v_3, within

[8] (-$2,685+$782+$149) + $346×log(413 cows) = $330. The $782 and $149 are the average yearly firm and time fixed effects values.

equation (8) are appended to management implied returns to better control for the unobserved heterogeneity across management quality and efficiency. Random farm effects capture differences in management styles, and random herd size effects capture differences in management efficiency as some managers are better at maintaining small herds rather than large herds. For comparison purposes, a random coefficient model was estimated with only random farm effects included to control for management quality and efficiency together. The difference between the two coefficient and one coefficient RCM is that the stochastic herd size effects, v_3, would be dropped from the implied returns to management leaving $(\mu + \mu_i) + \gamma_t + \beta_3 logcow_{it}$.[9]

Results for both RCMs can be found in Table 2. A likelihood ratio test performed on the -2 residual/restricted log likelihoods for both random coefficient models and was significant at the $\alpha = 0.01$ level indicating the addition of a random herd size effect in a model with random farm effects is a significant improvement.[10] The random coefficient model including random farm and herd size components indicates that in the long-run equity earns an implied real return of approximately 5 percent per year, operator labor earns an implied real return of $323 per labor month per cow, and management earns an implied real return represented by $-\$778 + \mu_i + \gamma_t + (\$167 + v_i) * logcow_{it}$ for a given farm in a given year. The farm random effects range from -3,143 to 1,700 with 124 significant at the $\alpha = 0.05$ level, while the herd size random effects range from -307 to 475 with 77 significant at the $\alpha = 0.05$ level confirming the high degree of heterogeneity between farms.

[9] A random coefficients model that only includes a random component related to the constant term is also considered a random effects model.

[10] The likelihood ratio test when compared to the null model is evaluated as a chi-squared test with 3 degrees, and 2 degrees of freedom for the random intercept model.

The random coefficient model including only random farm effects indicates that in the long-run equity earns an implied real return of approximately 5 percent per year, operator labor earns an implied real return of $231 per labor month per cow, and management earns an implied real return represented by $-\$690 + \mu_i + \gamma_t + \$153 * logcow_{it}$ for a given farm in a given year. The farm random effects range from -1,044 to 615 with 55 significant at the $\alpha = 0.05$ level.

"Insert Table 2 Here"

Testing Hypothesis I

We are interested in testing for evidence of positive implied return associated with socioemotional wealth for family business partners over the period of 1999-2008 as formulated in hypothesis I. This hypothesis may be tested by using a one-sided independent two-sample t-test for comparison of group means (Kutner et al., 2005). In order for the two-sample t-statistic to be a valid test statistic the assumptions that the data originate from a normally distributed independent random sample must be confirmed.

Independence between samples is trivial as the Bureau of Labor Statistics datasets excludes self-employed workers. Normality of each univariate sample is statistically tested through the Shapiro-Wilk statistic (Shapiro and Wilk, 1965) using approximation methods from Royston (1992). Lastly, since the two-sample t-statistic assumes equal variance for both samples, a folded F-statistic based on Steel and Torrie (1980) may be determined to assess the hypothesis that the sample variances are equal.

The median farm manager market and implied compensation estimates from 1999-2001 are reported in Table 3. The median manager market and implied compensation estimates are compared because the cross-sectional predictions (not shown) are right skewed due to the larger farms within the sample. The Shapiro-Wilk W statistics (not shown) were highly significant for

all four samples confirming univariate sample normality. The folded F-tests (not shown) testing the null hypothesis of equal sample variances for each of the market to implied sample pairs were not significant, failing to reject the null hypothesis that the sample means are equal, finalizing the complete validation of the assumptions required for the two-sample t-statistic (Kutner et al., 2005).

"Insert Table 3 Here"

The t-values and power of the one-sided two-sample independent t-tests comparing group means for the manager median market and implied compensation estimates over 1999-2008 are reported in Table 4. The two-sample t-statistics testing each of the three mean manager implied compensation estimates compared to the mean manager market compensation estimates are all significant at the α=0.01level rejecting the null in hypothesis I that manager group mean market and implied compensation estimates for 1999-2008 are equal. Rejection of hypothesis I provides statistical evidence that positive implied economic value was associated with socioemotional wealth for managers within dairy farm family businesses over the period 1999-2008. Power calculations in Table 4 indicate all three tests have a high degree of sensitivity reflecting a low probability of a Type II error. Differences in the manager market and implied compensation estimates indicate that family business managers' socioemotional wealth had an implied economic value ranging from $22K to $33K per year over 1999-2008.

"Insert Table 4 Here"

SUMMARY AND CONCLUSIONS

An empirical estimate of the implied return associated with socioemotional wealth was estimated for managers within New York dairy farm family businesses. Also, an empirical technique was developed to compare market compensation returns for managers to the estimated implied

manager compensation returns in the family business to test for the extent of positive implied return associated with manager socioemotional wealth. New York dairy farm partnership financial data from an unbalanced panel were used within fixed effects and random coefficient panel regression models to estimate the implied returns to equity, labor, and management while controlling for unobserved heterogeneity arising from differing firm size and management. Farm data are ideal for empirical testing for socioemotional wealth given the long standing goal of farm families to keep the farm in the business and the availability of an extended and large panel data set from the same business type, which in this case are family dairy farms.

Results of one-sided two-sample t-tests provide statistical evidence that managers within dairy farm family businesses append economic value to socioemotional wealth since the implicit financial return that that they earn from the family business is statistically lower than the market return of farm managers. The socioemotional return was estimated to range from 22 to 33 thousand dollars a year per family partner with financial returns that averaged 27 to 37 thousand dollars per year per manager, for a total compensation of 49 to 70 thousand dollars a year comprising a total return consisting of financial returns and socioemotional wealth. Panel regression estimates suggest equity earns an implied return of 4.5 to 6 percent excluding capital appreciation.

Although the results of this analysis are based on a sample of New York dairy farms the generality of the methods is applicable to all closely held private small family businesses. Future research could apply the methods developed within this paper to other industries to further assess the socioemotional wealth-financial performance tradeoff between family and nonfamily businesses. Experimental methods may also be utilized to elicit the beliefs of family businesses on the value of socioemotional wealth. Our data set includes very limited characteristics of these

family businesses, but characteristics may also be collected to help determine the driving factors behind the implied valuations of socioemotional wealth. Lastly, once a comparable agricultural equity index is developed the socioemotional wealth-financial performance relationship may be assessed for the equity contribution within dairy farm family businesses.

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Table 1. Pooled Variable Summary Statistics and Definitions for New York Dairy Farms 1999-2008 (N = 1,165)

Variable	Mean	Std. Dev.	Definition
nfipcow	$564	$549	Net farm income per cow in 2008 dollars
equitypcow	$6,038	$3,016	Equity per cow in 2008 dollars
oplaborcow	0.159	0.138	Operator labor months per cow
logcow	5.582	0.971	log(average yearly total cows)

Table 2. Parameter Estimates for the Fixed-Effects and Random Coefficient Regression Models for New York Dairy Farms, 1999-2008. (N=1,165)

	Two-way Fixed Effects Model		Random Intercept and logcow Model		Random Intercept Model	
Variable	**Estimate**	**t-value**	**Estimate**	**t-value**	**Estimate**	**t-value**
Intercept	-2,684.7600*** (619.200)	-4.34	-778.4700*** (273.030)	-2.85	-690.1400*** (262.980)	-2.62
equitypcow	0.0611*** (0.013)	4.56	0.0488*** (0.007)	6.93	0.04523*** (0.007)	6.52
oplaborcow	259.1820 (361.900)	0.72	322.7400 (261.790)	1.23	230.9400 (244.780)	0.94
logcow	345.5163*** (96.612)	3.58	166.5900*** (40.984)	4.06	153.2000*** (38.965)	3.93
Year 1999	460.7794*** (65.416)	7.04	313.6300*** (49.552)	6.33	330.1100*** (49.557)	6.66
Year 2000	76.9189 (63.813)	1.21	-57.3386 (48.786)	-1.18	-41.8213 (48.773)	-0.86
Year 2001	345.6560*** (60.505)	5.71	234.3600*** (49.182)	5.03	247.9300*** (49.331)	5.03
Year 2002	-136.8280** (58.266)	-2.35	-237.5000*** (49.119)	-4.84	-226.4900*** (49.284)	-4.6
Year 2003	-178.8780*** (57.310)	-3.12	-261.9400*** (49.494)	-5.29	-256.5500*** (49.682)	-5.16
Year 2004	322.5802*** (53.982)	5.98	257.9400*** (48.079)	5.36	262.1800*** (48.299)	5.43
Year 2005	137.3242*** (49.340)	2.78	99.1028** (45.822)	2.16	105.7100** (46.076)	2.29
Year 2006	-332.0110*** (47.969)	-6.92	-351.7500*** (45.396)	-7.75	-349.0200*** (47.969)	-7.64
Year 2007	649.0500*** (43.497)	14.92	643.2700*** (42.827)	15.02	642.6400*** (43.128)	14.9
F-stat. no fixed effects	8.18***		-		-	
R^2	0.70		-		-	
Adjusted R^2	0.62		-		-	
-2 Res. Log Likelihood	-		17,101		17,121	

[a] Note that *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.
[b] Standard errors (rounded) are in parenthesis.

Table 3. Median Farm Manager Market and Implied Compensation Estimates and Summary Statistics for New York Dairy Farms, 1999-2008.

Year/Statistic	Market Estimate	*Predicted Implied Manager Compensation Estimates*		
		Two-way FE	Random Int. and logcow	Random Int.
1999	$41,884	$22,386	$27,964	$20,039
2000	$46,191	$24,338	$30,263	$21,709
2001	$53,013	$26,707	$33,297	$23,881
2002	$53,929	$26,675	$33,514	$23,905
2003	$61,440	$28,723	$35,783	$25,597
2004	$64,466	$31,065	$38,693	$27,752
2005	$74,986	$30,562	$38,135	$27,306
2006	$72,129	$32,155	$39,984	$28,654
2007	$68,899	$32,535	$40,474	$29,064
2008	$53,726	$41,971	$52,296	$37,443
Mean	$59,066	$29,712	$37,040	$26,535
St. Dev.	$11,096	$5,463	$6,778	$4,857

[a] All Dollar values are measured in real terms base year 2008.
[b] Market compensation estimates are based on U.S. Bureau of Labor Statistics Occupational Employment Statistics, New York farmers, ranchers, and other agricultural managers dataset (U.S. Department of Labor, 2010b).

Table 4. Two-Sample *t*-tests Comparing Sample Means of Farm Manager Market and Implied Compensation Estimates for New York Dairy Farms, 1999-2008 ($N_1=N_2=10$).

Two-way FE		Random Int. and logcow		Random Int.	
t-value	**Power**	**t-value**	**Power**	**t-value**	**Power**
7.51***	0.9999	5.36***	0.9493	8.49***	1.0000

[a] Note that *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.
[b] Power calculations are based on the α=0.0001 level.
[c] Market compensation estimates are based on U.S. Bureau of Labor Statistics Occupational Employment Statistics, New York farmers, ranchers, and other agricultural managers data (U.S. Department of Labor, 2010b).

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