Abstract

Succession planning is a component of a household's risk management strategy for its farm business in as much as it is aimed at continuity of the business' management team. The family farm sector relies heavily on intergenerational succession. Succession and retirement are inter-linked and are reflective of the life cycles of the farm household and the farm business. This study uses Agricultural Resource Management Survey (ARMS) of the USDA to examine farm, operator, and family characteristics that affect farm succession within the family. Results indicate that large farms are more likely to be transferred within families. Level of farm debt, education, and being engaged in farm enterprises like other crops and dairy, affect within-family transfers of the farm business.

Factors Affecting Succession Decisions in Family Farm Businesses: Evidence from a National Survey

By Ashok K. Mishra and Hisham S. El-Osta

Most farm households control a substantial amount of wealth. In 2001, U.S. farm households had an average net worth of $545,869, compared with $395,500 for non-farm households (Mishra, et al.). Failure to plan carefully for retirement and transfer of the estate can result in serious problems such as financial insecurity, personal and family dissatisfaction, and unanticipated capital losses. In family farms, the farm itself constitutes a physical asset that is highly illiquid, indivisible to a large extent, and in most cases constitutes a large fraction if not all of family wealth. According to Pesquin, et al., the family farm sector relies heavily on intergenerational succession.

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Gale points out that entry into farming by the "next generation" holds a place of central importance in the determination of industry structure and total number of farmers and farm families. Empirical studies indicate that the importance of family firms and family succession differs between economies as well as between different sectors within an economy. By studying occupations of different family members (grandfathers, fathers, and sons), Laband and Lentz find that occupational inheritance is particularly strong among farmers and to a lesser extent among other groups such as lawyers and self-employed proprietors.

The family farm is more than a profit maximizing enterprise. It is an asset whose productive life expectancy may extend well beyond that of its operator, and whose future value depends crucially on its continuous functioning; it is a place of residence for the farmer in old age; and it is attached to land, whose symbolic importance exceeds its economic value in many societies. Moreover, the market value of a farm is often well below its value as a "going concern" and this illustrates the fact that retirement and succession cannot be disentangled from day-to-day farm management decisions (Dunaway). Gasson and Errington looked at the development cycle of the farm family and the growth and decay cycle of the farm business, and concluded that "synchronizing these two cycles may itself be crucial for the continuance of the farm family business." Ownership and managerial control of the family farm are combined in the hand of the farmer's family and handed down within the family. Clearly, intergenerational succession is one of the important links between those two cycles. The issue of farm retirement and succession has been of increasing interest to both researchers and practitioners in recent years. This interest arises in part because of the aging farm population, many of whom will be faced with decisions about the transfer of their farms in the next decades. Yet to others the wealth embedded in farm ownership will provide, upon liquidation of the asset base, a stream of income for post-retirement living expenditures.

There have been limited studies that have investigated farm transfers (Kimhi and Nachlieli; Weiss; Glauben, Tietje and Weiss; Stiglbauer and Weiss). However, it should be noted that these studies are from Israel or European countries (Austria and Germany) where farms are quite different in terms of production and financial structure, and agriculture's contribution to the total economy is very small compared to the farms in the U.S. For example, in Israel most farms are cooperative farms with small holdings and grow several commodities, whereas farms in Europe are small, diversified, and receive government payments (both related to commodities and agro-tourism). Further, many farm operator and spouses work off the farm. Unlike farms in Israel and Europe, farm in the U.S. are private farms that specialize in one or two commodities and are big sector in the total economy. Many of these farms receive commodity payments and/or conserve reserve program payments.

The phenomenon of predominant intrafamily succession is observed in many economies (Bryden, et al.). Kotlikoff and Spivak argue that intrafamily succession enables the extended family to enjoy the benefits of intergenerational risk-sharing when annuity markets are imperfect. Pesquin, et al., mention additional advantages of intrafamily farm succession such as "smooth" transition, reduction in transfer cost, and lower transfer taxes. Additionally, Tweeten and Zulauf point out that intrafamily farm succession allows entering farmers to overcome borrowing constraints, at least in commercial farms. Investing in agriculture or withdrawing from agriculture are two options that result from increasingly competitive commodity markets and reduced government subsidies for agriculture. These two options are closely tied to the family life cycle and especially related to the availability of a successor.

Although there has been some discussion of farm transfer and succession in the sociology literature, there have been only few studies, mainly from Europe and Israel, in agricultural economics literature. In contrast to the limited existing literature, the present paper is devoted to analyzing the factors that are likely to influence family succession on U.S. family farms. Farm, operator, and family characteristics that may contribute to family succession will be identified. The analysis is conducted on a national farm-level basis with the unique feature of a larger sample, comprising farms of different economic sizes, and in different regions of the United States. An understanding of the factors that influence succession is important as it allows policymakers to alter these factors to prevent or promote structural changes, depending on the

prevailing social, political, and economic goals. Further, examination of family succession decisions facilitates strategic planning as well as guiding educational and business programs.

Literature Review

Succession planning is a component of a household's risk management strategy for its farm business in as much as it is aimed at continuity of the business management team. A unique feature of the farming sector, as opposed to most other sectors of the economy, is that businesses are traditionally passed on within the family. The study of farm succession already has a long tradition in the Rural Sociology literature (e.g., Gasson and Errington; Blanc and Perrier-Cornet; Carroll and Salamon; Coughenour and Kowlaski; Friedberger). However, these studies lack rigorous economic analysis of factors affecting farm succession decisions. Only a few studies have investigated the reasons and factors affecting the predominance of intergenerational succession within the farm sector (e.g., Kimhi and Nachlieli; Weiss; Glauben, Tietje and Weiss; Stiglbauer and Weiss).

Some studies cited in the literature relate to farm succession and farm investment. For example, Potter and Lobley show that on-farm investment behavior of farmers without successors was radically different from that of those where a successor has been already identified. Blanc and Perrier-Cornet report that in France, the Netherlands, and Belgium, farm modernization is associated with intergenerational succession. However, farms located in the United Kingdom, Greece, and Italy did not show any significant relationship. Kimhi and Nachlieli, using panel data of Israeli farms, found that during the 1970s succession contributed tremendously to farm expansion (both in terms of farm size and intensity of production). However, due to a widespread farm financial crisis in the 1980s, the expansionary phase did not continue. On the contrary, the farm financial crisis forced many successors to seek off-farm employment. Phimister argues that financial pressures arising from intergenerational farm asset transfers may have a negative impact on subsequent farm investment. Kimhi and Nachlieli studied the likelihood of intra-family intergenerational succession on Israeli family farms. They found that age of the operator, level of schooling of the operator, and the age of the oldest child as significant factors in having an intra-family successor. Further, number of children and off-farm work did not have any impact on the probability of having an intra-family successor. The authors also found that farms with more land have lower probability of intra-family succession.

Using panel data of Austrian farms, Weiss found a strongly significant effect of intra-family succession on farm survival. Analyzing actual farm succession on the basis of census data for Upper Austria, Stiglbauer, and Weiss find the probability of succession to be significantly influenced by far, as well as personal characteristics. Their results suggest that an increase in farm size, family size, and degree of farm diversification raises the probability of farm succession within the family. They also found a significant life-cycle pattern in the farmers' succession behavior. In a recent study Glauben, Tietje, and Weiss examined farm and family characteristics affecting the choice and timing of intergenerational farm transfers. Using survey data from Northern Germany and a competing risk approach model they find that farm characteristics significantly influence succession decisions since farm characteristics affect the value of the farm for the potential successor

Data

Data for the analysis are from the 2001 Agricultural Resource Management Survey (ARMS). ARMS is conducted annually by the Economic Research Service and the National Agricultural Statistics Service. The survey collects data to measure the financial condition (farm income, expenses, assets, and debts) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households.

The target population of the survey is operators associated with farm businesses representing agricultural production in the 48 contiguous states. A farm is defined as an establishment that sold or normally would have sold at least $1,000 of agricultural products during the year. Farms can be organized as proprietorships, partnerships, family corporations, non-family corporations, or cooperatives. Data are collected from one operator per farm, the senior farm operator. A senior farm operator is the operator who makes most of the day-to-day management decisions. For the purpose of this study, operator households organized as non-family corporations or cooperatives and farms run by hired managers were excluded.

The 2001 ARMS collected information on farm households in addition to farm economic data collected through the regular survey. It also collected detailed information on off-farm hours worked by spouses and farm operators, the amount of income received from off-farm work, net cash income from operating another farm/ranch, net cash income from operating another business, and net income from share renting. Furthermore, income received from other sources, such as disability, social security, and unemployment payments, and gross income from interest and dividends was also counted. Specifically, our analysis will focus on married farm couples. The issue of retirement and succession is central to the family decisionmaking process and the literature points to the fact that a majority of farms are passed on directly to children of farm operators and owners. Secondly, the altruistic motive of parents (farm family in this case) is basic to the theory of intergenerational transfers.

In 2001 ARMS, farmers were also queried about whether they had developed a succession plan for their farming operation. The issue of retirement and succession is especially pertinent for farmers who are ready to retire in the next five years. Their retirement will have implications for farm wealth, industry structure, and the supply of food and fiber. Using the 2001 ARMS we have classified farm operators based on succession plans into two categories: (1) no succession plan (base group); and (2) family based succession.

About 34 percent of farm operators who indicated that they will retire within the next 5 years had a succession plan and about 80 percent of these households have a family member taking over the farm. Farm operators who are over 65 years of age and have no retirement plans appear to be a little more organized in terms of having a succession plan than other groups of households, with about 40 percent of these households having succession plans. As with other groups, most of the successors are family members. But, while a large share of these farms reported a succession plan, a smaller share of these actually involved their successor in operation of the business than did farms in general. All of the variables used and summary statistics are presented in Table 1.

Results

The results of the logit model and corresponding marginal effects are presented in Table 2. Table 2 provides information on the overall fit of the model. Since an R^2 does not accurately measure the fit of a logit model, a pseudo-R^2, the likelihood ratio, is calculated. The pseudo-R^2 of 0.43 represents a relatively good fit for a logit model (Hensher and Johnson). In our model the base group is farmers with no succession plan.

Farm households are unique in the ways they accumulate wealth (Mishra, et al.). Farm households have land, buildings and other facilities, machinery, and other equipment that are part of farm net worth. On the other hand, farm households accumulate non-farm wealth (such as savings, investments, and real estate property) that adds to the net worth of the household (Mishra, et al.). As described earlier, the intergenerational transfer of wealth has been an important aspect of farm succession. In this study household net worth is a measure of financial well-being of the farm family. Mishra, et al. indicate that at least 70 percent of farm household wealth comes from the farm and is directly related to farm size. A higher level of expected household wealth increases the probability of family succession by four-tenths of a percent (0.38%).

The probability of having a succession plan is significantly influenced by an operator's education. Literature (Tweeten; Goddard, et al.) provides evidence that an operator's education level is an important factor that determines structural change in the farm sector. The probability of having a succession plan that includes a family member decreases with the educational level of the farm operator by 1.1 percent. The findings may reflect the notion that parents with a higher level of educational attainment may process information, allocate resources, and evaluate new technologies more effectively and thereby raise the current farm's earning capacity and delaying farm transfer. Another plausible explanation is that more educated farm operators can negotiate a later succession time with their potential successors and in the process have extra time to make informed decisions on the identity of the successor. Our results contrast with the findings of Kimhi and Nachlieli and Stiglbauer and Weiss, but are consistent with Kimhi. Presence of children between ages 13-18 increases the probability of family based succession by seven-tenths of a percent (0.72 %).

Farms organized as sole proprietorships are likely to have family succession. Results indicate that the probability of family succession increases by approximately 4.4 percent if the farm is organized as a sole proprietorship (Table 2). Farm succession is

significantly influenced by farm characteristics such as size, farm growth (acres), farm income growth, and farm type. Two dummy variables (SIZE 100_250 and SIZE_250) were included in the model to assess the impact of farm size on succession plans.[1] Size100_250 represents intermediate farms, with farm sales between $100,000-$249,999 and SIZE_250 represents commercial or large farms, with farm sales $250,000 or more. Results indicate that the probability of family succession increases by almost 16 percent for intermediate farms and about 41 percent for commercial or large farms (Table 2). This finding further strengthens the argument that compared to small farms, intermediate and large farms hold out the best prospects of providing a potential successor with reasonable and secure income. These results are consistent with the findings by other studies (e.g., Stiglbauer and Weiss; Glauben, Tietje, and Weiss).

Farm debt could also have potential impact on succession decisions. The 2001 ARMS survey asked farm operators about their farm debt. In particular, they were asked if farm debt in 2001 was greater, less, or same as in 1996. A dummy variable, FDEBT_01, was created and coded as 1 if debt levels were greater in 2001 than in 1996. Results indicate that the probability of family-based succession increases by about 4.1 percent with size of farm debt. A possible explanation is that larger farms generally have higher amounts of farm debt and these are the farms that are more likely to have a family successor. Further, higher farm debt loads between 1996 and 2001 could be an indicator that farmers were willing to take more risk and finance on-farm investment through increased debt. Taking on debt may also be an indication that upkeep, maintenance, expansion, or retooling of the farm's capital structure is likely needed to keep the business a competitive enterprise for future generations.

Succession may differ among types of farm businesses. Pesquin, et al., point out that a successor is more common on dairy farms since work can be divided easily between two people. Additionally, dairy farms (and others such as nursery, green house, etc.) may have more stable and reliable sources of income and dairy producers are more attuned to record keeping and financial management than other producers. Further, the successor and the operator may specialize in different phases of the farm operation. For example, recent data show that many farms, particularly larger operations, may have two or three people who participate in machinery work, production, accounting and budget, and management of the farm. Results show the probability of family succession increases if farms are specialized in the production of other crops and dairy. One thing that stands out here is that each of these commodities (other crops and dairy) produce high value outputs and require large capital investments. Further, dairy farms require a steady supply of family labor and are perceived as a relatively stable source of income compared to some other farm types. The probability of having developed a succession plan (family) is highest for dairy farms (about 10%), followed by other crops farms (approximately 6%). Our findings are consistent with Kimhi and Nachieli who found that fruits, vegetable, and other crop farms are likely to have successors.

Summary and Conclusions

Succession planning is a part of the development of a complete business plan for a farm operation. Succession plans specify when, how, and under what circumstances management of the business will pass from the current operator to another individual. In one sense, succession plans are a road map for use in deciding how to handle management of the business as the household enters the retirement or transfer stage of the family life cycle, or incurs an unexpected circumstance such as the incapacitation or death of the operator. Succession and retirement are inter-linked and are reflective of the life cycles of the farm household and the farm business. Growth, consolidation, and exit phases of a business may overlap with the retirement and transfer phases of a household. Despite the important role that family succession may play in the continuity of farm businesses, little theoretical or empirical work has been devoted to this issue. The present study remedies this shortcoming by including a direct measure of succession based on information that was collected in a survey of farmers in the U.S.

Empirical investigation of the presence of a formal family succession plan utilizing a logit model revealed the importance of farm, operator, financial, and household attributes. Factors found to significantly influence having a known family successor included education, expected household wealth, taking on higher debt loads in the past five years, and being engaged in farm businesses like other crops and dairying that require relatively large amounts of capital expenditures and

managerial oversight. Further, sole proprietorship farms and intermediate and large farms are likely to have family succession. The likelihood of having a succession plan rises with expected household wealth, indicating that larger businesses may be better positioned to support multiple households. Operators with smaller businesses and expected household wealth may depend on their farm assets to support income needs in later life. This could likely mean leasing, selling, or making other use of farmland or other business assets. Large farms are more likely to be transferred within the family. This strengthens the argument that large farms hold out the best prospects of providing a potential successor with reasonable and secure income.

As with many family businesses, one of the prime objectives of family farms is to pass on control of a sound and often improved business to the next generation. Farm families themselves are also concerned about the future of their operations. Succession can have a powerful influence on the development trajectory of a farm business. Farms lacking a successor would be less likely to be managed intensively, and that "the production cycle declines closer to a subsistence mode in old age than at any other point in the life cycle". On the other hand, the identification of a successor can act as a trigger for business development, and existence of a successor can provide a powerful motivation for ongoing investment in the business even into the old age of the retiring farmer. Further, the existence of a successor within the family farm business is a key variable in determining the course of future structural change.

This investigation has highlighted the most significant factors affecting farm succession decisions. Based on the literature, farm-arm subsidies are capitalized into land values; with land being a significant part of farm balance sheet and wealth, farmers tend to rely on government subsidies and approach retirement slowly. However, wealth and indirectly government subsidies are influential in farm transfers to family members. If policies are more market oriented (reduced government intervention), transfer of family farms may be altered. This study also highlights the importance of continued structural change in the succession decisions of farm operators. Finally, extension agents/economists and financial counselors who encounter family farm businesses need to take into consideration the unique challenges of each business and perhaps uncover how family farm business owners have developed the types of succession planning they have or are considering. In addition, extension agents/economists and financial counselors need to give family farm business owners help in solving business problems or other issues inherent in the family business, so the owners would be able to make decisions regarding succession more easily. Finally, it is important that economists, financial planners, and business consultants encourage family farm business owners to utilize their services. To assist family farm businesses with formal succession plans, the following strategies can be used: (1) develop and conduct educational sessions regarding succession planning for family farm business owners and their families; (2) develop procedures that clearly identify the steps that need to be taken to successfully complete the succession planning process; and (3) provide examples of types of succession plans that other family farm business owners have implemented.

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Appendix

Model and Estimation Procedure

Qualitative response models, which are strongly linked to utility theory, have been widely used in economics to investigate factors affecting an individual's choice from among two or more alternatives (Amemiya; Greene). In this study farmers were queried if they had a family succession plan or not, indicating logistic model. Maximum likelihood logistic regression (LOGIT) was used to analyze farmers' decision to have a family succession plan rather than Ordinary Least Squares (OLS) because the dependent variable is binary (0,1) (see Pindyck and Rubenfeld). Specifically, the logit is defined as the natural logarithmic value of the odds in favor of a positive response (in this case having a succession plan that is within the family), that is:

$$Y_i = \begin{cases} 1 & \text{if farm operator has a succession plan} \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

An empirical representation of the succession plan (Y_i) model by farm operator i to observable explanatory variables, is given by,

$$Log\left(\frac{P_i}{1-P_i}\right) = \mathbf{X}_i\beta + \psi_i \quad (2)$$

where X_i is a vector of explanatory variables, P_i is the probability that the i^{th} farm operator has a family succession plan,. B is a vector of unknown parameters, and i is a residual error assumed normally distributed with a zero mean and constant variance. In a binary logit model, the marginal effect of a variable X^j on the response probability is:

$$\frac{\partial P_i}{\partial X_j} = f(\mathbf{X}_i\beta)\beta_j \quad (3)$$

Where f(.) is the normal marginal density function. For dummy variables, the marginal effect with respect to variable X^j is found by taking the difference in the predicted probabilities calculated at $X^j = 1$ and $X^j = 0$, holding other variables constant at their means. Independent variables are included for farmer characteristics such as education level, number of children, and household wealth (on-farm and off-farm). Additionally, past research indicates that farm size, specialization, work choice of operators and spouses, and regional location of farms are important considerations affecting farm succession decisions.

Table 1. Definition and weighted means of variables used in the succession decision of family farms, 2001

Variable definition and symbol	Weighted means[1] No succession	Family succession
Education of operator, years (*OPEDUC*)	13.16	13.45
Presence of young persons, dummy variables:		
(=1 if person's age was under 6; 0 else) (*CHILD6*)	0.12	0.06
(=1 if person's was between 13 and 18; 0 else) (*CHILD13_18*)	0.24	0.21
Off-farm labor participation, dummy variables:		
(=1 if only the operator worked off-farm; 0 else) *(OPOFFONLY)*	0.16	0.19
(=1 if only the spouse worked off-farm; 0 else) *(SPOFFONLY)*	0.17	0.14
(=1 if both operator and spouse worked off-farm; 0 else) *OPSPOFF*)	0.43	0.33
Expected household net worth ($10,000) (*EXPHHNW*)	52.85	67.14
Farm organization, dummy variable:		
(=1 if sole proprietorship; 0 else) (*SOLE*)	0.93	0.9
Farm size, dummy variables:		
(=1 if sales were between $100,000 and $249,999; 0 else) (*SIZE100_250*)	0.09	0.09
(=1 if sales were $250,000 or more; 0 else) (*SIZE_250*)	0.07	0.09
Productivity index (0=least productive, 100=most productive) (*PRODINDEX*)	72.69	71.64
Farm tenure, dummy variable (=1 if farm was fully owned; 0 else) (*FULLOWN*)	0.58	0.56
Past indebtedness dummy variable:		
(=1 if farm debt in 2001 was more than in 1996; 0 else) (*FDEBT_01*)	0.17	0.19
Income stream, dummy variable:		
(=1 if household income in 2001 was below 1996's income (*INCOME_01*)	0.19	0.17
Farm growth, dummy variable:		
(=1 if household operated more acres in 2001 than in 1996; 0 else) (*ACRES 01*)	0.18	0.23
Expected government support, dummy variable:		
(=1 if support was expected regardless of prices over next 4 years; 0 else) (*GOVP*)	0.27	0.28
Type of farm specialization, dummy variables:		
(1= if farm specialized in cash grain production; 0 else) (*CASHGRAIN*)	0.1	0.11
(1= if farm specialized in production of other crops; 0 else) (*OTHERCROPS*)	0.33	0.34
(1= if farm specialized in dairy production; 0 else) (*DAIRY*)	0.04	0.05
(1= if farm specialized in production of beef cattle or hogs; 0 else) (*BEEF_HOGS*)	0.35	0.38
Regional dummy variables:		
(=1, if location = non-metro farming county; 0 else) (*NONMETROF*)	0.14	0.14
(=1, if location = metro county; 0 else) (*METRO*)	0.32	0.34

[1] *The coefficients of variation (CVs) of all non-binary estimates are below 10 percent.*

Table 2. Logit estimates of factors affecting family based succession by farm households, 2001

Variables	Family succession: $log\ (P_1 / P_0)$	Marginal effect
INTERCEPT	-1.7102**	-0.2334
Education of the operator	-0.0815**	-0.0108
Presence of children under 6 years	-0.4086	-0.0755
Presence of children 13-18 years	0.0361**	0.0072
Only operator works off the farm	0.1297	0.0257
Only spouse works of the farm	0.2756	0.0399
Operator and spouse work off the farm	0.0113	-0.0003
Expected wealth of farm household	0.0262***	0.0038
Farm organized as sole proprietorship	0.3051*	0.0446
Farm size 1(sales between $100,000-250,000)	1.1301**	0.1674
Farm size 2 (sales of $250,000 or more)	2.8007***	0.4062
Soil productivity index	-0.0003	-0.0002
Farm tenure, full owners	-0.1834	-0.0249
Increase in farm debt between 1996-2001	0.2547**	0.0405
Decrease in household income between 1996-2001	-0.0137	-0.0077
Increase in farm size (acres) between 1996-2001	-0.0305	0.0062
Expected government payments to remain same regardless of price over next		
Cash grain farms	-0.1377	-0.0229
Other crop farms	0.4415	0.0661
Diary farms	0.3752*	0.0614
Beef and hog farms	0.5545*	0.0979
Farm located in non-metro farming county	0.0346	0.0136
Farm located in metro county	0.2739	0.0439
	-0.2059	-0.0309
Number of observation:		
Sample: 4,608		
Population: 1,693,159		
	R^2 =0.43	
-2 Log Likelihood: 2748488		
-2 Log Likelihood (restricted): 2906675		

Note: Regression parameters are estimated using the Jackknife variance estimation method.
** Significant at 10%. ** Significant at 5%. *** Significant at 1%*