CrossMark

ORIGINAL PAPER

Is Working with Your Spouse Good for Business? The Effect of Working with Your Spouse on Profit for Rural Businesses

Tia Michelle McDonald[1] · Maria I. Marshall[2] · Michael S. Delgado[2]

Abstract The goal of this article is to uncover more precise and unbiased estimates of the relationships between relationship satisfaction, a copreneurial business structure, and profit. Because of the suspected simultaneity between profit levels, the choice to be copreneurial and relationship satisfaction, a multivariate recursive probit is used to test for endogeneity between these variables. The results of the empirical analysis suggest that spouses self-select into a copreneurial business structure depending on the level of satisfaction they feel in their interpersonal relationships. Additionally, copreneurial businesses with high relationship satisfaction are more likely to have higher profit than if they were non-copreneurial.

Keywords Copreneur · Multivariate probit · Relationship satisfaction · Family business profit

Introduction

In the wake of agricultural consolidation, small businesses have become increasingly important as a means of supporting rural employment and economic activity. However,

rural businesses have been found to be less successful than their urban counterparts, having less employment growth and lower survival rates (Renski 2008). Research has also shown that rural businesses are more likely to be family businesses (Shields 2005), are more likely to be jointly managed by spouses (henceforth referred to as copreneurial; Fitzgerald and Muske 2002) and have fewer employees (Shields 2005) than urban businesses. Aside from the rural location, previous research has given cause for concern regarding the success of copreneurial businesses. Copreneurs were shown, on average, to be less successful than their non-copreneurial counterparts in terms of profit (Fitzgerald and Muske 2002; Muske et al. 2003) and perceived success (Danes and Olson 2003; Fitzgerald and Muske 2002). However, Dyer et al. (2012) found no effect when couples switched from non-copreneurial to copreneurial. Belenzon and Zarutskie (2012) found that family businesses performed better when the two leading shareholders were married and Parker (2008) found that knowledge spillovers were more efficient between copreneurial couples than non-married business partners. This has left a gap in our understanding of the causal effect on profitability of business owners that have chosen to work with their spouse and has provided the research objective for this article.

Researchers in the fields of family business and industrial organization have increasingly directed their attention to issues of cooperation, conflict, and innovation, and their effect on business success (Amarapurkar and Danes 2005; Danes and Lee 2004; Danes and Olson 2003; Danes et al. 2002; Flores-Fillol et al. 2010; Kretchmer and Puranam 2008; Werbel and Danes 2010). These studies have shown that profitability was a function of more than input and output prices; buried within the production function was a business's capacity for cooperation and the ways that it

✉ Tia Michelle McDonald
  mcdonalt@ohio.edu

  Maria I. Marshall
  mimarsha@purdue.edu

  Michael S. Delgado
  delgado2@purdue.edu

[1] Economics Department, Ohio University, Bentley Annex, 309, Athens, OH 45701, USA

[2] Department of Agricultural Economics, Purdue University, 403 W State St., West Lafayette, IN 47907, USA

Springer

deals with conflict. This article has contributed to the current literature by establishing causal linkages between spousal involvement and business performance. First, the article has incorporated theoretical models of cooperation into existing models of family and family business functioning. Second, a multivariate analysis has been employed which can account for suspected endogeneity resulting from self-selection and can estimate the causal effect of choosing a copreneurial business structure on profit for small and medium-sized rural firms. The results of the empirical analysis have suggested that spouses self-select into a copreneurial business structure depending on the level of satisfaction they felt in their interpersonal relationships. Additionally, the results have shown that copreneurial businesses with high relationship satisfaction were more likely to have a higher profit than if they were non-copreneurial.

Literature Review

Economic theory has suggested that individuals will choose the family business structure that maximizes their profitability or the welfare of the more broadly defined family business and household. Previous literature has suggested that copreneurial couples were worse off on both accounts: profit and welfare as indicated by the level of business tensions (Danes and Olson 2003; Fitzgerald and Muske 2002).[1]

Increased business tensions may be explained by the economics of decision-making, as the number of people involved in decision-making increases, so too do the costs of evaluation (Sah and Stiglitz 1988). Consider, for example, the relationship between family-business tension and the decision to be copreneurial: Copreneurial businesses were likely to experience more business tension than non-copreneurial family businesses because they have more individuals involved in the decision-making process holding all other variables constant. The work of Danes and Olson (2003) supported this theory and showed that, on average, copreneurial structured family businesses report higher tension levels than non-copreneurial family businesses. They further showed that, on average, higher tension was associated with lower business success. A comparison of means was not sufficient to establish a causal link from copreneurial structure to increased tension to decreased success, therefore, this study has warranted further examination into the effect of working with your spouse on the business.

Fitzgerald and Muske (2002) compared copreneurial and non-copreneurial businesses and found that copreneurial businesses had, on average, lower gross revenue levels, lower profit levels, and lower perceived success. Dyer et al. (2012) used a panel of small businesses and found no effect on profit when businesses switched from non-copreneurial to copreneurial.[2] The literature showed, at best, working with your spouse had no effect on the business and, at worst, working with your spouse may have negatively impacted the business. Even when spousal involvement was shown to increase business stability, it was associated with decreased business growth.[3] If these were true, in a causal sense, it would be hard to explain the behavior of those that have chosen a copreneurial family business structure.

Further differences exist between copreneurial and non-copreneurial family businesses that may help to explain the disparity in success between these two types of businesses. Fitzgerald and Muske (2002) found that copreneurial business owners were more likely to see the business as a way of life rather than a way to generate income. Muske and Fitzgerald (2006) found that managers of more successful businesses who were family oriented were more likely to invite their spouses to work in the business.[4] These findings suggested that copreneurial family business owners were less driven by profit and perhaps own businesses as a lifestyle choice. It was also likely that business owners who were less profit driven had lower profits. Therefore, it may have been that copreneurial businesses self-selected into a copreneurial business structure because they were more family-oriented and less profit-oriented. Their lower profit levels, when compared to non-copreneurial businesses, may have been a result of self-selection, meaning that the decision to work with your spouse was not the direct cause of lower profit.

Conceptual Model

The following article utilized the Sustainable Family Business Model (SFBM; Stafford et al. 1999) and the Fundamental Interpersonal Relations Orientations (FIRO) model (Schutz 1958). These models provided the framework for understanding the importance of the family to the family

---

[1] It should be noted that previous research has been varied in their definitions of copreneurship. Fitzgerald and Muske (2002) defined copreneurs as spouses who are both major decision-makers. Danes and Olson (2003) did not examine copreneurship explicitly, but examined the effect of wives working in the family business and the effect of wives' involvement in decision-making.

[2] Dyer et al. (2012) defined copreneurship as co-ownership and/or the spouse working in the business.

[3] Belenzon and Zarutskie (2012) analyzed differences between business owners that were married and not married.

[4] The Muske and Fitzgerald (2006) article followed Fitzgerald and Muske's (2002) definition of copreneur.

business and the process by which individuals enter and become a part of the family business. Additionally, we incorporated two economic theories of voluntary cooperation to further inform our understanding of interpersonal relationships and the value of working together.

The SFBM has been used in previous research as a foundation to examine spousal relationships in the family business context (Amarapurkar and Danes 2005). This model was useful because the model tenants expressed the influence of the family on the family business where the two systems (the family and the business) were interdependent. Success in the business was assumed to depend on a minimal level of functioning in the family and can be measured objectively or subjectively. The Fundamental Interpersonal Relations Orientations (FIRO) model (Schutz 1958) had provided additional insight into the process of group formation. Doherty and Colangelo (1984) applied this model to families and Danes et al. (2002) applied this model specifically to family businesses. The first stage of group formation, inclusion, was defined as the process by which individual membership was established. Individuals within the group must have felt a sense of belonging while maintaining their own unique identities (Doherty and Colangelo 1984). The second stage, control, was centered on power and authority (Doherty and Colangelo 1984). In this domain, the focus was often the distribution of resources (Schutz 1958) which were tangible or material in nature (Doherty and Colangelo 1984).

The culminating stage, the result of the formation of the group, was the integration stage (Danes et al. 2002). The integration domain was characterized by a deep level of communication where individuals engaged in open-disclosure while sharing a reciprocal appreciation for the uniqueness of others in the group (Doherty and Colangelo 1984). A deeper level of communication allowed individuals to share personal emotions and allowed them to feel emotionally close (Schutz 1958). Other research has used relationship satisfaction as a measure of the integration stage (Amarapurkar and Danes 2005).

Our measure of relationship satisfaction was adapted from the Family APGAR, which originated in the family medicine discipline to measure family functioning (Smilkstein 1978). The original intent of the score was to provide medical professionals with a clinical method of assessing the health of the family unit. The Family APGAR was comprised of five questions that address different aspects of the function of the family: adaptation, partnership, growth, affection, and resolve. A modified 5-point score has been used in the family business context to measure the functioning of family relationships (Danes et al. 1999; Danes and Olson 2003; Olson et al. 2003; Danes and Lee 2004; Danes and Morgan 2004). The literature has recognized the limitations of these measures since they were not originally intended to address the unique dynamics of a family business nor were they intended for use in family business research (Björnberg and Nicholson 2007). Nevertheless, a modification of the Family APGAR score to address relationship satisfaction within the family and family business was a useful measure of the integration stage of the FIRO process within the family business.

A relevant theoretical model of voluntary cooperation supported the premise that there were emotional considerations to joining a group (Holländer 1990). The model posited that for two individuals to choose to cooperate, they must be part of a social group that would sanction this action. In addition, they must expect to receive an emotional reward from working together. These hypotheses have been particularly relevant in the family business context, where the social group was well defined and the emotional reward could be thought of as a form of relationship satisfaction. Consider a couple that chose to work together in the family business; according to Holländer (1990), they did so because they had created a family business culture that was amenable to that decision and they expected to experience high levels of relationship satisfaction.

We have used both Holländer's (1990) theory and the Family FIRO model to understand the emotional considerations of choosing to work with your spouse. Holländer stated that the social group must be accepting of that configuration and that the participants should expect an emotional reward. The Family FIRO model showed that the expected emotional reward would manifest itself in the last stage in terms of a deeper connection between spouses. To understand the effect of cooperation on business success, we utilized the work of Kretchmer and Puranam (2008).

The theoretical work of Kretchmer and Puranam (2008) demonstrated how cooperation could lead to increased business profit. They defined cooperation as two individuals in a firm choosing to work with the other person in their department. When the cooperating parties had a positive joint marginal productivity, the profits of the business increased. In their model, instances of cooperation were mediated by the employees' pay-off structure (whether or not they chose to work together depended on their individual payoffs). In the family business context, the manager and the manager's spouse were considered the residual claimant so the effect of joint productivity on the decision to work together was unqualified; the couple chose to work together if they had positive joint marginal productivity. Therefore, we expected an emotional reward that compels couples to choose to be copreneurial would also positively affect the profit.

Hypotheses

The conceptual model and a review of the pertinent literature have led us to the following hypotheses:

Hypothesis 1:

H1 Couples who expect to have high relationship satisfaction are more likely to choose to be copreneurial than couples with low relationship satisfaction.

Because couples who have chosen to work together in order to realize higher relationship satisfaction may be less profit focused, therefore this may explain why copreneurial couples have been shown to have lower profit levels when directly compared to non-copreneurial couples. A direct comparison between profit levels of copreneurial and non-copreneurial couples does not signify causality when there may have been other systematic differences between copreneurial and non-copreneurial couples. To address causality, we analyzed the counterfactual: Do copreneurial couples have higher profit levels than if they chose to be non-copreneurial? In addition to economic theory that suggests, at the very least, couples will not have chosen a structure that decreased their profit, the theoretical work of Kretchmer and Puranam (2008) combined with the theoretical work of Holländer (1990) suggested that copreneurial couples may be better off working together than not. The emotional reward of cooperation indirectly affects profit, through the decision to be copreneurial, and directly affects profit, through the productivity of the working relationship. This leads to Hypothesis 2.

Hypotheses 2a and 2b:

H2a Copreneurial couples with high relationship satisfaction have a higher profit than if they had chosen to be non-copreneurial.

H2b Copreneurial couples with high satisfaction will have a higher profit than copreneurial couples with low relationship satisfaction.

Embedded in these hypotheses, because of the possible presence of self-selection, was the existence of endogeneity. Endogeneity was an important consideration because it has inhibited previous research from finding casual relationships through a comparison of average outcomes. If endogeneity was present in the model, then the choice to be copreneurial and the resulting profit levels were endogenously determined and therefore previous estimates of differences between copreneurial and non-copreneurial businesses captured correlations, but were not casual.

Hence, both Hypotheses 1 and 2 have implied simultaneity of the family business system. Couples chose to work together and that choice may have affected profit, but as Muske and Fitzgerald (2006) demonstrated, the profit level may have influenced the choice to be copreneurial. Additionally, couples may have chosen to work together to capitalize on their relationship satisfaction, but as the work of Danes and Olson (2003) showed, this decision increased tensions which may have had a negative effect on relationship satisfaction. This simultaneity and the suspected self-selection suggested an endogenous system and led to the last hypothesis:

H3 Relationship satisfaction, the choice to be copreneurial, and profit are endogenously related.

To address these hypotheses we employed a method of estimation that could account and test for suspected endogeneity. The methodology was discussed in the following section, followed by a discussion of the results.

Methodology

Data Description

The data used were from the 2012 Intergenerational Family Business Survey. The 2012 Intergenerational Family Business Survey was a 30-minute telephone survey of rural small and medium-sized family businesses in Illinois, Indiana, Michigan, and Ohio. The interviews were conducted from April 2011–February 2012. The final sample contains 736 family businesses for an overall response rate of 34%. To qualify for the study as a family business, one of the following metrics, which were not mutually exclusive, had to be met. At least one other member of the family besides the respondent had to have ownership interest in the business (86% of the sample). At least one other member of the family besides the respondent had to work at least part-time in the business (92% of the sample). The respondent inherited the business (18% of the sample). The respondent planned to transfer the business to a family member (55% of the sample). The full sample was culled for non-responses to individual questions of interest resulting in a sample of 515 observations. 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

The following empirical model estimated the simultaneous effect of relationship satisfaction and the choice to be copreneurial on family business profit accounting for the likelihood that couples self-select into a copreneurial business arrangement. The complexity of this simultaneous

Table 1 Variables and definitions

Category	Variable	Definition
Dependent variables	High profit	Business profit greater than $50,000, 1 = high profit, 0 otherwise
	Copreneurial	Is your spouse involved in the day to day management of the business, 1 = copreneurial, 0 otherwise
	High relationship satisfaction	How often are you satisfied that you can turn to people at home and work for help when something is troubling you? 1 = high satisfaction (most of the time or all of the time), 0 otherwise
Conflict variables	Conflict frequency	How often do conflicts arise where a decision has to be made in favor of the family versus the business?[a]
	Tolerance	To what extent has your family business developed an organizational culture that values differences of opinion?[b]
Household characteristics	Kids ages 0–6	Number of children ages 0 to 6 years
	Outside income	1 = greater than 50% of income from outside of the businesses and principal operator's primary employment is the business (indicates spouses outside option)
Business characteristics	Full-time employees	Number
	Decision-makers	Number of individuals involved in business decision-making
	Female business accounting	Currently, how much of the accounting or record keeping are female members of your family doing?[c]
	Agriculture	1 = agriculture
	Managerial accountability	Have you developed procedures that hold individuals accountable for management responsibilities? 1 = yes; 0 otherwise
Business owner characteristics	Exp	Experience = age-Education (in decades)
	Role satisfaction	To what extent are you satisfied with your role in the business?[d]
	Gender	1 = male
Regional Characteristics	Median income	Median income of the surrounding zip code area

[a] 1- never, 2-hardly ever, 3-some of the time, 4-most of the time, 5-all of the time

[b] 1-not at all, 2-slightly, 3-somewhat, 4-very much, 5-extremely

[c] 1-none at all, 2- a little, 3-about half, 4-most, 5-all

[d] 1-not at all, 2-slightly, 3-somewhat, 4-very much, 5-extremely

model, along with the binary nature of the key copreneurial variable, has suggested the use of a multivariate probit. In order to explain the estimation procedure we first defined the dependent variables. A complete list of variables used in this analysis has been made available in Table 1 along with detailed descriptions.

There were three dependent variables in the following analysis: profit, family-business structure, and relationship satisfaction. All three dependent variables were ascertained from the survey of business owners. The profit variable was the result of a discrete choice question where business managers were asked whether their business profit fell within a range of categories. Most businesses (381 out of 526) fell within the category where profit was $49,000[5] or less and were defined as low profit. Businesses with $50,000 or more in profit were defined as high profit.[6] The second variable, family-business structure, was the result of businesses categorized as copreneurial or non-copreneurial based on whether the business manager's spouse was involved in day-to-day management of the business.

The third variable, relationship satisfaction, was defined by the business manager's response to the question: "How often are you satisfied that you can turn to people at home

---

[5] All dollar values were in US dollars.

[6] The original question asked business owners to indicate their business profit by indicating the category which best reflected their business profits. The 12 categories ranged from $49,000 or below up to $5,000,000 or more. The rationale for converting this variable from a discrete categorical variable into a binary variable was two-fold. First, there were not enough businesses in each of the 12 categories to justify the categorical variable. Second, multivariate analysis with binary variables, while complex, allowed us to consider marginal effects in a more intuitive format. Marginal effects for variables with many discrete categories would be complex and seemed unnecessary in order to address our research objective.

and work for help when something is troubling you?" The response was recorded via a categorical variable where 1 = Never, 2 = Hardly ever, 3 = Some of the time, 4 = Most of the time, 5 = All of the time. Those that responded with 4 or greater were considered to have a high level of relationship satisfaction. The question was an adaptation of the first question from the Family APGAR (Smilkstein 1978). While the Family APGAR was a score of five questions with three possible responses, our use of a single item allowed us to fit the measure into a binary form. Even though the Family APGAR has been used in the family business context to measure family functioning (Danes et al. 1999; Danes and Olson 2003; Olson et al. 2003; Danes and Lee 2004), Björnberg and Nicholson (2007) noted the limitations of this measure since it was not originally intended to address the unique dynamics of a family business nor was it intended for use in family business research. The relationship satisfaction variable addressed Holländer's (1990) notion of an expected emotional reward and allows us to identify couples who chose to work together because they expected a high level of relationship satisfaction at home and at work. Those who were highly satisfied with the support they receive in their home and work (where their spouses dominate) were likely to expect an emotional reward from working with them.

The analysis adopted the following triangular specification:

$$
\begin{aligned}
Y_1^* &= \theta_{12}Y_2 + \theta_{13}Y_3 + \beta_1 X_1 + \epsilon_1, & Y_1 &= 1\,(Y_1^* \geq 50{,}000) \\
Y_2^* &= \theta_{23}Y_3 + \beta_2 X_2 + \epsilon_2, & Y_2 &= 1\,(Y_2^* \geq 0) \\
Y_3^* &= \beta_3 X_3 + \epsilon_3, & Y_3 &= 1\,(Y_3^* \geq 0)
\end{aligned}
\tag{1}
$$

where Y_1 was business profit (taking on the value of 1 for businesses with $50,000 profit and above and 0 otherwise), Y_2 was the choice of family business structure (1 if copreneurial, 0 otherwise), and Y_3 was the level of satisfaction in the family business (1 if high satisfaction, 0 otherwise).[7] The model was recursive, meaning that each individual equation feeds into the next as we move up the triangle. For example, in the base equation given in Eq. 1, Y_3 was a function of only exogenous variables. As we moved up to the copreneurial equation, Y_2 was a function of satisfaction and other exogenous variables. The top equation—also the equation of interest—was the profit equation. This was a function of copreneurial and satisfaction as well as other

exogenous variables. The specification of each equation has been discussed in further detail.

Testing for Endogeneity

One of the advantages of the triangular system of equations defined by (1) was that by estimating the equations jointly (as a system),[8] we allowed the error terms to be correlated across equations. We captured these correlations via a new parameter, ρ. This parameter was also an important measure of endogeneity (Monfardini and Radice 2008), allowing us to directly test Hypothesis 3. By testing the significance of ρ_{12}, we tested for endogeneity between profit and copreneurship; similarly testing the significance of ρ_{13} was a test for endogeneity between profit and relationship satisfaction, and testing significance of ρ_{23} tested for endogeneity between copreneurship and relationship satisfaction. These parameters captured endogeneity between profit, family business structure, and relationship satisfaction, because they captured the extent to which these outcome variables were related to each other after controlling for other variables in the model.

The triangular specification, in which each of the endogenous variables was binary, had several unique properties. When normality conditions were satisfied, Maddala (1983) and Greene (2008) demonstrated that estimation by the recursive bivariate probit was impervious to endogeneity as all the possible outcome probabilities were accounted for in the likelihood equation. However, exclusion restrictions allowed for unbiased estimation of the endogenous variable without having to rely on normality assumptions (Monfardini and Radice 2008). An exclusion restriction amounts to each estimated equation having at least one variable unique to that equation, in other words a variable that was present in one equation and excluded from the others. These variables should be correlated with the dependent variable of the equation it was included in and uncorrelated with the dependent variable of the equations it was excluded from. Therefore, the specification of each of the profit, copreneurial, and relationship satisfaction equations had unique variables that ensured unbiased estimation without relying on potentially unrealistic normality assumptions. Whether a particular variable was included or excluded from a particular equation was not a statistical issue, but rather a conceptual issue and must be argued on sociological or economic grounds. These have been discussed in further detail in the following sub-sections.

---

[7] To be precise, the Y^* variables are "latent" outcome variables, where we only observed the binary Y indicators for each outcome. Since the Y variables are binary, we specify each equation as a probit regression, which means that in our regressions we estimate the probability of a particular outcome being equal to 1. See Greene (2008) for details.

[8] Estimation of the joint likelihood required evaluating the trivariate normal pdf, which was computationally intensive. In this case the Geweke-Hajivassiliou-Keane (GHK) smooth recursive simulator was used to approximate the integrals (Greene 2008; Terracol 2002).

Variables in the Profit Equation

The variable unique to the profit equation was managerial accountability. By including this variable, we were able to satisfy the exclusion restriction. Martínez et al. (2007) identified managerial accountability as a possible weakness in family businesses when compared to non-family businesses. As such, we expected family businesses with this trait would have higher levels of success than those without this trait. Managerial accountability was not included in the copreneurial or relationship satisfaction specifications, because establishing a policy whereby managers were held accountable was assumed a separate decision from choosing to be copreneurial. This was consistent with previous literature which has not identified managerial accountability as an important determinant of the choice to be copreneurial (Fitzgerald and Muske 2002; Muske and Fitzgerald 2006) nor has it been identified as an important determinant of relationship satisfaction (Ford et al. 2007). Further, in our sample, there was not a statistical difference between copreneurial couples with managerial accountability and non-copreneurial couples with managerial accountability. This lent additional support to its exclusion from the copreneurial equation.

Owner, household, and business characteristics were used as control variables. These included manager's experience (measured using Mincer's (1974) calculation of age-education), number of employees and a dummy variable indicating whether the business was related to agriculture. Owner characteristics and household demographics have often been used to explain family business success (e.g., Anderson and Miller 2003; Baron and Markman 2003; Bosma et al. 2004; Gimeno-Gascon et al. 1997; Lee et al. 2006, 2010; Masuo et al. 2001; Sorenson 2000; Stafford et al. 2010). Business characteristics such as industry and number of employees also have been found to influence business success (e.g., Headd 2003; Lee et al. 2010; Masuo et al. 2001; Stafford et al. 2010). Economic theory suggests that profit levels were also partially determined by demand. In order to control for local demand we included median income of the surrounding region (defined by the business zip code) as a demand control.

Variables in the Copreneurial Equation

The variables unique to the copreneurial equation were outside income and the female accounting variable, which allowed us to satisfy the exclusion restriction for this equation. The outside income variable identified households where the business owner's primary occupation was the business but a large proportion of household income (greater than 50%) came from outside the business. This variable was suggestive of the reservation wage of the

spouse, where the spouse had a lucrative outside option. We posited that having a spouse work outside the home would decrease the likelihood couples will choose to be copreneurial. Muske and Fitzgerald (2006) used gross household income as a control variable but this may have been a noisy indicator of the spouses outside options. Therefore, we opted for a more specific measure where we could identify the spouse's contribution to household income. This variable was not included in the profit or relationship satisfaction equations. While the spouse's outside option may have affected profit indirectly (through the decision to be copreneurial) it should not have a direct effected on the profitability of the business. Likewise, with regard to relationship satisfaction, the spouse having an outside option may have indirectly affected relationship satisfaction through the decision to be copreneurial but was unlikely to have affected relationship satisfaction directly.

The second variable that addressed the exclusion restriction within the copreneurial equation was the female accounting variable. Previous research has shown that it has been common for businesses to assign business accounting and recording tasks to females (Dyer et al. 2012), and we posited that businesses that did this were more likely to be copreneurial. This variable was not included in the profit equation. Doing so would have presupposed that the accounting abilities of females and males were inherently different and likely to have affected profit. This variable was also not included in the relationship satisfaction equation because we posited that assigning females to accounting positions did not affect relationship satisfaction directly.[9]

Control variables within the copreneurial equation closely followed the specification of Muske and Fitzgerald (2006). These variables included gender, age, education (measured using Mincer's (1974) calculation of age-education), and number of children. Muske and Fitzgerald (2006) controlled for location (rural, urban) in their study. Our sample was limited to rural businesses; therefore, we did not control for this.

Variables in the Relationship Satisfaction Equation

The exclusion restriction for the satisfaction equation was satisfied by the role satisfaction variable. Role satisfaction has been shown to affect family business tensions (Danes

---

[9] One might think that role conflict could result from assigning females to accounting positions and that role conflict could influence relationship satisfaction. Role conflict, as identified by McClendon and Kadis (1991), arises because of conflicting archetypal roles that individuals may have in the family and the business, not the positions granted within the family business. Therefore, we assume that merely assigning accounting tasks to females does not result in role conflict.

and Lee 2004). We consequently posited that own role satisfaction has influenced how well we interact with others and will affect relationship satisfaction. This variable was not included in the copreneurial and profit equations. Role satisfaction was assumed not to influence the choice to be copreneurial; in fact, no statistical difference existed between reported role satisfaction levels between copreneurial and non-copreneurial couples. Additionally, we did not expect role satisfaction to influence business profit directly. This variable was not included in Dyer et al.'s (2012) analysis of business income and we found no compelling evidence to suggest this should have been present in the profit equation.

Control variables in the relationship satisfaction equation were informed by previous studies, which have shown that conflict and conflict management tended to influence relationship satisfaction (Amarapurkar and Danes 2005; Gottman and Krokoff 1989). Hence, tolerance to new ideas and conflict frequency were included as important relationship satisfaction control variables. Additional control variables included manager's experience, gender and the number of young children.

Evaluation of the Hypotheses 1 and 2: Marginal Effects

To address Hypotheses 1, 2a, and 2b three marginal effects were calculated.[10,11] Unlike a linear regression model, the parameters in the probit model were not the same as the marginal effects of the regressors on the dependent variable because the probability function was nonlinear; hence, we directly computed the marginal effects for our analysis. The first marginal effect addressed the effect of relationship satisfaction on the probability of being copreneurial. To quantify this we examined the marginal effect of relationship satisfaction on the probability of choosing to be copreneurial. The marginal effect of relationship satisfaction on the probability of choosing to be copreneurial was calculated as the difference between two conditional probabilities

$$\Pr\left(Y_2 = 1|Y_3 = 1, \bar{X}\right) - \Pr(Y_2 = 1|Y_3 = 0, \bar{X}) \quad (2)$$

The first term in Eq. 2 represented the probability of the couple choosing to be copreneurial given that they have high relationship satisfaction. The second term represented the probability of choosing to be copreneurial given that

the couple has low relationship satisfaction. If couples with high relationship satisfaction were more likely to choose to be copreneurial than couples with low relationship satisfaction, then the marginal effect would be positive, offering support of Hypothesis 1.[12]

To address Hypothesis 2a, we considered the marginal effect of the choice to be copreneurial on profit conditional on the couple having high relationship satisfaction. Again, because the variables of interest were discrete, the marginal effect could be calculated by considering the discrete change in the copreneurial variable

$$\Pr\left(Y_1 = 1|Y_2 = 1, Y_3 = 1, \bar{X}\right) - \Pr(Y_1 = 1|Y_2 = 0, Y_3 = 1, \bar{X}). \quad (3)$$

The first term represented the probability of having high profit given the both choice to be copreneurial and the couple having high relationship satisfaction. The second term represented the probability of having high profit given the choice to be non-copreneurial but still having high relationship satisfaction. A positive result would support Hypothesis 2a and suggest those that choose to be copreneurial have a higher probability of having high profit than if they had chosen to be non-copreneurial.

Hypothesis b states that *copreneurial couples with high satisfaction will have a higher profit than copreneurial couples with low relationship satisfaction*. In order to address this, the marginal effect of relationship satisfaction on profit was considered, given that the couple was copreneurial. We quantified this by differencing the conditional probabilities shown in Eq. 4

$$\Pr\left(Y_1 = 1|Y_2 = 1, Y_3 = 1, \bar{X}\right) - \Pr(Y_1 = 1|Y_2 = 1, Y_3 = 0, \bar{X}) \quad (4)$$

Empirical Results

Descriptive Results

Table 2 displays means and standard deviations for continuous and categorical variables and frequencies and percentages for binary variables. Seventy-five percent of the sample was comprised of copreneurial businesses and 25% were non-copreneurial businesses. In terms of profitability, 27% of the businesses had profit levels greater than $50,000, and were considered high profit, whereas 73% of businesses had less than $50,000 in profit and were considered low profit. Seventy-three percent of the sample was

---

[10] The marginal effect and standard errors for Hypothesis 1 were calculated using STATA. The marginal effect Hypotheses 2a and 2b were calculated in Limdep, which allowed for consistency between the estimated coefficients and the marginal effects because both rely on the GHK simulation of the trivariate distribution.

[11] For consistency with the model specification, we continue to refer to Y_1, Y_2, and Y_3 as profit, copreneurial, and relationship satisfaction, respectively.

[12] Bayes Theorem was used in order to calculate the conditional probabilities listed in Eq. 2. The conditional probability is equal to the ratio of the bivariate and univariate normal cumulative distribution functions (cdf). For example, the first term in Eq. 2 is $\Pr(Y_2 = 1|Y_3 = 1, \bar{X}, \rho_{23}) = \frac{\Phi_2(\beta_2\bar{X}_2, \beta_3\bar{X}_3; \rho_{23})}{\Phi_1(\beta_3\bar{X}_3)}$.

Table 2 Summary statistics

Binary variables	Frequency	Percent
Copreneurial	395	75
High profit	145	27
High relationship satisfaction	380	73
Agriculture	379	71
Gender (1 = male)	321	60
Outside income (1 if >50% outside business)	214	40
Managerial accountability (1 = yes)	183	35
Variable	Mean	St. Dev
Full-time employees	2.44	7.97
Decision-makers (#)	2.71	2.01
Experience (10 years)	3.98	1.20
Female business accounting	3.27	1.45
Role satisfaction	4.11	0.71
Kids ages 0–6 (#)	0.21	0.62
Conflict frequency	2.62	0.94
Tolerance	3.09	1.19
Median income	28,570	6443

comprised of businesses with owners who reported high relationship satisfaction and 27% were businesses with owners who reported low levels of relationship satisfaction.

The businesses in the sample were 71% agricultural with business managers who were 60% male. Forty percent of the sample derived more than half their income from sources other than the family business. The business managers reported that 35% had implemented a policy that holds managers accountable. The mean number of full-time employees was 2.44 and mean number of decision-makers in the business was 2.71 though both varied widely. The maximum number of employees reported in the sample was 150 and the maximum number of decision-makers was 18. The business managers had an average of 39.8 years of experience. The mean response for female business accounting was 3.27, indicating that the average business had half to most of its accounting conducted by females. The business managers reported a mean level of role satisfaction equal to 4.11, meaning that their level of satisfaction with their role in the business was, on average, very much satisfied to extremely satisfied. The broader household and business characteristics showed that the sample was comprised of households that have an average of less than 1 young child. The summary statistics also indicated that the average household in the sample experienced conflicts between household and business resource distribution between hardly ever and some of the time. The average family business in the sample reported a tolerance value of 3.09 which indicated they had somewhat developed a culture that valued differences of opinion. The median income

was included in the profit analysis as a demand control. This variable showed that the family businesses were located in zip code areas with an average median income of $28,570.

One underlying theme in this article was the extent to which the copreneurial businesses were different from non-copreneurial businesses. Table 3 showed the difference between copreneurial and non-copreneurial businesses for all of the variables included in the analysis. For categorical and binary variables, Fisher's exact test was used to uncover statistical differences since the classic t-statistic relies on a normality assumption, which does not apply to categorical and binary variables. In this case, the probability was displayed in the table since no test statistic exists for Fisher's exact test. For continuous variables, a t test was employed and the t-statistic was listed in the table.

The Fisher's exact test suggested copreneurial businesses had higher levels of relationship satisfaction as well as lower levels of profit than non-copreneurial businesses. It was not surprising, given the theoretical foundations in this article, to have found copreneurial businesses with higher degrees of satisfaction, considering this might be an important factor in deciding whether to be copreneurial or non-copreneurial. Regarding profit, 34% of non-copreneurial businesses were considered high profit compared to only 24% of copreneurial businesses. This was also expected, given that previous literature had uncovered a correlation between copreneurial businesses and lower profit levels (Fitzgerald and Muske 2002). What the data could not tell us, with these simple statistics, was the counterfactual:

Table 3 Summary statistics by family-business structure

Variable	Non-copreneurial (n=131)		Copreneurial (n=395)		T test (t-stat)	Fisher's exact test (p)
	Mean	SD	Mean	SD		
High profit	0.34	0.47	0.24	0.43		0.02*
High relationship satisfaction	0.63	0.48	0.74	0.44		0.03*
Conflict frequency (Likert 1–5)	2.55	0.81	2.66	0.99		0.02*
Role satisfaction (Likert 1–5)	4.07	0.78	4.10	0.70		0.54
Female accounting (Likert 1–5)	2.66	1.62	3.49	1.32		0.00***
Full-time employees (#)	2.61	5.16	2.34	8.88	0.65	
Experience	39.21	11.49	39.99	12.14	−0.55	
Kids ages 0–6 (#)	0.27	0.77	0.20	0.57	0.14	
Median income	28,598	6874	28,656	6358	−0.22	
Managerial accountability (1=yes)	0.38	0.49	0.33	0.47		0.259
Tolerance (Likert 1–5)	3.16	1.27	3.04	1.17		0.255
Gender (Male=1)	0.75	0.43	0.55	0.50		0.00***
Outside income (1 if > 50% outside business)	0.58	0.51	0.38	0.49		0.04*
Decision-makers (#)	2.50	2.49	2.80	1.78	−1.43*	

Statistical significance is indicated by ***p<0.001, **p<0.01, *p<0.05

Table 4 The Effect of a Copreneurial Structure and High Satisfaction on Profit Assuming Exogeneity: Univariate Regression Results

Variables	Univariate Probit					
	(Y_3)		(Y_2)		(Y_1)	
	High Satisfaction		Copreneurial		High Profit	
	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)
High satisfaction			0.305	(0.13)*	0.166	(0.14)
Copreneurial	0.335	(0.14)†			−0.248	(0.14)†
High profit	0.166	(0.14)	−0.257	(0.14)†		
Outside income			−0.280	(0.13)*	0.125	(0.13)
Tolerance	0.119	(0.05)†	−0.096	(0.052)†	0.020	(0.05)
Conflict frequency	−0.188	(0.07)***	0.085	(0.068)	0.055	(0.07)
Kids age 0–6 (#)	0.289	(0.22)	0.018	(0.21)		
Female accounting			0.213	(0.05)***		
Gender (male=1)	−0.158	(0.13)	−0.176	(0.16)	0.425	(0.13)**
Exp (10 year)	−0.107	(0.28)	0.039	(0.31)	0.559	(0.26)*
Exp (10 year) squared	0.016	(0.04)	0.019	(0.038)	−0.072	(0.03)*
Decision-maker (#)			0.060	(0.031)†	0.115	(0.03)***
Agriculture			0.316	(0.13)**	0.042	(0.14)
Full-time empl (#)			−0.001	(0.01)	0.013	(0.01)†
Role satisfaction	0.338	(0.08)***				
Mgmnt Accountable					0.200	(0.13)
Med inc ($ thous)			0.028	(0.0956)	0.074	(0.09)
Constant	−0.751	(0.70)	−0.852	(0.513)†	−2.76	(0.65)**
Observations	526		526		526	

Statistical significance is indicated by ***p<0.001, **p<0.01, *p<0.05, and †p<0.10

were copreneurial businesses more profitable than they would be if they were non-copreneurial?

The remaining tests showed that copreneurial businesses reported more frequent conflict and copreneurial businesses were more likely to assign females to accounting

tasks. The sample statistics also suggested that more males were non-copreneurial than were copreneurial, 75% of non-copreneurial businesses had a male business manager whereas 55% of copreneurial business managers were male. In addition, couples where the spouse had a lucrative outside option were more likely to be non-copreneurial and copreneurial businesses had on average, more decision-makers (2.8 vs. 2.5).

Univariate Probit Results

The results of the univariate empirical analysis are displayed in Table 4. The coefficients listed were not marginal effects, though in the univariate case we were able to interpret the signs of the coefficients as the direction of influence.

Relationship Satisfaction

Several variables significantly increased or decreased the probability of having high relationship satisfaction. The coefficient on the copreneurial variable was positive and suggested that copreneurial couples had a higher probability of having high relationship satisfaction than non-copreneurial couples. The coefficient on tolerance was positive and significant at the 5% level and demonstrated that tolerance to new ideas increased the probability of having high satisfaction. The next significant variable, conflict frequency, had a negative coefficient, and suggested more frequent conflict decreased the probability of having high satisfaction. The coefficient on role satisfaction was positive and significant which meant that business managers with higher role satisfaction had a higher probability of having high relationship satisfaction.

Copreneurial

The univariate results offered expected associations between high relationship satisfaction and high profit and the likelihood of being copreneurial. The coefficient on high relationship satisfaction was positive meaning that those with high relationship satisfaction were more likely to be copreneurial. The coefficient on high profit was negative and significant suggesting that businesses with high profit were less likely to be copreneurial. The coefficient on outside income showed that households that derived more than half of their income from outside the family business were less likely to be copreneurial. Unexpectedly, the negative coefficient on tolerance suggested that businesses with a more tolerant organizational culture were less likely to be copreneurial. The positive coefficient on female business accounting showed that businesses that assign much of their accounting to females were more likely to be copreneurial. The coefficient on the number of decision-makers was positive and signified that the more decision-makers there were in the business, the more likely that the business would be copreneurial. The results also suggested that agricultural family businesses were more likely to be copreneurial than non-farm family businesses.

Profit

The results of the univariate regression of profit revealed several significant variables. The coefficient on copreneurial was significant and negative showing a negative association between copreneurial businesses and the probability of high profit. The coefficient on the male dummy variable was positive suggesting that male-managed businesses had a higher probability of high profit than female-managed businesses. This result was consistent with Du Rietz and Henrekson (2000) who found that the preferences of female business owners (like business size, industry, and goals) tended to result in lower profit levels when compared to male-owned businesses. The coefficients on experience and experience squared were positive and negative, respectively. This suggested a concave relationship between profit and experience, meaning that those in the middle range of experience had the highest probability of high profit. The coefficient on the number of decision-makers was positive meaning that businesses with more decision-makers had a higher probability of high profit. The number of full-time employees had a significant and positive coefficient. This variable controlled for the size of the business and suggested that businesses with more employees have a higher probability of high profit.

Multivariate Probit Results

Table 5 displays the coefficients from the multivariate probit estimation.[13] We first considered the possibility of endogeneity between relationship satisfaction, the choice to be copreneurial, and profit. The multivariate results served as a test of the third hypothesis in this article (*H3: Relationship satisfaction, the choice to be copreneurial, and profit are endogenously related*). As the methodology indicated, we tested this by examining the significance of the ρ parameters from the multivariate analysis. The ρ parameter, $\rho(2, 3)$, represented the correlation of the error terms in the high relationship satisfaction and the copreneurial equations. This term was a test of the existence of endogeneity between relationship satisfaction and the choice to be copreneurial. The standard errors suggested that this term

---

[13] The multivariate regression was estimated using Limdep software, version 9.0.

Table 5 The Effect of a copreneurial structure and high satisfaction on profit assuming endogeneity: multivariate regression results

Variables	Multivariate Probit					
	(Y_3)		(Y_2)		(Y_1)	
	High Rel. satisfaction		Copreneurial		High profit	
	Coef.	(SE)	Coef.	(SE)	Coef.	(SE)
High relationship satisfaction			−0.517	(0.412)	0.792	(0.390)[†]
Copreneurial					1.089	(0.165)**
Outside income			−0.531	(0.121)**		
Tolerance	0.113	(0.052)[†]	−0.047	(0.055)	0.012	(0.056)
Conflict frequency	−0.175	(0.067)*	0.045	(0.079)	0.028	(0.069)
Kids age 0–6 (#)	0.167	(0.210)	−0.232	(0.173)		
Female accounting			0.118	(0.042)*		
Gender (Male = 1)	−0.188	(0.129)	−0.435	(0.168)*	0.599	(0.124)**
Exp (10 year)	−0.165	(0.296)	−0.408	(0.254)	0.567	(0.197)*
Exp (10 year) squared	0.023	(0.038)	0.067	(0.034)[†]	−0.078	(0.024)*
Decision-maker (#)			0.008	(0.023)	0.042	(0.026)
Agriculture			0.196	(0.126)	−0.118	(0.120)
Full-time empl (#)					0.012	(0.004)**
Role satisfaction	0.317	(0.082)***				
Mgmnt accountable					0.078	(0.091)
Med inc ($ thous)					0.008	(0.064)
Constant	−0.229	0.721	1.404	(0.672)[†]	−3.321	(0.504)**
$\rho(1,2)$	−0.949	(0.050)***				
$\rho(1,3)$	−0.540	(0.243)[†]				
$\rho(2,3)$	0.512	(0.253)[†]				
Observations	526					

Statistical significance is indicated by ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, and [†]$p < 0.10$

was significantly different from zero (significant at the 5% level); therefore, we detected endogeneity between relationship satisfaction and copreneurial. The second ρ parameter, $\rho(1, 3)$, tested for endogeneity between relationship satisfaction and profit. We rejected the hypothesis that $\rho(1, 3) = 0$ and thereby detected the presence of endogeneity between relationship satisfaction and profit. The third ρ parameter, $\rho(1, 2)$, was statistically significant at the 1% level. Testing the significance of this term was a test for endogeneity between copreneurial and profit. Because it was significantly different from zero, we concluded that endogeneity existed between the choice to be copreneurial and profit. Hence, the significance tests for the three ρ parameters provided evidence in support of Hypothesis 3.

The meaning of these ρ parameters provided insight into the unobservable aspects that determined each of these dependent variables in a family business. The correlation between the error terms in the high satisfaction and copreneurial equations was positive ($\rho(2, 3)$). This suggested that there were unobservable variables that were positively correlated with each. One possible unobserved variable proposed in the beginning of this article was that work tensions might be correlated with the choice to be

copreneurial and relationship satisfaction. This was based on the work of Danes and Olson (2003) who showed that copreneurial couples had higher levels of work tension than non-copreneurial couples. Based on their findings we would have expected the error term in the copreneurial equation to have been positively correlated with work tension. We further proposed that work tension may negatively impact relationship satisfaction which would have been indicated by a negative correlation between work tension and relationship satisfaction. These proposed relationships would have resulted in a negative correlation between the unobserved errors in the copreneurial and relationship satisfaction equations, but we observed a positive correlation between these errors.

The $\rho(2, 3)$ term suggested that there was some element or family business characteristic that was positively correlated with both the decision to be copreneurial and relationship satisfaction that we were not accounting for in our model. The work of Muske and Fitzgerald (2006) might inform this. Their work indicated that being more family oriented was a determinant of the choice to be copreneurial. Those who were more family oriented tended to be more likely to work with their spouses, indicating a positive

Table 6 Marginal effects results

Hypothesis tested	Marginal effect description	Test	Result	SE
H1	Marginal effect of high relationship satisfaction on the probability of choosing to be copreneurial	$\Pr\left(Y_2 = 1 \vert Y_3 = 1, X\right) - \Pr(Y_2 = 1 \vert Y_3 = 0, X)$	0.326***	0.013
H2a	Marginal effect of switching from non-copreneurial to copreneurial for couples with high satisfaction on the probability of having high profit	$\Pr\left(Y_1 = 1 \vert Y_2 = 1, Y_3 = 1, X\right) - \Pr(Y_1 = 1 \vert Y_2 = 0, Y_3 = 1, X)$	0.284***	0.005
H2b	Marginal effect of relationship satisfaction for copreneurial couples on the probability of having high profit	$\Pr\left(Y_1 = 1 \vert Y_2 = 1, Y_3 = 1, X\right) - \Pr(Y_1 = 1 \vert Y_2 = 1, Y_3 = 0, X)$	0.119***	0.004

Statistical significance is indicated by ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, and †$p < 0.10$

relationship. Family orientation may have also influenced relationship satisfaction in a positive way. Family orientation may have been the unobserved element that resulted in a positive correlation between the errors in the copreneurial and relationship satisfaction equations.

The negative correlation between the error terms in relationship satisfaction and profit, $\rho(1, 3)$, and copreneurial and profit, $\rho(1, 2)$, showed that there was some unobserved element that was negatively correlated within each pair. These negative correlations could be explained by self-selection. Based on the work of Fitzgerald and Muske (2002) and Muske and Fitzgerald (2006), copreneurial couples were less likely to be profit oriented and more likely to see the family business as a way of life. These unobserved motivations were likely to be positively correlated with both relationship satisfaction and copreneurial but negatively correlated with profit. This was the main reason why we suspected that there were lower profit levels shown for copreneurial than non-copreneurial couples, which was not caused by merely working with your spouse, but a result of a more family and less profit oriented family business. An additional reason for correlation between the error terms in the profit and copreneurial equations, supported by the work of Du Rietz and Henrekson (2000), may have been that women and men have been shown to differ in terms of business motivations and this has resulted in women, on average, with lower profit levels than men. The extent to which these motivations were correlated with the choice to be copreneurial and the profit levels may account for the negative relationship between the error terms in the profit and copreneurial equations.

Because we detected endogeneity between the three dependent variables, the multivariate probit results were used for the remainder of the analysis. Caution must be used when interpreting any of the coefficients in the copreneurial or profit equations because of the triangular specification; these variables appeared in multiple equations and therefore may have had a direct and an indirect influence on the profit equation. However, the signs of the coefficients in the relationship satisfaction equation were directly interpretable, because relationship satisfaction formed the base of the triangular specification and did not include any endogenous variables.

The significant variables in the high relationship satisfaction equation were very similar to the results from the univariate specification. Tolerance and conflict frequency were both significant with positive and negative coefficients, respectively. Also, role satisfaction was significant and positive. These results were consistent with the univariate analysis.

There were several changes to the signs and significance of the variables in the copreneurial and profit equations when comparing the univariate and multivariate results. In the copreneurial equation, the sign of the high relationship satisfaction variable was no longer significant and was negative. This did not indicate the effect of relationship satisfaction on the likelihood of being copreneurial. We analyzed this in the next section by considering the marginal effect of high relationship satisfaction on the probability of being copreneurial. The coefficient on the tolerance, conflict frequency, the number of decision-makers and agriculture were no longer significant, though the signs remain the same as in the univariate analysis. This might be a reflection of the lack of explanatory power of the multivariate regression, which contained many more variables than the univariate regression, thereby possibly exhausting our ability to have detected significance in these variables. The outside income, female accounting, and gender variables remained significant with the same signs as the univariate analysis.

The endogenous variables in the profit equation behaved differently in the multivariate and univariate regressions. In the multivariate regression, high relationship satisfaction and copreneurial were positive and significant. Again, this did not suggest the direction of influence because of the presence of endogeneity. The marginal effects of both

of these variables on profit were considered in the next section. The coefficients on the remaining exogenous variables were very similar to the univariate results. Gender, experience, experience squared, and full-time employees were significant and had the same signs as in the univariate analysis.

The results of the marginal effect calculations are shown in Table 6. The test of Hypothesis 1 (*Couples who have high relationship satisfaction are more likely to choose to be copreneurial*) was displayed first. We tested this by calculating the marginal effect of relationship satisfaction on the probability of choosing a copreneurial business structure. The result was positive and significant and suggested that those with high relationship satisfaction were 33% more likely to be copreneurial than their low relationship satisfaction counterparts. The result offered evidence to support our hypothesis and supported the theoretical work of Holländer (1990).

The second result in Table 6 was a test of Hypothesis 2a (*Copreneurial couples who have high relationship satisfaction have a higher profit than if they had chosen to be non-copreneurial*). We examined the marginal effect of choosing to be copreneurial on the probability of having high profit and found a positive and significant result. The marginal effect was 0.28 and suggested that couples with high relationship satisfaction who choose to work together were 28% more likely to have high profit than if they had chosen not to work together in the family business.

The third result in Table 6 was a test of Hypothesis 2b (*Copreneurial couples with high satisfaction will have a higher profit than copreneurial couples with low relationship satisfaction*). This tested the effect of joint marginal productivity proposed by the Kretchmer and Puranam (2008) theoretical model. The result was positive and significant. The result suggested that copreneurial couples who changed from low to high relationship satisfaction were 12% more likely to have had high profit.

Discussion and Implications

The goal of this article is to obtain causal estimates of the relationships between profit, relationship satisfaction, and a copreneurial business structure for small and medium-sized rural businesses. Because we suspect simultaneity between profit levels, the choice to be copreneurial, and relationship satisfaction, we utilize a methodology that allows us to test for endogeneity between these variables (Hypothesis 3). The results allow us to calculate unbiased estimates of the effect that relationship satisfaction has on the choice to be copreneurial (Hypothesis 1), the effect of the choice to be copreneurial on profit (Hypothesis 2a), and the effect of improving relationship satisfaction for couples who have

chosen to be copreneurial (Hypothesis 2b). What we found helps to add additional nuance to our understanding of the effect of working with your spouse.

The methodology employed is an analysis of three simultaneous equations, each with a binary outcome (high profit, high satisfaction, and copreneurial) using a triangularly specified multivariate probit. This methodology allowed us to examine the relationships between profit, satisfaction, and copreneurial/non-copreneurial family business structure and detect endogeneity. We found evidence of endogeneity with respect to relationship satisfaction, the choice to be copreneurial, and profit of the family business. We posit that this is due to couples self-selecting into a copreneurial arrangement based on their relationship satisfaction and other characteristics such as lifestyle choice and business goals, as demonstrated by the work of Fitzgerald and Muske (2002) and Muske and Fitzgerald (2006).

Building on the theoretical work of Holländer (1990), we hypothesized that couples who expect to have high relationship satisfaction are more likely to be copreneurial (Hypothesis 1). High relationship satisfaction is an indication of an expected emotional reward from voluntary cooperation (Holländer 1990). In this article, we posited that couples self-select into a copreneurial structure because of the emotional reward they will receive when they do so. The empirical results showed that couples with high relationship satisfaction were 33% more likely to be copreneurial than those with low relationship satisfaction. These results support not only this hypothesis and the work of Holländer (1990), but also add additional nuance to the work of Danes and Olson (2003) which showed copreneurial businesses have higher business tension levels than non-copreneurial businesses. It may be that couples choose to work together because they have high relationship satisfaction, but then working together increases tension within the business. In order to remain a copreneurial business, one might assume that the benefits of working together must outweigh the costs. One reason couples might persist in a copreneurial business structure despite higher business tension could be that they had higher profit levels than if they had opted for a non-copreneurial structure. To test this, we accounted for self-selection bias and calculated the effect of choosing to be copreneurial on profit. The result supports our intuition and showed that copreneurial couples were 28% more likely to have high profit than if they had chosen to be non-copreneurial.

The results regarding the positive effect of choosing a copreneurial business are important because they provide more insight into the choice of family business structure. Prior studies (Danes and Olson 2003; Dyer et al. 2012; Fitzgerald and Muske 2002) showed that, on average, copreneurial businesses were less successful than non-copreneurial businesses. This analysis demonstrates that

choosing to work with your spouse does not necessarily cause lower levels of success. A lower level of success, when compared to non-copreneurial businesses, is likely the result of self-selection and when this is accounted for we show that copreneurial businesses are better off copreneurial than they would be if they were non-copreneurial. The results further show that couples self-select into a copreneurial arrangement, in part, based on how satisfied they are with their relationships.

These results are useful for practitioners who work with rural copreneurial couples in that it identifies a mechanism for increasing profit levels. The results suggest that improving relationship satisfaction within the business and family should result in higher profit. The results demonstrate that this happens through two pathways. One pathway is that higher relationship satisfaction directly affects profit. In economic terms proffered by Kretchmer and Puranam (2008) relationship satisfaction can translate into positive joint productivity or synergy where individuals working together are more productive than the sum of their separate productivities. The second pathway is indirect. Higher relationship satisfaction increases the likelihood of choosing to work with your spouse. For those couples who have high relationship satisfaction, working together increases their likelihood of higher profits. Our research uncovered some mechanisms by which couples can improve their relationship satisfaction such as reducing conflict frequency, increasing tolerance to new ideas, and improving one's own role satisfaction. Couples who are interested in improving relationship satisfaction and potentially improving the profitability of their business should consult a family business practitioner.

This research has focused on voluntary cooperation or the choice to work with your spouse in the family business. The results also shed light on copreneurial constraints or factors that reduce the likelihood that couples will work together. A spouse with a lucrative outside option reduces the likelihood of the spouses working together in the family business. While this may be good for the family (in terms of total household income), it may reduce the success of the business, because it takes that spouse's human capital and potential synergies outside of the family business. Additionally, male-owned businesses are less likely to be copreneurial as are business owners with some experience (the relationship is convex and shows that those with low and high levels of experience are most likely to be copreneurial). Future research may explore the extent to which these copreneurial constraints reduce business success.

While our study did find that male business owners are less likely to be copreneurs, our dataset has limited information about the spouse of the business owner, therefore we were not able to investigate fully the implications of gender or power dynamics. Previous research has noted differences between men and women in discourse styles (Danes et al. 2005) and relationship satisfaction (Acitelli 1992). While we do not expect these differences to bias our analysis, they do present an interesting next step for future research. The determinants of relationship satisfaction and the determinants of the choice to be copreneurial may differ based on the gender of the primary business owner. A deeper investigation of gender dynamics in this context would be a worthy pursuit.

We also note that the data set is comprised of small and medium-sized family businesses in the rural Midwest. As such, the causality determined by the empirical analysis may not speak to the effect of copreneurs on profit for businesses of every size. It may be interesting to investigate the causal effects of working with your spouse for larger and possibly urban businesses. Any systematic differences will further enhance our understanding of the spousal and family business dynamic.

Compliance with Ethical Standards

Conflict of interest   The authors declare that they have no conflict of interest.

Ethical approval   All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent   Informed consent was obtained from all individual participants included in the study.

References

Acitelli, L. (1992). Gender differences in relationship awareness and marital satisfaction among young married couples. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/68960/10.1177_0146167292181015.pdf?sequence=2&isAllowed=y.

Amarapurkar, S. S., & Danes, S. M. (2005). Farm business-owning couples: Interrelationships among business tensions, relationships conflict quality, and spousal satisfaction. *Journal of Family and Economic Issues, 26*(3), 419–441. doi:10.1007/s10834-005-5905-6.

Anderson, A. R., & Miller, C. J. (2003). "Class matters": Human and social capital in the entrepreneurial process. *Journal of Socio-Economics, 32*(1), 17–37. doi:10.1016/s1053-5357(03)00009-x.

Baron, R. A., & Markman, G. D. (2003). Beyond social capital: The role of entrepreneurs' social competence in their financial success. *Journal of Business Venturing, 18*(1), 41–60. doi:10.1016/s0883-9026(00)00069-0.

Belenzon, S, and Zarutskie, R. (2012). *Married to the firm? Family ownership, performance, and financing in private firms*. Working paper, Duke University. Retrieved from https://faculty.fuqua.duke.edu/~sb135/bio/Bel_Zar_062512_Names.pdf.

Björnberg, Å., & Nicholson, N. (2007). The family climate scales: Development of a new measure for use in family business research. *Family Business Review, 20*(3), 229–246. doi:10.1111/j.1741-6248.2007.00098.x.

Bosma, N., van Praag, M., Thurik, R., & de Wit, G. (2004). The value of human and social capital investments for the business performance of startups. *Small Business Economics, 23*(3), 227–236. doi:10.1023/b:sbej.0000032032.21192.72.

Danes, S. M., Haberman, H. R., & McTavish, D. (2005). Gendered discourse about family business. *Family Relations, 54*(1), 116–130. doi:10.1111/j.0197-6664.2005.00010.x.

Danes, S. M., & Lee, Y. G. (2004). Tensions generated by business issues in farm business-owning couples. *Family Relations, 53*(4), 357–366. doi:10.1111/j.0197-6664.2004.00042.x.

Danes, S. M., & Morgan, E. A. (2004). Family business-owning couples: An EFT view into their unique conflict culture. *Contemporary Family Therapy, 26*(3), 241–260. doi:10.1023/B:COFT.0000037913.20921.0e.

Danes, S. M., & Olson, P. D. (2003). Women's role involvement in family businesses, business tensions, and business success. *Family Business Review, 16*(1), 53–67. doi:10.1111/j.1741-6248.2003.00053.x.

Danes, S. M., Rueter, M. A., Kwon, H., & Doerty, W. (2002). Family FIRO Model: An application to family business. *Family Business Review, 15*(1), 31–43. doi:10.1111/j.1741-6248.2002.00031.x.

Danes, S. M., Zuiker, V., Kean, R., & Arbuthnot, J. (1999). Predictors of family business tensions and goal achievement. *Family Business Review, 12*(3), 241–252. doi:10.1111/j.1741-6248.1999.00241.x.

Doherty, W. J., & Colangelo, N. (1984). The family FIRO model: A modest proposal for organizing family treatment. *Journal of Marital and Family Therapy, 10*, 19–29. doi:10.1111/j.1752-0606.1984.tb00562.x.

Du Rietz, A., & Henrekson, M. (2000). Testing the female underperformance hypothesis. *Small Business Economics, 14*(1), 1–10.

Dyer, W. G., Dyer, W. J., & Gardner, R. G. (2012). Should my spouse be my partner? Preliminary evidence from the panel study of income dynamics. *Family Business Review, 26*(1), 68–80. doi:10.1177/0894486512449354.

Fitzgerald, M. A., & Muske, G. (2002). Copreneurs: An exploration and comparison to other family businesses. *Family Business Review, 15*(1), 1–16. doi:10.1111/j.1741-6248.2002.00001.x.

Flores-Fillol, R., Iranzo, S., & Mañé Vernet, F. (2010). *Workers cooperation within the firm: an analysis using small and medium size firms*. Working Paper, Department of Economics, Universitat Rovira i Virgili. Retrieved from http://EconPapers.repec.org/RePEc:urv:wpaper:2072/179606.

Ford, M. T., Heinen, B. A., & Langkamer, K. L. (2007). Work and family satisfaction and conflict: A meta-analysis of cross-domain relations. *Journal of Applied Psychology, 92*(1), 57. doi:10.1037/0021-9010.92.1.57.

Gimeno-Gascon, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly, 42*(4), 750–783. doi:10.2307/2393656.

Gottman, J. M., & Krokoff, L. J. (1989). Marital interaction and satisfaction: a longitudinal view. *Journal of Consulting and Clinical Psychology, 57*(1), 47. doi:10.1037/0022-006x.57.1.47.

Greene, W. H. (2008). *Econometric analysis* (6th ed.). New York: Prentice Hall.

Headd, B. (2003). Redefining business success: Distinguishing between closure and failure. *Small Business Economics, 21*, 51–61. Retrieved from http://www.jstor.org/stable/40229277.

Holländer, H. (1990). A social exchange approach to voluntary cooperation. *The American Economic Review, 80*(5), 1157–1167. Retrieved from http://www.jstor.org/stable/2006767.

Kretchmer, T., & Puranam, P. (2008). Integration through incentives with differentiated organizations. *Organization Science, 19*(6), 860–875. doi:10.1287/orsc.1070.0352.

Lee, Y. G., Danes, S. M., & Shelley, M. C. II (2006). Work roles, management and perceived well-being for married women within family businesses. *Journal of Family and Economic Issues, 31*(4), 523–541. doi:10.1007/s10834-006-9030-y.

Lee, Y. G., Jasper, C. R., & Fitzgerald, M. A. (2010). Gender differences in perceived business success and profit growth among family business managers. *Journal of Family and Economic Issues, 31*(4), 458–474. doi:10.1007/s10834-010-9226-z.

Maddala, G. S. (1983). *Limited-dependent and qualitative variables in econometrics* (no. 3). Cambridge: Cambridge University.

Martínez, J. I., Stöhr, B. S., & Quiroga, B. F. (2007). Family ownership and firm performance: Evidence from public companies in Chile. *Family Business Review, 20*(2), 83–94. doi:10.1111/j.1741-6248.2007.00087.x.

Masuo, D., Fong, G., Yanagida, J., & Cabal, C. (2001). Factors associated with business and family success: A comparison of single manager and dual manager family business households. *Journal of Family and Economic Issues, 22*(1), 55–73. doi:10.1023/A:1009492604067.

McClendon, R., & Kadis, L. B. (1991). Family therapists and family business: A view of the future. *Contemporary Family Therapy, 13*(6), 641–651. doi:10.1007/bf00890598.

Mincer, J. A. (1974). *Schooling, experience, and earnings*. New York: Columbia University.

Monfardini, C., & Radice, R. (2008). Testing exogeneity in the bivariate probit model: A Monte Carlo study. *Oxford Bulletin of Economics and Statistics, 70*(2), 271–282. doi:10.2139/ssrn.886506.

Muske, G., & Fitzgerald, M. A. (2006). A panel study of copreneurs in business: Who enters, continues, and exits? *Family Business Review, 19*(3), 193–205. doi:10.1111/j.1741-6248.2006.00070.x.

Muske, G., Fitzgerald, M. A., & Haynes, G. (2003). The intermingling of financial resources among copreneurial couples. In *Proceedings of the 17th annual US association for small business and entrepreneurship conference*.

Olson, P. D., Zuiker, V. S., Danes, S. M., Stafford, K., Heck, R. K., & Duncan, K. A. (2003). The impact of the family and the business on family business sustainability. *Journal of Business Venturing, 18*(5), 639–666. doi:10.1016/S0883-9026(03)00014-4.

Parker, S. C. (2008). Entrepreneurship among married couples in the United States: a simultaneous probit approach. *Labour Economics, 15*(3), 459–481. doi:10.1016/j.labeco.2007.03.004.

Renski, H. (2008). New firm entry, survival, and growth in the United States: A comparison of urban, suburban, and rural areas. *Journal of the American Planning Association, 75*(1), 60–77. doi:10.1080/01944360802558424.

Sah, R. K., & Stiglitz, J. E. (1988). Committees, hierarchies and polyarchies. *The Economic Journal, 98*(391), 451–470. doi:10.2307/2233377.

Schutz, W. C. (1958). *FIRO: A three dimensional theory of interpersonal behavior*. New York: Rinehart.

Shields, J. F. (2005). Does rural location matter? The significance of a rural setting for small businesses. *Journal of Developmental Entrepreneurship, 10*(01), 49–63. doi:10.1142/s1084946705000057.

Smilkstein, G. (1978). The family APGAR: A proposal for family function test and its use by physicians. *The Journal of family practice, 6*(60), 1231–1239.

Sorenson, R. L. (2000). The contribution of leadership style and practices to family and business success. *Family Business Review, 13*(3), 183–200. doi:10.1111/j.1741-6248.2000.00183.x.

Stafford, K., Bhargava, V., Danes, S. M., Haynes, G., & Brewton, K. E. (2010). Factors associated with long-term survival of

family businesses: duration analysis. *Journal of Family Economic Issues, 31*, 442–457. doi:10.1007/s10834-010-9232-1.

Stafford, K., Duncan, K. A., Danes, S. M., & Winter, M. (1999). A research theory of sustainable family businesses. *Family Business Review, 12*(3), 197–208. doi:10.1111/j.1741-6248.1999.00197.x.

Terracol, A. (2002). Triprobit and the GHK simulator: a short note. *STATA Documentation*. Retrieved from http://fmwww.bc.edu/repec/bocode/g/GHK_note.pdf.

Werbel, J. D., & Danes, S. M. (2010). Work family conflict in new business ventures: The moderating effects of spousal commitment to the new business venture. *Journal of Small Business Management, 48*(3), 421–440. doi:10.1111/j.1540-627x.2010.00301.x.

Tia Michelle McDonald is an Assistant Professor in the Economics Department at Ohio University. She earned her Ph.D in 2014 from Purdue University with a focus on regional economic analysis. As a regional economist, her research focuses on rural economic development and regional responses to exogenous shocks. Her rural development research focuses on small business disaster mitigation and adaptation, family responses to financial shocks, and management decisions. Dr. McDonald's regional research focuses on the impacts of natural disasters on migration, food security, and business resilience.

Maria I. Marshall is a Professor in the Department of Agricultural Economics at Purdue University. Her research focuses on small business development and family business management. Her small and family business research is focused on areas such as the resource exchange between the household and the business, family business management and marketing. Her rural economic development research focuses on alternative enterprises, small farms, and disaster recovery. Dr. Marshall's outreach and teaching programs seek to increase economic development through entrepreneurship. Her focus is on small business development via educational programs aimed at increasing the number, viability, and sustainability of small businesses.

Michael S. Delgado is an assistant professor of agricultural economics at Purdue University. His research focuses on the development and application of econometric models to policy issues in the areas of agricultural and environmental economics. His work emphasizes the identification and estimation of causal effects using semiparametric and nonparametric methods. Recent empirical applications have focused on understanding behavioral demand drivers underlying household decision making.