A Representative Model of Farm Transition Planning

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Introduction

Successfully transferring the family farming operation across generations is a significant challenge for families (Boehlje and Eisgruber 1972; Tauer 1985; Lobley 2010; Mishra et al. 2010). However, the Family Business Institute shows that family-owned and operated businesses have roughly a 30 percent success rate in transferring the assets and control of their business from the founding generation to the second generation; 12 percent make it from the second to the third generation and a dismal 3 percent successfully transfer from the third to the fourth generation (Ferrell et al. 2013). A 2009 study of Minnesota farms showed nearly 90 percent of the respondents did not have an up-to-date farm transfer plan and nearly 60 percent did not have an up-to-date estate plan (Hachfeld et al. 2009). The main reasons farm transitions fail are inadequate estate and retirement planning, insufficient farm capitalization and failure to properly prepare the next generation of farm operators (Spafford 2006). Here, we summarize research from Reed et al. (2021) demonstrating the difficulties associated with successful farm transfers and the extreme importance of early planning to facilitate intergenerational transfers.

Methodology

We assume farm owners want to maximize the probability of successful farm transfer subject to maintaining their own retirement income and some measure of equity between heirs, a Farm Heir and an Off-Farm Heir. A successful transfer is defined as an on-farm heir's ability to meet financial obligations for a 20-year time span while the parents maintain retirement income and an off-farm heir is treated equitably.

Assuming a 1.0 full-time equivalent Oklahoma integrated cow-calf and crop farm, we develop a representative farm modeling using data from Kansas Farm Management Southeast Association (KFMA 2017). Net farm income data from KFMA was used to determine trends and variability in farm income

for the representative farm. Financial statements, including balance sheet information, net farm income and cash flows, were developed using a Microsoft Excel. The cash flow demands of each alternative strategy is calculated and subtracted from the available farm cash flow to determine its feasibility.

A Monte Carlo simulation was then utilized to incorporate variability in net farm income and cash flow. The model then determined if the farm cash flows were sufficient to fund the cash flow demands of alternative transfer strategies. When the funds are sufficient to meet the criteria of each strategy, it is considered a success. Likewise, when there are insufficient funds to meet the criteria for a strategy, it was considered a failure. The probability of success for each strategy was then calculated as the number of successful transitions divided by the total number of iterations.

Representative Farm Assumptions

Southeast KFMA data showed family living expenses average about $70,000 per year, so annual net farm income of $100,000 was assumed for the representative farm (KFMA 2017). Net farm income and debt to asset ratios were also calculated using the KFMA summary data. An equipment compliment of $500,000 and buildings worth $100,000 were assumed. Off-farm income was also included given many farm operations have at least one family member who works off the farm, bringing in additional household income. Per capita income for Oklahoma of $44,356 was used in the model farm as an after-tax off-farm income (BEA 2017). Beginning balance sheets were also developed from KFMA data (table 1).

The enterprise mixture of the representative farm consisted of half of the farm income coming from cattle production with the other half coming from crop production. In terms of total value of production, cattle and crops (wheat, corn, and soybeans) are historically the largest of Oklahoma's agricultural commodities (NASS 2018). Based a 50/50 enterprise

split, gross income from cattle was $330,000. Our model generated this level of income from a 338-head cow (88% calving percentage). Calves are weaned at 500 pounds and grazed on winter wheat to 750 pounds. The total value of "operating assets" is $908,784. The remaining asset value of $2,291,216 was the value of 1,146 acres for owned pasture and cropland. Another 2,539 acres of pasture cropland was leased.

Assets		Liabilities	
Breeding Livestock	$408,784	Long-Term Debt	$660,000
Equipment	$500,000	Total Liabilities	$660,000
Total Operational Assets	$908,784		
Buildings	$100,000	Owner's Equity	$2,640,000
Land	$2,291,216	Total Liabilities and Owner's Equity	
Total Assets	$3,300,000		$3,300,000

Table 1. Balance Sheet (Derived from KFMA data 2017).

Representative Farm Family

The model has two parents deciding at age 58 to plan for a farm transition. A "Farm Heir" is 32 and an "Off-Farm Heir" is 30. The model assumes the father passes away at 76 and the mother passes away at 81. When the mother passes away, the Farm Heir is 55 years old and the Off-Farm Heir is 53 years old, so the modeling starts when there are 18 years left before the father passes away and 23 years left before the mother passes away. If the parents had not developed a farm transition plan, the Farm Heir must buy out the Off-Farm Heir's share with short notice.

Based on these assumptions (see Reed et al. 2021 for a more complete description of the model), four separate failure criteria are analyzed: 1) the representative farm debt to asset ratio reaches 0.60; 2) the farm incurs three consecutive years of unpaid operating debt; 3) the farm ever incurs any operating debt; and 4) the parents cash reserves ever fall below zero. Using these four measures of success/failure, we then compute the probability of success for five different transfer strategies.

In Strategy 1, the Farm Heir and Off-Farm Heir receive the entirety of the farm asset base in undivided interests upon ther mother's death. Two versions of this strategy are considered. First, Strategy 1(a) the Farm Heir takes out a commercial loan to buy out the Off-farm Heir. In Strategy 1(b) the Off-Farm Heir agrees to seller financing of the payoff.

With Strategy 2, the Farm Heir receives all the farm assets upon the mother's death, while the Off-Farm Heir receives a financial asset equal to the value of the farm. Two versions of this strategy are also considered. With Strategy 2(a), the parents make an annual investment in an off-farm portfolio to build up sufficient cash reserves so that the Off-Farm Heir receives an inheritance equal to the value of the farm. Under Strategy 2(b), the parents purchase a permanent

coverage, second-to-die whole life insurance policy at age 58.

In Strategy 3, the parents place the farm operating assets and real estate in separate entities, respectively. An operating entity is a legally recognized entity that houses assets, such as an LLC. This operating entity consists of the breeding livestock and equipment. At the mother's death, the Farm Heir receives ownership of the operating entity. The Farm Heir and Off-Farm Heir receive equal interests in the land entity. The farm entity pays fair market value rents to the land entity, which distributes that income back to the Farm Heir and Off-Farm Heir. Two versions, identical to Strategies 2(a) and 2(b) are simulated.

With Strategy 4, the Farm Heir's contributions to the value of farm assets is recognized and he/she receives a larger inheritance. Strategy 4 mirrors Strategy 3 in that the farm operating assets and real estate are placed in separate entities. However, the two strategies differ in the amount of inheritance the Off-Farm Heir inherits the operating assets and one-half of the farm real estate. Both an investment fund, Strategy 4(a) and a life insurance policy, Strategy 4(b), are analyzed.

Last, in Strategy 5, we evaluate lifetime farm business transfers to determine whether the lifetime transfer provides a more financially viable path for all stakeholders in comparison to at-death transfers. Strategy 5 is a gradual transfer of ownership and management from one generation to the next. This allows both generations to actively work together while living to aid in the continuity of the operation. As with Strategies 3 and 4, farm operating assets are placed in an operating entity, with a separate entity holding the farmland. Each year, the Farm Heir receives a salary of $42,000 from the farm. The Farm Heir then purchases shares of the operating entity with the salary.

Results

Simulations were performed in MS Excel over a 20-year planning horizon. Each scenario was evaluated 500 times with farm income randomly drawn for each year of the simulation. In table 2, the probabilities of success, as measured by the four criteria, are reported. All but Strategy 1(a) were successful in maintain a debt-to-asset ratio of 0.60 or better. However, the stricter criteria of not paying off operating debt less than three years in a row and not incurring operating debt resulted in much lower probabilities of success for Strategies 1 and 2. Both sets of strategies require the Farm Heir generate sufficient cash to buy out the Non-Farm Heir for all one half of all assets (Strategy 1) or operating assets (Strategy 2). Neither strategy was successful to any significant degree using either a loan or life insurance under the stricter criteria. However, the investment fund strategies (3a and 4a) and life insurance policy strategies (3b and 4b) were largely successful in meeting the strictest criteria at least 89% for Strategy 3 (assets in separate legal entities) and at least 97% for Strategy 4 (off-farm investment fund). Both strategies place lower cash demands on the post-transfer farm income.

The final criterion of the parents maintaining positive cash reserves was only evaluated under Strategy 5 (the Farm Heir receives a salary for farm work which is used to transfer assets over time). This approach was 99% likely to generate sufficient cash to prevent the parents cash reserves from dropping below zero.

	Criterion			
Strategy	D/A Ratio < 0.60	Op. Debt < 3 years	No Op. Debt	Cash Reserves
1 (a)	1%	0%	0%	N/A
1 (b)	100%	4%	0%	N/A
2 (a)	100%	0%	0%	N/A
2 (b)	100%	1%	1%	N/A
3 (a)	100%	96%	89%	N/A
3 (b)	100%	100%	97%	N/A
4 (a)	100%	100%	97%	N/A
4 (b)	100%	100%	99%	N/A
5	100%	N/A	N/A	99%

Table 2. Probability of Success by Strategy and Criterion

Conclusions

Studies show relatively few farm owners are prepared to transfer farm assets to succeeding generations. If the retiring generation's goal is to pass on an intact, viable farming or ranching business to an operator-owner heir, equal treatment of a nonfarming heir creates substantial financial challenges to a successful transition. We considered using an off-farm financial asset or a second-to-die life insurance policy as means of creating a bequest for a nonfarming heir. Some strategies considered splitting farm assets into operating and real estate segments, with the on-farm heir receiving the operating assets and splitting the ownership real estate assets between on-farm and off-farm heirs. Real estate was then rented to the on-farm heir.

Equity considerations proved to be the most challenging issue for successful transition. An equal division of assets between on-farm and off-farm heirs likely fail our criteria for a successful transfer. Rather, equitable but unequal division of assets had higher probabilities of success in our simulations. Under this approach, the on-farm heir's contributions to farm income were rewarded with a salary used to purchase shares in the business. Over time, the share of income increased as the on-farm heir's share of the business grew, leading to purchases of more shares.

The use of off-farm investments to create a pool of wealth as the bequest to the non-farm heir proved to be infeasible. The cash flow demands needed to build the required off-farm wealth were more than the farm enterprise could generate while maintaining the income requirements of the current farming generation. However, the use of life insurance to treat the nonfarming heir equitably succeeded in some of our strategies. Life insurance proceeds are nontaxable, reducing cash flow demands relative to sinking funds.

When combining an equitable but not equal strategy—a split between operating assets and real estate—with a life insurance policy, we found farm transfer can succeed with a high degree of confidence. The key implication of our results is that time is of the essence. The sooner a farm transition plan is developed, the more time stakeholders have to actively work toward the agreed-upon goal. Extended planning horizons allow for strategies with lower cash flow demands, due to the time value of money. However, the families must have agreed-upon goals before choosing a plan.

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