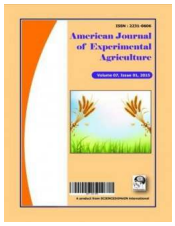

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Intergenerational Transfers of Managerial Control in U.S. Family Farm Businesses

K. Y. Lange[1*], J. W. Johnson[2], P. N. Johnson[1], D. Hudson[1], C. Wang[1] and A. W. Gustafson[3]

[1]Department of Agricultural and Applied Economics, Texas Tech University, Lubbock, Texas, USA.
[2]Delta Research and Extension Center, Mississippi State University Extension Service, Stoneville, Mississippi, USA.
[3]Department of Personal Financial Planning, Texas Tech University, Lubbock, Texas, USA.

Authors' contributions

This work was carried out in collaboration between all authors. Author KYL designed the study, wrote the protocol and wrote all drafts of the manuscript. Author JWJ reviewed the experimental design and drafts of the manuscript. Authors PNJ, DH, CW and AWG reviewed manuscript drafts and provided additional feedback. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Sustaining a family farm business for multiple generations is a great concern for many farm families. The transfer of managerial control in family farm businesses often takes place separately from the transfer of farm ownership. This article identifies variables affecting the transfer of managerial control of family farms and determines the impact of these variables on the transfer decision.
Study Design: An intergenerational transfer model integrating both altruistic motivation and exchange motivation for family farm management intergenerational transfers is used to examine the motivations impacting the decision for a designated farm successor to participate in the management activities of a family farm business.
Methodology: A national farm-level dataset, the Agricultural Resource Management Survey (ARMS), was utilized. The total number of respondents who stated that a successor had been

**Corresponding author: E-mail: kelly.lange@ttu.edu;*

selected was 4090. Of those respondents who indicated that a successor had been selected, 750 specified that the successor participated in the management activities of the business. A binary logit model was estimated in order to examine the decision for a designated successor to participate in the management activities of the farm business.

Results: Results indicate that operator demographics, business planning practices, value of farm assets and inputs, and non-farm assets significantly impact the decision to transfer managerial control to a designated successor.

Conclusion: Business planning professionals and financial advisors must be aware of factors impacting farmer decisions to transfer farm businesses and subsequent management responsibilities to successors. Results presented will allow these consultants to better educate farm operators during the transfer planning process, thus improving the succession decisions that farm families make, and ultimately enhancing the opportunity for successful farm transfer.

Keywords: ARMS; family farms; intergenerational transfer; succession.

1. INTRODUCTION

The succession of a farm business is often a turbulent time for farm families. Members of the older generation often desire to transfer farm management responsibilities to the next generation, but may be unsure how to begin and sustain the transfer process. Insight into the factors affecting the transfer of managerial control of farm businesses will provide a better understanding of methods by which to plan and implement farm succession. This article utilizes a national farm-level database, the Agricultural Resource Management Survey (ARMS), to econometrically examine how various aspects of family farm business structure and operator demographics may impact the decision of how family farm operators decide to transfer managerial decision-making responsibility to a selected farm successor. While some research has examined the factors which influence the selection of a successor in family farms, factors specifically influencing the decision to transfer managerial control of family farm businesses in the United States have not been thoroughly examined.

This study employs an intergenerational transfer model incorporating both altruistic and exchange motivation in order to examine the motivations by which an intergenerational transfer of farm management responsibility may be influenced. Altruistic transfers are presumed to occur because the individual offering the transfer cares about the welfare of the recipient and desires improve the well-being of the recipient via the transfer [1]. Exchange motivated transfers are posited to occur because the individual offering the transfer desires to compensate the recipient for some form of services rendered [2]. The phenomenon of intergenerational farm transfer is seen worldwide, and many intergenerational transfers of farm management responsibility occur while both the older and younger generations are alive. Empirical analysis of intergenerational farm transfer events provides information on transfer motivations, which can enable families and business planners to better prepare for generational turnover of agricultural businesses. This article identifies variables which affect the transfer of managerial control of family farm businesses to a designated successor and determines the impact of these variables on the decision to transfer managerial power to the selected successor.

The majority of farm businesses in the United States are family owned. The United States Department of Agriculture (USDA) Economic Research Service (ERS) estimates that approximately 98 percent of U.S. farm businesses are family operations [3]. Many of these farm businesses have been owned by the same family for multiple generations. Oftentimes, families wish to continue the tradition of passing the farm on to other family members and successful farm transfers aid in the overall sustainability of farm businesses.

The process of transferring management responsibilities and business ownership from one generation to the next typically occurs over time, rather than all at once. Often, the younger generation will become involved in some of the management decisions of the business years before the actual ownership of the business may be transferred.

Various factors can impact the older generation's decision of when and how to transfer management responsibilities to the younger generation. The decision to transfer managerial

control to the successor of the business must be considered in relation to many other farm and principal operator variables. The management responsibilities that the successor assumes often vary with time. The successor may initially be in charge of management decisions primarily associated with day-to-day production practices. Over time, as the older generation begins the process of retirement from the farm business, the successor will take on an increasing amount of management responsibility.

2. LITERATURE REVIEW

Family farm succession is an exceedingly complex topic. Economic and financial considerations related to the preservation of the business are obviously of great importance to the operator; yet, concerns regarding family communication and the preservation of family harmony during the transition are also paramount during the transfer decision-making process. Because a multitude of components compose the transfer process, family farm succession has been a topic of interest in multiple disciplines, such as agricultural economics, agricultural communication and education, human sciences, and financial planning.

The study of factors impacting the selection of a successor to the farm business has received considerable attention. Mishra, El-Osta, and Shaik [4] found that farm operator age, farm operator education, off-farm work by the farm operator or the farm operator's spouse, expected farm operator household wealth, and geographic location were all significant indicators of the likelihood of the farm operator selecting a successor.

Other research has investigated issues surrounding the determination of an optimal time in which the older generation passes the farm business on to the successor. Kimhi [5] found that optimal transfer time tended to be decreasing in parent age. Thus, parents tended not to transfer the farm until productivity began to decline. Additionally, the operator working at an off-farm job tended to increase the likelihood of the farm business being transferred to the successor [5]. Kimhi [5] also found evidence that parents will act in altruistic ways when transferring the family farm in an effort to maximize family welfare. Pesquin, Kimhi, and Kislev [6] examined how passing the family farm from one generation at an optimal time could produce financial security for the older generation in retirement.

2.1 Intergenerational Transfers

The transfer of family farming businesses to the next generation can be thought of as a special type of wealth transfer. Farm families often possess tremendous amounts of wealth that are tied up in the assets of the farm business. Knowledge, human capital, and managerial power associated with a family farm can also be transferred from one generation to another by methods similar to the intergenerational transfer of wealth. The study of wealth transfer from one person to another has long been of interest to economists. A significant amount of existing research focuses on intergenerational transfers in the form of bequests [7]. Becker [1] suggested that one person will transfer wealth to another because that individual cares about the welfare of the other. Because one person derives utility in part from the utility of another, the individual making the transfer is motivated by altruism. Transfers between parents and children are often believed to be motivated by altruism. In instances where a parent has multiple children, and is motivated purely by altruism, the parent may make transfers to each child in order to equalize the children's well-being. So, the parent may transfer more wealth to the child who has the lowest income in an effort to equalize that child with other children who have higher incomes. Children with higher incomes will tend to receive less wealth through transfers. Additional theoretical work by Ishikawa [8], Becker and Tomes [9], Adams [10], and Menchik and David [11] also advocate altruistic motivation for intergenerational wealth transfers.

In contrast to altruistic motivation for wealth transfers, others have proposed that transfers are exchange motivated. Bernheim, Shleifer, and Summers [2] suggested that intergenerational transfers of wealth are actually compensation for some type of services rendered. In the case of parents and children, this suggests that parents will allocate wealth transfers based on some sort of services provided to the parent by the children. Services can include many things, but often, if the child provides for the parent during retirement or old age, it is believed that the parent will allocate an appropriate proportion of wealth transfer to the child to compensate for the services provided. Research suggests that exchange motivated parents tend to allocate an equal amount of wealth to be transferred to each

child. Thus, exchange motivated transfers tend to be depicted by equal transfers to all persons, rather than one person receiving more or less than another [2,7,12]. Menchik [13] found that estate transfers to heirs upon death of the surviving parent tended to be divided equally among heirs. Additionally, evidence of inter-vivos exchange transfers, those made from parent to child while the parent is still alive, was observed by Cox [7] and Altonji, Hayashi, and Kotlikoff [14].

2.2 Distributions in Intergenerational Farm Transfers

Partibility indicates how business assets are distributed among the successors in a family farm business. There are multiple types of partibility patterns. Strict impartibility occurs when the farm assets and land are passed on in entirety to one individual. Often this type of transfer is one of primogeniture, in which the oldest son receives all farm assets and land. This type of transfer is common in United Kingdom farm families [15].

In contrast to impartibility, partibility of assets includes other methods. In some cases, financial help provided by parents may be offered in order to help an heir purchase the farm from the parents, thus providing the parents with a source of retirement income. Alternatively, the farm may be passed on to one successor in exchange for that child providing for the parents during retirement. In some instances, the farm may be undervalued when the assets are being distributed to the successors. Another option is that the farm may be divided equally among multiple successors, but one is granted the opportunity to lease land from others. A final alternative may be that the owner possesses other types of financial assets which may be distributed to heirs that do not receive a portion of the farm business [15,16].

The degree to which a farm and its assets are partible or impartible depends on legal and financial situations both for the individual family as well as on a general level. Tax implications can have an enormous impact on the decisions of when and how to transfer the business to successors due to changing tax policies and potential tax benefits and burdens [15].

The transfer of farm management often occurs at a different time than the transfer of farm ownership. In many cases, management is transferred in increments as the younger generation assumes increasing amounts of management responsibility over time. Gasson and Errington [15] and Errington [17] examined this phenomenon and recognized it as a "succession ladder." The first management activities transferred from the older generation to the younger generation along the succession ladder tend to be short term day-to-day decisions. Next on the succession ladder is the transfer of longer term strategic management decisions. The third rung of the succession ladder is the transfer of personnel management decisions. The next step is the transfer of financial management decisions related to the farm business. The final step of the succession ladder is the transfer of the "control of the purse strings" [17], or the authority to pay bills. This final transfer of managerial control often occurs considerably later than the transfer of other management decisions lower on the succession ladder. This could be due to the older generation feeling as though it continues to have a significant stake in the farm so long as it retains control of the business checkbook [15,17].

Relatively little research has been conducted incorporating intergenerational transfers with family farm transitions. In a foundational study, Mishra, El-Osta, and Shaik [4] found that farmer demographics, off-farm work by a spouse, household wealth, debt, business organization, and location contributed to the likelihood of a farm businesses having a succession plan. Mishra and El-Osta [18] investigated the effects of farm growth and policy on farm succession decisions. They found that farmer demographics, wealth, and policy significantly influenced succession decisions in farm families. While previous work has investigated farm household decisions on successor selection, this study specifically examines the factors which motivate a transfer of managerial control to be made to a designated successor.

3. MATERIALS AND METHODS

3.1 Conceptual Framework

Based on the work of Cox [7], Cox and Rank [12], and Mishra, El-Osta, and Shaik [4], an intergenerational transfer model integrating both altruistic and exchange motivation for family farm management intergenerational transfers is introduced. Consider a farm family with two generations, an older generation (parent) and a younger generation (child). Assume the parent

gives the transfer and the child receives the transfer. The parent's utility function is as follows:

$$U_p = U_p\left(C_p, s, V(C_k, s)\right), \quad (1)$$

where U_p represents the parent's utility, C_p represents the parent's consumption, s represents services that the child provides to the parent, V represents the child's utility, and C_k represents the child's consumption. Because the parent cares about the well-being of the child (i.e. the parent is altruistic), $\partial U_p/\partial V > 0$. The child provides services to the parent which includes providing company to the parent and performing various functions in a manner in which the parent approves. The child is assumed to dislike performing services for the parent, as this reduces the child's independence and infringes on the child's free time. Thus, $\partial V/\partial s < 0$. Parent utility with respect to parent consumption is assumed to be positive, $\partial U_p/\partial C_p > 0$, parent utility with respect to services provided by the child is assumed to be positive (i.e. the parent enjoys the services provided by the child), $\partial U_p/\partial s > 0$, and child utility with respect to child consumption is assumed to be positive, $\partial V/\partial C_k >$. Parent consumption and child consumption are assumed to be normal goods [4,7].

The parent seeks to maximize (1) subject to the following budget constraints:

$$C_p \leq I_p - T, \quad (2)$$

$$C_k \leq I_k + T, \quad (3)$$

$$V(C_k, s) \geq V_0(I_k, 0), \quad (4)$$

where I_p represents parent income, I_k represents child income, and T represents managerial transfers from parent to child. $V_0(I_k, 0)$ represents the child's "threat point" utility level and indicates the utility the child would derive from consuming only out of his own income and not providing any services to the parent [4,7]. Constraints (2) and (3) are assumed to be binding and can be substituted into (1) to generate the following Lagrangian function:

$$\mathcal{L} = U_p\left(I_p - T, s, V(I_k + T, s)\right) + \lambda\big(V(I_k + T, s - V0Ik, 0. \quad (5)$$

The parent desires to choose amounts of s and T that will maximize (1) subject to constraints (2)-(4). The Kuhn-Tucker conditions which yield the optimal amounts of s and T are:

$$\frac{\partial \mathcal{L}}{\partial T} = -U_c + U_v V_c + \lambda V_c \leq 0, T\frac{\partial \mathcal{L}}{\partial T} = 0, \quad (6)$$

$$\frac{\partial \mathcal{L}}{\partial s} = -U_s + U_v V_s + \lambda V_s \leq 0, s\frac{\partial \mathcal{L}}{\partial s} = 0, \quad (7)$$

$$\frac{\partial \mathcal{L}}{\partial \lambda} = V(I_k + T, s) - V_0(I_k, 0) \geq 0, \lambda\frac{\partial \mathcal{L}}{\partial \lambda} = 0, \quad (8)$$

where U_c represents the parent's marginal utility of consumption, $U_v V_c$ represents the child's marginal utility of consumption from the parent's perspective ($U_v = \partial U_p/\partial V$), U_s represents parent's marginal utility of services, and $U_v V_s$ represents the child's marginal disutility of services from the parent's perspective. Cox [7] and Mishra, El-Osta, and Shaik [4] note that the parent's marginal utility of consumption is associated with the child's marginal utility of consumption from the parent's perspective via transfer, T. Additionally, the value of services provided by the child is established when the parent's marginal utility of services corresponds to the child's marginal disutility of services from the parent's perspective.

The decision to transfer managerial control of the family farm business can be an unobserved, latent variable, *t**. The latent variable which determines the transfer decision can be expressed as:

$$t^* = \left(\frac{\partial U}{\partial C_k}\right) - \left(\frac{\partial U}{\partial C_p}\right). \quad (9)$$

Additionally, $T > 0$ iff $t^* > 0; T = 0$ otherwise. Because the marginal utility of consumption for both the parent and the child is assumed to be diminishing:

$$\left(\frac{\partial t^*}{\partial I_k}\right) < 0\ , \left(\frac{\partial t^*}{\partial I_p}\right) > 0. \quad (10)$$

The latent variable that establishes the transfer decision will be inversely related to child income level and positively related to parent income level [4,7,12].

A designated successor who participates in management activities provides the principal operator with the assurance that another capable person is available to assist with business operations. It also provides the successor with the satisfaction of being a business associate rather than simply hired labor. Thus, engaging a successor in the management activities of the farm business is in the best interest of both the older and younger generations. In the dataset

used for the empirical analysis, the utility of the principal operator and the designated successor is not directly observable, but the principal operator's decision of whether or not to include the designated successor in the farm management activities is known.

3.2 Methods and Procedures

The dataset used for the empirical analysis consisted of national farm-level data from the Agricultural Resource Management Survey (ARMS), which is conducted annually by the United States Department of Agriculture (USDA) Economic Research Service (ERS). Adequate data on U.S. family farm succession are quite scarce, as many farm families dislike divulging information regarding farm and personal finances. The 2001 ARMS queried farmers about succession planning, but the topic has not been inquired about in subsequent survey years. Given these constraints, data are used from the 2001 ARMS. The total number of respondents who stated that a successor had been selected was 4090. Of those respondents who indicated that a successor had been selected, 750 specified that the successor participated in the management activities of the business. Because this analysis is specifically considering managerial responsibility transferred to a successor rather than an explicit transfer of monetary wealth, the value of farm assets for which the successor could potentially be responsible for managing is considered in the transfer decision, rather than operator net worth. The value of operator non-farm assets, such as checking, savings, and retirement accounts and other non-farm financial assets is considered.

The dependent variable for the transfer decision was a binary variable which indicated whether the successor of the farm business did or did not participate in the management of the farm business. Because the dependent variable takes on a value of either 1 (successor participates in management) or 0 (successor does not participate in management), a limited dependent variable model is appropriate for analysis. Linear probability models are simple to utilize, but have some drawbacks when applied to binary dependent variables. The most concerning of these issues include obtaining probabilities which can be greater than one or less than zero and constant partial effects [19,20]. The logit model corrects for these issues; thus, a binary logit model was estimated in order to examine the effect of the explanatory variables on the decision for a designated successor to participate in the management activities of the farm business. The explanatory variables included operator demographics, value of farm assets and inputs, and value of non-farm assets. A summary of these variables is presented in Table 1.

Table 1. Variable names and descriptions

Variable name	Variable description
FAMRELA	1 if successor is a member of the operator's family, 0 otherwise
OPRETIRE	1 if operator plans to retire from farm work within the next 5 years or is now considered to be retired, 0 otherwise
OPEXIT	1 if operator plans to exit from farm work within the next 5 years for any reason other than retirement, 0 otherwise
LEGALSTAT	1 if sole/family proprietorship, 0 otherwise
OPAGE	Age of operator on last birthday
OPEDU	1 if operator education is less than high school, 0 otherwise
OPRISKTOL	Operator risk tolerance measured by operator on scale from 0 to 10; 0=Avoid risks as much as possible, 10= Take risks as much as possible
FINSTATE	1 if operator uses income and net worth statements to analyze business performance in relation to annual or longer term business plans, 0 otherwise
GOVT	1 if operator expects government support regardless of price developments during the next 4 years, 0 otherwise
OPOFFFARM	1 if operator worked off-farm for wages or salary during 2001, 0 otherwise
SPOFFFARM	1 if operator's spouse worked off-farm for wages or salary during 2001, 0 otherwise
VALUFARMSTRUC	Market value in dollars of all farm buildings and structures

	(excluding dwellings) as of December 31, 2001
VALUORCH	Market value in dollars of all orchard trees and vines, and trees grown for wood products as of December 31, 2001
VALULAND	Market value in dollars of all land (excluding dwellings, buildings, orchard trees and vines, and trees grown for wood products) as of December 31, 2001
VALURENTFROM	Estimated market value in dollars of land and buildings on acres rented from others as of December 31, 2001
VALURENTTO	Estimated market value in dollars of land and buildings on acres rented to others as of December 31, 2001
VALUCROP	Estimated market value in dollars for the farm share of crops owned as of December 31, 2001
VALUBRSTOCK	Estimated market value in dollars for the farm share of breeding livestock owned by and located on the operation as of December 31, 2001
VALUNBRSTOCK	Estimated market value in dollars for the farm share of non-breeding livestock owned by and located on the operation as of December 31, 2001
VALUPRODINOWN	Estimated market value in dollars for the farm share of production inputs owned by the operation as of December 31, 2001
VALUPRODINUSED	Estimated market value in dollars for the farm share of production inputs used by the operation as of December 31, 2001
VALUVEHICLES	Estimated market value in dollars for the farm share of trucks and cars owned by the operation as of December 31, 2001
VALUEQUIP	Estimated market value in dollars for the farm share of tractors, machinery, tools, equipment, and implements owned by the operation on December 31, 2001
VALUFCSCOOP	Estimated market value in dollars for the farm share of stock in Farm Credit System and other farm cooperatives on December 31, 2001
AMTOWEDTO	Amount owned in dollars to the operation for sales or production from 2001 and earlier years as of December 31, 2001
VALUOTHERFASSETS	Value code for the estimated market value in dollars for all other farm assets owned by the operation as of December 31, 2001
VALUNFASSETS	Value code for the total value of non-farm assets owned by the operator (including cash, checking, savings, retirement accounts, corporate stock, real estate not part of the farm, and all other non-farm assets) as of December 31, 2001

4. RESULTS AND DISCUSSION

The results of this analysis indicate factors which influence the decision for a designated successor to participate in the management responsibilities of the farm business. Weighted means and standard errors for all variables are provided in Table 2.

The following variables were found to be significant at the one percent level: successor being related to the operator (*FAMRELA*), the operator being retired or expecting to retire within five years (*OPRETIRE*), the operator intending to exit farm work for reasons other than retirement (*OPEXIT*), the legal status of the business (*LEGALSTAT*), operator age (*OPAGE*), operator education (*OPEDU*), operator risk tolerance (*OPRISKTOL*), the operator's use of financial statements in business planning (*FINSTATE*), expected government support (*GOVT*), whether the operator and the operator's spouse work off-farm (*OPOFFFARM* and *SPOFFFARM*), value of farm structures (*VALUFARMSTRUC*), value of orchards (*VALUORCH*), value of land (*VALULAND*), value of land rented from others (*VALURENTFROM*), value of land rented to others (*VALURENTTO*), value of breeding livestock (*VALUBRSTOCK*), value of production inputs owned and value of production inputs used (*VALUPRODINOWN* and *VALUPRODINUSED*), value of equipment (*VALUEQUIP*), value in farm credit systems stock and cooperatives (*VALUFCSCOOP*), the amount owed to the business (*AMTOWEDTO*), the value of other farm assets

(*VALUOTHERFASSETS*), and the value of non-farm assets (*VALUNFASSETS*). The value of crops (*VALUCROP*) and the value of non-breeding livestock (*VALUNBRSTOCK*) were significant at the five percent level. The value of vehicles (*VALUVEHICLES*) was not found to be significant. Table 3 contains the results of the binary logit analysis.

While many of the variables are found to be significant, some variables are of particular interest. It is to be expected that the value of farmland, farm assets, and inputs will have a significant impact on the decision to have a successor that participates in management, since in general, larger farm operations will have more invested in assets, and will thus need additional management assistance. Additionally, demographic factors such as farm operator age and education as well as the designated successor being related to the principal operator are also expected to impact the management transfer decision.

Other variables that are of more interest in the farm management transfer decision include expected operator retirement plans, farm business legal status, operator risk tolerance, operator and operator's spouse off-farm work, and value of non-farm assets. Additional discussion of these variables follows.

Table 2. Weighted means of variables

Variable name	Weighted means		
	Successor participates in management activities	**Successor does not participate in management activities**	**Total ARMS sample**
FAMRELA	0.97 (0.01)	0.14 (0.01)	0.22 (0.02)
OPRETIRE	0.29 (0.03)	0.23 (0.02)	0.24 (0.02)
OPEXIT	0.09 (0.01)	0.07 (0.01)	0.07 (0.01)
LEGALSTAT	1.20 (0.02)	1.08 (0.01)	1.09 (0.01)
OPAGE	61.12 (0.85)	54.23 (0.63)	54.91 (0.61)
OPEDU	2.70 (0.08)	2.57 (0.04)	2.58 (0.04)
OPRISKTOL	4.66 (0.17)	4.27 (0.10)	4.30 (0.09)
FINSTATE	0.43 (0.03)	0.27 (0.02)	0.28 (0.02)
GOVT	0.26 0.03)	0.23 (0.01)	0.23 (0.01)
OPOFFFARM	2.09 (0.08)	1.80 (0.03)	1.83 (0.03)
SPOFFFARM	1.68 0.10)	1.49 (0.06)	1.51 (0.06)
VALUFARMSTRUC(10,000's)	6.74 (1.00)	3.52 (0.19)	3.83 (0.19)
VALUORCH (10,000's)	4.24 (2.88)	1.19 (0.28)	1.49 (0.31)
VALULAND (10,000's)	36.91 (3.97)	21.40 (0.88)	22.92 (0.79)
VALURENTFROM (10,000's)	27.34 (4.78)	19.15 (1.42)	19.95 (1.41)
VALURENTTO (10,000's)	3.88 (1.31)	1.48 (0.28)	1.72 (0.26)
VALUCROP (10,000's)	1.75 (0.25)	1.05 (0.05)	1.12 (0.05)
VALUBRSTOCK (10,000's)	3.61 (0.68)	1.94 (0.15)	2.10 (0.16)
VALUNBRSTOCK (10,000's)	1.07 (0.22)	0.70 (0.07)	0.74 (0.06)
VALUPRODINOWN(10,000's)	0.25 (0.06)	0.13 (0.01)	0.14 (0.01)
VALUPRODINUSED(10,000's)	0.24 (0.06)	0.13 (0.02)	0.14 (0.02)
VALUVEHICLES (10,000's)	1.78 (0.14)	1.21 (0.03)	1.27 (0.03)
VALUEQUIP (10,000's)	6.13 (0.76)	3.69 (0.16)	3.93 (0.15)
VALUFCSCOOP (10,000's)	0.30 (0.65)	0.16 (0.02)	0.17 (0.02)
AMTOWEDTO (10,000's)	0.63 (0.13)	0.32 (0.03)	0.35 (0.04)
VALUOTHERFASSETS	5.46 (0.53)	4.69 (0.17)	4.77 (0.18)
VALUNFASSETS	16.35 (0.90)	13.87 (0.48)	14.12(0.46)

Note: Standard errors are reported in parentheses

Table 3. Results of binary logit analysis

Variable	Coefficient	Standard error	Wald X^2
FAMRELA	5.353***	0.0150	127,899.0630
OPRETIRE	-0.148***	0.0088	281.6614
OPEXIT	0.448***	0.0138	1049.5458
LEGALSTAT	0.635***	0.0083	5819.7674
OPAGE	0.017***	0.0003	2678.7558
OPEDU	0.045***	0.0031	207.1047
OPRISKTOL	0.053***	0.0015	1302.1237
FINSTATE	0.651***	0.0074	7804.9957
GOVT	0.139***	0.0081	295.7329
OPOFFFARM	0.082***	0.0040	415.2878
SPOFFFARM	-0.133***	0.0029	2138.5405
VALUFARMSTRUC	1.090E-6***	2.4610E-8	1961.4248
VALUORCH	7.708E-8***	1.8700E-8	16.9673
VALULAND	-6.260E-8***	5.5600E-9	126.8977
VALURENTFROM	-1.590E-8***	3.2020E-9	24.6625
VALURENTTO	6.673E-7***	1.5350E-8	1889.4410
VALUCROP	7.190E-8**	2.8920E-8	6.1920
VALUBRSTOCK	1.932E-7***	1.7830E-8	117.4830
VALUNBRSTOCK	-9.960E-8**	4.5900E-8	4.6997
VALUPRODINOWN	-1.510E-6***	2.2550E-7	45.0666
VALUPRODINUSED	-1.260E-6***	2.7370E-7	21.3214
VALUVEHICLES	-1.360E-7	1.8000E-7	0.5693
VALUEQUIP	5.0390E-7***	3.2100E-8	245.5169
VALUFCSCOOP	3.677E-6***	1.3220E-7	774.1357
AMTOWEDTO	-8.350E-7***	7.8360E-8	113.5394
VALUOTHERFASSETS	-0.018***	0.0005	1318.7257
VALUNFASSETS	-0.002***	0.0004	35.7608
Intercept: -7.7898			
Wald X^2: 147,663.756	(p < .0001)		
Percent concordant: 93.7			
Percent discordant: 5.8			
Percent tied: 0.5			
Pseudo R^2: .5025			

*Note: *,**,*** denote statistical significance the 10%, 5% and 1% levels, respectively*

The operator being retired or expecting to retire within five years has a negative impact on the decision for a successor to participate in the management of the business. When the operator reaches retirement age, the designated successor may already have acquired his or her own farming business. Thus, the operator may decide to simply lease or sell his or her own farmland to another, non-family member as a way of generating retirement income. Such circumstances may explain the negative relationship to farmer retirement and the successor participating in the management of the operator's business.

The legal status of the farm business has a positive effect on the transfer decision. If the business is either a sole or family proprietorship, the likelihood of the successor participating in management is greater than if the business is another entity type. This could be due to sole or family proprietorships growing in size to a point where the operator needs to bring in additional managerial help and therefore incorporates the successor into the business activities. This type of arrangement may be a precursor to the farm business legal structure being changed to another type of agreement such as a legal

partnership, limited liability company, or corporation.

Operator risk tolerance also positively affects the decision to bring the successor into the management of the business. Operators surveyed tended to be relatively risk averse. The appointment of a successor within the farm business can be seen as a way to minimize the risk of business management activities being unable to continue effectively and efficiently in the event that the operator becomes unable to maintain complete managerial control of the business. If the successor participates in the business management, this can provide some insurance that business operations can continue even if the operator cannot perform all management activities personally.

The operator working an off-farm job also positively impacts the decision to involve the successor in management. If the operator is busy working off-farm, the successor taking over some managerial responsibilities may be crucial to ensuring that the farm business continues to operate efficiently and effectively.

The operator's spouse working off-farm has a negative impact on the successor being involved in the management of the business. If the farm business is small, the operator and his or her spouse may need to supplement income via an off-farm job. In this case, the farm business may be sufficiently small enough that the operator can take care of all managerial activities by him or herself and the successor is not needed in a managerial capacity.

The value of the operator's non-farm assets had a negative impact on the decision to have the successor participate in the management activities of the business. If the operator had little in the way of other farm assets, this could make it unnecessary for the operator to need any additional help in the management of the farm business.

5. CONCLUSION

Ensuring the continuity of family farm businesses is of great concern to many farm business owners. While other work in the area of farm succession has focused on determining factors which influence the selection of a successor, this article is unique in that it specifically considers factors which impact the decision to transfer managerial control of a farm business to a successor who has already been designated by the older generation. By placing the research emphasis on the transfer of managerial control, the succession process can be examined separately from operator retirement and farm ownership transfer.

By assessing the transfer of managerial control independent of operator retirement and ownership transfer considerations, the results can be better disseminated and applied in practice. Improved knowledge of the factors which are most important in the decision to include a successor in the management activities of the farm business will allow practitioners and financial planning professionals to provide better assistance to farm families constructing succession plans. Succession plans can often be put into action earlier than retirement or estate plans, and thus provide more time for a successful transfer to take place.

Some limitations in this article are due to a lack of data. Because the ARMS survey has not questioned farmers about succession since 2001, more recent data are not available. A similar analysis performed with more recent data would likely reveal similar results, though farmer age and retirement decision impacts would likely be more pronounced, given an aging farmer population. Also, there is a lack of complete data specifically focused on the succession transition process. Other factors could also potentially affect the decision to transfer managerial control of a family farm business to a successor, yet these factors are not included in the analysis due to a lack of data. These factors include, but are not limited to, geographic location of the farm businesses, presence of hired workers or managers who are not family members, multiple successors, successor age, successor location, and successor education.

With the collection of additional data regarding the distribution of managerial control in situations where multiple successors are involved in the family farm business, the intergenerational transfer model presented could be utilized to its full capacity. With these additional data, factors affecting not only the transfer decision, but factors affecting the amount of managerial control transferred among multiple successors could be analyzed as well. Knowledge of how managerial control is transferred among multiple successors in a family farm business would provide insight into the motives which prompt farm operators to distribute managerial control as they do.

Future work will involve gathering more complete data to more thoroughly examine the farm succession process. Additional data to be gathered include the previously mentioned variables, as well as data pertaining to managerial control transfer amounts distributed among multiple successors. Additionally, similar analysis of the factors affecting family farm ownership transfers could be performed. The ownership transfer process can be studied in a similar way to that of managerial transfer. A thorough investigation of the factors affecting the decision to transfer the ownership of farm assets as well as the factors affecting the distribution of farm asset ownership would greatly enhance the knowledge base regarding the family farm business transfer process.

Business planning professionals and financial advisors need to be aware of the factors that farmers consider when transferring farm management responsibilities to their successors. The information provided in this article will allow these consultants to better educate farm operators during the transfer planning process, thus improving the succession decisions that farm families make, and ultimately enhancing the opportunity for successful farm transfer.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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