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Family Conflict and Farm Profitability: Not Always a Negative Relationship

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Abstract

This article analyzes the effects of conflict using a non-linear model and relies heavily on economic theory to define the relationship between conflict and profitability. This research builds on the model of Kretchmer and Puranam (2008), an effort-based model that captures the effects of employee collaboration. We expand upon this model and derive and test two main hypotheses. The first deals with the convexity of the relationship between conflict and profitability. The second analyzes the effect family business structure has on conflict and profitability.

Introduction

Conflict is an important ingredient in understanding innovation and organizational success. Increasingly, researchers in the fields of family business and industrial organization are directing their attention to issues of cooperation, conflict, and innovation (Flores-Fillol et. al. 2012; Kretchmer & Puranam 2008; Danes et al. 2002; Danes & Olson 2003; Danes & Lee 2004; Amarapukar & Danes 2005; Werbel & Danes 2010). These studies show that profitability is a function of more than input and output prices, but buried within the production function is a business's capacity for cooperation and the ways that it deals with conflict. These issues are important to understand business success.

Succession planning is an important stage in most family owned farms and can be a source of long term instability. In fact, only 30% of family businesses survive transfer from the original owner to the next generation and subsequent transfers are even less successful (Amarapurkar and Danes, 2005). Family business sustainability and successful intergenerational transfer is impacted by the degree of conflict in the business and household (Venter et al., 2005; Morris et al., 2003). This is also true for the family farm where increased conflict in the business is linked to decreased success in business succession planning (Jones and Marshall, 2012). Therefore it is critical to understand conflict in order to improve both yearly profitability and also improve long-term sustainability.

This article makes two important contributions to the existing literature. First, it is an analysis of conflict that relies heavily on economic theory to define household structure and the relationship between profit and conflict. Previous research has analyzed conflict processes and conflict outcomes and the implication of different business-household structures (McDonald and Marshall, 2013). Using Becker's (1991) household specialization theory, households are characterized on a continuum from coprenuerial to specialized. Specialized family farms are those where one spouse manages the farm while the other spouse manages the household. Each operates independently. In a coprenuerial family farm household each spouse is involved in the decision-making of both the farm and the household. In Becker's model, specialization is a result of spouses with differing comparative advantages. The spouse whose comparative advantage lies in the market will specialize in those activities while the other spouse specializes in household activities. This is partially determined by human capital endowment.

The second contribution of this article is an analysis of conflict using a non-linear model. The presence of conflict in an organization, whether it is a family or business, can have positive or negative impacts (Busby 1977). This implies a non-linear relationship between organizational success and conflict. In addition, economic theory demonstrates the tradeoff between the number of decision-makers and the costs of decision-making (Sah & Stiglitz 1988). This paper presents an extension to an existing theoretical model (Kretchmer & Puranam 2008) that suggests, when the tradeoffs between the amount of interaction between people is taken into account, the amount of conflict is convex to profit. Although there is widespread recognition that conflict has characteristics that make it non-linear, studies that have analyzed levels of conflict adopt models

that impose a linear and negative relationship with business or family success (Danes et al. 2002; Danes & Olson 2003; Danes & Lee 2004; Amarapukar & Danes 2005; Werbel & Danes 2010). A non-linear relationship allows for positive marginal effects of conflict on farm profitability. The assumption imposed by a linear model is too restrictive and results in a strictly negative relationship between conflict and success.

Previous Literature

The term conflict can be used to describe four different phenomena: antecedent conditions, affective states, cognitive states, and conflictual states (Pondy 1967). Antecedent conditions refer to the underlying source of the conflict such as a lack of resources. The affective states refer to resulting stress and tension from conflict. The cognitive state is how sensitive and perceptive individuals are to conflict. Pondy describes conflictual behavior as being a continuum from passive resistance to overt aggression.

Pondy (1967) describes these states as being part of the overall conflict process. First, there are the antecedent conditions that necessitate the conflict. Second, there is the individual's attentiveness and ability to perceive the conflict followed closely by the individual's actions (conflictual behavior). Third, there are the feelings or affective states that result from the conflict whether they are feelings of satisfaction and accomplishment or tension and frustration. The result of the conflict process is the affective state; this article focuses on the affective state and its relationship to business profitability.

At its worst conflict can be debilitating for an organization and at its best it can foster creativity and problem solving (Busby 1977). The presence of conflict in an organization, whether it is a family or business, can have positive or negative impacts (Busby 1977). This implies a non-linear relationship between organizational success and conflict, the nature of this non-linearity is the subject of this article. Within the categories of conflict, Pondy (1967) focuses on the negative aspects. To incorporate Busby's (1977) positive contributions, we offer an expanded definition of the types of conflict. For instance the affective state incorporates both feelings of tension and stress as well as satisfaction stemming from collaborative problem solving and full expression of self. This lends itself to the positive aspects of the conflictual state that include the act of problem solving and brainstorming.

<u>Family Business conflict</u>

There are unique aspects to a family business that influence the types of conflict that are experienced. In many instances the expectations of the family and the expectations of the business are not compatible. In other cases the optimal functioning of the family and the business are not compatible. McClendon & Kadis (1991) detail the four types of antecedent conflict that family businesses are likely to experience: life cycle conflict, role conflict, identity conflict, and justice conflict. Danes and Lee (2004) used McClendon and Kadis' (1991) categories of family business conflict by measuring each category of conflict as a dependent variable in an ordinary least squares

(OLS) regression. The independent variables included business-family prioritization, budgetary constraints, family functioning, presences of young children, stress and role satisfaction.

Empirical analyses have attempted to link tension to family business success. Tension is one example of an affective state of conflict. Several studies have measured business tensions in a similar way (Amarapukar and Danes 2005; Danes and Lee 2004; Danes and Olson 2003). They use likert scale questions to measure business tension regarding: lack of role clarity, confusion over authority, unequal ownership, unfair compensation, failure to resolve business conflicts, and unfair workloads. The likert scale ranges from no tension to a great deal of tension. Given these restrictions it is difficult for individuals to communicate any information about positive experiences regarding conflictual situations. This limitation leads to the conclusion that increases in affective conflict lead to decreased success and ignores the possible benefits of conflict. They also fail to uncover variables that help to decrease tension or improve the quality of conflict.

Economics of conflict

In economics the tradeoff between too little and too much conflict can be understood in terms of type I and type II errors and the cost of evaluating decisions. Sah and Stiglitz (1988) describe this in terms of committee decision-making. As the size of a committee increases the probability of approving a bad project decreases, but it also means that fewer good projects are accepted. The average quality of accepted projects increases with increased committee size. The evaluation costs, however, increase as committee size increases. This can be illustrated in the extremes. In a committee of just one person, the probability of rejecting a good project is very low, but the probability of approving a bad one is very high. Many projects are approved and the evaluation cost is low. In a committee of an infinite number of people, the probability of accepting a bad project is low, but the probability of rejecting a good project is very high. Not many projects are approved and the organization is paralyzed. In addition, the evaluation costs are very high. In general this means that there is a tradeoff between the average quality of the approved project and the cost of evaluation.

Therefore, in a family business, evaluation costs will be higher when more people are involved in the decision-making process. Included in evaluation costs is conflict between members. An important aspect of this article is how family businesses affect their own evaluation costs. In particular, how can family businesses minimize their evaluation costs and what role does family structure play in this consideration. Recall the important notions that Busby (1977) proposed, that willingness to compromise and openness to communication can affect the quality of conflict. Here too, Sah and Stiglitz suggest, the number of decision-makers is an important determinant.

As such, involvement of the spouse in the management and decision-making of the business is a central consideration in this article. While there is evidence that there are gender-based differences in conflict styles (Metz et al. 1994), the focus of this article is purely the involvement of the spouse (either gender) in the family business. One study in particular looked into the effect of having the wife involved in the farm family business (Danes & Olson 2003). The

study found that when the wife was involved in the family business, her presence in the family business increased business tensions for both the husband and the wife. These increased tensions were also linked to decreased businesses success. The natural conclusion of their results suggests that removing the wife from the family business increases business success. One limitation of this study is the assumption of a linear relationship between conflict and business success. The second limitation is the treatment of business outcomes without considering the effect on the quality of conflict in the family business as a whole.

Another relevant study, from Amarapukar and Danes (2005), uses path analysis to determine the effect of education, off-farm employment, farm size, locus of control, and decision involvement discrepancy on three different dependent variables: business tensions, relationship conflict quality, and satisfaction with spouse. This is an important study demonstrating negative effects increased business tensions can have on relationship conflict quality, and the positive affect relationship quality conflict has satisfaction with spouse. Path analysis requires some restrictive assumptions. Mainly, endogeneity is allowable between dependent variables but the direction (the path) can only flow in one direction. The use of one directional path analysis may mask a relationship between the three dependent variables that is more simultaneous in nature.

The structure of the family business has important implications for decision-making. Becker (1991) offers insight into this with his household specialization model. According to Becker, individuals can either specialize in the market or the household. The model suggests that in a two-person household, individuals will allocate their time to the sector where they have a comparative advantage.

Becker provides important insights for those families that mimic his specialization model and those that do not. The first insight regards families that follow the specialization model where one spouse specializes in managing the business and the other spouse specializes in managing the household. Particularly, family business literature has documented a phenomenon where males within the family perpetually dominate managerial roles within the family business (Keating & Little 1997; Danes et al. 2005). This phenomenon is attributed to boys being mentored into the business, which later defines their comparative advantage and leads to their promotion to managerial roles.

Becker's model suggests that if we restrict our attention to consumption, time, and human capital investments, it is clear that individuals are better off when they specialize. However, there are families where both spouses are involved in the management of the household and the business. One possibility is that Becker's model leaves out important variables that may explain why families choose not to specialize. Some of these reasons are explained by McClendon and Kadis' (1991) discussion of types of conflict. For example, identity formation and issues of equality are important functions of the family and may explain why people are involved in both the household and the business.

If we assume households are comprised of two spouses who are the primary decision-makers, the degree to which spouses are involved in the decision-making process in each system is an important indication of evaluation costs and the quality of the decisions. This represents a

continuum of family business structure where in one extreme each individual is perfectly equally involved in decision-making in each system (Samuelson 1956). Family business literature refers to these couples as coprenuers. The other end of the continuum is a family business where one spouse is in charge to the business and the other in charge of the household, referred to as a specialized family business.

There are many definitions of coprenuers based on ownership, management, and time spent in the business (Fitzgerald & Muske 2002). The definition for coprenuers by Fitzgerald and Muske (2002) is used in this paper where the spouse must be involved in the business in a way that is recognized by the business manager and the spouse must be involved in the decision-making of the business.

Model

Kretchmer and Puranam's (2008) effort based model captures the effects of collaboration between employees in the same firm that are in different departments. The basic model is given in Equation 1. Their model assumes two departments (i and j) and two employees (i and j). Each employee can exert effort in their own department (x) or in the other person's department (y). Profit in each department is given by π and is a function of the effort exerted by both individuals. The model also assumes a collaborative output bonus, given in the gamma term. Here the effort of person i on their own project is multiplied by the effort of person j on person i's project.

$$\pi_i = \tau x_i + (1-\tau) y_j + \gamma x_i y_j - \mu_i \tag{1}$$

The collaborative term (γ) is the focus of the proposed model in this article. The main existing fault with the Kretchmer and Puranam model is the strong assumption implied by their restricted attention to only positive values of gamma. This does not reflect what empirical studies have demonstrated, mainly that working together does not result in only positive outcomes, depending on the amount and the quality, and there can be high cost to interaction resulting mainly from conflict. Therefore, we propose an expansion to the Kretchmer and Puranam model that encapsulates both the positive and negative aspects of conflict.

The focus is on the first best case, put forth by Kretchmer and Puranam, where the actors jointly maximize the combined profit of both departments. This is fitting when studying family businesses because of the long time-horizon and low discount rate that characterize many family businesses (Pushkarskaya & Marshall 2009). When these two conditions are met, the first best solution is achievable (Alexrod 1984).

For the ease of future explanations we will present the Kretchmer and Puranam model with a slight alteration. First, assume a family business is like a firm with two departments. The business exists as department *i* and the household exists as department *j*. There are two individuals, a business manager and a household manager. They jointly maximize Π.

$$\max_{x_i, y_i} \Pi \tag{2}$$

$$\Pi = \pi_i + \pi_j \tag{3}$$
$$\pi_i = x_i + y_j + \alpha x_i y_j + x_i^2 + y_j^2 \tag{4}$$

The slight modification is given in the alpha term (here we substitute alpha for gamma, to denote the difference in underlying assumptions). The alpha term here represents the range of values–from positive to negative–associated with conflict. Alpha is bounded between 2 and -2. Positive values of alpha represent the collaborative realm proposed by Kretchmer and Puranam (2008). Negative values of alpha represents the negative effects of conflict and when alpha is negative is it easy to imagine, just by rearranging terms, the joint output becomes part of the cost function.

The first order conditions are nearly identical to those in the Kretchmer and Puranam model.

$$\tau + \alpha y_j - 2x_i = 0 \tag{5}$$
$$(1 - \tau) + \alpha x_i - 2y_j = 0 \tag{6}$$

Maximized levels of effort are given in equations 7 and 8

$$x_i^* = \frac{-2\tau - \alpha + \alpha\tau}{\alpha^2 - 4} \tag{7}$$
$$y_j^* = \frac{2 - 2\tau + \alpha\tau}{\alpha^2 - 4} \tag{8}$$

And maximized profit is given in equation 9

$$\Pi^* = \frac{2(\alpha\tau^2 - 2\tau^2 - \alpha\tau + 2\tau - 1)}{\alpha^2 - 4} \tag{9}$$

Results of the second-order Hessian indicate profit is positive definite, indicating a convex relationship between profit and conflict and specialization. The non-linear nature of the resulting optimized profit function give justification for an empirical investigation of nonlinear effects of conflict on profit.

The comparative statics derived from equation 9 give us a second, testable hypothesis. The comparative static to consider is the derivative of profit with respect to alpha. This is given in Equation 10.

$$\frac{\partial \Pi^*}{\partial \alpha} = \frac{2(4\tau^2 - 4\alpha\tau^2 - 4\tau - 2\alpha + 4\alpha\tau - \tau\alpha^2 + \tau^2\alpha^2)}{(\alpha^2 - 4)^2} \tag{10}$$

Family businesses can be characterized as either being specialized, where the business manager and the household manager do no work in the other sphere (τ=1). The other special case

is when both managers work in both spheres, this is also known as a copreneurial structure (τ=1/2). The comparative static in Equation 10 yields a different result depending on the value of τ. For copreneurial businesses (τ=1/2) the sign is positive. For specialized businesses (τ=1), the sign of Equation 10 depends on the value of alpha. When alpha is negative, conflict is negative, and the comparative static is negative. The converse is also true when alpha takes on positive values. This is demonstrated in Figures 1 and 2.

Ultimately, this model provides two testable hypotheses to focus on in the following empirical investigation. First is the convex relationship between conflict and profit. Second, the interaction between family business structure, whether specialized or copreneurial, will have an effect of conflict on profit. Mainly, specialized family businesses will experienced increased levels of profit for both increases in positive and negative conflict. The specialized family business will only experience increased profit with increased positive conflict. The following paper is organized as follows: methodology, results and discussion.

Methodology

Data

The sample consists of a convenience sample of 2,097 small and medium sized farms Illinois, Indiana, Michigan, and Ohio; and a random sample of 1,059 small Indiana businesses. The final sample fielded by the University of Wisconsin Survey Center consisted of 3,156 cases from April 2011-February 2012. Cases with no contact information were removed for a total of 2,163 viable cases. The sample contains 736 observations of which 721 are complete telephone surveys and 15 are usable partial complete telephone surveys. The Farm sample has 653 (641 complete) observations and the Non-Farm 83 (80 complete) observations. The response rate was 34% overall, with the Farm sample at 44% and the Non-Farm Indiana sample at 12%.

Dependent variable

The dependent variable in the following analysis, profit, is an objective measure of business success. Profit was ascertained by survey from the business owners. The variable is the result of a multiple choice question where business managers were asked whether their business profit fell within a range of categories displayed in Table 1. Most businesses (439 out of 597) fell within the category where profit is $49,000 or less and were defined as low profit. Business with $50,000 or more in profit were defined as high profit.

Measuring conflict

The primary objective of this analysis is to measure the effect of affective conflict on business profit. To do this we use two indices that measure affective family business conflict in the forms of satisfaction and tension. The tension index measures tension resulting from interactions with family members and co-workers and has been used in previous conflict studies (Amarapukar & Danes 2005; Danes & Lee 2004; Danes & Olson 2003). The second index is a

measure of satisfaction resulting from interaction between family members and co-workers. This allows us to assess both results from conflict that are good (satisfying) and bad (tension-producing).

Six Likert scale questions assess tension. These questions include measures of confusion regarding workloads and authority and failure to resolve conflicts. The index is produced by means of iterated principle factor analysis, which reduces redundancy between the individual indicators of tension, evident in the results of analysis and the high weight given to the first factor (Table 2). The results from the factor analysis were used to predict tension scores for each individual within the samples. Figure 3 displays the distribution of the resulting tension scores.

Three Likert scale questions assess how satisfied the business manager is with his/her interaction with family and co-workers. These include measures of satisfaction with the family's ability to communicate and problem solve. The same method for creating the tension index was used to create the satisfaction index. The results of the iterated principle factor analysis are displayed in Table 3. The results from the factor analysis were used to predict conflict scores for each individual within the samples. Figure 4 displays the distribution of the resulting conflict scores.

Another important variable is the role the spouse has in business decision-making. Prior studies (Danes & Olson 2003) have shown that this is mainly negative. One of the contributions of this study is to analyze the interaction of family business structure with affective conflict. Family business structure can be matched to τ from the theoretical model. A dummy variable is included in the model to indicate whether the business manager's spouse is involved in business decision-making. When the dummy variable takes on the value 1, this corresponds to a copreneurial structure. When the dummy variable takes on the value 0, this corresponds to a specialized structure.

Additional control variables

A complete list of variables and summary statistics is given in Table 4. These variables include manager experience, number of part-time and full-time employees, median income of the surrounding region (defined by the business zip code), and a dummy variable indicating whether the business is related to agriculture. The experience variable is based on the Mincer (1974) calculation, which is the number of years of education subtracted from a person's age. Median income was procured from the 2007-2011 American Community Survey 5-Year Estimate and matched to businesses within the sample by zip code.

Model Specification

A probit analysis was used with a binary dependent variable, taking on the value of 1 for businesses with $50,000 profit and above and 0 otherwise. The categorical nature of the dependent variable requires the use of a binary choice model. The following analysis adopts the probit regression with the following specification:

$$\pi = B_1x_1 + B_2x_2 + B_3x_3\ B_{13}x_1x_3 + B_{23}x_2x_3 + \bar{Z}\gamma + \epsilon \tag{11}$$

Where:

π = profit
x_1 = tension
x_2 = satisfaction
x_3 = copreneurial dummy variable
Z = a vector of control variables
B= a vector of parameters to estimated
ε= random error term (assumed to be normally distributed)

$$\pi_i = \begin{Bmatrix} 0\ if\ 0 \leq \pi_i^* < 50{,}000 \\ 1\ if\ 50{,}000 \leq \pi_i^* \end{Bmatrix}$$

The first hypothesis of this paper is convexity in the conflict parameters. A Box-Tidwell regression allowed us to determine whether the exponents on any given explanatory variables were significantly different from one. The results showed that neither the tension nor the satisfaction index showed evidence on non-linearity. This test did indicate non-linearity in the relationship between the number of full-time employees and profit. In addition, a link test was performed to test for specification error (Tukey 1949; Pregibon 1979). Initial tests indicated the presence of specification error. Once the results from the Box-Tidwell regression were included—that is to say, the variable for the number of full-time employees was transformed—the specification error was alleviated.

The second hypothesis of the paper is an analysis of the ways in which copreneurial businesses interact with conflict and profit. To analyze this, interaction terms were introduced, where the copreneurial dummy variable (x_3) was interacted with both the tension and the satisfaction indices. Using interaction terms within non-linear regression models requires some caution. The marginal effects for each variable and the interaction term were calculated according to the equations the following equations according to the methods developed by Ai and Norton (2003), Norton et al. (2004), and Greene (2010).

$$\frac{\partial E[\pi|x_1, x_2, x_3, Z]}{\delta x_1} = \Phi(A)\ \times\ (B_1 + B_{13}x_3) \tag{12}$$

$$\frac{\partial E[\pi|x_1, x_2, x_3, Z]}{\delta x_2} = \Phi(A)\ \times\ (B_2 + B_{23}x_3) \tag{13}$$

$$\frac{\Delta E[\pi|x_1, x_2, x_3, Z]}{\Delta x_1} = \Phi(B_1x_1 + B_2x_2 + B_3 + B_{13}x_1 + B_{23}x_2 + \gamma Z) - \Phi(B_1x_1 + B_2x_2 + \gamma Z) \tag{14}$$

$$\frac{\Delta\partial E[\pi|x_1,x_2,x_3,Z]/\partial x_1}{\Delta x_3} = (B_1 + B_{13})\Phi(B_1x_1 + B_2x_2 + B_3 + B_{13}x_1 + B_{23}x_2 + \Upsilon Z) - B_1\Phi(B_1x_1 + B_2x_2 + \Upsilon Z) \quad (15)$$

$$\frac{\Delta\partial E[\pi|x_1,x_2,x_3,Z]/\partial x_2}{\Delta x_3} = (B_2 + B_{23})\Phi(B_1x_1 + B_2x_2 + B_3 + B_{13}x_1 + B_{23}x_2 + \Upsilon Z - B_2\Phi(B_1x_1 + B_2x_2 + \Upsilon Z) \quad (16)$$

Where:

Φ is the cumulative distribution function for a standard normal distribution

Φ(A)= $E[\pi|x_1,x_2,x_3,Z]$

The analysis also required an investigation of endogeneity caused by simultaneity between conflict and profit. The direction of causation proposed in this article states that conflict partially determines the business' level of profit. We recognize that there may be occasions when profit (especially low levels of profit) may determine the level of satisfaction or tension in the family business. To test this, a two-stage instrumental variable probit was used to test for endogeneity in betwee both satisfaction, tension and profit. Two variables instrument for tension and satisfaction. The number of children ages five to eighteen is highly correlated with the tension index and the percentage of employees who are relatives instruments for satisfaction. The Wald test of exogeneity was not rejected with a probability of 0.49, concluding that tension and satisfaction are exogenous in this model and we proceed with a probit regression.

Results

Results from the probit regression, as displayed in Table 5, show support for the hypotheses derived from the theoretical model. Let us focus our attention on the marginal effects provided in Table 6. First, the hypothesis concerning the convexity of conflict with respect to profit is evidenced by the positive marginal effect of tension, though the marginal effect of satisfaction is not significant. A positive coefficient on tension indicates that increased tension causes an increased probability of having high profit.

The second hypothesis concerns the inclusion of the spouse in management decisions, known as a copreneurial business structure. This requires the testing of interaction terms between the conflict variables and the coprenuerial dummy variable. The results of the copreneurial dummy variable indicate a negative relationship between having a coprenuerial structure and probability of high profit, similar to the results of Danes & Olson (2003). The analysis presented here is more nuanced however, looking at the interaction between conflict and family business structure. The marginal effect of satisfaction interacted with coprenuerial structure is negative. This is contrary to the hypothesis derived from the model. The theoretical model showed that copreneurial business profit would benefit from increased satisfaction. For the negative realm of conflict the theoretical

model showed a positive relationship between increased tension and profit. This is also not supported empirically. The regression results indicate, when a regime change occurs from specialized to coprenuer, the effect of increased tension is negatively related to profit.

Discussion

The hypotheses tested in this analysis come from an expansion of a theoretical model developed by Kretchmer and Puranam (2008). The original model is meant to characterize collaboration between employees who work in different parts of the same firm. The model we prosed in this article broadens the range of personal interaction to include positive and negative aspect of conflict. The first hypothesis of the model is that conflict is convex to profit, meaning that profit is increasing in both positive and negative conflict. The second hypothesis is that copreneurial business structures (where both spouses are involved in business decision-making), will differ in the relationship between conflict and profit from businesses that have a specialized structure.

The analysis uses two indices to measure positive and negative aspects of conflict. For positive conflict, an index is constructed that describes the business manager's satisfaction with his/her interaction with co-workers and family members. For negative aspects of conflict, a similar index is constructed that measures tension between the business manager and co-workers and family members.

Another aspect of the empirical investigation analyzed the relationship between conflict and profit for specialized and copreneurial family business structures. The expanded Kretchmer and Puranam model suggests that for coprenuerial family businesses a marginal increase in the satisfaction will increase profit. For specialized family businesses, the marginal effect depended on the type of conflict (positive or negative), and that movements toward satisfaction or tension would increase profit.

The empirical results did, in part, support the model of the specialized business. The results suggest that specialized businesses may benefit from increased tension but not necessarily increased satisfaction. This result lends support for a need to re-think our approach to conflict. Healthy businesses need conflict to address problems and possibly spur innovation. The amount of innovation that results from tension and conflict is a source of future research worth exploring. For coprenuerial business, the empirical results were contrary to the hypotheses derived from the model, both increased satisfaction and increased tension decreased the probability of having high profit.

While the empirical results of the interaction of coprenuerial business structure and conflict are counter to the theoretical model, there may be an intuitive explanation. When coprenuerial businesses increase tension, there is spillover into the family realm. This can exacerbate the costs of that tension. The negative marginal effect of the interaction between conflict and satisfaction, may be explained by an examination of goals. For many small businesses, profit, especially short-term profitability is not a primary goal of their enterprise. Many want to provide employment to

family members or have a legacy to leave to the next generation, goals that are not primarily motivated by profit. In future iterations, controlling for the primary goal of the business may shed some more light on this relationship.

In addition, there may be a technical reason for the contradiction between the model and empirical results, generated by the definition of coprenuer in the theoretical model, which is defined as family businesses where the household and business responsibilities are perfectly shared between the two individuals. In fact, this is a special case of the model, only for value of τ (the measure of specialization) exactly equal to ½ do we see a positive marginal relationship across the entire range of values. The survey from which we determine coprenuerial from specialized structure asks if the spouse is involved in the management of the business. From the survey we can exactly identify specialized structures (those that answered "no"), but we cannot exactly identify if individuals exactly share responsibility if they answered yes. Therefore it is not surprising that the results to indicate negative effects of tension, because others on the spectrum may be included in this perfectly coprenuerial group. This is one limitation of the current study and will be addressed in future research.

Nevertheless, this study provides information about how important it is to attend the personal and professional relationships in small family businesses. For small family business that are specialized the results suggest an immense opportunity to capitalize on the tension that exists and use it to innovate and problem solve. For those businesses that are more coprenuerial, this study suggests that moving away from high-tension environments may help improve profitability.

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Tables and Figures

Figure 1. Comparative static for specialized structure

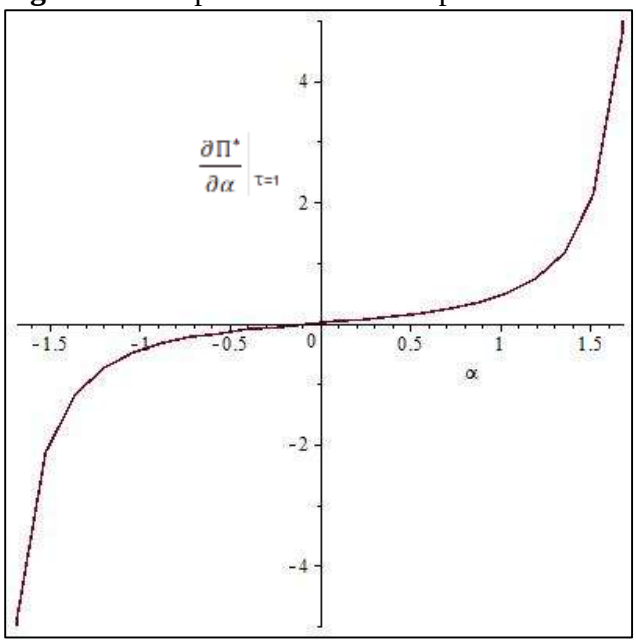

Figure 2. Comparative static for copreneurial structure

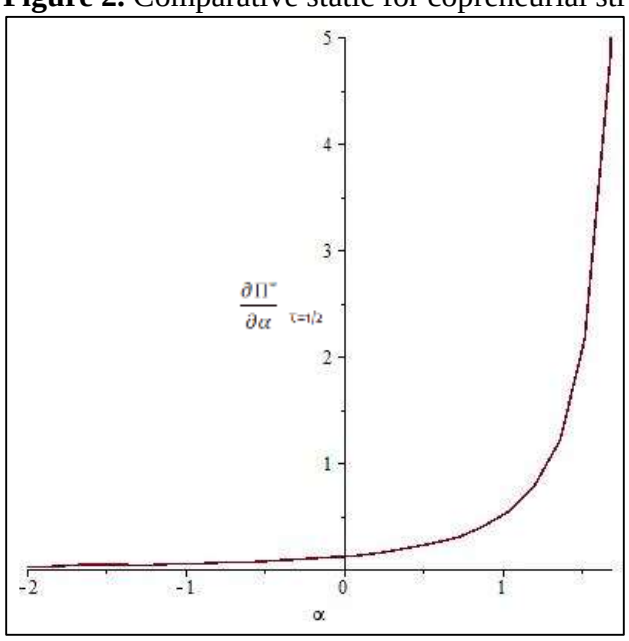

Figure 3. Histogram of tension index

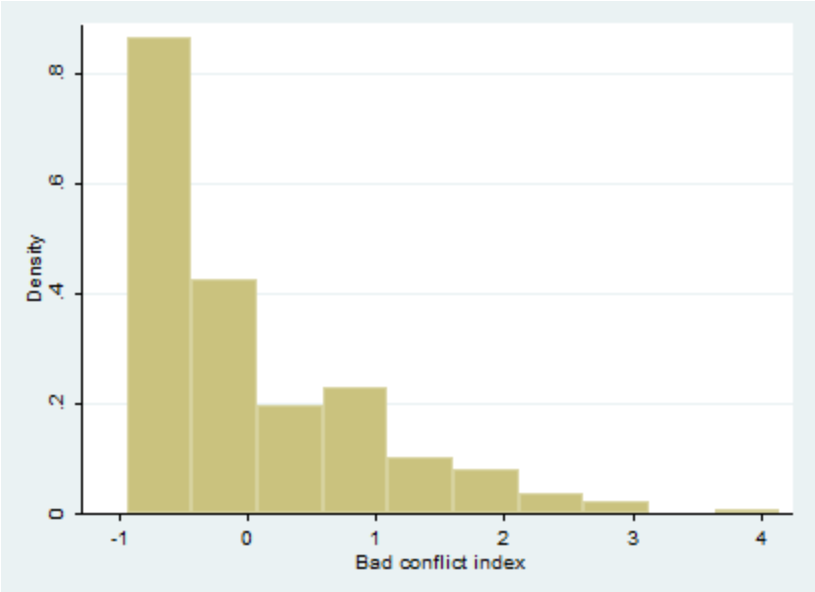

Figure 4. Histogram of satisfaction index

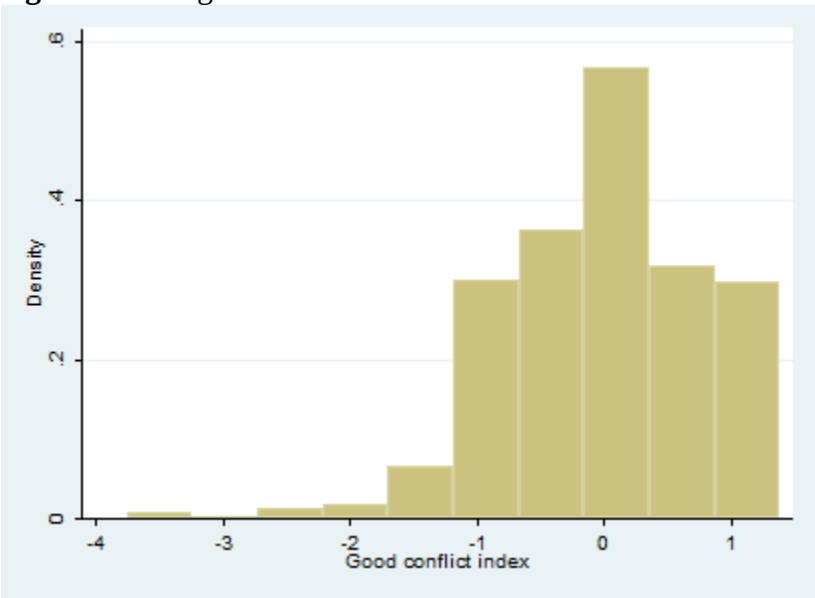

Table 1. Business profit categories and frequencies.

Business Profit 2010	Frequency
$49,000 or less	439
$50,000 - $99,000	85
$100,000 - $149,000	35
$150,000 - $199,000	11
$200,000 - $299,000	10
$300,000 - $399,000	3
$400,000 - $499,000	5
$500,000 - $599,000	1
$600,000 - $799,000	1
$800,000 - $999,999	3
$1,000,000 - $4,999,000	4

Table 2. Iterated principle factors for components of tension index

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	2.552	2.190	0.778	0.778
Factor2	0.361	0.141	0.110	0.888
Factor3	0.220	0.122	0.067	0.955
Factor4	0.098	0.047	0.030	0.985
Factor5	0.051	0.051	0.015	1.000
Factor6	0.000	.	0.000	1.000

Table 3. Iterated principle factors for components of satisfaction index.

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	1.331	1.322	0.993	0.993
Factor2	0.009	0.009	0.007	1.000
Factor3	0.000	.	0.000	1.000

Table 4. Summary statistics for key variables

Continuous variables	Mean	Std. Error
Satisfaction index	1.14E-08	3.46E-02
Tension index	-8.92E-10	3.79E-02
Number of part-time employees	2.32	0.31
Number of full-time employees	7.84	1.10
Median income (by zip code)	$ 28,701	259.60
Experience	40.10	0.50

Binary variables	Freq.	Percent
Specialized structure	178	30%
Coprenuerial structure	419	70%
Agriculture	415	70%
Non-Agriculture	182	30%
Male business owner	362	60%

Table 5. Estimates from probit regression

Dependent variable: high profit=1	Coeff.	Robust st. err	z
Coprenuerial structure	-0.2262	0.12424	-1.82
Satisfaction index	0.288034	0.117156	2.46
Tension index	0.411032	0.117996	3.48
Satisfaction index *coprenuerial	-0.31336	0.149358	-2.1
Tension index *coprenuerial	-0.23326	0.137369	-1.7
Experience	0.004737	0.004825	0.98
Gender (male=1)	0.346448	0.125772	2.75
Number of part-time employees	0.006374	0.012128	0.53
Number of full-time employees	0.308119	0.066264	4.65
Agriculture	0.057469	0.130388	0.44
Median income (by zip code)	1.08E-05	8.56E-06	1.26

Table 6. Marginal effects for key variables

Variable	dy/dx	Standard error[1]	
Coprenuerial structure	-0.20372	0.055315	***
Satisfaction index	0.021598	0.023005	
Tension index	0.078435	0.021179	***
Satisfaction index *coprenuerial	-0.10483	0.043877	**
Tension index *coprenuerial	-0.11254	0.050112	**

[1]Standard errors calculated in STATA using the delta method (Norton et al. 2004)