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# **THE IMPACT OF FARM SUCCESSION DECISIONS ON THE FINANCIAL PERFORMANCE OF THE FARM**

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## **Abstract**

Farm succession by the “next generation” is a key factor in the determination of industry structure and the total number of farmers and has profound implications for farm families which rely heavily on intergenerational succession. Our results indicate that, in addition to farm, operator, and off-farm work variables, succession plans have a positive and significant effect on financial performance, both in terms of higher profit margins and returns to equity. Further, we also find that farms with designated family successors have higher financial performance, both in terms of higher profits margins and returns to equity.

## **THE IMPACT OF FARM SUCCESSION DECISIONS ON THE FINANCIAL PERFORMANCE OF THE FARM**

Farm succession by the “next generation” is a key factor in the determination of industry structure and the total number of farmers and has profound implications for farm families which rely heavily on intergenerational succession. Succession and retirement are also linked to and reflect the life cycles of the farm household and the farm business (Mishra et al, 2010). Family farms are more than profit-maximizing enterprises. The productive life of farm assets may extend well beyond that of current farm operators, and future value depends crucially on continuity. Gasson and Errington (1993) examined 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.” Clearly, intergenerational succession is one of the important links between those two cycles. The existing literature, such as Sharma et al. (2001) and Morris et al. (1997), suggests that well developed succession plans can increase the likelihood of co-operation among stakeholders in businesses, thereby enhancing the chance of a smooth and effective succession. However, contrary to the significant concern on planning, business owners and managers rarely outline their future succession (Sharma et al., 2000, 1996; Astrachan and Kolenko, 1994). According to Lansberg (1988), most stakeholders in family businesses are psychologically ambivalent toward succession planning. Company founders encounter psychological deterrents to succession planning as it may imply a letting go of power.

The effectiveness of succession is not limited to whether a managing director/CEO/leader has been designated, but includes the ongoing health of a firm, quality of life, and family dynamics.

Research in relevant areas indicates that strategically, many critical factors are related to the effective succession, such as succession planning (Ibrahim et al., 2001a; Gersick et al., 1997; Kets de Vries, 1993), offspring grooming (Ibrahim et al., 2001b; Danco, 1997), inter-generational relationships (Handler, 1992; Seymour, 1993; Kets de Vries, 1993), and remuneration of managers (Aronoff and Ward, 1997). Researchers generally agree that business performance is a valid indicator to assess the effectiveness of business succession (Morris et al., 1997; Goldberg, 1996). Hence more empirical investigations into the relationship between succession issues and business performance become necessary. In the literature, relatively few papers endeavor to address this issue empirically and most of these attempts focus on the comparison between family and non-family businesses (Daily and Dollinger, 1992; Chaganti and Schneer, 1994). However, Goldberg (1996) and Morris et al. (1997) do empirically investigate the relationship between succession issues and business performance. However, none of the above studies investigate the issue of succession and successor choice (family or non-family member) on the financial performance of the firm/farm. Hence, the objective of this study is to investigate the impact of succession plan and successor choice on farm financial performance. We use 2001 Agricultural Resource Management (ARMS) data, the latest ARMS data where questions are asked about farm succession. First, we investigate the following hypotheses:

*H1a:* Succession planning is positively related to farm business performance as measured by profit margin.

*H1b:* Succession planning is positively related to farm business performance as measured by return to equity.

Secondly, we investigate if the choice of successor (family, non-family member) impacts financial performance, specifically profit margin and return to equity or return to capital employed, of the farm firm.

*H2a:* Succession by a family member is positively related to farm business performance as measured by profit margin.

*H2b:* Succession by a family member is positively related to farm business performance as measured by return to equity.

Policymakers, local leaders, and rural communities have a direct stake in the economic well-being of farmers and local agricultural businesses. They believe that population retention and quality of life are key to the current and future viability of rural communities. Farmers support local economies and communities, protect natural resources and sources of food, fiber, and feed and provide industrial components. Many have argued that without a smooth transition of business to next generation, rural communities will find it difficult to attracting new businesses and supporting population growth. Recently, policymakers, economists, and researchers have been interested in assessing the impact of succession on the growth and survival of farm businesses. These could also be related to the aging farming and rural population and/or international trade negotiations. Nevertheless, interest in growth and survival of farms is a hot topic among many in Washington and on Capitol Hill (recent tax legislation<sup>1</sup>, and 2008 Farm Bill).

## **Literature Review**

### *Succession Planning*

Researchers in the field of family business agree that succession is the most important issue that most family firms face. Burkart, Panunzi and Shleifer (2002) underscore the importance of succession in family firms. The authors argue that “a crucial issue in the discussion of family firms from the perspective of corporate governance and finance is succession” (p.3).

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<sup>1</sup> The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA).

Succession planning, in general has three objectives (Davis, 1992). First, to efficiently distribute assets from the older generation to younger generation. Second, to pass control of the business in a way that will ensure effective business leadership. Finally, succession planning also helps to maintain and promote family harmony. The existing literature, such as Sharma et al. (2001) and Morris et al. (1997), suggests that well developed succession plans can increase the likelihood of co-operation among stakeholders in businesses, therefore enhancing the chance of a smooth and effective succession. The absence of a succession plan can cause serious management problems, even leading to a business failure (File and Prince, 1996). The reasons for the demise of these family businesses are many. However, Ward (1987) indicates that inability to plan strategically for the business future is a major cause.

Similarly, family farms rely heavily on intergenerational succession. Succession and retirement are inter-linked and reflect the life cycles of the farm household and the farm business. A seminal piece of work on farm firm succession planning in the U.S. was done by Mishra, El-Osta, and Shaik (2010). The authors, using a large-national farm level data—Agricultural Resource Management Survey (ARMS)—examined farm and family characteristics that affect the likelihood of a household's development of a succession plan for its farm business.

Controlling for wealth, as an endogenous factor, the authors found that age of the farm operator, off-farm work by either spouse alone or with operator, expected household wealth, having a farm business organized as a sole proprietorship, taking on higher debt loads in the past five years, and having a farm business located in the Northern Great Plains increased the likelihood of farm businesses to have a succession plan.

In another study Mishra and El-Osta (2008) investigated the impact of government farm policy and farm growth on both succession decisions and the likelihood of intra-family transfers of the farm business. Again using a large cross-sectional database from farm families, the authors found that succession decisions are significantly influenced by government farm policy, farm wealth, age, and educational attainment of current farm operators. The authors found that off-farm work by operators and spouses, presence of retirement income (pensions), and regional location are positively correlated with non-family farm succession decisions. On the other hand, farm ownership, educational attainment, and marital status of the operator increased the likelihood of family-based succession decisions.

#### *Succession and Business Performance*

As mentioned above, family business succession results in the identification of a variety of factors associated with effective transition of management from one generation to another. Researchers in the business community (Morris et al., 1997; Goldberg, 1996) generally agree that business performance is a valid indicator to assess the effectiveness of business succession. Hence investigations into the relationship between succession issues and business performance are warranted.

In the literature, relatively few papers address this issue empirically—especially true of farm firms. Most of these attempts focus on the comparisons between family and non-family businesses (Daily and Dollinger, 1992; Chaganti and Schneer, 1994). Nevertheless, Morris et al., 1997 and Goldberg, 1996, do empirically investigate the relationship between succession issues and business performance. Yet, in our investigation of the literature we found no such paper that empirically analyses the relationship between succession planning and business performance in



family farm firms. Existing research on the impact of a generational transfer on the performance of a family firm is still inconclusive. Although some authors point to stagnating performance of next-generation family firms, others reach opposite conclusions.

Financial outcomes enable managers and business owners to make decisions and plan for business development (Jenkins, 1995). However, there is a consensus that no single financial indicator can accurately and comprehensively capture business performance, particularly in the small firm arena (Daily and Dollinger, 1992). Dyson (1997) states that business financial performance can be measured by four ratios: profitability ratio, growth ratio, efficiency ratio and liquidity ratio. This study uses a financial approach, two measures of financial performance; profit margins (OPM) and rate of return to equity (ROE).

Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business. OPM is a measure of the operating efficiency of the business. If expenses are held in line relative to the value of output produced, the farm will have a healthy OPM. A low OPM may be caused by low prices per unit sold, high overhead expenses, or inefficient production. On the other hand, ROE is, in effect, the interest rate earned on owned assets (equity). If assets are valued at market value, this return can be compared with returns available if the assets were liquidated and invested in alternative investments. If assets are valued at cost, this represents the actual return to the amount of equity capital you have invested in the farm business.

## Methodology

The two hypotheses will be tested using treatment effects regression models to evaluate the effect of a succession plan on financial performance measures. Comparisons of treatment effects in separate family versus a non-family successor models will be used to evaluate hypothesis 2. A Smith–Blundell test will be used to test for endogeneity of succession plan and types of succession plans in the financial measure equations.

### *Treatment Effects model*

The treatment effects model is an extension of the basic model of selectivity and is used to measure treatment effects and program effectiveness (Greene, 2003). The model estimates the effect of an endogenous binary treatment  $z_j$ , on a continuous, observable variable  $y_j$ , conditional on the independent variables  $x_j$  and  $w_j$  (Stata, 2003). The regression equation used in the model is of primary interest and can be expressed as

$$y_j = x_j\beta + \delta z_j + \varepsilon_j,$$

where  $z_j$  is an exogenous dummy variable indicating whether the treatment is assigned or not.

The binary decision associated with treatment is modeled as the outcome of an unobserved variable,  $z_j^*$ . We assume that  $z_j^*$  is a linear function of the exogenous covariates  $w_j$  and a random component  $u_j$

$$z_j^* = w_j\gamma + u_j$$

where  $\varepsilon_j$  and  $u_j$  are bivariate normal with mean zero and with the following covariance matrix.

$$\begin{bmatrix} \delta & \rho \\ \rho & 1 \end{bmatrix}$$

Given truncation (for sample selection) and that  $w_i$  is an endogenous dummy variable, the task at hand is to estimate the regression coefficients  $\beta$ , while controlling for selection bias due to treatment assignment.

For a full description of the treatment effect model see Green, 2003 or Maddala, 1983. Estimates presented in this paper were produced using STATA and maximum likelihood estimation.

## **Data**

Our analysis is conducted using farm-level data from a large national sample, comprised of farms of different economic sizes and in different regions of the United States. Data for this analysis are taken from the 2001 Agricultural Resource Management Survey (ARMS). The ARMS is conducted annually by the Economic Research Service and the National Agricultural Statistics Service. The survey collects measures of 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.

In the 2001 ARMS, farmers were also queried about whether they had developed a succession plan for their farming operation. The issue of succession is especially pertinent for farmers who are ready to retire in the next five years. Using 2001 ARMS data, we classify farm operators into two groups: those with a succession plan and those without.

## **Results and Discussion**

Descriptive statistics for the data are shown in table 2. Twenty-one percent of the farms have succession plans and seventeen percent have succession plan involving a family member.

Results from the treatments effects models are shown in tables 3-6. The variable depicting a family succession plan is positive and significant in all equations. Estimates for return on equity (ROE) are 0.77 percent for a non-family succession plan and 0.70 percent for a family succession plan. These results indicate that the presence of a family succession plan increases (ROE) from 0.70 to 0.77 percent. The estimates for operating profit margin (OPM) are similar – the higher the probability of a succession plan, the higher the OPM. The value for non-family succession is 0.56 percent and non-family succession is 0.65 percent.

Large farms also had large positive effects in the ROE regression equations, but large negative effects in the OPM equations. The findings on ROE and OPM are consistent with the fact that average rates of return are negative for smaller farms but positive for large, and very large farms (Hoppe and Banker, 2006).

The government payments variable had mixed positive and significant effects across the equations. The effects are greater for ROE than OPM. Higher government payments would be expected to generate higher farm returns, other things remaining equal.

Other variables are also significant in both the ROE and OPM regressions. Off-farm income has a negative and significant effect in all equations. A one-percent increase in off-farm income reduces both ROE and OPM by about 0.01 percent. One explanation may be that these farm operators might be expected to have a weaker tie to their farm than operators who are actively engaged in farming.

Operating age squared also has a small significant effect in all equations. This result is consistent with life cycle effects. ROE tends to increase at a decreasing rate. Regional variables have mixed effects across regression equations.

In summary, our results indicate that, in addition to farm, operator, and off-farm work variables, succession plans have a positive and significant effect on financial performance, both in terms of higher profit margins and returns to equity. Further, we also find that farms with designated family successors have higher financial performance, both in terms of higher profits margins and returns to equity. Finally, preliminary results also show that succession decisions are endogenous to financial measures. Hence, we use the predicted probability of having a succession plan and types of succession (family or non-family) plan to correct for endogeneity.

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Table 1. List of variables

Name	Description
Lnroe	Log of return on equity
Lnopm	Log of operating profit margin
Family succession plan	Operation has family succession plan; 1=yes and 0=no
Succession plan	Operation has non-family succession plan; 1=yes and 0=no
Operator age	Operator age in years
Operator age squared	Operator age in years squared
Medium farms	Medium sized farms (gross sales \$100,000 – less than \$1 million)
Large farms	Large sized farms (gross sales \$1 million or more)
Sole ownership	Sole ownership of farm business; 1=yes and 0=no
Crop farm	Type of farm; 1=crop farm and 0=livestock farm
Regional dummies	Northeast=1, Lake States=1, Northern Plains=1, Southern Plains=1, Mountain=1, Pacific=1; base= other ARMS regions
Household net worth	Household net worth / \$10,000
Government payments	Government payments / \$10,000
Children	Presence of children 13-18 years; 1=yes and 0=no
Off farm income	Operator and spouse of farm income / \$10,000

Table 2. Descriptive statistics

Variable	Mean	Standard Deviation
Operator age squared	2710.16	1,169.45
Medium size farms	0.47	0.50
Large farms	0.25	0.44
Northeast	0.07	0.25
Corn Belt	0.18	0.38
Crop farm	0.58	0.49
Lake States	0.10	0.30
Northern Plains	0.12	0.33
Household net worth	165.71	395.62
Government payments	5.64	12.05
Off farm income	1.39	5.38
Succession plan	0.21	0.41
Family succession plan	0.17	0.38
Operator age	50.89	10.99
Farm net worth	22.84	86.05
Sole ownership	0.60	0.49
Mountain	0.09	0.29
Pacific	0.08	0.27

Table 3. Marginal effects—log of return on equity and probability of non-family succession

Variable	dy/dx	Standard Error	P>[z]
<i>Regression on lnroe</i>			
Operator age squared	-0.0002	0.00004	0.0000
Large size farm*	0.7670	0.1424	0.0000
Notheast*	-0.3556	0.1433	0.0130
Corn Belt*	-0.1346	0.1073	0.2100
CropFarm*	0.1162	0.0882	0.1870
Lake States*	-0.3144	0.1083	0.0040
Nothern Plains*	0.0116	0.1238	0.9250
Household net worth	-0.0006	0.0002	0.0000
Government payments	0.2222	0.0060	0.0000
Off farm income	-0.0151	0.0072	0.0360
Succession plan	1.6347	0.3453	0.0000
<i>Prediction of splan</i>			
Large size farm*	0.2818	0.1405	0.0450
Crop farm*	-0.0303	0.0964	0.7530
Northern Plains*	-0.0371	0.1227	0.7620
Government payments	-0.0104	0.0071	0.1450
Off farm income	0.0283	0.0085	0.0010
Operator age	0.0262	0.0041	0.0000
Medium size farm*	0.2263	0.0981	0.0210
Sole ownership*	-0.2258	0.0975	0.0210
Southern Plains*	0.1425	0.1694	0.4000
Mountain*	0.4253	0.1595	0.0080
Pacific*	0.1964	0.2074	0.3440
Children*	0.3597	0.1387	0.0090

(\*) Dy/dx for discrete change of dummy variable from 0 to 1

Table 4. Marginal effects—log of return on equity and probability of family succession

Variable	dy/dx	Standard Error	P>[z]
<i>Regression on lnroe</i>			
Operator age squared	-0.0002	0.00003	0.0000
Large size farm*	0.7009	0.1511	0.0000
Northeast*	-0.3689	0.1377	0.0070
Corn Belt*	-0.1635	0.0994	0.1000
Crop Farm*	0.0989	0.0937	0.2910
Lake States*	-0.3343	0.1017	0.0010
Northern Plains*	0.0300	0.1224	0.8070
Household net worth	-0.0005	0.0001	0.0000
Government payments	0.0256	0.0063	0.0000
Off farm income	-0.0173	0.0072	0.0170
Succession plan	2.1307	0.1668	0.0000
<i>Prediction of splan</i>			
Large size farm*	0.2818	0.1373	0.0450
Crop farm*	-0.0303	0.0964	0.7400
Northern Plains*	-0.0371	0.1236	0.8700
Government payments	-0.0104	0.0081	0.0040
Off farm income	0.0283	0.0063	0.0010
Operator age	0.0262	0.0043	0.0000
Medium size farm*	0.2263	0.0940	0.0150
Sole ownership*	-0.2258	0.0917	0.0370
Southern Plains*	0.1425	0.1046	0.6790
Mountain*	0.4253	0.1201	0.3160
Pacific*	0.1964	0.1615	0.9350
Children*	0.3597	0.0972	0.2040

(\*) Dy/dx for discrete change of dummy variable from 0 to 1

Table 5. Marginal effects—log of operating profit margin and probability of non-family succession

Variable	dy/dx	Standard Error	P>[z]
<i>Regression on lnopm</i>			
Operator age squared	-0.0002	0.00003	0.0000
Large size farm*	0.6646	0.1368	0.0000
Notheast*	-0.3727	0.1206	0.0020
Corn Belt*	-0.1241	0.0972	0.2010
CropFarm*	0.1411	0.0794	0.0750
Lake States*	-0.2757	0.0986	0.0050
Northern Plains*	0.0008	0.1144	0.9940
Household net worth	-0.0005	0.0002	0.0000
Government payments	0.0163	0.0001	0.0030
Off farm income	-0.0146	0.0055	0.0270
Succession plan	1.6065	0.0066	0.0000
<i>Prediction of splan</i>			
Large size farm*	0.2670	0.1437	0.0630
Crop farm*	-0.0247	0.0961	0.7970
Northern Plains*	-0.0284	0.1220	0.8160
Government payments	-0.0121	0.0076	0.1110
Off farm income	0.0282	0.0082	0.0010
Operator age	0.0256	0.0041	0.0000
Medium size farm*	0.2391	0.0974	0.0140
Sole ownership*	-0.2192	0.0905	0.0150
Southern Plains*	0.1373	0.1529	0.3690
Mountain*	0.3806	0.1491	0.0110
Pacific*	0.1973	0.2083	0.3430
Children*	0.3268	0.1230	0.0080

(\*) Dy/dx for discrete change of dummy variable from 0 to 1

Table 6. Marginal effects—log of operating profit margin and probability of family succession

Variable	dy/dx	Standard Error	P>[z]
<i>Regression on lnopm</i>			
Operator age squared	-0.0002	0.00002	0.0000
Large size farm*	0.6483	0.0546	0.0000
Notheaste*	-0.2954	0.7744	0.0000
Corn Belt*	-0.1678	0.0539	0.0020
CropFarm*	0.1978	0.0468	0.0000
Lake States*	-0.2302	0.0672	0.0010
Nothern Plains*	0.1047	0.0689	0.1290
Household net worth	-0.0003	0.0001	0.0000
Government payments	0.0086	0.0019	0.0000
Off farm income	-0.0101	0.0039	0.0070
Succession plan	1.5570	0.1229	0.0000
<i>Prediction of splan</i>			
Large size farm*	0.3244	0.0656	0.0000
Crop farm*	-0.0487	0.0496	0.3260
Northern Plains*	-0.1322	0.0752	0.0790
Government payments	-0.0044	0.0026	0.0810
Off farm income	0.0140	0.0038	0.0000
Operator age	0.0290	0.0023	0.0000
Medium size farm*	0.2251	0.0486	0.0000
Sole ownership*	-0.1038	0.0427	0.0150
Southern Plains*	0.1469	0.0787	0.0620
Mountain*	0.1860	0.0667	0.0050
Pacific*	0.2084	0.0753	0.0060
Children*	0.1824	0.0574	0.0010

(\*) Dy/dx for discrete change of dummy variable from 0 to 1