ECONOMIC EVALUATION OF ASSET OWNERSHIP TRANSFER METHODS AND FAMILY FARM BUSINESS ARRANGEMENTS AFTER THE TAX REFORM ACT OF 1976

By

CLINT EDWARD ROUSH

Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
1969

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1972

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Thesis Approved:

Harry P. Mapp Jr.
Thesis Adviser

David L. Kletke

Darrell E. Ray

Ted K. Nelson

Winfield P. Betty

Norman N. Durham
Dean of the Graduate College

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CHAPTER I

INTRODUCTION

The individual or family controlled unit is the dominant form of farm business organization in the agricultural production sector. The life cycle of an individual or family operated farm business typically parallels the life cycle of the farm operator. During the farm operator's lifetime, the business generally passes through three stages of the family farm life cycle. These stages have been identified as entry, growth and exit (Boehlje 1973). In recent years a substantial amount of interest has been focused on the increasingly complex and costly problems of transferring the ownership and control of family farm firms between generations at the retirement or death of the existing farm operators.

Many farm families want to provide for continuity of the business after the retirement and death of the older generation by transferring the ownership of farm assets and the managerial control of the farm firm to the younger generation of the family. Providing for the continuity of family ownership and control of a farm business requires long-range forward planning to coordinate the retirement and estate transfer processes of the older generation with the business establishment and growth processes of the younger generation. If the proper strategy is not used to transfer ownership of farm assets and provide for continuity of management, family conflicts, large economic losses

and inefficient use of available capital resources may prevent the achievement of the family retirement, ownership transfer and business development objectives. The purposes of this study are to develop planning aids and to provide information to help Oklahoma farm families evaluate the use of alternative asset ownership transfer methods and farm business arrangements.

The Problem

An increasing number of farm operators in Oklahoma as well as other areas of the United States will be confronted with the problems of retirement and estate transfer during the next ten to twenty years. Data from the 1974 Census of Agriculture indicate that the average age of Oklahoma farm operators was 52.6 years in 1974 compared to 51.7 years in 1969 and 1964 (U. S. Department of Commerce 1977). In 1964, 39 percent of the farm operators on Oklahoma farms having sales of $2,500 or more were 55 years of age or older. By 1974, 49 percent of Oklahoma farm operators were at least 55 years of age. The number of farmers who were 55 years of age or older increased nearly 41 percent from 1964 to 1974.

Continued growth in the size of farms and quantity of production assets owned by farm operators combined with the recent rapid appreciation in the value of farm assets, particularly land, have increased the cost of transferring the ownership of farm firms between generations. Growth in farm capital requirements has also made it increasingly difficult for beginning farm operators to acquire control of a large enough unit to generate an income level competitive with off-farm employment opportunities.

From 1964 to 1974 the average value of land and buildings on Oklahoma farms with sales of at least $2,500 more than doubled, increasing from $84,766 to $187,069 (U. S. Department of Commerce 1977; 1967). During this same ten-year period, the number of Oklahoma farms with land and buildings valued at $200,000 or more increased from 3,313 to 13,367. The growing number of large farms is also evidenced by sales data for farms. The number of Oklahoma farms with annual sales of $100,000 or more increased from 276 in 1964 to 2,375 in 1974.

Data from the Balance Sheet of the Farming Sector indicate that the average value of assets including non-real estate and financial assets controlled by U. S. farm operators on January 1, 1977 is $243,801 (Evans et al., p. 4). This is 2.3 times the average value of assets per farm on January 1, 1970 and 4.6 times the average value of assets on January 1, 1960.

In recent years the major factor responsible for the increase in value of capital used by farm operators has been appreciation in the value of farm real estate. The average value of Oklahoma farm real estate increased from $173 to $374 per acre from 1970 to 1977 (USDA 1975, p. 15; 1977, p. 22). This represents an average increase of 11.6 percent per year. The average annual increase from 1960 to 1970 was 7.2 percent.

The recent rapid growth in the value of farm assets has increased the awareness among farm families of the potential impact of estate transfer costs on the family farm business. At the deaths of the farm operator and spouse, a large amount of cash may be needed to pay federal and state estate taxes; administrative costs such as attorney's fees, executor's or administrator's fees, and court costs; final

medical and funeral expenses; and debt claims against the estate. Most farm estates do not contain enough cash and liquid assets to pay these costs. Data from the Balance Sheet of the Farming Sector indicate that approximately 74 percent of the total value of assets controlled by U. S. farm operators consists of farm real estate (Evans et al., p. 3).

Farm families who want to continue family ownership of the business assets are often reluctant to sell the land and other farm assets. However, some of the heirs may not want to use their own funds or incur indebtedness to pay estate settlement costs. Income taxes and other selling expenses incurred when assets are liquidated further reduce the value of the estate that can be transferred to the heirs. Also, reducing the size of the farm business by selling part of the farm assets may eliminate economies of size advantages for the family farm business. At the time of estate transfer, the heirs involved in the operation of the family farm may not have adequate credit capacity to purchase farm property that the non-farm heirs want to sell.

Due to the potential for economic losses and family conflicts, an increasing number of farm families realize the importance of early estate planning to aid in accomplishing their farm ownership transfer objectives. The distribution of the farm estate at the farm operator's death can be specified and death taxes can be reduced by making a will. In order to reduce transfer costs at death, the will must be drafted to make efficient use of the marital deduction and other provisions of federal and state estate tax laws. Estate transfer costs and liquidity requirements should be estimated for the deaths of both parents under alternative will strategies.

Continued increases in the value of farm assets have encouraged the owners of large estates to consider making inter-family transfers of property ownership during their lifetimes to reduce the future value of their estates and transfer costs. Annual lifetime gifts to the heirs equal to the amount of annual exclusions allowed by federal and state gift tax laws remove property from the parents' estates and are not subject to gift taxation. Making larger gifts may require the payment of federal and state gift taxes. To incorporate lifetime gifts into the overall ownership transfer plan, the estate planner must consider the impact that gifts and gift taxes will have on the availability of income for the parents during retirement and old age and the future estate values and transfer costs.

Most farm assets such as land and machinery are difficult to divide into small enough units to take advantage of the annual tax-free gifts allowed by federal and state gift tax laws. Making gifts of cash and other liquid assets may create liquidity and financial security problems for the parents during retirement. The problem of dividing physical farm assets has encouraged farm families to consider incorporating the farm business to facilitate the transfer of ownership interests. Shares of stock are divided into small units, and transfers do not require the use of liquid assets except to the extent of the gift taxes paid.

Selling property to the potential heirs is another method of transferring ownership of farm assets during the parents' lifetimes. The sale transfer will not directly reduce the value of the owner's estate if the investments purchased with the proceeds or the balance of the loan used to finance the sale are retained in the estate. However,

the sale may allow the parents to make annual tax-free gifts to the children and provide liquid assets to pay estate transfer costs. Also, lifetime sales of farm land avoid subjecting future appreciation to estate taxation. When considering lifetime sale transfers, the farm family must weigh the potential benefits against the costs of the sale transfer. The costs include the federal and state income taxes on the capital or ordinary gain and the administrative costs to implement the transfer.

There are a number of decisions that the parents make during early stages of the family farm life cycle that do not implement ownership transfers but have a substantial impact on the transfer process. Decisions about the property ownership method and the division of ownership between a husband and wife which are made at the time farm property is acquired have important consequences for the estate distribution and transfer costs at the death of the property owner and his spouse. Investment and financing decisions made during the growth stage of the family farm life cycle determine to a large extent the future sources of income for retirement and the size, composition and liquidity of the owner's estate. Thus, retirement and estate transfer considerations should be integrated into investment and property ownership decisions which are made during the entry and growth stages of the family farm life cycle.

Most farm businesses are organized as sole proprietorships. Due to the growing capital and management requirements in farming and the resulting entry and exit problems, many farm operators and their families are considering the use of various joint family farm business

arrangements. Various types of operating agreements between the parents and members of the younger generation can be used to modify the sole proprietorship arrangement. Employer-employee type arrangements, agreements to share machinery and exchange labor, or farm asset rental and lease agreements may be used to provide for the establishment of the members of the younger generation into the farming business. After accumulating additional equity capital and management experience, the younger member of the family can expand by renting or purchasing additional farm assets from the retiring parents or other retiring operators.

Alternatively, the farm family may decide to establish a longer-term, jointly owned business arrangement such as a partnership or corporation. These forms of business organization may provide an easier means of determining an equitable division of farm income compared to the proprietorship arrangement. Also, the current income tax regulations for regular corporations may encourage incorporation of family farm firms (Forster, p. 3). Consideration must be given to the impact that alternative business arrangements will have on the retirement income and security for the parents, as well as the income and firm growth potential for the younger members of the family who are involved in the farm business (Thomas and Boehlje).

As indicated in the above discussion, the process of planning for the transfers of the ownership of farm assets and the managerial control of the farm business between generations is extremely complex. Decisions concerning the use of alternative transfer methods or farm business arrangements usually affect all members of the farm family. Thus, the planning process involves simultaneous consideration of many

objectives some of which are competitive. Planning also requires consideration of the impact of several uncontrollable variables such as the possible timing and sequence of death events, inflation rates, changes in the values of farm assets and several other economic and financial factors.

One of the major uncontrollable variables in the planning process is the legal environment. Information must be obtained on federal and state laws affecting property ownership and transfers; alternative forms of business organization; and income, gift and estate taxes. The Tax Reform Act of 1976 (U. S. Congress 1976, Sec. 2001-2010) made major revisions in federal estate and gift tax regulations and changed the procedure for determining the income tax basis of assets received by the heirs from an estate. The separate tax rate schedules and separate exemptions for gift and estate taxes are replaced with a single unified rate schedule and one unified tax credit for both gift and estate transfers (Sec. 2001).[1] Another provision of the new law allows qualified real property to be valued based on its "current use," rather than its "highest and best" use (Sec. 2003). The costs of generating liquidity to pay estate transfer costs by selling farm assets will likely be higher under the new law because the income tax basis of estate assets cannot be increased to the estate value at the time of the owner's death (Sec. 2005). The planning implications of these and other changes in federal tax laws made by the Tax Reform Act of 1976 need to be determined.

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[1]The former estate and gift tax exemptions and rates have been in effect since the early 1940's (Woods, p. 1).

Objectives of the Study

The primary purpose of this study is to provide information to help Oklahoma farm families evaluate how well various legal and financial tools accomplish their retirement, asset ownership transfer and business development goals. The specific objectives of the study are:

1. To construct a multi-owner family farm business simulation model capable of projecting the information flows needed to evaluate alternative asset ownership transfer methods, farm business arrangements and other legal and financial tools that affect the family farm intergeneration transfer process.
2. To utilize the simulation model and data from an actual farm firm and family situation to estimate the impact of selected decision variables upon asset ownership transfer costs, value of transfers to the heirs, availability of income and liquidity for the parents during retirement and old age, and the potential firm growth and financial positions of the farm and non-farm heirs. Decision variables investigated in this study include:
    a. Will strategies implemented at the deaths of the parents specifying alternative distributions of estate assets between outright and life estate transfers to the surviving spouse and transfers to the farm and non-farm heirs.
    b. Alternative levels of lifetime gifts and combinations of sales and gifts from the parents to the heirs.
    c. Alternative levels of lifetime marital gifts from the husband to the wife.

d. Alternative family farm operating arrangements using the proprietorship and corporation legal forms of business organization.

3. To determine the potential impact of the timing and sequence of the parents' deaths upon the outcome for alternative will and marital gift strategies.
4. To determine the long-run impact of the changes in federal estate and gift tax laws implemented by the Tax Reform Act of 1976 on asset ownership transfer costs and transfer strategies.

Previous Research

Several books, research bulletins and extension publications have been written to provide information specifically for farm families on the legal and economic aspects of planning the various processes that occur during the exit stage of the family farm life cycle. One of the reasons for conducting this research is to construct a simulation model of the family farm business capable of empirically evaluating the inter-related effects of retirement, estate transfer, and farm business organization decision alternatives identified by previous studies. Most of the ownership transfer strategies and farm business arrangement alternatives have not been empirically tested under the current legal environment.

The processes of planning for retirement, estate transfer and farm business continuation are discussed in books written by Harl (1977) and Looney. The primary objectives for both books are to identify the planning alternatives and to describe the potential tax and economic consequences for the farm business and family. Numerous planning

strategies that need empirical investigation are suggested.

Several publications are also available to help the farm operator plan for retirement. Procedures for estimating retirement income needs and for evaluating alternative income sources are illustrated in several extension publications and research reports (Lee and Brake; Maynard and Boehlje; Smith). In an Oklahoma research study, a stochastic simulation model was developed to evaluate the impact of farm rental, farm sale and non-farm investment alternatives on the expected value and variability of retirement income (Spence and Mapp). Legislation on retirement funds for self-employed persons provided the impetus for extension efforts to determine the potential use by farmers (Maynard; Wright and Acker). The tax implications of selling the assets of the farm business and the use of installment sales to reduce tax liabilities are important considerations for both retirement and estate planning (Smith and Weigle; Suter).

Most state agricultural extension services also have publications available that describe estate planning decision alternatives and the applicable property ownership, estate tax and gift tax regulations (Barry and Prater; Maynard and Laughlin 1970; Uchtmann and Bock). The magnitude of estate tax savings possible through the use of various legal tools such as property ownership methods, the estate tax marital deduction, life estates and lifetime gifts are illustrated in several extension publications (Barry and Prater; Maynard and Roush).

Publications are available in Oklahoma and other states that describe the characteristics and legal aspects of proprietorship, partnership and corporation forms of business organization (Buss et al.; Browning et al; Harl 1977; Looney and Rottman; Maynard and

Laughlin 1975). A recent paper by Forster and a regional extension publication by Levi and Grover illustrate the tax impact of alternative corporation and partnership business organizations for farm businesses with various levels of income and numbers of owners. A recent regional extension bulletin by Thomas and Boehlje outlines the major planning considerations and suggests procedures for selecting a joint family farm business arrangement. In addition to partnerships and corporations, the bulletin describes various types of joint family operating arrangements to modify a proprietorship business organization.

Previous research studies have empirically evaluated several of the decision alternatives that affect the family farm intergeneration transfer process using various procedures and models. Harl (1965) used a simulation model with a linear programming subroutine to evaluate the impact of regular and Subchapter "S" corporation business organizations on firm growth, income taxes and estate transfer costs for a Iowa family farm situation during a ten-year planning horizon. Alternative levels of lifetime gifts and sales of stock to the heirs and different levels of transfers to the surviving spouse at the death of one shareholder were evaluated.

Harrison used a multi-period linear programming model to determine the optimal gift policy for a widow owning a farm estate. The objective function was to maximize the value of property transferred to farm heirs assuming the widow's death occurred at the end of the fifth year of the planning horizon. Uncontrollable variables considered include inflation, earning capacity of assets, appreciation in real estate values, consumption requirements and social security benefits.

Stone applied a dynamic programming model to a non-farm estate planning situation. The decision variable considered was the proportion of the remaining estate given to the heirs during each year of a ten-year planning horizon. The objective function was to maximize the accumulated value of gifts plus after-tax earnings on gift property at the time of the estate owner's death. Using the dynamic programming technique, the optimal decision for any year depends not only on the current stage and state of the process, but also on the impact that the current decision has on subsequent states and the ultimate value of transfers. The state variables were the remaining value of the estate and previous accumulated gifts. Stages were defined as the number of years of remaining life. The dynamic programming technique may be incapable of solution or too expensive to solve when there are several types of decision alternatives and when the estates and deaths of both parents are considered.

Allwood used a static linear programming model to minimize the sum of federal gift and estate taxes for the ownership transfer of a farm estate. The remaining life spans for the parents were 17 years for the husband and 22 years for the wife. Total transfer taxes were minimized by selling the farm to the farm heirs. The model assumed that consumption expenditures for the parents would not exceed asset earning capacity and social security benefits. Inflation and changes in land value were not considered. The optimal strategy might be different if land values appreciated during the planning horizon creating an income tax liability on the capital gain resulting from sales of farm assets.

A simulation model was utilized by Simunek to examine the effects of parent's age, liquidity and gift strategy on total transfer costs,

total value transferred and consumption. The simulation model accounted for variation in the timing of death events and variation in farm income. However, the model did not account for inflation or changes in the value of assets. The results from this study indicated that liquidity of the farm business is one of the most important variables. For situations involving relatively large outstanding debts, gift taxes on large gifts increased liabilities and reduced the amount of income available for debt service. Even annual cash gifts to utilize the annual exclusions could not be made because available cash was needed to service outstanding debt. The alternative of selling assets to generate cash for lifetime gifts was not evaluated. For estate situations involving no outstanding debt, making additional gifts until the marginal gift tax rate reached the anticipated marginal estate tax rate substantially reduced total transfer costs and increased the value of transfers. However, under the current federal gift and estate tax laws, gift and estate transfers are combined and are subject to the same tax rate schedule.

Research completed by Buss during 1971 compared the income and social security tax consequences of alternative legal forms of business organization for Oklahoma farms and ranches. Also, gift and estate tax liabilities for alternative estate and gift transfer plans were evaluated. Taxes were estimated assuming constant estate values over time. The results indicated that larger income and social security tax liabilities were encountered by the sole proprietorship and the regular corporation business organization compared to a partnership arrangement. The income taxes were higher for the regular corporation due to double taxation of dividends. However, the regular corporation

became more important in terms of tax savings as the amount of taxable income increased. Total estate settlement costs were lowest when the husband's will left one-half of the estate to the wife outright, and the other half was left to the wife in a life estate with remainder interest to the children.

Boehlje (1971) developed conceptual and empirical procedures for analyzing estate creation and estate transfer processes. A simulation model was used to simultaneously evaluate production and investment decisions and lifetime and at-death transfer alternatives. A search procedure was used to determine the optimal estate creation plan and to select the will, gift and property ownership decisions to be implemented during each year of the planning horizon. The objective function was to maximize the discounted value of the estate transferred to the heirs. The present value of transfers was determined for each possible death event. Data on the probability distribution of death events were used to determine the expected present value of transfers for strategies selected by the model. Due to the large number of possible death events, the planning horizon was limited to ten years when only one parent was living and to six years for simulation experiments when both parents were living. Results from Boehlje's study indicate that maximizing the value of transfers to the heirs depends on estate creation or firm growth decisions as much as proper ownership transfer decisions.

A study was recently completed by Epperson using a multi-stage dynamic programming model to determine the optimal gift policy for two case farm situations. The objective function was to maximize the discounted expected value of the transferred estate. The optimal gift

policies determined under the legal environment prior to the Tax Reform Act of 1976 were also simulated under the new gift and estate tax laws. Under both the old and new tax laws, the benefits of making gifts were greater for the large case estate compared to the smaller estate. For the small case estate, the value of the transferred estate was higher under the new law compared to the old law.

The review of previous research studies indicates that several types of decision alternatives need further empirical evaluation. With the exception of Epperson's research, the previous studies were completed prior to the Tax Reform Act of 1976. Also, most of the models do not account for the increasing asset values encountered by farm families during the 1970's.

Method and Organization of Thesis

The first objective of this study is to construct a model to represent the complex decision environment faced by the farm family during the period of time the ownership of farm assets and managerial control of the farm firm are transferred between generations. Chapter II describes the relevant theoretical considerations and identifies the controllable and uncontrollable variables that need to be considered in constructing a model of the system. A mathematical model specifying the interrelationships between the various elements of the intergenerational transfer process is presented.

Chapter III presents the multi-owner family farm business simulation model developed to analyze alternative asset ownership transfer methods and alternative farm business arrangements. The input data requirements to represent a farm firm and family situation and to

implement annual decisions are described. The specific operations performed by each subroutine of the model are identified.

Data for an Oklahoma farm firm and family situation are used to test the simulation model and to evaluate alternative ownership transfer methods and farm business arrangements. The characteristics of the family and farm firm are presented in Chapter IV. By manipulating data representing annual decisions and the environment, the simulation model is capable of evaluating a wide range of decision alternatives and uncontrollable factors. The specific simulation experiments conducted and variables analyzed for the case farm and family situation are also described in Chapter IV.

The simulation results are presented and analyzed in Chapters V, VI, VII, and VIII. Chapter V presents the simulation results describing firm growth, financial structure and liquidity for the family farm business and its owners under the modified proprietorship farm business arrangement. An analysis of the impact of alternative will strategies is also presented. The effects of alternative levels of lifetime gifts, combinations of gift and sale transfers and combinations of gift and will strategies are analyzed in Chapter VI. The use of marital gifts from the husband to the wife are also evaluated.

The alternative will and gift strategies described in Chapters V and VI are simulated assuming the timing and sequence of death events occur in accordance with the parents' life expectancies. Results for simulation experiments conducted to determine the impact of the timing and sequence of death events upon ownership transfer costs and transfer strategies are presented in Chapter VII. The long-run impact of the changes in federal estate and gift tax laws implemented by the Tax

Reform Act of 1976 are also analyzed in Chapter VII.

In Chapter VIII, results for simulation experiments involving corporation farm business arrangements are presented and compared to the results for the modified proprietorship arrangement. The impacts of will and gift strategies are also analyzed for the corporation business arrangement.

Chapter IX presents the summary, conclusions and implications of the results of this study. Potential applications of the simulation model are discussed and recommendations are made for further research.

CHAPTER II

CONCEPTUAL DEVELOPMENT

The discussion of the problem indicates the need for planning the intergeneration transfer of the ownership and control of the family farm business. Planning involves identifying objectives, analyzing the possible outcomes resulting from various decision alternatives and selecting strategies that will accomplish the objectives. As with other managerial planning problems, there are several controllable and uncontrollable variables that determine the outcome of the family farm intergeneration transfer process.

An essential part of planning is the formulation of a model that represents the system of relationships between the relevant variables of the process. The use of a model allows the planner to manipulate the values of controllable and uncontrollable variables to estimate their impact on the outcome of the process. By comparing the outcomes generated by alternative controllable decision variables, the planner can select strategies that most nearly satisfy the goals and objectives.

The purpose of this chapter is to present the conceptual development of the simulation model which is described in Chapter III. The theoretical considerations relevant to the development of the model are discussed. Also, the mathematical model specifying the relationships among the relevant variables of the family farm intergeneration transfer process is presented and described.

Theoretical Considerations

The formulation of a model to represent a system requires the specification of four elements: components, variables, parameters and functional relationships (Orcutt, p. 898; Naylor et al., p. 10). The specific components of the model for this study include the family farm firm and the individual family members who currently, or as a result of a transfer decision, have an ownership interest in the firm or assets of the farm firm. Family members include the parents (husband and wife) and the children (farm heirs and non-farm heirs).

Functional relationships describe the interaction of the variables of a model. General functional relationships for a static model can be specified as:

$$Y_i = \phi_i (X_1,\ldots,X_n, Z_1,\ldots,Z_p, W_1,\ldots,W_q) \qquad (2\text{-}1)$$

where:

Y_i = set of endogenous or outcome variables, i = 1,...,m,

X_j = set of controllable exogenous variables, j = 1,...,n,

Z_k = set of uncontrollable exogenous variables, k = 1,...,p, and

W_ℓ = set of status variables, ℓ = 1,...,q.

Specifically, the model of equation (2-1) relates the i^{th} endogenous variable (Y_i) to the n controllable exogenous variables (X_j), p uncontrollable exogenous variables (Z_k) and q status variables (W_ℓ).

Exogenous (input) variables affect the system but are predetermined variables that are not affected by the system. These variables are classified as either controllable or uncontrollable inputs (Naylor et al., pp. 10-11).

Controllable or decision inputs are the exogenous variables that can be manipulated by the decision maker or planner for the system (Naylor et al., p. 11). For example, in a static model of the intergeneration transfer process of the family farm, controllable decision variables include the form of property ownership, the farm business arrangement, the value of property transferred through lifetime gifts by a parent to the spouse or children, and the distribution of the estate to the spouse and heirs at the death of a parent.

Uncontrollable or environmental inputs are exogenous variables determined by the environment in which the system operates, rather than being controlled by the decision maker (Naylor et al., p. 11). For the model of this study, examples of uncontrollable variables include federal and state income, estate and gift tax regulations; laws affecting property ownership and legal forms of business organization; administrative costs for different methods of transfer and the factors affecting the market values of the farm firm assets.

Status variables describe the state of a system at the beginning, during or at the end of a time period (Naylor et al., p. 11). The value of a status variable may be determined by the values for outcome variables, decision variables and uncontrollable variables of preceding time periods. For example, the total value of transfers from the parents to the heirs, an endogenous variable, will depend in part on the value of assets owned by a parent at the time of death, a status variable. The value of assets owned at the time of death will depend on the values for investment and transfer decision variables in previous periods.

Values for endogenous or outcome variables are determined by the values of the exogenous and status variables of the system and the parameters of the functional relationships. In the managerial planning process, the values for the outcome variables generated by the model are compared to the goals and objectives of the decision maker and appropriate decision strategies are selected. Examples of endogenous variables for this study are the net value of property transferred to the heirs, the amount of cash income available to the parents each year, and the ending net worth (equity) of the heirs.

Boehlje identified three theoretical issues that should be considered in the development and use of decision models to analyze family farm entry-exit problems (1973, pp. 29-30). The issues relate to the inclusion of the time dimension, the specification and measurement of the utility function and the evaluation of utilities in an uncertain environment. The alternative approaches used to incorporate the time and uncertainty elements into a model determine the classification of the model as static or dynamic and deterministic or stochastic (Naylor et al., pp. 16-20).

Time Dimension

Including the interactions of time on the variables makes the model dynamic rather than static. In a dynamic model, the values for input and output variables are dated (Hicks, p. 115). Baumol states that, "Economic Dynamics is the study of economic phenomena in relation to preceding and succeeding events" (p. 4). Samuelson notes that a ". . . dynamic system generates its own behavior over time . . ." (p. 354). Plaxico indicates that the time variable needs to be

included to evaluate the impact of a decision implemented in one period on production opportunities and decisions in future periods (p. 12).

The static model of equation (2-1) is modified to include the time dimension:

$$Y_{it} = \phi_{it}\,(X_{1t},\ldots,X_{nt},\ Z_{1t},\ldots,Z_{pt},\ W_{1t},\ldots,W_{qt},\ Y_{1t-1},\ldots,Y_{mt-1}) \qquad (2\text{-}2)$$

where:

Y_{it} = value of the i^{th} endogenous or outcome variable in period t, $i = 1,\ldots,m$,

X_{jt} = value of the j^{th} controllable exogenous variable in period t, $j = 1,\ldots,n$,

Z_{kt} = value of the k^{th} uncontrollable exogenous variable in period t, $k = 1,\ldots,p$,

$W_{\ell t}$ = value of the ℓ^{th} status variable in period t, $\ell = 1,\ldots,q$ and

Y_{it-1} = value of the i^{th} outcome or endogenous variable in the preceding period $(t - 1)$, $i = 1,\ldots,m$.

The value of the i^{th} output variable at time period t depends not only on the values for exogenous and status variables in time period t, but also on the values for the same or other endogenous variables in the preceding time period.

The nature of the problem for this study involves a long planning horizon. Farm business arrangements are often selected several years prior to the parents' retirement at the time members of the younger generation decide to farm. Asset ownership transfers from the parents to the younger generation may be implemented through gifts or sales

during any year prior to or after the parents' retirement or by estate transfers at the time of the parents' deaths.

Due to the inter-temporal nature of decisions that are implemented and events that occur during the planning horizon, the model must include the time-varying interactions. Business arrangement or lifetime asset ownership transfer decisions implemented at a certain date may require payment of transfer costs on or near that same date, but have income, liquidity, and firm growth effects over several periods of time. These decisions also affect the size and composition of the parents' estates at the future unknown date of their deaths.

A will specifying the estate owner's desired distribution of assets must be made prior to the time of death. The will decision affects the magnitude of estate settlement costs at the time of the property owner's death, the future income and financial security for the surviving spouse, and the liquidity and growth of the firm and its owners for many years.

The amount of lifetime and at-death transfers that can be made by the parents also depends on their investment decisions. After-tax cash earnings that exceed debt servicing commitments and family living requirements can be allocated among alternative farm or non-farm investments. The investment decision affects the future availability of cash income, the estate growth rate and the liquidity for the parents. The property ownership method selected for investments purchased by the parents also affects future estate transfers.

Also, in a dynamic model, the valuation of the estate and purchasing power of future income are influenced by uncontrollable factors such as the rate of inflation and the asset appreication or

depreciation rates. In a decision environment that includes inflation and land value appreciation, the timing as well as the amount of lifetime transfers are significant.

Utility Function: Goals and Objectives

In any managerial planning problem, the first step is to identify the goals and objectives of the decision maker. The classical objective function is to maximize utility. However, in most actual planning situations, the utility function for the decision maker is not clearly specified and the value of utility resulting from alternative values for controllable decision variables cannot be measured. Thus, in order to make an economic analysis of decision alternatives, simplifying assumptions about the nature of the decision maker's utility function must be made. A traditional assumption is that utility is a linear function of one outcome variable such as money income. Thus, the optimal strategy is the combination of decision inputs that maximize the level of the selected goal variable.

In most managerial planning situations, there are several objectives that the decision maker wants to simultaneously achieve. Thus, utility is a function of the values for more than one outcome variable. If the weights indicating the importance that decision makers attach to the various goal variables were known, or could be estimated, the resulting utility function could be incorporated into a model and decisions that give the highest value of aggregate utility could be selected.

Alternatively, the multi-dimensional utility theory approach could be used. This concept is based on the assumption that the

decision maker has a hierarchy of goals and satisficing levels for each goal (Ferguson). The decision strategy selected is the one that maximizes the number of goals that reach their satisficing levels given that all higher ranked goals have reached their satisficing levels. Using the multi-dimensional utility theory approach, the planner encounters the problems of estimating the ranking and satisficing levels for goals. Also, the approach does not consider the substitution or trade-offs between goals and assumes that the marginal utility for values of goals above the satisficing levels are zero (Hatch, pp. 25-26). The multi-dimensional utility analysis approach is often modified by specifying an objective function that maximizes the value for one goal variable subject to the constraint that satisficing levels for other goal variables are achieved (Hatch, pp. 25-26).

The problem of specifying a utility function to analyze alternative methods of transferring the ownership of farm assets and control of a family farm business between generations is difficult. The parents will likely have several objectives that they want to simultaneously accomplish. Asset ownership transfer and family farm business arrangement decisions obviously affect both farm and non-farm members of the younger generation. Thus, several multi-dimensional utility functions need to be considered by the planner (Boehlje 1973, p. 29). Several of the goals held by various family members may be the same, but some goals will likely be competitive. The process of planning is facilitated greatly if the family members can resolve their conflicts and specify a group utility function.

The model developed in this study assumes that the farm family has several goals, some of which they desire to maximize and some of

which they desire to satisfice. The specific nature of the utility function is unique to the individual farm and family situation. It is outside the scope of this study to estimate the empirical ranking, satisficing levels or trade-offs for the farm family goals. Thus, optimal decisions will not be determined by the model. Rather, the simulation model focuses on projecting the effect of alternative values for decision variables on the values of the outcome variables that are likely to be included in the farm family's utility function. The members of the family can evaluate the simulated values for the relevant outcome variables and make decisions that will maximize their group family utility function.

The alternative goals and objectives of farm families must be identified to insure that outcome variables needed to measure the level of achievement of goals are included in the model. In developing the simulation model for this study, it is assumed that farm family utility functions include goal variables that relate to:

1. Income and financial security for the parents,
2. Desired distribution of the parents' property among members of the younger generation,
3. Farm business development and growth, and
4. Net value of equity transferred to the heirs during the planning horizon.

Providing a satisfactory level of income for the parents during retirement and old age, regardless of how long they live, is probably one of the most dominant goals. The satisficing level for this goal will depend on the family living costs and the types of activities planned by the parents. Also, the parents may want to maintain

ownership or control of a specified level of farm or non-farm assets as security for unexpected cash needs. The model should be capable of projecting values for outcome variables that measure annual after-tax cash income flows and changes in the financial and liquidity positions of the parents.

The parents usually have an objective concerning the distribution of assets among the potential heirs. The desired distribution of transfers among heirs at the time of death can be controlled by making a will. In many cases the parents desire to make lifetime gifts and at-death transfers that will provide equal or at least equitable treatment of all heirs. Due to the varying vocations and interests of the children, the parents may simultaneously desire to make bequests of specific farm or non-farm assets to certain heirs. For example, the parents may want to transfer farm assets to the farm heir(s) and non-farm assets to the non-farm heir(s). The property distribution goals provide constraints on ownership transfer decisions.

Business development and firm growth considerations are important when the family has decided to provide for continuity of family ownership and control of the farm business beyond the retirement and deaths of the parents. The model should be capable of projecting values for outcome variables that measure the potential earnings, equity growth, and financial position for the members of the younger generation. Consideration must be given to distribution of farm asset ownership and managerial control of the business between the farm and the non-farm heirs.

One of the most frequently mentioned objectives of estate planning is to reduce the cost of transferring property owned by the parents to

the next generation. In a dynamic environment, annual production, investment, financing, ownership transfer and farm business arrangement decisions affect the rate of equity growth, the future size and value of the parents' estates and the resulting estate transfer costs. Thus, a more appropriate objective is to increase the value of equity, net of transfer costs, transferred by the parents to the younger generation. Using the net value of transfers, rather than transfer costs, as the evaluation criterion allows the planner to simultaneously consider the impact of both estate creation and estate transfer alternatives.

The timing, as well as the amount of transfers, will affect the level of family satisfaction or utility. Lifetime gifts from the parents to the children can be made during any time period of the planning horizon. Also, estate transfers are made at the deaths of both parents. These deaths are likely to occur during different time periods. Boehlje (1971) accounts for the time value of transfers by determining the discounted value of transfers during the planning horizon.

One of the problems encountered in the application of discounting procedures is choosing the appropriate discount rate. In investment analysis applications, the discount rate is generally specified as the firm's required rate or return which reflects the cost of capital or opportunity cost (Aplin et al.; Hopkin et al.). The discount rate is applied to the stream of cash flows resulting from the investment.

What is the appropriate discount rate to apply to transfers of equity from the parents to the heirs? The appropriate rate may be the opportunity cost, the after-tax rate of return that the heirs could earn on the most favorable use of the equity transfer. If the heir has

outstanding debt, the minimum rate would be the after-tax cost of borrowed funds.

Additional questions involved in the specification of the appropriate discount rate in a dynamic environment relate to the impacts of inflation and asset appreciation on the values of different types of property transferred. Also, the opportunity cost rate will likely be different for farm and non-farm heirs and may increase or decrease during the planning horizon due to varying financial and income tax situations.

An alternative outcome variable that incorporates the timing of equity transfers without requiring specification of a discount rate is the value of net worth (equity) for the heirs at the end of the planning horizon. Ending net worth depends on the amount and timing of transfers and the after-tax rate of return earned on the use of equity transfers. The value of ending net worth for the heirs also measures the income tax, growth and liquidity effects of alternative ownership transfer methods and farm business arrangements on the heirs. The net present value of transfers from the parents to the heirs measures these effects only as they affect the parents' gift and estate transfer capacity and transfer costs.

The approach used in this study is to project both the net present value of transfers and the ending net worth of the heirs for alternative values of decision variables. The values for these outcome variables can be evaluated simultaneously by the decision maker with the outcome for the other goal variables. Whether these two criteria result in the same or a different ranking of strategies will depend on the discount rate used to determine the net present value of transfers.

Risk and Uncertainty

A third theoretical problem confronted when developing a model to analyze decision alternatives is evaluating utilities in an uncertain environment. The values derived for outcome variables for alternative decision strategies depend on the values specified for uncontrollable variables. The values for several of the uncontrollable variables may not be known with certainty by the planner. The different states of information available to the planner are summarized by Cohen and Cyert:

> In a certainty model it is assumed that the economic agent possesses complete information which relates a unique outcome to an alternative course of action.
>
> In the absence of certainty, multiple outcomes may result from at least some actions the decision makers can take. If the agent is able on an objective basis to compute the probability that a particular outcome will result if any given action is taken, then the decision model is an objective risk model. When the economic agent has no objective basis for determining these probabilities but nevertheless feels that he knows them, then the decision model is a subjective risk model. Finally if the economic agent is unwilling or unable to formulate, either on objective or subjective grounds, the probabilities that specific outcomes will correspond to particular actions, but instead is able only to indicate the range of outcomes which might follow from any action, then the decision model is an uncertainty model (pp. 307-308).

If neither the uncontrollable variables nor the outcome variables are random and the equations of the model are exact relationships, then the model is deterministic. On the other hand, if the values of one or more uncontrollable variables or parameters are specified randomly or by a probability function, the model is stochastic (Naylor et al., p. 16).

The planning environment for this study includes several uncontrollable variables for which the available information concerning

their values could be classified as either certainty, objective risk, subjective risk or uncertainty. The planner can obtain information that will give certainty about the present income, gift and estate tax regulations. However, there is uncertainty about the change that may occur during the planning horizon. The planner may have enough information to specify either objectively or subjectively the values and/or probability distributions of values for inflation rates, asset appreciation or depreciation rates, farm input costs, farm output prices, production coefficients, returns on non-farm assets, and other uncontrollable variables that affect the level of earnings and value of owner equity.

In an evaluation of alternative asset ownership transfer methods, the timing of the deaths of the parents is one of the most important uncontrollable variables that must be considered by the planner. The expected lifetime and probability distribution for death events depend on the individual's age and health. Published life tables provide information that can be used to determine the expected lifetime and the probability associated with surviving for a specified number of years for persons of given sex and age (U. S. Department of Health, Education and Welfare 1968).

The simulation model developed in this study is deterministic. However, recognizing that in a long planning horizon many values for uncontrollable variables cannot be specified with certainty, the model is structured to allow the planner to specify alternative values or time trends for most of the uncontrollable variables. In the analysis portion of this study, the timing of death events is based on the expected remaining lifetimes. However, a sensitivity analysis (Naylor

and Vernon, pp. 409-410) is used to investigate the effect of the timing of the parents' deaths for selected ownership transfer strategies. The timing and sequence of death events may be especially critical for decision making about the amounts of lifetime and at-death marital transfers between the husband and wife. The use of this approach assumes that the decision maker can evaluate alternative strategies by weighting the values for outcome variables with the subjective probabilities of occurrence for the death events simulated.

Specification and Description of the Mathematical Model

The mathematical model relates the outcome variables of the family farm intergeneration transfer process to the controllable decision variables, uncontrollable exogenous variables and status variables. The model is based on the mathematical model of the farm estate creation-transfer process developed by Boehlje (1971). However, variables and functional relationships are added to allow asset ownership transfers by sale, appreciation in asset values and alternative types of farm business arrangements.

The components of the mathematical model include the family members (parents, farm heirs and non-farm heirs) who own farm assets or ownership interests in the farm firm. If the legal form of business organization is a corporation or partnership, the corporation or partnership entity represents an additional component. The functional relationships of the model include the variables and parameters that affect the accumulated value of transfers from the parents to the heirs as well as the values for owner's equity, before-tax net cash flows and

income and social security tax liabilities for each component during each year of the planning horizon.

The subscripts and superscripts used by the model are defined in Table 1. The decision, outcome and status variables are denoted by upper case English letters and are defined in Table 2. Uncontrollable variables and parameters are denoted by Greek letters and are defined in Table 3.

Accumulated Net Present Value of Transfers

The accumulated net value of transfers at the end of the planning horizon (t = T) is defined in equation (2-3) as the sum of the discounted market value of assets transferred by the parents to the heirs by lifetime gift and by transfers implemented at death for each year of the planning horizon.

$$V_T = \sum_{t=1}^{T} \left[\sum_{k=3}^{4} \sum_{h=5}^{6} \sum_{j=1}^{f} (G^h_{jkt} + W^h_{jkt})\theta_t \right] \tag{2-3}$$

Gifts can be made by either parent to farm and/or non-farm heirs during any year of the parents' remaining lifetimes.

Inequality (2-4) indicates that gift and at-death transfer decisions are restricted by federal and state regulations such as state laws of descent, legal property ownership methods, gift tax laws and estate tax laws.

$$G^h_{jkt},\ W^h_{jkt} \leq \zeta^h_{jkt} \tag{2-4}$$

The laws of descent in Oklahoma (Oklahoma Statutes Title 84, Sec. 213) specify the division of estate property among the survivors when the decedent dies without a will. For example, if the survivors include a

Table 1. Definitions of Subscripts and Superscripts for the Mathematical Model.

Subscript or Superscript	Description of Subscript or Superscript
t	The time period (year), t = 1,...,T.
k	The family member or entity, k = 1,...6. 1 represents the corporation entity 2 represents the partnership entity 3 represents the husband. 4 represents the wife. 5 represents the farm heirs. 6 represents the non-farm heirs.
h	The recipient of an asset ownership transfer, h = k = 3,...,6.
j	The type of asset, j = 1,...,f. 1,...,b represent farm assets. c represents the checking account. d,...,e represent non-farm assets. f represents corporation stock or partnership shares.
ℓ	The type of crop or livestock enterprise produced, ℓ = 1,...,p.
m	The type of input services required for farm production, m = 1,...,z. 1,...,b represents farm assets. g represents labor and management. h,...,z represents operating inputs.
n	Form of business organization, n = 1,...,4. 1 represents a proprietorship. 2 represents a regular corporation. 3 represents a sub-chapter "S" corporation. 4 represents a partnership.

Table 2. Definitions of Outcome, Decision and Status Variables for the Mathematical Model.

Variable[a]	Description of Variable
A_{jkt}	Market value of asset j owned by owner k at the end of year t.
B_{jkt}	Dollar amount of new borrowings on asset j in year t by owner k.
C_t^n	Retained earnings of corporation or partnership taxable to family member owners in year t assuming legal form of business organization n.
D_{jkt}	Dollar amount of debt secured by asset j owned by owner k at the end of year t.
E_{kt}	Value of equity (net worth) for owner k at the end of year t.
F_{kt}	Family living expenses paid by family member k in year t.
G_{jkt}^h	Market value of asset j transferred by gift to family member h from owner k in year t.
H_{kt}	Social security benefits paid to family member k in year t.
I_{kt}	Before-tax net cash flow from farm and non-farm sources for owner k during year t.
J_{jkt}	Variable indicating whether earnings on asset j owned by family member k are rent ($J_{jkt}=0$) or self-employment earnings ($J_{jkt}=1$) in year t.
L_{jkt}	Depreciation rate expressed as a proportion of remaining income tax basis of asset j owned by k in year t.
M_{kt}	Amount of labor and management services contributed by family member k in year t.
N_{kt}	Off farm wages or salary for family member k in year t.
$O_{\ell t}$	Number of units of output produced from farm enterprise ℓ in year t.
P_{jkt}	Value of asset j purchased in year t by owner k.
Q_{jkt}	Amount of services contributed to farm production from asset j owned by family member or entity k in year t.
R_t^n	Total dollar amount of corporation (n = 2,3) or partnership (n = 4) earnings withdrawn by stockholders or partners. R_t^n does not include salaries for labor and management or rent on owned assets paid to family members.
S_{jkt}	Value of asset j liquidated or sold by owner k in year t.
T_{kt}	Total income (state and federal) and social security taxes paid by family member or entity k in year t.
U_{jkt}	Income tax basis of asset j owned by owner k at the end of year t.
V_t	Accumulated present value of transfers from the parents to the heirs at the end of year t.
W_{jkt}^h	Market value of asset j transferred to family member h at the death of owner k in year t.
X_{mt}	Number of units of purchased inputs of type m used for farm production in year t (Includes operating inputs, services of durable assets and hired labor).
Y_{jkt}	Net cash return to equity in farm asset j owned by family member or entity k in year t.
Z_t	Dollar return to farm assets owned by all family members and the corporation or partnership entity in year t.

[a]Variables are listed in alphabetical order.

Table 3. Definitions of Uncontrollable Variables and Parameters for the Mathematical Model.

Variable[a]	Description of Variable
α_{jt}	Administrative cost rates to sell or liquidate asset j in year t.
β_{jkt}	Maximum debt to asset ratio for debt secured by asset j owned by owner k in year t.
Γ^{n}_{kt}	Set of constraints provided by social security tax and benefit regulations applicable to family member or entity k in year t when legal form of business organization is n.
γ_{mt}	Cost per unit of purchased input m in year t.
Δ_{kt}	Proportion of family living expenses and non-farm asset ownership costs that are itemized deductions for family member k in year t.
δ^{n}_{kt}	Set of federal and state income tax regulations that affect determination of taxable income resulting from earnings and asset sales by family member or entity k assuming legal form of business organization n in year t.
ε_{jt}	Legal and administrative cost rates associated with the estate transfer of asset j at the owner's death in year t.
ζ^{h}_{jkt}	Set of federal and state legal regulations that are applicable to gift and estate transfers of asset j from owner k to family member h in year t.
η_{jt}	Appreciation or depreciation factor for determining market value of asset j in year t.
Θ_{t}	Discount factor for year t.
ι_{jt}	Variables cost rate to obtain services of owned asset j in year t.
κ_{jt}	Set of coefficients specifying the relationship between the amount of production services and the value of farm asset j in year t.
Λ_{jt}	Set of parameters specifying allowable rate of investment credit on purchases of asset j in year t.
λ_{kt}	Federal and state income tax rates applicable to family member or tax entity k in year t.
μ^{h}_{jkt}	Federal and state gift tax rates for transfer of asset j owned by k to family member h in year t.
ν_{kt}	Minimum cash balance at the end of year t for owner k.
$\xi_{\ell mt}$	Set of production coefficients specifying the units of output of enterprise ℓ produced per unit of services available from input m in year t.
π_{jt}	Rate specifying the fixed ownership costs for asset j (property taxes, insurance premiums, etc.) during year t.
ρ_{jt}	Interest rate on debt secured by asset j at year t.
$\sigma_{\ell t}$	Price per unit of output produced from enterprise ℓ in year t.
τ_{jt}	Federal and state estate tax rates for at-death transfers of asset j in year t.
T^{n}_{t}	Zero, one variable indicating whether retained earnings, gains on asset sales and investment credit items of corporation or partnership entity with legal form of business organization n are passed on to family member-owners ($T^{n}_{t} = 0$ if n = 1 or 2 and $T^{n}_{t} = 1$ if n = 3 or 4).
ϕ_{jt}	Rate of cash earnings on non-farm assets (j = c,...,e) in year t.
χ_{jt}	State corporate franchise tax rates applicable to asset j in year t.
ψ_{jt}	Proportion of outstanding debt on asset j paid in year t.
Ω^{n}_{kt}	Social security tax rate on employee or self-employment earnings applicable to family member or entity k assuming legal form of business organization n in year t.
ω_{jt}	Administrative cost rates to make gift of asset j in year t.

[a]Variables are listed in the order of the Greek Alphabet.

widow and two or more children, under state laws of descent in Oklahoma, the widow receives one-third of the estate and the children receive two-thirds of the estate. The legal method by which property is owned by the decedent also restricts at-death transfers. For example, if a husband and wife own property as joint tenants, the wife takes full ownership of the property at the husband's death regardless of the transfer decision specified in the husband's will (Maynard and Laughlin 1970).

As indicated by inequality (2-5), the value of any asset, except the cash balance, transferred by gift or at-death by parent k to the spouse or children cannot exceed the value of the asset owned by the donor or decedent at the end of the previous year.

$$\sum_{\substack{h=3 \\ h\neq k}}^{6} G^{h}_{jkt}, \sum_{\substack{h=3 \\ h\neq k}}^{6} W^{h}_{jkt} \leq A_{jkt-1} \text{ for all } j \neq c \qquad (2\text{-}5)$$

The total value of cash bequests may exceed the value of the donor's checking account balance because funds can be obtained by borrowing, by sale or liquidation of farm or non-farm assets or by redemption of corporation stock.

Equation (2-6) indicates that the total value of assets transferred to the surviving spouse and heirs is equal to market value of assets owned by decedent k at the end of the year preceding the death event reduced by (1) the total dollar amount of debt owed by the decedent, (2) the legal and administrative costs of estate settlement, (3) federal and state estate taxes, (4) administrative costs to implement sales of estate assets and (5) federal and state income taxes on the taxable income resulting from sales of estate assets.

$$\sum_{\substack{h=3 \\ h\neq k}}^{6} \sum_{j=1}^{f} W_{jkt}^{h} = \sum_{j=1}^{f} (A_{jkt-1} - D_{jkt-1}) - \sum_{j=1}^{f} \varepsilon_{jt} A_{jkt-1}$$

$$- \sum_{j=1}^{f} \tau_{jt} (A_{jkt-1} - D_{jkt-1} - \varepsilon_{jt} A_{jkt-1})$$

$$- \sum_{j=1}^{f} S_{jkt} \alpha_{jt} - \sum_{j=1}^{f} [S_{jkt} (1 - \alpha_{jt})$$

$$- U_{jkt-1}]\lambda_{kt} \qquad (2\text{-}6)$$

The value of federal and state estate taxes is expressed as a simple linear function of the total value of assets reduced by debt and administrative costs. In actual situations, the estate tax rates are graduated, the value of the taxable estate is determined by valuation procedures and deductions allowed by federal and state law, and the amount of taxes is reduced by various types of credits.

Sale or liquidation of some of the estate assets may be specified to provide funds for payment of debt, administrative costs and estate taxes; and to allow accomplishment of the desired distribution of the estate value and specific estate assets among the heirs. For example, at the husband's death the desired distribution of the estate value might be 50 percent to the wife and 25 percent to each of the two children. The husband's will decision may also specify bequests of specific assets to the wife and/or heirs. If the total market value of specific bequests to an estate recipient exceeds the desired portion of the estate to be received, then part of the specific bequests will need to be sold to the recipient. The sale will provide liquid funds to distribute to other estate recipients or to pay estate settlement costs. The value of the cash received by a survivor may be either

positive or negative depending on the composition of estate assets; the estate liquidity requirements; and the estate distribution, asset bequest, and sale decisions.

The amount of state and federal income taxes to be paid depends on the value of estate assets sold, the income tax basis of assets sold, the amount of administrative selling expenses and the income tax rates applied to the ordinary income or the long term or short term gain. As indicated by inequality (2-7), the sale transfer decision and the determination of the income tax basis for various assets are restricted by federal and state income tax regulations.

$$S_{jkt},\ U_{jkt} \leq \delta^{n}_{kt} \tag{2-7}$$

Value of Equity, Assets and Debt

The parents' transfer capacity and resulting transfer costs depend on the value of equity owned at the time the transfer is implemented. The amount, timing and type of assets transferred affect the value of equity and the liquidity position of the parents and younger family members in subsequent time periods. The accounting identity specified in equation (2-8) defines the value of equity for family member or business entity k at the end of year t as the total market value of assets owned less the dollar amount of debt secured by the assets.

$$E_{kt} = \sum_{j=1}^{f} (A_{jkt} - D_{jkt}) \tag{2-8}$$

The market value of any farm or non-farm asset other than the cash balance at the end year t is specified in equation (2-9) as the market value at the end of the preceding year adjusted for appreciation

or depreciation in value, purchases, sales, at-death transfers received and gifts received or made during year t.

$$A_{jkt} = A_{jkt-1} + \eta_{jt} A_{jkt-1} + P_{jkt} - S_{jkt} + W_{j3t}^{h=k} + W_{j4t}^{h=k} + G_{j3t}^{h=k} + G_{j4t}^{h=k} - \sum_{\substack{h=3 \\ h\neq k}}^{6} G_{jkt}^{h} \text{ for all } j\neq c \qquad (2\text{-}9)$$

The gift and at-death asset transfers do not apply to the corporation or partnership entity (k = 1 or 2). The values of gifts and at-death transfers received by family member k from the husband (k = 3) or wife (k = 4) are preceded by positive signs. The total value of gifts made by parent k to other family members is preceded by a negative sign.

The total dollar amount of debt secured by asset j owned by family member or entity k at the end of year t is defined in equation (2-10) as the value of debt at the end of the preceding year reduced by principal payments and increased by new borrowing.

$$D_{jkt} = D_{jkt-1} - \psi_{jt} D_{jkt-1} + B_{jkt} \qquad (2\text{-}10)$$

The identity specified in equation (2-11) indicates that the total value of corporation stock or partnership shares (j=f) owned by family members at the end of year t is equal to the partnership or corporation net worth.

$$\sum_{k=3}^{6} A_{fkt} = E_{kt} \quad k=1 \text{ or } 2 \qquad (2\text{-}11)$$

Cash Balance and Financial Constraints

The value of the checking account asset (j=c) for family member or entity k at the end of year t is defined as:

$$A_{ckt} = A_{ckt-1} + G^{h=k}_{c3t} + G^{h=k}_{c4t} + W^{h=k}_{c3t} + W^{h=k}_{c4t} - \sum_{\substack{h=3 \\ h\neq k}}^{6} G^{h}_{ckt}$$

$$- \sum_{\substack{h=3 \\ h\neq k}}^{6} \sum_{j=1}^{f} \omega_{jt} G^{h}_{jkt} - \sum_{\substack{h=3 \\ h\neq k}}^{6} \sum_{j=1}^{f} \mu^{h}_{jkt} G^{h}_{jkt} - \sum_{\substack{j=1 \\ j\neq c}}^{f} P_{jkt}$$

$$+ \sum_{j=1}^{f} B_{jkt} + \sum_{\substack{j=1 \\ j\neq c}}^{f} S_{jkt} (1 - \alpha_{jt}) - \sum_{j=1}^{f} \psi_{jt} D_{jkt-1}$$

$$+ I_{kt} - T_{kt} \qquad (2\text{-}12)$$

As indicated by equation (2-12), the annual change in the checking account balance for family member k reflects lifetime gift and at-death transfers of cash received from the husband or wife, cash gifts made to the spouse or children, legal and administrative costs to implement all gifts, the gift taxes on all gifts, the value of assets purchased, cash obtained by borrowing, cash received by the sale of assets, principal payments on debt, net cash flow from farm and non-farm sources, and the income and social security taxes.[1] Constraints on the minimum checking account balance (2-13) and maximum net borrowing (2-14) provide restrictions on the amount of investable funds available and the asset purchase decisions for family member or entity k.

$$A_{ckt} \geq \nu_{kt} \qquad (2\text{-}13)$$

$$\sum_{j=1}^{f} B_{jkt} \leq \sum_{j=1}^{f} (\beta_{jkt} A_{jkt} - D_{jkt}) \qquad (2\text{-}14)$$

---

[1]The gift and estate transfer transactions do not pertain to the determination of the checking account balance for the corporation or partnership entity.

The total amount of funds available to the parents for acquiring ownership of additional farm and non-farm assets depends on the cash requirements to implement gift decisions and service debt; the amount of cash available from sales of assets and the amount of after-tax cash earnings from farm and non-farm sources. Lifetime and at-death transfers of cash increase the amount of funds available for investment or debt reduction for the farm and non-farm heirs. However, recall that the at-death transfers of cash to the heirs may be negative if the decedent's estate does not contain enough cash or liquid assets to meet estate liquidity requirements. Thus, the heirs would need to borrow funds or reduce liquid asset balances to cover the estate liquidity deficit. Lifetime gifts and at-death estate transfers of assets will increase the maximum borrowing capacity and affect the future after tax net cash flows for the recipients.

Cash Farm Income

The total cash return to all owned farm resources during year t is defined by equation (2-15) as total receipts reduced by the cost of purchased inputs and the variable costs to obtain the services of owned farm assets.

$$Z_t = \sum_{\ell=1}^{p} O_{\ell t}\, \sigma_{\ell t} - \sum_{m=1}^{z} \gamma_{mt}\, X_{mt} - \sum_{k=1}^{6} \sum_{j=1}^{b} \iota_{jt}\, Q_{jkt} \qquad (2\text{-}15)$$

The quantity of purchased inputs (X_{mt}) is a decision variable which includes hired labor and assets rented from non-family members as well as other purchased operating inputs. The quantity of output produced from farm enterprises ($O_{\ell t}$) is constrained by the quantity of inputs purchased, the availability of services from owned assets, the

availability of labor and management services for family members and the input-output coefficients for the production function specified in equation (2-16).

$$\sum_{\ell=1}^{p} O_{\ell t} \leq \sum_{\ell=1}^{p} \left(\sum_{m=1}^{z} \xi_{\ell mt} X_{mt} + \sum_{k=1}^{6} \sum_{j=1}^{b} \xi_{\ell jt} Q_{jkt} + \sum_{k=3}^{6} \xi_{\ell gt} M_{kt} \right) \tag{2-16}$$

The quantity of services available from owned farm asset j (Q_{jkt}) is constrained by the value of assets owned by family members or the business entity.

$$Q_{jkt} \leq \kappa_{jt} A_{jkt} \tag{2-17}$$

The total cash return to all owned farm resources is allocated to specific farm assets. As indicated by equation (2-18), the net cash return to the owner's equity in farm asset j (Y_{jkt}) is defined as the total cash return to all owned farm resources (Z_t) times the proportion of total resource services contributed by asset j minus interest on debt secured by the asset and other asset ownership costs (property taxes and insurance).

$$Y_{jkt} = Z_t Q_{jkt} / \left(\sum_{k=1}^{6} \sum_{j=1}^{b} Q_{jkt} + \sum_{k=3}^{6} M_{kt} \right) - \rho_{jt} D_{jkt} - \pi_{jt} A_{jkt} \tag{2-18}$$

The form of compensation for owned assets, net rent or net farm earnings, will depend on the farm business arrangement.

Before-Tax Net Cash Flow

The before-tax net cash flow for family member k during year t is defined as:

$$I_{kt} = \sum_{j=1}^{b} Y_{jkt} + Z_t M_{kt} / \left(\sum_{k=1}^{6} \sum_{j=1}^{b} Q_{jkt} + \sum_{k=3}^{6} M_{kt}\right)$$

$$+ \sum_{j=c}^{e} \left[(\phi_{jt} - \pi_{jt}) A_{jkt} - \rho_{jt} D_{jkt}\right] + N_{kt} + H_{kt} - F_{kt}$$

$$+ R_t^n \left(A_{fkt} / \sum_{k=3}^{6} A_{fkt}\right) \quad \text{for all } k=3,\ldots,6 \tag{2-19}$$

Equation (2-19) indicates that the before-tax net cash flow from farm and non-farm sources for family member k includes the sum of net cash returns to the owner's equity in farm assets, returns to labor and management contributions, net cash returns from non-farm assets, off-farm salaries and wages and social security benefits. Also, the value of family living expenses during year t (F_{kt}) is subtracted. If the legal form of business organization is a corporation or partnership, family members who own an interest in the entity receive withdrawals or dividends based on the portion of the stock or shares owned. As specified by equation (2-20) the value of social security benefits received by the parents is constrained by social security regulations.

$$H_{kt} \leq \Gamma_{kt}^n \tag{2-20}$$

The net before tax cash flow for the corporation or partnership entity is defined by equation (2-21) as the sum of net cash returns to assets owned by the entity minus dividends or withdrawals to owners.

$$I_{kt} = \sum_{j=1}^{c} Y_{jkt} - R_t^n \quad \text{for } k = 1 \text{ or } 2 \tag{2-21}$$

As indicated by inequality (2-22), the total value of dividends or withdrawals cannot exceed the net cash returns for the entity reduced by depreciation on owned assets, and income and social security taxes paid by the entity.

$$R_t^n \leq \sum_{j=1}^{c} (Y_{jkt} - L_{jkt}\, U_{jkt-1}) - T_{kt} \leq \delta_{kt}^n \quad \text{for } k=1 \text{ or } 2 \qquad (2\text{-}22)$$

The dividend or withdrawal decision is also constrained by federal and state income tax regulations.

Income and Social Security Taxes for Family Members

Equation (2-23) specifies the federal and state income and social security tax calculation for family member k.

$$\begin{aligned} T_{kt} = {} & \lambda_{kt} \{ I_{kt} - H_{kt} + (1 - \Delta_{kt}) (F_{kt} + \sum_{j=c}^{e} \pi_{jt}\, A_{jkt}) \\ & - \sum_{j=1}^{b} L_{jkt}\, U_{jkt-1} + \sum_{j=1}^{f} [S_{jkt}(1 - \alpha_{jt}) - U_{jkt-1}] \\ & + [\sum_{\substack{j=1 \\ k=1 \text{ or } 2}}^{b} (S_{jkt} - \alpha_{jt}\, S_{jkt} - U_{jkt})\, T_t^n + C_t^n]\, (A_{fkt} / \sum_{k=3}^{6} A_{fkt}) \} \\ & - \sum_{j=1}^{b} \Lambda_{jt}\, P_{jkt} - T_t^n \sum_{\substack{j=1 \\ k=1 \text{ or } 2}}^{b} \Lambda_{jt}\, P_{jkt}\, (A_{fkt} / \sum_{k=3}^{6} A_{fkt}) \\ & + \Omega_{kt}^n [Z_t M_{kt} / (\sum_{k=1}^{6} \sum_{j=1}^{b} Q_{jkt} + \sum_{k=3}^{6} M_{kt}) \\ & + \sum_{j=1}^{b} (Y_{jkt} - L_{jkt}\, U_{jkt})\, J_{jkt} + (R_t^4 + C_t^4)(A_{fkt} / \sum_{k=3}^{6} A_{fkt}) \\ & + N_{kt}] \quad \text{for } k=3,\ldots,6 \end{aligned} \qquad (2\text{-}23)$$

Taxable income includes the net before-tax cash flow from farm and non-farm sources adjusted for non-taxable social security benefits, non-deductible family living expenses and non-deductible asset ownership costs on non-farm assets; minus depreciation on farm assets plus taxable income from farm asset sales. If the legal form of business

organization is a sub-chapter "S" corporation or a partnership, the taxable income of the family member includes the owner's share of the gain on asset sales and retained earnings (C_t^n) of the corporation or partnership. The family member's income tax liability is determined by multiplying the applicable federal and state income tax rates (λ_{kt}) by taxable income and subtracting investment credit on purchases of qualified assets. The investment credit for assets purchased by a sub-chapter "S" corporation or a partnership is shared by the owners of the entity.

The final part of equation (2-23) defines the social security or self-employment tax liability for the family member as the employee or self-employment earnings times the applicable tax rate (Ω_{kt}^n). Earnings subject to the tax include returns to labor and management contributions, net returns to owned farm assets, the family members share of partnership withdrawals and retained earnings, and off-farm salaries and wages. If the form of compensation for owned asset contributions is rent ($J_{jkt} = 0$), the earnings are not subject to social security or self-employment taxes. The farm business arrangement also determines whether the compensations for labor and management are taxed as employee or self-employment earnings.

The amount of retained earnings of the sub-chapter "S" corporation or partnership entity taxable to the family member-owners is defined by equation (2-24) as the taxable income for the entity minus dividends paid.

$$C_t^n = T_t^n\left[\sum_{j=1}^{c} (Y_{jkt} - L_{jkt}\, U_{jkt-1}) - R_t^n\right] \quad \text{for } k=1 \text{ or } 2 \qquad (2\text{-}24)$$

Inequality (2-25) indicates that the determination of the family member's tax liability is subject to the federal and state income and social security tax regulations applicable to family member k and legal form of business organization n.

$$T_{kt} \leq \delta^{n}_{kt},\ \Gamma^{n}_{kt} \tag{2-25}$$

Income and Social Security Taxes for Corporation

The income and social security tax liability for the corporation entity (k=1) is defined by equation (2-26).

$$\begin{aligned} T_{1t} = \lambda_{1t} \{ & \sum_{j=1}^{b} (Y_{j1t} - L_{j1t}\, U_{j1t-1}) + \sum_{j=1}^{b} [S_{j1t}(1 - \alpha_{jt}) - U_{j1t-1}]\} \\ & + \sum_{j=1}^{b} \chi_{jt}(U_{j1t-1} - D_{j1t-1}) - \sum_{j=1}^{b} \Lambda_{jt}\, P_{j1t} \\ & + \Omega^{n}_{1t}[Z_t \sum_{k=3}^{6} M_{kt} / (\sum_{k=1}^{6} \sum_{j=1}^{b} Q_{jkt} + \sum_{k=3}^{6} M_{kt})] \end{aligned} \tag{2-26}$$

A sub-chapter "S" corporation is not subject to federal income taxes. However, the sub-chapter "S" corporation is subject to Oklahoma income taxes. Income taxes are determined by multiplying the corporation tax rate (λ_{1t}) by taxable income. Taxable income includes the net cash return on owned assets reduced by depreciation taken during the year and the gain on sales of assets owned by the corporation. The corporation is also subject to the Oklahoma corporate franchise tax which is based on the net capital of the corporation. The federal income taxes for a regular corporation are reduced by investment credit taken on qualified asset purchases. Both regular and sub-chapter "S"

corporations pay the employer's share of social security taxes on compensations for labor and management services provided by family members. As indicated by inequality (2-27), the determination of the corporation tax liability is subject to federal and state income tax and social security tax regulations.

$$T_{1t} \leq \delta^{n}_{1t}, \Gamma^{n}_{1t} \tag{2-27}$$

The functional relationships of the mathematical model and many of the decision and outcome variables are constrained by federal and state income, gift and estate tax laws. The current tax regulations affecting the ownership transfer decisions and alternative farm business arrangements investigated in this study are presented in Roush.

CHAPTER III

THE SIMULATION MODEL AND DATA REQUIREMENTS

The simulation model is developed to provide decision makers with empirical estimates of the values needed to evaluate the impact of alternative asset ownership transfer strategies and business arrangements for family farm situations. The model structure accomodates the complex legal and economic interrelationships identified by the mathematical model presented in the previous chapter.

The first part of this chapter presents a general overview of the model structure and capabilities. Next, the components, and initial data requirements for the computer program are discussed. Annual input data requirements and the computational steps for each subroutine of the model are presented. The chapter concludes with a summary of the output printed by the model.

Nature and Scope of the Simulation Model

The simulation model is designed to represent the decision-making environment and economic activities of a family farm business during the period of time the ownership and control of the firm assets are being transferred from the parents to the children. The model is structured to provide for multiple owner business arrangements; asset ownership transfer by means of sale, gift and will; and firm growth through purchase of additional farm assets, rental of additional land

and purchase of non-farm assets. The length of planning horizon is constrained only by the availability and cost of computer time and disk storage space. Normally the planning horizon would start at the time younger members of the family enter the farming business and end after the death events for both parents have occurred.

Representing the Family Situation

For simulation purposes, the farm family consists of the parents (husband and wife) and the children. The children are classified as either farm or non-farm. The "farm" classification includes the children who provide labor and management for the operation of the farm. The "non-farm" classification includes the children who do not provide labor and management, but may at some future time own part of the farm business. Values for selected characteristics of each family member are provided as initial input data for the model.

Changes in the family situation over time are communicated to the model by providing annual input data specifying the variable to be changed and its new value. For example, the amount of labor available from the husband may be reduced as he approaches retirement age. Values for the variables describing the family situation might also be changed in order to simulate outcomes assuming alternative levels for some variables. For example, the death age for one or both parents might be modified to reflect an alternative timing or sequence of death events.

Representing Initial Asset Ownership

The initial asset ownership situation is represented by an

inventory of the farm and non-farm assets owned by each family member. Values describing the ownership method, type of asset, market value, amount of debt secured by the asset, and other data needed to calculate annual depreciation and debt payments are provided for each asset owned.

The farm business arrangement is identified by specifying the legal form of business organization and describing the procedures for compensating resource owners. The initial legal form of business organization can be a proprietorship, partnership or corporation. If the firm is initially a corporation or a partnership, assets owned by the respective entity are included in the initial asset inventory. If the firm is initially a proprietorship, alternative legal business organizations are simulated by specifying input data for the beginning simulation year indicating the specific assets to be transferred to the new entity, the types of stock or shares issued, owner dividend or withdrawal rates, the tax option for a corporation and information describing procedures for compensating resource owners. Rental rates, salaries and parameters for calculating the value of contributions for each type of resource and each resource owner are specified by the user.

Representing Annual Decisions and Strategies

The specific "decisions" to be implemented during the planning horizon are communicated to the model by providing a set of annual input data for each simulation year. The general types of annual decisions that can be simulated by the model include ownership transfers at the death of each parent, purchases of farm or non-farm assets, renting additional farm land and changes in the family farm business arrangement.

The model and data input procedures are structured to provide flexibility in specifying the decision alternatives to be simulated. During any year, the user can specify values for any of the decision types. A set of decision values for a particular decision type specified for each year of the planning horizon defines a strategy. For example, a gift strategy would be defined by specifying the amount of specific assets to be given to each donee during each year of the planning horizon. Specific strategies for each decision type to be evaluated by the model in this study are discussed in Chapter IV.

Representing the Annual Operations for the Firm

Information needed to evaluate a multiple owner farm business arrangement and asset transfer strategy is derived by simulating the annual operations for a farm firm and its owners for a specified number of years. The model is structured so that a simulation year corresponds to a calendar year. Prior to beginning a simulation year, modifications are made in the previous year's ending environment to reflect any changes in the family situation or farm business arrangement. Also, before incrementing the year and ages of family members, the model checks to see if a parent's age has reached the specified death age. If an estate transfer is to occur, the model calculates the estate transfer costs and distributes the estate assets according to the will decision described by the annual input data.

Annual decisions to make lifetime gifts or sales of assets, purchase assets, or rent additional land are implemented at the start of each simulation year. For land and non-farm investment purchase decisions, the model checks the prospective buyer's working capital and

unused credit capacity to determine if the decision can be implemented.

In addition to implementing ownership transfer and purchase decisions, the cash requirements for debt principal payments and the cash receipts from payments on loans receivable and non-farm investments are determined at the start of a simulation year. The cash flows resulting from the beginning-of-the-year transactions are used to adjust the previous year's cash and debt balances for each owner.

After the beginning ownership and financial structure is determined, the model calculates cash farm income and cash farm operating expenses for the simulation year. The net cash farm income is allocated to a resource owner based on either the proportion of total resource services provided by the family member or a predetermined rent or salary. The forms of compensation received by each family member for resources provided depend on the type of farm business arrangement. Asset ownership costs (interest on debt, property taxes, and insurance premiums) are calculated for each asset owner and deducted from the owner's resource compensations. Depreciation is also calculated for each asset owner and saved for use in determining taxable income.

Cash inflows from non-farm asset earnings, social security benefits and off-farm salaries, and cash outflows for non-farm asset ownership costs, income and social security taxes and family living expenses are determined by the model. These non-farm cash flows are combined with the farm cash flows to determine the quarterly cash, savings and short-term debt balances for each family member and entity. The income and social security tax calculations performed by the model depend on the type of farm business arrangement.

Input data values used to determine income and expense flows, and asset market values are specified in year one "money" values. Separate trend rates for determining future values of family living expenses, farm receipts, farm expenses, land values and asset purchase costs can be specified by the user.

The simulation year is completed by determining the ending values for assets, debt, and net worth for the partnership or corporation and each family member. The change in net worth includes increases or decreases in asset market values, as well as retained earnings from farm and non-farm sources.

Representing a Firm's Ownership Over Time

The number of years over which the model simulates the ownership and annual operations of the firm is specified by the user. Simulation years are linked by saving the data values for the ending asset ownership and family situation to start the next simulation year. At the end of the specified number of years to be simulated, the ending environment is stored on disk for use in other simulation runs starting at this point in time.

The Computer Program Components and Data Requirements

The computer program for the simulation model consists of a MAIN program and 33 subroutines. The primary functions of the MAIN program are to "read" the data specifying the farm firm and family situation for the start of a simulation period and to call the subroutines needed to perform specific operations or carry out instructions supplied by the

input data for each simulation year. Each subroutine performs a set of closely related functions discussed later in this chapter. Two versions of three subroutines are available to accomodate the estate and gift tax laws before and after the Tax Reform Act of 1976.

The simulation model is written in Fortran IV language and designed for the IBM 370 computer. The MAIN program, 33 subroutines, and seven data files containing the initial input data are stored on disk. The seven data files require approximately 80 tracks of space on an IBM 2314 disk pack. The computer program requires an additional 322 tracks of disk space. Operation of the computer program requires a set of card input specifying the annual input data representing the annual decisions and changes in the environment variables for the simulation period. The computer program requires approximately 350,000 bytes of core. Saving the modified environment for subsequent simulation runs requires 50 tracks of disk space.

Two support programs are used to build the seven data files containing the initial input data. The ENVIRONMENT program builds the Asset and Environment files containing values representing the beginning farm firm and family situation. The UTIL program is used to build the other five data files which contain values for the parameters that are not modified by the simulation model. A description of each data file is presented below.

Asset File

The Asset file is a direct access file containing 1500 records or rows. Each row of the Asset file provides space for entering data values describing one asset. Twenty data values are specified by the

user for each asset initially owned by the family members. The simulation model modifies the file when additional assets are purchased, original assets are replaced, or asset ownership is transferred by means of gift, sale, or will.

Each asset is identified by a four-digit number. The first two digits specify the asset type code. Asset type codes and a description of the assets represented are shown in Table 4. The second two digits on an asset number provide the asset with a unique number. For example, the first item of crop machinery would be assigned the number 1101; the second 1102, etc. As additional assets are acquired, new numbers assigned by the model will be one larger than the highest asset number already in the file. The maximum number of assets of each type is 99. The asset numbers are used when providing annual decisions to replace, give, sell, or will a specific asset.

Since buildings, fences, and other real estate improvements are tied directly to the land, all assets on a particular tract of land are given the same asset number. For example, asset number 1002 might consist of several asset rows (a tract of land, fences, and one or more buildings). Other types of assets all have unique numbers. However, several items of the same asset can be combined on the same asset row and assigned only one number. The number of units of an asset specified for a record (row) depends on future plans regarding ownership transfers of the asset.

When providing the initial input data, the user must identify the asset number, ownership method code, and values for the twenty data variables describing each asset. The owners and alternative ownership methods which can be used are listed in Table 5. The data variables for

Table 4. Asset Type Codes Utilized by the Simulation Model.

Asset Type Code	Description
10	Farm Real Estate (land, fences & buildings
11	Crop Machinery and Equipment
12	Breeding Livestock
13	Not Assigned
14	Livestock Equipment
15	Current Inventory
16	Farm Checking Account
17	Stock in Corporation or Share of Partnership
18	Loans to Others
19	Non-Farm Investments
20	Annuities
21	Savings Account
22	Personal Checking Account
23	Life Insurance on Husband
24	Life Insurance on Wife
25	Personal Assets (home, auto, etc.)

Table 5. Asset Ownership Codes Utilized by the Simulation Model.

Asset Ownership Code	Owner and Ownership Method
1	Owned by Corporation
2	Owned by Partnership
3	Owned by Husband Outright
4	Owned by Husband in Joint Tenancy with Wife
5	Owned by Husband in Life Estate with Remainder Interest Owned by Farm Heirs
6	Owned by Husband in Life Estate with Remainder Interest Owned by Non-Farm Heirs
7	Owned by Wife Outright
8	Owned by Wife in Joint Tenancy with Husband
9	Owned by Wife in Life Estate with Remainder Interest Owned by Farm Heirs
10	Owned by Wife in Life Estate with Remainder Interest Owned by Non-Farm Heirs
11	Owned by Farm Heirs Outright
12	Owned by Non-Farm Heirs Outright

which values must be assigned for each asset of a particular type are shown in Table 6.

Values for the data variables shown in Table 6 can be obtained from the family farm records. The asset item and description codes (data variables 12 and 13) are used to denote a more detailed classification of the assets within each type. These codes are used to identify the location of a set of fixed parameters in the Buy Table which is discussed later in this section.

The inventory asset includes all current farm assets except the farm checking account. Thus, the values for feed, stored crops, feeder livestock and cash investment in growing crops are combined. The value of current inventory is modified by the simulation model to reflect changes in inventory value due to increases in the size of the farm operation and changes in the prices of inventory items.

Environment File

The Environment file is a sequential disk file that has one record containing values for all input data variables, except those in the Asset file, which must be saved from one simulation year to the next. Environment variables are identified by "keywords." Some variables have single values while others are one or two dimensional arrays. The keywords and subscripts for the variables must be specified when inputting the initial input data or annual input data for modifications. Descriptions of the variables contained in the Environment file are shown in Table 7. For illustration purposes, the variables are grouped by functional areas.

Table 6. Input Data Variables Describing Owned Assets for Each Type of Asset in the Asset File.

Asset Type	Variables Describing Each Asset Owned[a]
Real Estate and Depreciable Farm Assets (type codes 10, 11, 12, 14)	1. Market value 2. Basis (cost less depreciation) 3. Debt secured by asset 4. Purchase cost 5. Accumulated depreciation for tax purposes 6. Accumulated market depreciation 7. Initial basis 8. Asset age in years 9. Years owned 10. Amount of investment credit taken 12. Asset item code 13. Asset description code 14. Number of units owned (acres of land and items of other assets) 15. Depreciation method and investment credit code for income tax purposes 0 - No tax depreciation 1 - Straight line and investment credit 2 - Declining balance and no investment credit 3 - Straight line and investment credit 4 - Declining balance and investment credit 16. Useful life (years) 17. Salvage value 18. Debt payment method code 1 - constant payment on principal 2 - constant total payment 19. Amount of constant payment on debt 20. Annual interest rate on debt
Current Inventory (type code 15)	1. Market value 2. Basis (purchase cost) 3. Short-term debt owed to stockholders 5. Value of inventory subject to property taxes 6. Value of inventory insured 12. Asset item code 13. Asset description code 20. Interest rate on debt owed to stockholders
Farm and Personal Checking Accounts (type codes 16 and 22)	1. Account balance 2. Short-term debt balance 12. Asset item code 13. Asset description code 20. Interest rate on short-term debt

Table 6. (Continued)

Asset Type	Variables Describing Each Asset Owned[a]
Stock in Corporation or Share of Partnership (type code 17)	1. Market value 2. Basis 3. Debt secured by asset 4. Purchase cost 7. Initial value of stock or shares 9. Years owned 10. Fixed dividend rate (percent of initial value) 12. Asset item code 13. Asset description code 14. Number of $1000 units 15. Debt payment code 16. Constant annual debt payment 17. Interest rate on debt
Loans Receivable (type code 18)	1. Loan balance 5. Long-term gain (percent of principal payment) 6. Short-term gain (percent of principal payment) 7. Ordinary gain (percent of principal payment) 8. Age of loan in years 9. Years owned 12. Asset item code 13. Asset description code 18. Loan payment method code 20. Interest rate on loan
Annuities (type code 20)	1. Present value of annuity 4. Purchase cost 5. Income tax exclusion ratio 7. Simulation year to start payments 8. Number of years since first investment 9. Years owned 12. Asset item code 13. Asset description code 14. Number of $1000 units owned 19. Annual payment to be received
Non-Farm Investments (type code 19)	1. Market value 2. Basis 4. Purchase cost 6. Accumulated market depreciation 8. Age in years 9. Years owned 12. Asset item code 13. Asset description code 14. Number of $1000 units

Table 6. (Continued)

Asset Type	Variables Describing Each Asset Owned[a]
Life Insurance Policies (type codes 23 and 24)	1. Cash value 5. Face value 7. Beneficiary code 3 - Husband 7 - Wife 11 - Farm heirs 12 - Non-farm heirs 8. Age of policy 9. Years owned 12. Asset item code 13. Asset description code 14. Number of $1000 units 19. Annual premium per $1000
Personal Assets (type code 25)	1. Market value 2. Basis 3. Debt secured by asset 4. Purchase cost 6. Accumulated market depreciation 8. Age in years 9. Years owned 12. Asset item code 13. Asset description code 14. Number of units (items) 18. Debt payment method code 19. Constant annual payment on debt 20. Interest rate on debt
Personal Savings Account (type code 25)	1. Account balance 12. Asset item code 13. Asset description code 20. Annual interest rate on savings

[a]Numbers denote data variable number used by simulation model. The 20 data values are not all used for some types of assets.

Table 7. Environment Variables Used by the Simulation Model by Functional Area.

Functional Area	Variable Name	Description
Family Characteristics	AGE[a,b]	Age of each family member at end of previous year.
	DAGE	Age death event occurs for each parent.
	FAME	Family living expenses for each family member under various conditions (pre-retirement, one living parent, etc.).
	HEIR	Number of children in farm and non-farm heir classifications.
	LP	Living parents: 3-both parents living, 2-wife living, 1-husband living, 0-no living parents.
	RAGE	Retirement age for each parent.
	SALN	Non-farm salaries for each family member.
Income Tax Information	CTAX	Tax status of corporation: 1-regular with pre-1975 tax rates; 2-sub-chapter "S"; 3-regular with 1975-1977 tax rates.
	DUCT	Proportions of family living expense that are itemized deductions for each family member.
	EXEM	Dollar value of personal exemption per dependent.
	MAXD	Maximum additional first year depreciation for each owner.
	MAXG	Maximum level of long-term gain for alternative capital gain tax.
	MSTD	Maximum standard deduction for single return.
	NDEP[a]	Number of dependents specified for income tax purposes for each family member.
	RIRA	Dollar amount of annual investment in retirement annuity.
	STDR	Standard deduction rate.
	TINCO	Investment credit carryover for each owner.
	TLGCO	Long-term loss carryover for each owner.
	TSGCO	Short-term loss carryover for each owner.
	TXRE	Tax return method for each owner: 1-single; 2-joint; 3-married filing separately.
Social Security Information	ETAX	Employee social security tax rate.
	SAGE	Age of surviving spouse at first death event.
	SETX	Self-employment tax rate.
	SMAX	Maximum self-employment earnings before reduction in social security benefits.
	SSERN	Accumulated earnings for social security benefit calculation for each parent.
	SSWB	Maximum earnings for social security taxes.
	YEARN	Years of earnings for social security benefit calculation for each parent.
Farm Business Arrangement and Resource Availability, Use and Compensation	ALAB3	Hours of labor available from the husband each quarter.
	ALAB11	Hours of labor available from farm heirs each quarter.
	ALABH	Hours of labor available from permanent hired labor each quarter.
	AMG3	Proportion of management furnished by husband.
	AMG11	Proportion of management furnished by farm heirs.
	AMGH	Proportion of management hired.
	AUSE	Procedure for calculating payment for services provided by each asset type for each ownership method: 1-rent for share of earnings; 2-contribute for share of earnings; 3-fixed rent payment.
	IFARM	Legal form of business organization: 0-proprietorship; 1-corporation; 2-partnership.
	LUSE	Compensation for labor provided by husband and farm heir: 1-salary; 2-contribute for share of earnings.
	MUSE	Compensation for management provided by husband and farm heir: 1-salary; 2-contribute for share of earnings.
	OWAG	Opportunity wage rate on family labor.
	PAYL	Fixed salary for labor provided by the husband or farm heir.
	PAYM	Fixed salary for management provided by husband or farm heir.
	PMGT	Proportion of net cash income for determining management contributions.
	PWAG	Wage rate per hour for permanent hired labor.
	SWAG	Wage rate per hour on seasonal hired labor.
	TRLO	Total number of tracts of real estate owned.
	TRLR	Total number of tracts of real estate rented.

Table 7. (Continued)

Functional Area	Variable Name	Description
Cash Flow and Financing Information	CDIV	Proportion of cash farm income paid in dividends by corporation.
	CMAX	Maximum personal checking account balance before transfer to savings account for each family member.
	CMIN	Minimum personal checking account balance before borrowing for each family member.
	DINT	Interest rate on debt for refinancing for each asset type.
	DMAT	Maturity on debt for refinancing for each type of asset.
	DMAX	Maximum short-term personal debt before refinancing for each family member.
	FDMX	Maximum farm operating debt for husband, farm heir or business entity.
	FMAX	Maximum farm checking account balance before transferring to savings account for husband, farm heir or business entity.
	FMIN	Minimum farm checking balance before borrowing for husband, farm heir or business entity.
	PDIV	Proportion of partnership cash farm income withdrawn.
	PROD	Proportion of total dividends or withdrawals paid each quarter of the year.
	PROF	Proportion of corporate franchise tax paid each quarter.
	PROI	Proportion of interest paid each quarter.
	PROM	Proportion of management salary paid each quarter.
	PRON	Proportion of insurance premiums paid each quarter.
	PROR	Proportion of rent paid each quarter.
	PROT	Proportion of property tax paid each quarter.
	PWIT	Proportion of net cash farm income withdrawn to personal checking accounts if farm is a proprietorship.
	RANK	Use of excess cash by husband and farm heir: 1-contribute to farm firm; 2-non-farm savings account.
	RDAM	Maximum debt to asset value ratio for refinancing for each asset type.
	SRAT	Interest rate on savings account.
Administrative Expense Parameters	AEXGF	Gift administrative expense per dollar of value given away for each type of asset.
	AEXPP	Buying administrative expense per dollar of value purchased for each type of asset.
	AEXPS	Selling administrative expense per dollar of value sold for each type of asset.
	COEXP	Dollar amount of administrative expense for changing legal form of business organization.
Trend Parameters	SCLI	Annual rate of increase in cost of living.
	ZTRR	Annual rate of increase in cash farm receipts.
	ZTRX	Annual rate of increase in cash farm expenses.
Programming Variables	ISTOP	Year this simulation run is to stop.
	ISTRT	Year previous simulation run ended.
	LYR	Simulation year.
Balance Sheet Summary	DBTNF	Total non-farm debt for each owner and ownership method.
	TDEBT	Total farm debt for each owner and ownership method.
	TFVAL	Total value of farm assets for each owner and ownership method.
	VALNF	Total value of non-farm assets for each owner and ownership method.
Estate and Gift Transfer and Tax Information	AFLTG	Accumulated value of gifts less federal annual exclusions for each parent.
	ASLTG	Accumulated value of gifts less Oklahoma annual exclusions for each parent.
	FGTX1(1)	Federal gift tax calculated for the husband last year.
	(2)	Federal gift tax calculated for the wife last year.
	(3)	Federal gift taxes paid by husband last year.
	(4)	Federal gift taxes paid by wife last year.
	(5)	Accumulated federal gift taxes calculated for husband.
	(6)	Accumulated federal gift taxes calculated for wife.

Table 7. (Continued)

Functional Area	Variable Name	Description
	FGTX2(1)	Federal gift tax calculated for the husband two years ago.
	(2)	Federal gift tax calculated for the wife two years ago.
	(3)	Federal gift taxes paid by husband two years ago.
	(4)	Federal gift taxes paid by wife two years ago.
	(5)	Amount of husband's tax credit used for gifts.
	(6)	Amount of wife's tax credit used for gifts.
	FGTX3(1)	Federal gift tax calculated for the husband three years ago.
	(2)	Federal gift tax calculated for the wife three years ago.
	(3)	Federal gift taxes paid by husband three years ago.
	(4)	Federal gift taxes paid by wife three years ago.
	GIFT1(1)	Taxable gifts for husband last year.
	(2)	Taxable gifts for wife last year.
	(3)	Market value of gifts made by husband last year.
	(4)	Market value of gifts made by wife last year.
	(5)	Accumulated value of gifts (above $3,000) from husband to wife.
	(6)	Accumulated value of gifts (above $3,000) from wife to husband.
	GIFT2(1)	Taxable gifts for husband two years ago.
	(2)	Taxable gifts for wife two years ago.
	(3)	Market value of gifts made by husband two years ago.
	(4)	Market value of gifts made by wife two years ago.
	GIFT3(1)	Taxable gifts for husband three years ago.
	(2)	Taxable gifts for wife three years ago.
	(3)	Market value of gifts made by husband three years ago.
	(4)	Market value of gifts made by wife three years ago.
	FTTSP	Federal estate tax credit for taxes paid by surviving spouse on previous estate transfers.
	PGEXP	Present value of gift transfer costs
	PVGFT	Present value of gift transfers to farm and non-farm heirs.
	PVWLL	Present value of estate transfers to farm and non-farm heirs.
	PWEXP	Present value of estate transfer costs.
	SGTX1(1)	Federal estate taxes paid by husband eligible for four percent installment payment.
	(2)	Federal estate taxes paid by wife eligible for four percent installment payment.
	(3)	State gift taxes paid by husband last year.
	(4)	State gift taxes paid by wife last year.
	(5)	Federal estate taxes paid by farm heirs eligible for four percent installment payment.
	(6)	Federal estate taxes paid by non-farm heirs eligible for four percent installment payment.
	SGTX2(1)	Federal estate taxes paid by husband eligible for seven percent installment payment.
	(2)	Federal estate taxes paid by wife eligible for seven percent installment payment.
	(3)	State gift taxes paid by husband two years ago.
	(4)	State gift taxes paid by wife two years ago.
	(5)	Federal estate taxes paid by farm heirs eligible for seven percent installment payment.
	(6)	Federal estate taxes paid by non-farm heirs eligible for seven percent installment payment.
	SGTX3(3)	State gift taxes paid by husband three years ago.
	(4)	State gift taxes paid by wife three years ago.
	STTSP	Oklahoma estate tax credit for taxes paid by spouse on previous estate transfers.
	TGEXP	Total accumulated gift transfer costs.
	TVGFT	Total accumulated value of gift transfers to farm and non-farm heirs.
	TVWLL	Total accumulated value of will transfers to farm and non-farm heirs.
	TWEXP	Total accumulated estate transfer costs.
	ZRAT	Discount rate used to compute present value of transfers and transfer costs.

[a]Averages are used for farm and non-farm heirs when there is more than one member of the respective category.

[b]AGE(1) is a parameter indicating the simulation year corresponding to calendar year 1976. This information is needed to determine the carryover basis for estate assets under the Tax Reform Act of 1976.

Buy Table File

The Buy Table file is a direct access disk containing 880 records or rows. Each row contains the values for 20 parameters which are used by the model to calculate the purchase cost, change in market value, returns and ownership costs for a specific asset. A set of parameters must be specified for each asset item that is currently owned or to be purchased during the planning horizon, except for checking accounts, savings accounts, inventory assets, loans receivable, and shares of the corporation or partnership. Each asset record is identified by asset type, item and description codes. These codes are used to identify the location of the parameters for a specific asset in the Buy Table file and to communicate to the model the kinds of assets that require unique operations. For example, when determining the amount of taxable income for the sale of breeding livestock, it is necessary to know whether the item was purchased or raised. Table 8 defines the asset item and description codes used by the model for each type of asset.

The parameters which need to be specified for each type of asset are shown in Table 9. The values are specified prior to simulation and are not modified by the model during simulation. Monetary values are entered as year one "money" values.

Flow File

The Flow file is a direct access disk file with 30 records or rows. Each row contains the values used to determine farm income and expense for a specific size of farm operation measured by the total number of tracts of land operated (rented and owned). The user inputs values for

Table 8. Asset Item and Description Codes for Each Type of Asset.

Asset	Asset Type Code	Asset Item Code[a]	Asset Description Code[b]
Real Estate	10	Tract Number (1-20)	1 = land 2 = fence 3 = building and improvements
Crop Machinery	11	Machinery Item Number (1-20)	1 = size number 1 2 = size number 2 3 = size number 3 4 = size number 4
Breeding Livestock	12	1 = beef 2 = swine 3 = sheep	1 = purchased female 2 = purchased male 3 = raised female
Livestock Equipment	14	Equipment Item Number (1-20)	1 = size number 1 2 = size number 2 3 = size number 3 4 = size number 4
Inventory	15	1	1
Farm Checking Account	16	1	1
Stock or Share	17	1 = common 2 = preferred (fixed dividend and value)	1
Loan	18	1	1 = regular 2 = installment sale 3 = to corporation or partnership from husband or farm heir
Non-Farm Investment	19	1 = fixed value type 2 = equity type	1 = short term 2 = intermediate term 3 = long term 4 = infinite term
Annuity	20	1 = straight life (husband) 2 = straight life (wife) 3 = joint and survivor	1 = life annuity 2 = certain annuity (retirement fund)
Savings Account	21	1	1
Checking Account	22	1	1
Life Insurance on Husband	23	1 = term 2 = whole life 3 = life paid up at age ___[c] 4 = endowment at age ___	1 = purchased at age ___[c] 2 = purchased at age ___ 3 = purchased at age ___ 4 = purchased at age ___
Life Insurance on Wife	24	Same as above	Same as above
Non-Farm Personal Assets	25	1 = house 2 = auto	1

[a] Space is provided for 20 item codes for each asset type. However, only part of the codes are used for some asset types.

[b] Space is provided for four description codes for each asset item code. However, only part of the codes are used for some asset item codes.

[c] The age of the insured is specified by the user. The values for parameters describing the policy must correspond to the age specification.

Table 9. Definitions for Parameters Contained in the Buy Table File.

Type of Asset		Description of Parameter
Farm Assets	1.	Initial list price.
	5.	Annual percentage increase in asset rental rate.
	6.	Annual rent for asset.
	7.	Years of asset life.
	8.	Market depreciation method code (0-no change in value, 1-declining balance depreciation, 2-straight line depreciation, and 3-appreciates in value.
	9.	Remaining farm value factor number 1 or appreciation rate on land.
	10.	Remaining farm value factor number 2.
	11.	Purchase cost to list price ratio.
	12.	Annual percentage increase in purchase cost of asset.
	16.	Ratio of salvage value to purchase cost.
	17.	Property tax rate as a proportion of market value.
	18.	Property insurance premium as a proportion of original purchase cost.
	19.	Opportunity rate of return on investment.
	20.	Dollar value of asset contribution for determining share of farm income for asset.
Non-Farm Investments	1.	Initial list price.
	7.	Years to maturity (99 = infinite life).
	9.	Rate of cash return as a proportion of initial purchase cost (Interest or dividend).
	10.	Rate of appreciation in value as a percent of current market value.
	11.	Ratio of purchase cost to list price.
	12.	Annual percentage increase in purchase cost.
Life Insurance	2.	Ratio of annual increase in cash value to annual premium for policies owned less than or equal to five years.
	3.	Ratio of annual increase in cash value to annual premium for policies owned 6-10 years.
	4.	Ratio of annual increase in cash value to annual premium for policies owned 11-15 years.
	5.	Ratio of annual increase in cash value to annual premium for policies owned 16-20 years.
	6.	Years of premium payments (99 for whole life).
	7.	Years of coverage (99 for whole life and paid up life).
	8.	Premium payment per $1,000 face value.
	9.	Ratio of increase in cash value to annual premium for policies owned 21-30 years.
	10.	Ratio of increase in cash value to annual premium for policies owned greater than 30 years.
Annuity	1.	List price ($1,000).
	2.	Expected return multiple for determining income tax exclusion ratio.
	3.	Annual interest rate for determining value and annual payment.
	6.	Age of owner when payment starts (husband's age on joint annuities).
	7.	Years of annuity payments (99 on life annuity).
	8.	Years used to determine annual payment.
	11.	Ratio of purchase cost to list price.
Personal Assets	1.	List price
	3.	Repair cost rate as a proportion of purchase cost.
	7.	Years of asset life.
	8.	Market depreciation method.
	9.	Remaining value factor number one.
	10.	Remaining value factor number two.
	11.	Ratio of purchase cost to list price.
	12.	Annual percentage increase in purchase cost.
	16.	Ratio of salvage value to purchase cost.
	17.	Property tax rate as a proportion of market value.
	18.	Property insurance premium as a proportion of original purchase cost.

the 20 data variables shown in Table 10 for each possible size of farm starting with the smallest number of tracts operated to the largest (30 tracts). The number of acres in each tract of land can vary, but there must be a direct correspondence between the values for "the number of tracts operated" in the Flow file and the "tract number" identified by the asset item code in the Buy Table and Asset files. For example, if the total number of tracts operated is increased from 10 to 11, the additional tract of land rented should have an asset item code equal to 11.

Values for each of the data variables for each size of farm operation must be determined prior to simulation. The farm production and marketing plans, level of operating inputs used and level of production efficiency are implicit in the data values. Monetary values are specified in year one "money" values.

Tax File

The Tax file consists of nine 25 by 4 arrays representing the various federal and Oklahoma income, gift and estate tax rate schedules used by the model. The nine tax tables stored are: federal income tax (single), federal income tax (married, filing separately), Oklahoma income tax, federal estate tax, state death tax credit, Oklahoma estate tax (lineal heirs), Oklahoma estate tax (collateral heirs), Oklahoma gift tax and federal gift tax. To facilitate tax calculations for ownership transfers made both before and after the Tax Reform Act of 1976, two sets of federal gift and estate tax schedules are stored on the disk.

Table 10. Definition of Variables for the Flow File.

Data Variable Number	Definition
1, 2, 3 and 4	Total farm cash receipts for the specific size of operation for each quarter of the year.
5, 6, 7 and 8	Total farm cash operating expenses for the specific size of operation for each quarter of the year.
9, 10, 11 and 12	Total hours of labor required for the specific size of operation for each quarter of the year.
13	Total value of current inventory required for the specific size of farm operation.
14	Value of inventory subject to property taxes for the specific size of farm operation.
15	Insured value of inventory for the specific size of farm operation.
16	Dollar amount of rent for the tract of land corresponding to Flow file row number.
17	Annual percentage increase in rental rate for the tract of land corresponding to Flow file row number.
18	Number of acres in the tract of land corresponding to the Flow file row number.
19	Total maximum short-term farm operating debt for the specific size of farm operation.
20	Not used.

Age File

For purposes of calculating Oklahoma estate taxes, the marital deduction includes the value of the surviving spouse's interest in a life estate (Oklahoma Statutes Title 68, Sec. 807). To determine the life tenant's proportion of the total value of property in life estate, a five percent annuity factor based on the life expectancy of the surviving spouse is used. The Age file is a direct access file containing the life expectancies and five percent annuity factors for persons with ages ranging from 40 to 94.

Annuity File

The Annuity file is a direct access disk file containing the annuity factors for males and females of different ages. The six percent annuity factors are used to determine the value of an annuity for estate tax purposes (Federal Estate and Gift Taxes Explained, pp. 97-98).

Steps Performed by the Simulation Model

After the initial input data are stored on the disk files, a simulation run is made using a control deck which contains the annual input data for each year of the simulation period. Annual input data for a specific simulation year are arranged in the order shown in Table 11. Keywords are used to signal the beginning of the input of a particular type. The keyword also indicates to the MAIN program which subroutine to call to process the particular type of input data. The data values required for each type of decision are discussed with the presentation of steps performed by the major subroutines of the model.

Table 11. Types of Annual Decision Inputs Processed by the Simulation Model.

Decision Input	Keyword	Subroutine Called
Changes in Values for Environment Variables	ENVI	ENVIR
Estate Transfers Implemented at Death	WILL	WILLD
Change Legal Form of Business Organization to Corporation or Partnership	CORP or PART	OINPT
Asset Sales	SELL	SELLD
Asset Gifts	GIFT	GIFTD
Asset Purchases and Replacements	PURC	PURCHD
Make Additional Payments on Debt	DEBT	CASHFX

The simplified flow chart of the main program appearing in Figure 1 illustrates the general flow of the simulation model through the various subroutines. First, the Asset and Environment files for the initial data, or for the end of a previous simulation period, are located and copied on new files identified for the simulation run. Subroutines ENVIR, WILLD, OINPT, SELLD, GIFTD and PURCHD are called during a simulation year only if decision input requiring the subroutine are specified for the simulation year. Most of the other subroutines shown in Figure 1 are called every simulation year.

After the last subroutine is returned (subroutine UPDATE), the program checks to see if the simulation year is the last one to be processed during the simulation run. If it is, the Asset and Environment files for the end of the last simulation year are saved for use as

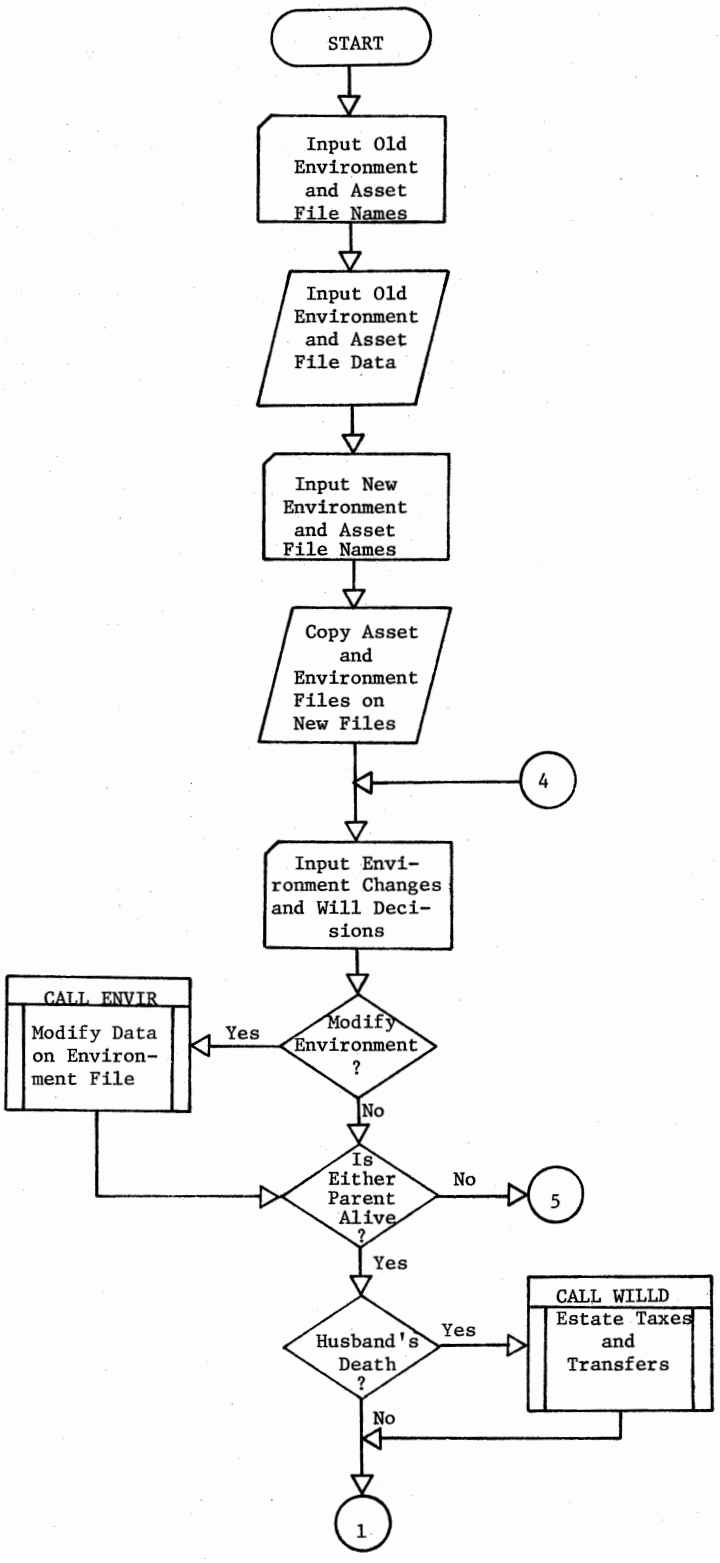

Figure 1. Flow Chart of Main Program

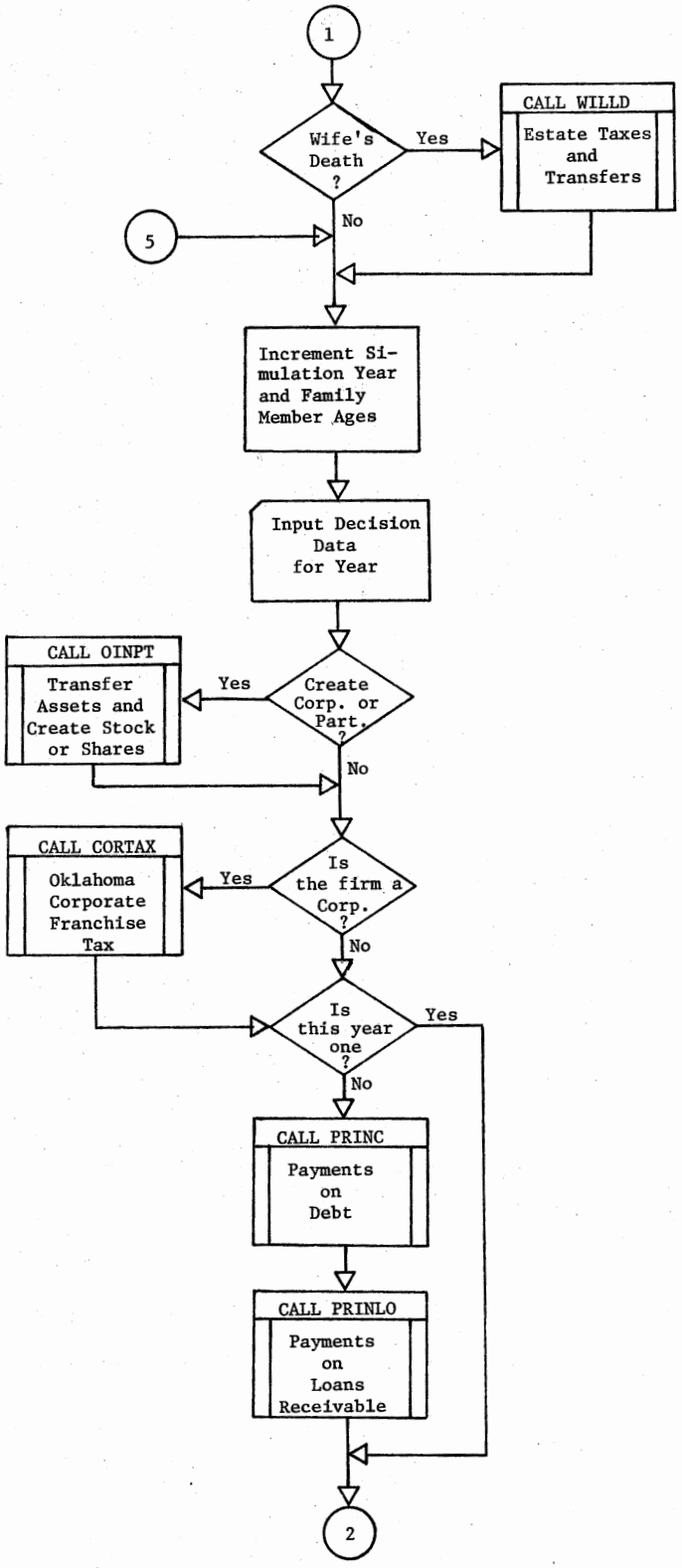

Figure 1. (Continued)

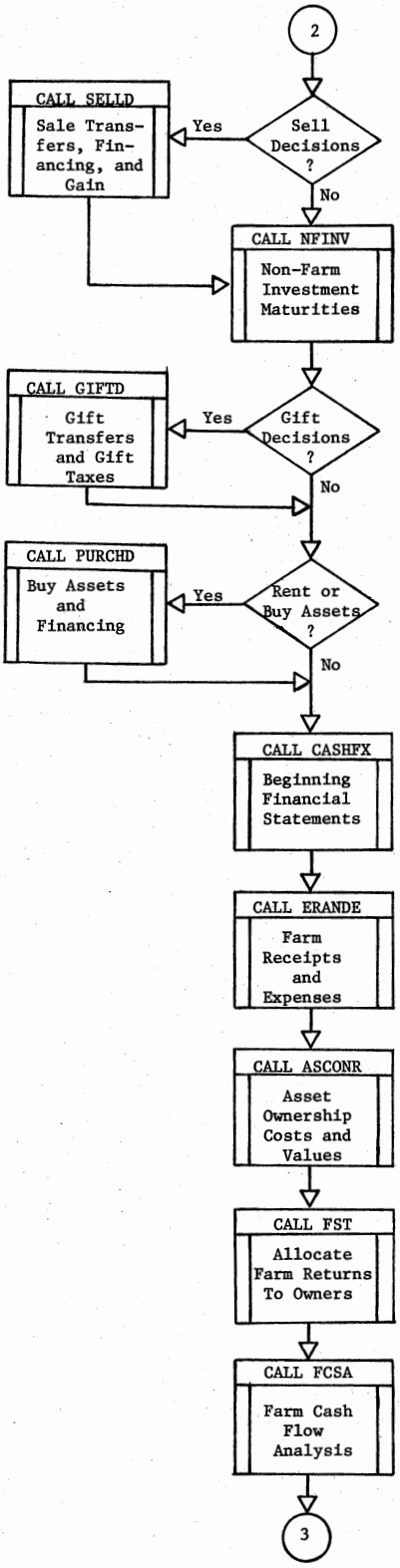

Figure 1. (Continued)

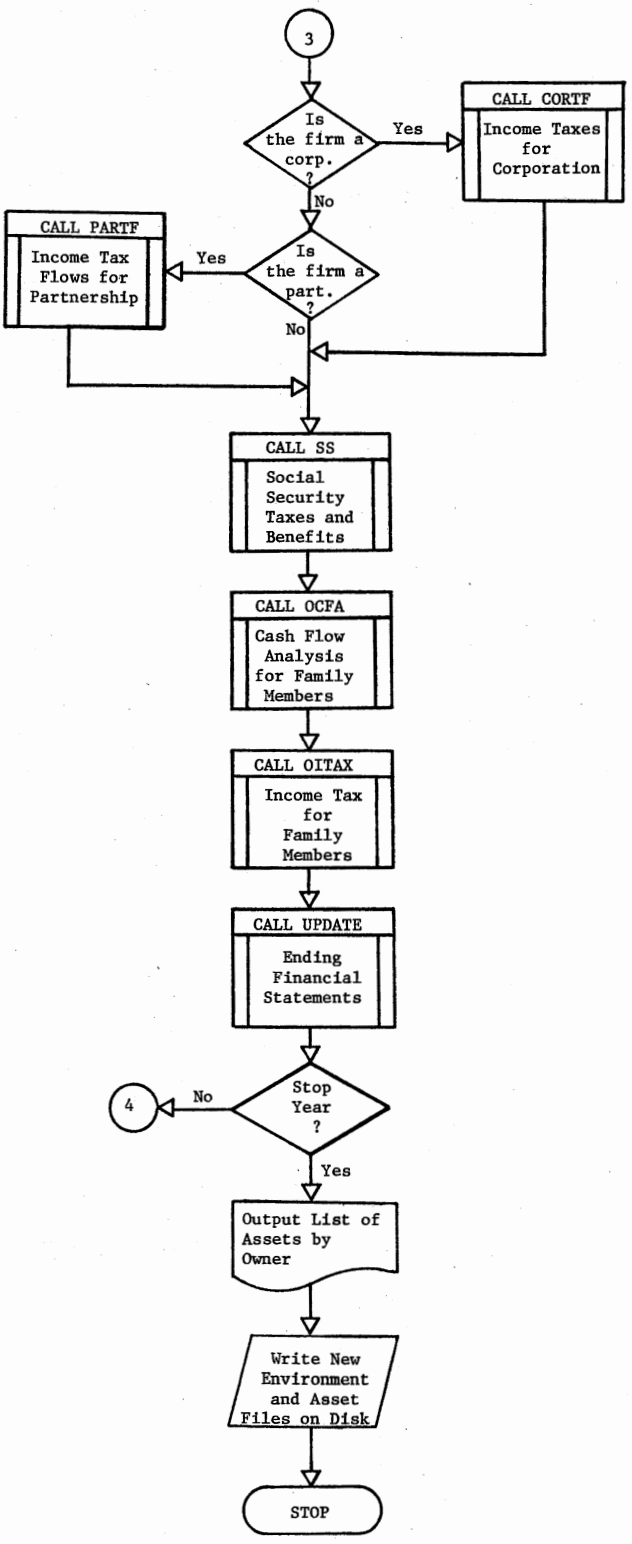

Figure 1. (Continued)

the beginning situation for future simulation runs.

If the simulation year is not the last to be processed in the simulation run, the program checks to see if there are changes in data values contained in the Environment file before processing annual input data for the next simulation year. The process continues until the specified number of years have been simulated.

Subroutine ENVIR

As indicated by Figure 1, subroutine ENVIR is called by the MAIN program if modifications are to be made in values of Environment file variables. Environment variable values are changed by specifying in the control deck the keyword ENVI followed by an identification of the variables to be changed and their new values.

Subroutine WILLD

Subroutine WILLD is called when a parent's age reaches the death age specified in the Environment file. If the deaths of both parents occur during the same year, the model assumes that the wife survives the husband. Two versons of subroutine WILLD are available to accomodate the federal estate tax laws before and after the Tax Reform Act of 1976. The following description of the input data requirements and steps performed by the subroutine are based on the new estate tax law. The procedures for determining estate taxes under the new law are described in Roush.

Annual input data specifying the will decision and other characteristics of the estate must be provided for the simulation year the estate transfer is to occur. The input data requirements for subroutine WILLD are shown in Table 12.

Table 12. Input Data Required to Specify an Estate Transfer Decision.

Decision Variable	Definition
UDUCT	Reduction in the market value of the estate for current use valuation of qualifying farm land or closely held business assets.
CHBUS	Net estate value of farm assets or interest in closely held business used to calculate the proportion of federal estate taxes eligible for installment payments.
UDJTA	Reduction in the market value of the estate for current use value appraisal of qualifying assets owned in joint tenancy.
MVJTA	Market value of estate assets qualifying for current use value appraisal and owned in joint tenancy.
PILL(I)	Desired proportion of net estate willed to recepient I. I — Recepient 1 Surviving spouse-outright. 2 Surviving spouse-life estate with remainder interest to farm heirs. 3 Surviving spouse-life estate with remainder interest to non-farm heirs. 4 Farm heirs-outright. 5 Non-farm heirs-outright. 6 Charitable organization.
DILL(I)	Additional cash bequest to recepient I.
DTAX(I)	Estate tax payment made by recepient I. DTAX = 0 No estate taxes paid by recepient I. DTAX = 2 Prorate estate taxes to recepient I. DTAX > 2 Specific dollar amount of estate taxes paid by recepient I.
BEQ	For each estate asset involving a specific bequest by will or sale to a family member, the following data must be provided: Asset number. Dollar value of asset or proportion of asset Recepient Whether asset is inherited by or sold to recepient Current use value of asset Whether asset transfer qualifies for marital deduction

The major functions of subroutine WILLD are to calculate estate transfer costs and implement the asset ownership transfers according to the instructions provided by the will decision. The specific steps performed by the subroutine are described below.

Life Insurance Policies and Annuities. The model locates the insurance policies on the deceased parent's life and examines the owner and beneficiary. The value of life insurance proceeds are determined for each beneficiary. If the owner or beneficiary of the policy is the deceased, the value of the proceeds are included in the gross estate. If the estate is the beneficiary, the proceeds are used to reduce short-term debt or increase the checking account balance.

The estate value of an annuity owned by the decedent is the present value of future annuity payments. The estate value is determined by multiplying the fixed annual payment by the six percent annuity factor for the surviving spouse's age specified in the Annuity file. Under the Tax Reform Act of 1976, qualified retirement annuities passing to a beneficiary are not subject to estate taxation (U. S. Congress 1976, Sec. 2009).

Gross Estate. The value of the decedent's gross estate is the market value of farm and non-farm assets owned outright and in joint tenancy plus the value of gifts exceeding the annual exclusions made by the decedent within three years preceding death. The total value of assets owned at the end of the previous simulation year saved in the Environment file is adjusted for the life insurance and annuity valuations discussed above.

Administrative Expenses. Administrative costs calculated by the model are: executor's fee, attorney's fee, court costs and other miscellaneous expenses. The executor's fee is calculated as a percentage of the market value of the gross estate. The rates used are five percent on the first $1,000, four percent on the next $5,000 and 2.5 percent on the excess (Oklahoma Statutes Title 58, Sec. 527). The estimated executor's fee is calculated and printed, but is not added to total estate transfer costs. It is assumed that the will specifies that the executor will be a family member serving without a fee.

The rates used to calculate the attorney's fee depend on the form of property ownership. The rates used for assets owned outright, in joint tenancy, and in a life estate are shown in Table 13. Attorney's fees are computed on the market value of assets less 50 percent of the debt secured by the assets (Maynard and Laughlin 1970, p. 37). Life insurance proceeds are not subject to the attorney's fee.

Table 13. Attorney Fee Rates Used to Calculate Estate Administrative Expenses.

Value	Rates on Property Owned Outright	Rates Used to Terminate Joint Tenancy or Life Estate
	(Percent)	(Percent)
First $10,000	5.0	1.50
Next $90,000	4.0	1.00
Next $400,000	3.0	0.75
Balance	2.5	0.50
	(Dollars)	(Dollars)
Minimum Fee	450	175

Source: Maynard and Laughlin 1970, p. 37.

Court costs and other miscellaneous expenses are calculated as 0.1 percent of the value of the gross estate less debt and gifts included in the gross estate. The minimum amount of court costs and other expenses is set at $150.

Adjusted Gross Estate. The adjusted gross estate is computed by subtracting debt, administrative expenses and funeral expenses from the gross estate value. Funeral expenses are set at $1,500 in year one money values and increased by the value specified for the annual percentage increase in the cost of living. For federal estate tax purposes, the calculated adjusted gross estate is also reduced by the difference between the "market" and "current use" value of qualifying farm real estate assets. The amount of reduction in the gross estate for current use value appraisal should be determined based on the required procedures (U. S. Congress 1976, Sec. 2003) and specified as annual input data for the will decision. The special use valuation cannot reduce the value of the estate by more than $500,000.

Marital Deduction. A marital deduction is available if part of the estate passes outright to a surviving spouse. The dollar value of the estate passing to the surviving spouse is calculated as the net estate value times the desired proportion to pass outright to the spouse (PILL), plus the additional cash bequests to the surviving spouse (DILL). The value of assets willed to the spouse must be greater than or equal to the value of assets owned in joint tenancy plus the estate value of annuities and life insurance which are included in the estate and pass to the surviving spouse.

The administrative expenses and estate taxes to be paid from the portion of the estate received by the spouse are subtracted from the value of the estate passing to the spouse. Total estate administrative expenses are allocated to estate recipients based on the proportion of the net estate received. The procedure for paying estate taxes is specified by the will decision input data (DTAX variable in Table 12).

For federal estate tax purposes, the marital deduction is limited to one-half the adjusted gross estate or $250,000, whichever is greater (U. S. Congress 1976, Sec. 2002). The marital deduction is adjusted for the current use value appraisal reduction of the estate based on the proportion of the estate received by the spouse.

Estate Distributions. The net estate value remaining after deducting for the value to be received outright by the spouse is distributed to the spouse in life estate, directly to the children or to charitable organizations as denoted by the will decisions (PILL and DILL variables in Table 12). Each recipient's portion of administrative expenses and estate taxes is deducted from the value of the estate received.

Estate Taxes. The federal taxable estate is calculated by subtracting the marital deduction and charitable contributions from the adjusted gross estate. The tax base for determining tentative estate taxes is the taxable estate plus taxable gifts that are not included in the gross estate. The tentative estate tax is calculated using the federal estate tax rate schedule stored in the Tax file. The unified estate and gift tax credit, a credit for state death taxes, a credit for federal estate taxes paid on prior estate transfers, and the amount

of gift taxes paid on lifetime taxable gifts made by the decedent are subtracted from the tentative federal estate taxes. The unified gift and estate tax credit is set at $47,000 which assumes that the death events occur after 1980.

The taxable estate for Oklahoma estate tax purposes is calculated by subtracting the marital deduction, charitable contributions, and a $60,000 specific exemption from the adjusted gross estate. For Oklahoma estate tax purposes, the marital deduction is the value passing to the spouse outright net of administrative expenses and taxes, plus the value of the spouse's interest in assets transferred in life estate. The proportion of the total value of assets transferred to the spouse in a life estate that can be deducted is determined using the five percent annuity factor corresponding to the age of the surviving spouse (Age file). The amount of Oklahoma estate taxes paid cannot be less than the credit for state death taxes allowed in computing federal estate taxes.

Specific Bequests of Assets. The next step performed by the model is to transfer ownership of the specific assets to satisfy the estate value distribution. The estate assets owned outright by the decedent are transferred according to the specific asset bequest decisions. Specific bequests of estate assets owned outright by the decedent can be made to the family members by inheritance or by sale. By purchasing assets from the estate, a family member can acquire ownership of a larger proportion of the estate than specified in the will decision. If a specific bequest is not provided for an asset owned outright, the asset will be liquidated by the model.

For each specific asset bequest, the model makes the transfer of ownership and modifies data values for the Asset file. The income tax

basis for each inherited asset is calculated using the procedures implemented by the Tax Reform Act of 1976 (U. S. Congress 1976, Sec. 2005). If an asset is sold or liquidated, the model calculates the selling expense and the amount of the ordinary income or long-term capital gain. The gain is calculated by subtracting the new basis and selling expenses from the market value of the asset. Federal and Oklahoma income taxes are calculated on the resulting taxable income.

Termination of Joint Tenancy and Life Estate. After the transfers of assets owned outright are made, the model transfers the ownership of assets owned by the decedent in joint tenancy to the surviving spouse. Assets owned in joint tenancy by the surviving spouse are changed to outright ownership. Assets owned by the decedent in a life estate are transferred to the heirs owning the remainder interest.

Adjustments to Survivors' Cash Balances. After all estate transfers and sales have been implemented, the model adjusts the checking acount balances for each surviving family member. The checking account balances are increased by proceeds from life insurance policies and decreased by the amount of cash paid for assets purchased from the estate. If the estate does not contain enough cash (after the asset sales and liquidations) to pay estate taxes, administrative costs, income taxes and debt claims, the deficit is paid by the survivors. If the estate contains excess cash, it is distributed to the survivors.

Installment Payment of Federal Estate Taxes. The model determines the amount of federal estate taxes that can be paid in installments over a fifteen-year period for each survivor. The portion of federal estate taxes that can be paid in installments is based on the proportion

of the adjusted gross estate that is comprised of closely-held business assets (U. S. Congress 1976, Sec. 2004). The estate value of farm assets, or interests in the farm partnership or corporation, owned by the decedent is provided by the user as part of the will decision. The values determined for the maximum amount of estate taxes that are eligible for installment payments with a four and seven percent interest rate are used in the financial calculations performed by subroutine CASHFX.

Estate Transfer Summary. The final step performed by subroutine WILLD is to determine the total accumulated value and the discounted value of the estate assets transferred to the farm and non-farm heirs. The discount rate is specified in the Environment file. Transfers to the heirs include outright transfers, property received by terminating a life estate, and life insurance proceeds. The value of transfers is reduced by estate debt, administrative expenses, estate taxes, selling expenses and income taxes.

Subroutine OINPT

If the legal form of business organization is to be changed from a proprietorship to either a corporation or partnership, the MAIN program calls subroutine OINPT to transfer the ownership of farm assets to the new entity and create stock or share assets for the owners. The decision to change the legal form of business organization is communicated to the model by providing annual input data specifying the keyword CORP or PART, a list of assets to be transferred to the new entity and the characteristics of the stocks or shares to be received by the owners.

The transfer of asset ownership to create the new entity is assumed to be a non-taxable exchange. The tax basis of each asset owned by the corporation is the previous owner's basis. Assets transferred to the new entity are not eligible for fast methods of depreciation. For assets depreciated using the declining balance method, the model changes the depreciation method to straight line.

The value of stock in corporation or share of the partnership received by each family member is calculated based on the net contribution of assets transferred minus the debt secured by the asset assumed by the new entity. The basis of the stock assets received is the total basis of assets contributed minus the debt assumed by the new entity.

If the new entity is a regular corporation, there can be two classes of stock. The user specifies the proportion of each owner's net contribution to be exchanged for each type of stock. The types of stock are common (type 1) and preferred (type 2). The preferred stock has a fixed dividend rate and its market value does not change from its initial value. The total value of common stock is determined at the end of each year based on the ending net worth of the corporation. The initial value of each share of stock is $1,000. The user provides the dividend rates for preferred and common stock. The dividend rate for preferred stock is expressed as a percent of the initial value.

The final step performed by subroutine OINPT is to deduct the administrative cost to organize the new entity from the new entity's checking account balance. For income tax purposes, the organizational expense is prorated over the next five years.

Changing the form of legal business organization may also require modification of values for the following variables contained in the

Environment file:

1. Tax option for corporation (CTAX), regular or subchapter "S",
2. Procedure for calculating rent payments for assets owned by family members (AUSE),
3. Payment method and salary for labor and management provided by husband and farm heir (LUSE, MUSE, PAYM, and PAYL),
4. Variable dividend rate on common stock or withdrawal rate for partners (CDIV and PDIV) and
5. Administrative expense for changing legal form of business organization (COEXP).

Subroutine CORTAX

If the legal form of business organization is a corporation, the MAIN program calls subroutine CORTAX to compute the Oklahoma corporate franchise tax. The tax is computed on the total income tax basis for all assets owned by the corporation less short-term operating debt. The tax rate is $1.25 per $1,000 of tax base.

Subroutine PRINC

The MAIN program calls subroutine PRINC in each simulation year, except year one, to compute principal payments on intermediate and long-term debt secured by each asset owned. It is assumed that principal payments occurring at the start of the first year have already been deducted from the debt balances provided in the initial Asset file. Installment payments on federal estate tax liabilities are also calculated. The total value of principal payments for each asset owner is saved for use by subroutine CASHFX.

Subroutine PRINC also examines endowment and term life insurance policies to determine if the age of the policy has reached maturity. If an endowment policy has reached its maturity date, the proceeds of the policy are paid to the named beneficiary and the asset is deleted from the Asset file. Term life insurance policies are deleted from the Asset file when the age of the policy reaches its maturity date.

Subroutine PRINLO

The MAIN program also calls subroutine PRINLO in all years, except year one, to calculate principal payments on loans receivable. If the loan was created by an installment sale, the amount of long-term, short-term and/or ordinary gain to report for income tax purposes is determined for each family member. If the loan balance is reduced to zero by the principal payment, the asset is deleted from the Asset file.

Subroutine SELLD

If there are asset sell decisions to be implemented, subroutine SELLD is called. Sell decisions are specified by providing the annual input data shown in Table 14 for each asset to be sold during the simulation year. An asset can be sold to another family member or sold to an external buyer. If the asset is sold to a family member, the subroutine processes the purchase transaction for the buyer, as well as the sell transaction for the seller.

The simulation model performs the following steps for each sell decision:

1. Locate asset to be sold in Asset file.
2. Calculate the selling price (market value times proportion sold).

Table 14. Input Data Required to Specify a Sell Decision.

Decision Variable	Definition
ACODE	Asset number of item sold.
PROS	Proportion of asset sold.
DPPC	Proportion of selling price paid in cash by the buyer.
SFIN	Loan number, if the asset sale is financed by the seller; 0, otherwise.
PMET	Code for method used in calculating annual debt payments for buyer.
MATY	Loan maturity in years.
RATE	Loan interest rate.
INST	1, if the seller finances the sale using the installment plan for computing taxable income; 0, otherwise.
BUYR	Ownership method code for buyer (0, if the asset is not sold to a family member).
ULIF	Years of useful life used by the buyer in calculating depreciation.

3. Calculate the selling expense (selling price times administrative expense rate for asset from Environment file).
4. For sales that are not installment sales, determine the amount of gain or loss (selling price minus basis minus selling expense) and allocate to long-term, short-term and ordinary gain based on income tax law for type of asset and number of years owned.
5. Calculate the amount of investment credit recapture if investment credit was taken and asset is sold prior to end of its useful life.
6. Calculate the amount of cash received by the seller (down payment minus selling expense minus remaining debt balance).
7. If the sale if financed by the seller, calculate the constant annual loan payment to be received based on the loan payment method, maturity and interest rate.
8. If the asset is sold to a family member, create a new record in the Asset file and determine the following values:
   a. Purchase cost (selling price).
   b. Administrative expenses paid by the buyer (purchase cost times administrative expense rate from Environment file).
   c. Cash paid by the buyer (down payment plus administrative expense).
   d. Basis (purchase price), useful life (decision input) and depreciation method (same as seller).
   e. Debt balance and annual debt payment.

After all sales of the same asset have been processed, the Asset file record for the asset sold is modified or deleted. After all sales financed by the same loan are processed, a new loans receivable asset record is created. If the sales financed by a loan are installment

sales, the gross profit percentages for long-term, short-term and ordinary gains are calculated and saved. The gains to be reported during the year of sale are added to gains calculated for non-installment sales.

Subroutine NFIVM

Non-farm investments, such as certificates of deposit or bonds, have a specified maturity date. Subroutine NFIVM locates the non-farm investment assets in the Asset file and compares the age of each investment (Asset file) to the years of life for the investment (Buy Table file). If an investment is to mature during the simulation year, the model calculates the long term gain or loss (market value less purchase cost) and deletes the asset record from the Asset file.

Subroutine GIFTD

The MAIN program checks the annual input data to determine if any gift decisions are to be implemented during the simulation year. Subroutine GIFTD is called to process the gift decisions. Two versions of subroutine GIFTD are available to accomodate the federal gift tax laws before and after the Tax Reform Act of 1976. The steps performed by the subroutine are described below under the new law. The procedures for determining federal and Oklahoma gift taxes are discussed in Roush.

The annual input data must specify the number of farm heirs and non-farm heirs that will receive gifts during the simulation year so that the number of annual exclusions can be determined. Table 15 defines the decision values that are needed to describe each gift decision. The amount of an asset given away can be denoted as a proportion of the

asset or a specific dollar value. Each parent can make gifts to the children or to the spouse. The ownership method for an asset owned by a parent can be changed by specifying a gift decision denoting the donee as the present owner with the new ownership method.

Table 15. Data Input Required to Specify a Gift Decision.

Decision Variable	Definition
ASCD	Asset number of asset given away.
VALGF	Value of gift.
PROG	Proportion of asset given away.
DONE	Ownership method code for donee.

For each gift decision, subroutine GIFTD performs the following steps:

1. Locate the asset to be given away.
2. Calculate the value of the gift and the proportion of the asset given away.
3. Check to see if more of the asset is given away than is available. Gifts of cash (checking accounts) can exceed the value of cash available.
4. Calculate the administrative expense (gift value times the administrative cost rate in the Environment file).

5. Pay off debt secured by the portion of the asset given away.
6. Create a new asset record in the Asset file for the donee and specify data values for the Asset file variables.[1] The basis for the asset is the donor's basis adjusted for gift taxes paid (U. S. Congress 1976, Sec. 2005).

After all gifts of one asset have been processed, the asset record for the donor is deleted or modified to reflect the proportion of the asset given away.

Once all gifts have been implemented, the model calculates the amount of taxable gifts for each donor. It is assumed that gifts to the children made by either parent are equally divided among both parents for determining federal gift taxes. The gift-splitting option is not allowed under Oklahoma gift tax law. To determine the value of taxable gifts, a $3,000 annual exclusion is subtracted from the value of gifts made to each child or spouse. For federal gift tax purposes, there is a marital deduction for the first $100,000 of gifts made to a spouse (U. S. Congress 1976, Sec. 2002). Also, only 50 percent of the marital gifts exceeding $200,000 are taxable. In Oklahoma, gifts to the spouse are not taxable (Oklahoma Statutes Title 68, Sec. 903).

The gift tax liability is determined for each parent by subtracting the gift tax on total accumulated lifetime taxable gifts from the gift tax on total accumulated lifetime taxable gifts made prior to the simulation year. The federal and Oklahoma gift tax rate schedules are stored in the Tax file. The unused portion of the unified estate and gift tax

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[1] A new asset is not created for gifts of current inventory and checking accounts. The value is added to the donee's existing asset.

credit is subtracted from the federal gift tax liability. The amount of the unified tax credit available is $47,000 (for gifts made after 1980) less the amount used to make taxable gifts in previous years.

Values for the unified credit remaining after gifts, total accumulated taxable gifts, accumulated gifts to the spouse, and total accumulated federal gift taxes are saved in the Environment file for gift and estate tax calculations in subsequent years. The discounted value of gifts made to farm and non-farm heirs and the discounted value of gift expenses (taxes and administrative costs) are also determined and saved in the Environment file.

Subroutine PURCHD

The keyword PURC is used to communicate to the model that the land rent decision is to be changed and/or additional assets are to be purchased during the simulation year. A change in the number of tracts of land rented is made by specifying a value for the annual input data variable "number of tracts of land operated" (TRLD) different than the number of tracts operated (rented and owned) during the previous simulation year.

Prior to reading the decision inputs, subroutine PURCHD calculates the amount of unused real estate credit capacity and the amount of cash available for asset purchases for each owner. Unused real estate credit capacity is determined by summing the differences between maximum debt allowed and the current debt balance for all real estate assets (land and improvements) owned. The maximum debt allowed is the maximum debt to asset ratio for the type of asset times the market value of the asset. Cash available for purchases is the checking account balance,

plus the value of current inventory, less short-term farm operating and personal debt. The cash transactions resulting from estate, sale and gift transfers; principal payments on debt payable and loans receivable; and non-farm investment maturities are also used to adjust the amount of cash available for purchases for each owner.

Next, the decision specifying the number of tracts of land to be operated (TRLD) is read. If TRLD is greater than the number of tracts currently operated, then the appropriate number of tracts are rented. If TRLD is less than the number of tracts currently operated, then part of the land rented during the previous year is released. If TRLD is less than the number of tracts owned, part of the land owned is rented outside the farm family. Changes in the number of acres rented should be accompanied by the purchase or sale decisions for inventory, breeding livestock, machinery, and equipment needed to accomodate the change in farm size.

Input data requirements to specify an asset purchase decision are listed in Table 16. If the asset to be purchased is land, the model checks to see if the tract of land to be purchased (asset item code) is at least one greater than the number of tracts currently owned. Tracts of land must be purchased in the numerical order used to specify tract numbers. Tracts of land purchased are tracts that are currently being rented. If the specified tract is already owned, then the land purchase decision is skipped.

If a purchased asset replaces an existing asset, the program locates the Asset file record for the asset to be replaced and performs the following steps:

1. Determine trade-in value (market value).

Table 16. Data Input Required for Purchase Decisions.

Decision Variable	Definition
REPL	One (1) if purchased asset is to replace asset already owned; zero (0), otherwise.
ASCD	Asset number of asset to be replaced; zero (0), if no asset is replaced.
TYPE	Asset type code for asset purchased.
ITEM	Asset item code for asset purchased.
DESC	Asset description code for asset purchased.
NUMB	Number of units purchased.
DPPC	Proportion of cost paid in cash (down payment).
PMET	Method used to calculate annual debt payments.
RATE	Annual interest rate on debt.
BUYR	Ownership method code for buyer.
DMET	Depreciation method and investment credit code.
MATY	Maturity on debt in years.
LIFE	Useful life for calculating depreciation.
BENF	Beneficiary code on life insurance policy purchased.
FDEP	One (1), if additional first year depreciation is taken, zero (0), otherwise.
PTXI	Proportion of inventory purchase cost that is feeder livestock.
PINI	Proportion of inventory purchase cost insured.

2. Pay off debt secured by the asset.
3. Save the values for basis, accumulated tax depreciation and years owned for calculating basis of new asset.
4. Calculate investment credit recapture.

Next, the model locates the set of parameters in the Buy Table file for the new asset to be purchased. The purchase cost is calculated based on the number of units purchased, list price, purchase cost to list price ratio and purchase cost trend rate. If the asset to be purchased is land (type 10) or a non-farm investment (type 19), the model checks the buyer's purchase capacity.

If the buyer's cash available and unused real estate credit capacity is less than the required down payment for land, then the tract of land and any subsequent purchases of improvements on the tract are not implemented. If the buyer has sufficient purchase capacity, the purchase is implemented and the variables denoting the number of tracts owned and rented are adjusted.

On non-farm investment purchase decisions, the buyer must have enough cash available to purchase the desired number of units. If sufficient cash is not available, the number of $1,000 units purchased is reduced until the purchase cost is less than or equal to the amount of cash available.

Next, the model calculates the administrative costs to implement purchases by multiplying the purchase cost times the rate stored in the Environment file. The model determines the amount of cash paid by the buyer by summing the down payment and purchase expenses and then subtracting the amount that the trade-in value exceeds the debt balance on the asset replaced.

The model creates a new record in the Asset file for the purchased asset. Additions to inventory are added to the buyer's existing inventory. The existing asset record is also used for new assets that replace existing assets. Calculations are made to determine the following data values in the Asset file record:

1. Market value (purchase cost).
2. Basis (Purchase cost less trade-in value of replaced asset plus remaining basis of replaced asset). If the trade-in value exceeds the purchase cost and is greater than the remaining basis of the replaced asset, then the amount and type of gain to be reported as taxable income is determined.
3. Debt balance secured by the new asset and annual debt payment.
4. Amount of investment credit taken on new asset based on specified useful life, basis of new asset and a ten percent investment credit rate.
5. Additional first-year depreciation on qualifying assets with useful life greater than or equal to six years. (Twenty percent of difference between purchase cost and trade-in value).
6. Value for determining future straight line depreciation (basis less additional first-year depreciation).

Additional calculations are required if the asset purchased is life insurance or an annuity. The annual premium for life insurance is calculated and saved in the Asset file. The amount of future annuity payments and the tax exclusion ratio are calculated for annuities based on the parameters stored in the Buy Table file.

Subroutine CASHFX

The MAIN program calls subroutine CASHFX to adjust each owner's cash and debt balances for the beginning of the year transactions performed by the previously described subroutines. Although no annual input data is required for the subroutine, the user may specify the maximum amount of additional debt principal payments to make for each family mamber and the corporation or partnership entity. The subroutine performs the following steps for each family member:

1. Locate personal checking account asset record for owner.
2. Compute trial cash balance by adjusting checking account balance for the cash transactions determined by previous subroutines.
3. Locate owner's personal savings account and add its balance to the trial cash balance.
4. If a death event occurred at the start of the simulation year, add the amount of federal estate taxes qualifying for installment payments with a four percent interest rate to the trial cash balance. It is assumed that the installment payment option will be used at least to the extent of the four percent portion, regardless of the family member's cash position.
5. Examine the owner's trial cash balance. If the trial cash balance is less than the minimum desired cash balance, increase short-term personal debt. If the trial cash balance is greater than the minimum balance, reduce short-term personal debt. The minimum and maximum desired checking account balances for each family member are specified in the Environment file.

6. If there is decision input to make additional principal payments on debt and the remaining cash balance is greater than the minimum cash balance, debt balances secured by assets are reduced until the maximum specified debt payment level is reached or until the cash balance reaches the minimum level. The short-term farm operating debt balance is reduced first.
7. The remaining cash above the maximum desired checking account balance is either invested in a savings account or made available to the farm business depending on the value of the variable RANK specified in the Environment file and the farm business arrangement. If the legal form of business organization is a partnership or corporation, the excess cash may be loaned to the corporation or partnership. The loan balance is saved in the loan receivable asset record designed for this purpose. The interest rate is the savings rate stored in the Environment file. If the farm business is a proprietorship, the excess cash may be added to the owner's farm checking account balance.
8. Examine the short term personal debt balance. If the owner's short term personal debt balance is greater than the maximum desired balance, the debt balance is set at the maximum balance and the cash deficit is covered by reducing the farm checking account, increasing farm operating debt or refinancing owned assets.
9. If the owner does not have a farm checking account balance and has a cash deficit or if the farm operating debt balance exceeds the specified maximum balance, the model borrows

additional cash by refinancing farm assets or ownership interests in the corporation or partnership. The amount of refinancing is limited by the unused credit capacity which is determined based on maximum debt to asset ratios specified for each asset type. If a death event occurred at the end of the previous simulation year, the seven percent portion of the federal estate taxes that qualify for installment payments is used prior to refinancing assets.

10. If a cash deficit exists after the refinancing alternative is exhausted, the remaining deficit is added to the owner's short term debt balance and a warning is printed about potential liquidity problems for the owner.

If the legal form of business organization is a corporation, the farm checking account and operating loan balance for the entity are examined and adjusted using procedures similar to the steps described above. The short term debt balance created by loans from stockholders is saved in the current inventory asset record for the corporation or partnership.

The final set of calculations performed by subroutine CASHFX determine the total asset, debt and net worth values for each owner. These values describe the beginning of year financial position after adjustments for ownership transfer, purchase and financial transactions.

Subroutine ERANDE

Quarterly and total cash farm receipts and operating expenses are calculated by subroutine ERANDE. Data used by this subroutine are located in the Flow file record corresponding to the total number of

tracts of land operated (TRLD). The following steps are performed by the subroutine:

1. Calculate the hours of seasonal farm labor required for each quarter by subtracting labor requirements (Flow file) from the hours of labor available from the husband, farm heirs and permanent hired labor (Environment file). Labor expenses are determined by multiplying the seasonal wage rate times the number of hours required. The employer's share of social security taxes are also calculated. The values for the wage rate, social security tax rate and inflation rate applied to farm expense items are stored in the Environment file.
2. Quarterly and total farm net cash flows are determined by subtracting cash operating expenses and seasonal labor expense from cash farm receipts. Quarterly cash receipts and cash expenses stored in the Environment file are compounded by the appropriate trend rate to determine future money flows.
3. Salaries for permanent hired labor and management (non-family) are calculated. The wage rate for permanent hired labor is multiplied by the hours available each quarter. The management salary is determined by multiplying the annual net cash flow determined in step two times a specified percent return for management times the proportion of total management provided by non-family members. The latter two values are specified by the user in the Environment file.
4. Rent paid to non-family members is calculated based on the cash rental rate and trend rate specified in the Flow file for each tract of land. The tracts of land rented have tract

numbers that range from one greater than the number of tracts owned to the total number of tracts operated (rented and owned).

5. The net cash return to owned resources is calculated by subtracting the labor and management salaries and land rent from the net cash flow determined in step two. The allocation of these expenses among quarters of the year is based on the cash flow parameters stored in the Environment file.

Subroutine ASCONR

Subroutine ASCONR is called to calculate ownership costs and change in market value for each owned asset. Parameters used are obtained from the Buy Table and Asset files. Subroutine ASCONR determines the following values for each farm asset owned by each family member and entity:

1. Interest on debt secured by the asset (debt balance times interest rate).
2. Property taxes (market value times property tax rate).
3. Property insurance premiums (property insurance rate times the insured value on inventory and purchase cost on other insured farm assets).
4. The end of the year market value based on the following market value equations and depreciation methods:
   a. Declining balance method[2]

[2]The value equation is a modified version of the standard double declining balance depreciation equation described in the operating manual for the Oklahoma State University Enterprise Budget Generator (Kletke, p. 20). Modifications are made to account for increasing replacement costs.

$$VALUE = (UNITS)\ (RFV1)\ (RFV2)^{(AGE + 1)}\ (LIST)\ (PCLP)\ (1 + TREND)^{YR}, \quad (3\text{-}1)$$

where:

UNITS = number of units of the asset owned,

RFV1 = parameter specifying proportion of the original value that remains after the first year depreciation occurs for the particular type of asset,

RFV2 = parameter used in standard double declining balance equation to specify the annual rate of depreciation,

AGE = the age of the asset in years,

LIST = list price of asset in year one money value,

PCLP = the purchase cost to list price ratio,

TREND = annual rate of increase in purchase cost, and

YR = the simulation year.

b. Straight line method

$$VALUE = (UNITS)\ (LIST)\ (PCLP)\ (1 + TREND)^{YR}\ [1 - (1 - SALV)\ (AGE + 1)/(LIFE)], \quad (3\text{-}2)$$

where:

SALV = ratio of salvage value to purchase cost and

LIFE = years of useful life.

c. Appreciation in value (land)

$$VALUE = BVALUE\ (1 + APPR), \quad (3\text{-}3)$$

where:

BVALUE = value of land at beginning of the year and

APPR = annual rate of increase in value for land.

5. Depreciation taken for income tax purposes based on either straight line or double declining balance tax depreciation

methods. If the declining balance tax depreciation method is selected, the rate is limited to twice straight line rate for machinery and equipment and one and one-half times straight line rate on buildings.

6. The dollar value of resource services provided by each farm asset, except inventory, is determined by multiplying the number of units owned by the contribution per unit of asset owned compounded by the annual percentage increase in farm income. The dollar value of the inventory contribution is determined by multiplying the opportunity interest rate by market value. The contribution for each type of asset is predetermined and specified in the Buy Table file. The value should be based on either the average annual ownership costs (interest on the investment, taxes, insurance and depreciation) or an opportunity rental rate. The computed values for asset contributions are used by subroutine FST to allocate farm income among resource owners.
7. If the value for the number of tracts of land rented is less than zero, some tracts of land owned are rented to farm firms outside the family. In this case, the program calculates rent income for the owner of the appropriate tracts based on rent parameters stored in the Flow file.

After completing the above calculations for farm assets, subroutine ASCONR performs specialized calculations for each of the other types of assets owned by family members. For corporation stock or partnership shares owned, the model calculates the following values:

1. Interest paid on debt secured by the asset.

2. Fixed dividends on preferred stock based on dividend rate and initial value of stock.
3. Total beginning of the year value of each type of stock or share owned by each family member.

On loans receivable assets, the model calculates the amount of interest to be received by each family member. The amount of cash received from non-farm investments (interest, rent or dividends) is calculated based on the initial value (purchase cost) and the cash earnings rate. The change in market value of equity type non-farm investments is determined and added to the beginning value based on the rate of growth specified in the Buy Table file.

The model examines each annuity to determine if payments to the owner are to be made during the simulation year. If a payment is made, the amount of taxable income for the owner is determined. The market value of the annuity is adjusted for the payment. If the payment is the last one to be made, the annuity is deleted from the Asset file. If the payment starting date has not been reached, the market value of the annuity is increased by the interest earnings for the year.

Annual premium payments are calculated for each owner of the life insurance policies. The cash value of the policy is increased based on the parameters specified in the Buy Table file for type of policy acquired at a given age of the insured.

For each personal non-farm asset owned by each family member, the model calculates interest on debt, property taxes and maintenance costs. These expenses are allocated to either deductible or non-deductible tax flow categories for income tax purposes. The end of year market value is calculated using the equation for the specified depreciation method.

Subroutine FST

Subroutine FST is called to allocate cash farm income among resource owners. The following steps are performed:

1. Determine the value of labor services provided by the husband and the farm heirs based on the annual hours of labor used, the opportunity wage rate specified in the Environment file, and the specified annual percentage increase in cash farm expense.
2. Determine the value of management services provided by the husband and the farm heirs based on farm net cash flow (determined by subroutine ERANDE), the proportion of total management provided, and the specified percent of farm cash flows allocated to management.
3. If the firm is a corporation or partnership, salaries are paid to the husband and the farm heirs. The salary may be the amount specified by the user (adjusted for the trend in farm expenses) or determined by the model based on the percentage of total resource services provided. In the latter case, the salary is the net cash farm income multiplied by the ratio of the value of labor and management services contributed by the owner to the total value of resource services (assets, labor and management) provided by all owners. If the farm is a corporation, the employer's share of social security taxes are determined using the rate and wage base specified in the Environment file. The social security wage base ($15,300 in 1976) is assumed to increase at the rate specified for the cost of living.

4. Rent payments to family members who lease assets to the farm business are determined based on either a fixed payment specified in the Buy Table file adjusted for the trend in farm expenses or the proportion of the total value of resource services provided by the particular asset.
5. Total and quarterly cash farm income flows are determined by adjusting the cash flows calculated in subroutine ERANDE for the rent and salary payments to family members and for social security taxes paid. If the firm is a proprietorship, net cash farm income is allocated between the husband and the farm heirs based on the proportion of the total value of the resource contributions provided. The cash ownership costs calculated by subroutine ASCONR are subtracted from the quarterly farm cash flows for the corporation or partnership, or the husband and farm heirs, depending on the farm business arrangement. The rent, salary and ownership expenses are allocated among quarters of the year based on the cash flow parameters stored in the Environment file.
6. The value of inventory owned by the corporation, partnership, or the husband and farm heirs is increased by the specified rate of increase in farm income.
7. The value of the Environment file variable denoting the maximum farm operating debt is set equal to the ending market value of inventory owned.

Subroutine FCSA

The primary function of Subroutine FCSA is to perform a quarterly

cash flow analysis for the farm business. The farm business arrangement determines the cash flow procedure for this subroutine. If the firm is a corporation or partnership, a cash flow analysis is performed for the business entity. If the firm is a proprietorship, a farm cash flow analysis is performed for both the husband and the farm heirs.

If the firm is a corporation, dividends on common stock are computed and added to fixed dividends on preferred stock. The total value of dividends paid on common stock are computed by multiplying the dividend rate (CDIV) times cash farm income for the corporation. Dividends are allocated to each owner based on the proportion of stock owned.

If the firm is a partnership, withdrawals for the partners are calculated by multiplying the withdrawal rate (PDIV) specified in the Environment file times cash farm income. The amount of withdrawals for a partner is determined based on the share of the partnership owned.

If the firm is a proprietorship, the husband and the farm heirs transfer a proportion of their cash farm income from their farm checking accounts to their personal checking accounts. The proportion (PWIT) is specified in the Environment file.

The quarterly farm cash flows calculated by the previously called subroutines reduced by owner withdrawals are used to determine farm interest payments, interest receipts, and the end of the year checking account and operating debt balances. If the calculated cash position at the beginning of a quarter is less than the specified minimum balance, additional funds are borrowed. If the calculated cash position is greater than the minimum balance, payments are made on the operating loan. If the operating loan balance is zero, and the cash balance is greater than the specified maximum checking account balance, the excess

is placed in a temporary farm savings account until needed in subsequent quarters. The amounts of interest received on savings and paid on debt are based on the average quarterly savings or debt balances.

If the farm is a proprietorship, subroutine SS is called to calculate social security payments and retirement benefits. If the firm is a corporation or partnership, subroutine CORTF or subroutine PARTF is called to determine the income tax flows for the respective entity and then subroutine SS is called.

Subroutine CORTF

Subroutine CORTF determines the taxable income and income taxes for the corporation. Taxable income for the corporation is cash farm income plus ordinary and short term gains from asset sales minus corporate franchise taxes, cash paid for deductible inventory purchases, additional first year depreciation and regular depreciation. If the corporation was formed during the preceding five years, one-fifth of the organizational expense is deducted.

The procedures used by the model to determine income taxes for a corporation are described in Roush. Net capital losses cannot be deducted by a corporation. They are carried forward by the simulation model to a subsequent year when they can be offset by capital gains. Short and long term capital losses are combined and treated as short term losses in subsequent years.

Oklahoma corporate income taxes are calculated as four percent of taxable farm income and net long term gain. Oklahoma income taxes are subtracted from taxable farm income for the federal tax calculation.

The method used to determine federal income taxes for the

corporation is specified in the Environment file (CTAX). The simulation model is structured to calculate corporate income taxes for a regular corporation using either the current tax rates (1975-1977) or the rates in effect prior to 1975. For a subchapter "S" corporation, the values for undistributed taxable income, net long term gain, investment credit taken and investment credit recapture are distributed to stockholders based on the proportion of the stock owned. Undistributed taxable income is taxable income reduced by dividends paid.

If the corporation is a regular corporation, the federal income tax liability is calculated by applying the corporate tax rate to taxable income plus net long term gain. If there is a net long term gain, an alternative capital gain tax (30 percent of net long term gain) is calculated and the computation resulting in the smallest taxes is used. The amount of investment credit recapture is added to calculated income taxes. Investment credit taken and carry-overs from previous years are deducted from taxes to the extent of taxes due. If there is excess investment credit, the amount is carried forward to the next simulation year.

Subroutine PARTF

Subroutine PARTF is called to calculate the partnership taxable income and allocate the income among partners based on the proportion of the partnership shares owned. Taxable farm income for the partnership is cash farm income plus ordinary income from asset sales minus regular depreciation, cash paid for deductible inventory purchases, and one-fifth of organizational expenses, if the partnership was formed within the preceding five years. The model calculates each partner's

share of taxable income, additional first year depreciation, long and short term capital gains, investment credit taken and investment credit recapture.

Subroutine SS

Subroutine SS determines social security taxes, social security benefits and retirement fund contributions for each family member. The steps performed to calculate social security taxes are:

1. Adjust the social security wage base by the specified rate of increase in the cost of living (SCLI).
2. Determine total employee compensations for each family member (non-farm salary plus salary received from the corporation).
3. Employee social security taxes due are determined by multiplying the employee tax rate times the amount of employee compensation that does not exceed the social security wage base.
4. Determine self employment income (partnership income including salaries and cash farm income from a proprietorship reduced by depreciation expense).
5. Self-employment taxes are determined by multiplying the self-employment tax rate times the amount of self-employment income that does not exceed the social security wage base reduced by employee compensations already taxed.
6. The amount of earnings taxed is added to accumulated social security earnings, and the number of years of social security earnings is increased.

The values for social security tax rates and the social security wage base are stored in the Environment file. The social tax

regulations applicable to proprietorship, partnership and corporations are discussed in Roush.

If tax deductible contributions are to be made to a retirement annuity (RIRA > 0) and the annuitant's age is less than the age when annuity payments are to begin, the subroutine adds the specified retirement fund contribution to the retirement annuity asset. The maximum amount of the contribution (desired or legal maximum) is specified in the Environment file (RIRA). The model checks to make sure the contribution does not exceed 15 percent of self-employment or employee earnings. The annual payment to be received at retirement is calculated based on the parameters specified in the Buy Table file (interest rate, age annuity payments start and number of payment years) and the current age of the contributor.

If the age of the parent is greater than or equal to the specified retirement age and the retirement age is at least 62, the model calculates the amount of social security retirement benefits. The expected level of retirement benefits at age 65 is specified by the user in year one money values prior to simulation. Prior to simulating the retirement year, the user should check the amount of projected accumulated social security earnings, re-estimate the base level of benefits, and modify the Environment file variable value (BENF). The parameters used to calculate and adjust social security benefits are based on regulations in effect on June, 1975 (U. S. Department of Health, Education and Welfare 1975). The model calculates the amount of social security retirement benefits for the husband by performing the following steps:

1. Adjust retirement benefit level and the maximum earnings level specified in the Environment file for the cost of living increase.

2. If the retirement age is less than 65, adjust the benefits for early retirement. Benefits are reduced by 6 2/3 percent for each year the retirement age is less than 65.
3. If the spouse is living and age is greater than or equal to 62, calculate the retirement benefit for the spouse. The spouse's benefit is fifty percent of the benefit determined above before the reduction for early retirement. If the spouse's retirement age is less than 65, the spouse's benefit is reduced by 8 1/3 percent for each year the retirement age is less than 65.
4. If the retiring parent's age is less than 72 and employment earnings for the simulation year exceed the maximum earnings, total benefits (retirement and spouse benefits) are reduced by one-half of the excess earnings.

Social security retirement benefits are determined for the wife if the wife has employment earnings. If the husband is deceased and the wife's age is at least 60, the model also determines the survivor's benefits. The survivor benefit level is equal to the husband's benefit level (if he were living) reduced by 5.7 percent for each year the wife's age at the time of the husband's death is less than 65. The model checks the total benefits (widow and retirement) received by the wife to make sure that they do not exceed the family maximum benefit level. If the wife's age is less than 72, total benefits are reduced by one-half the amount that employment earnings exceed the maximum level.

Subroutine OCFA

Subroutine OCFA is called by the MAIN program to perform a cash

flow analysis for each family member to determine the values for the ending personal checking account balance, short term personal debt balance, interest received on the savings account and interest paid on short term personal debt. Quarterly cash flows from farm and non-farm sources determined by the previously described subroutines are combined in the calculations performed by subroutine OCFA.

Family living expenses are obtained from the Environment file and adjusted for increases in the cost of living. The minimum and maximum desired personal checking account balances control the quarterly changes in the savings account and short term debt balances. The ending balances are adjusted for interest earned on savings or paid on debt.

Subroutine OITAX

Subroutine OITAX is called by the MAIN program to calculate federal and Oklahoma income taxes for each family member. The income tax calculation procedures are based on the tax regulations for 1976 returns which are described in Roush. The following steps are performed for each family member:

1. Determine the level of itemized deductions by adding the values for interest paid on short term personal debt, deductible ownership costs on personal assets and the portion of family living expenses that are itemized deductions.
2. Determine gross income by adding rent income, interest income, the taxable portion of annuity payments, non-farm salaries, ordinary gain from asset sales, dividends, farm salaries, taxable farm income and the share of undistributed taxable

income from the partnership or the subchapter "S" corporation. The deductions from gross income include asset ownership costs on assets rented to the farm firm, interest on debt secured by corporation or partnership shares, and the contribution to a retirement annuity.

3. If the husband and wife have a joint return, the wife's gross income, itemized deductions, gains from asset sales, investment credit recapture, investment credit taken and additional first year depreciation are added to the values determined for the husband.
4. The amount of additional first year depreciation taken is reduced if it exceeds the maximum allowable for the specified type of return.
5. The level of personal exemptions is determined based on the number of dependents and age of the family member.
6. The long and short term gains resulting from asset sales are examined and the net long term or short term gain or loss is determined. If there is a loss and it exceeds the maximum loss that can be deducted, then the amount of the long or short term capital loss carry-over is calculated and saved for the next simulation year.
7. The amount of itemized deductions are compared to the standard deduction available for the specified type of return and the appropriate deduction is determined.
8. Taxable income is calculated as gross income plus the net short or long term gain, minus additional first year depreciation, personal exemptions, a deduction for 50 percent of net

long term gain, and the itemized or standard deduction.

9. Federal income taxes are calculated using the appropriate tax rate schedule for the type of return. If there is a long term gain, federal taxes are computed against using the alternative capital gain tax. Taxes computed under the alternative method are used if a tax reduction results.
10. The amount of federal income tax is adjusted by adding investment credit recapture and subtracting investment credit taken (including carry-overs from previous years) and the personal tax credits. If the investment credit taken reduces taxes to less than zero, the excess amount is carried forward to the next simulation year.
11. The taxable income calculated above is also used to compute Oklahoma income taxes using the tax rate schedule applicable to the type of return.
12. If the parents file a joint return, the taxes are paid by each parent in proportion to the taxable earnings for each parent.

Subroutine UPDATE

The last major subroutine called by the MAIN program for a simulation year is subroutine UPDATE. This subroutine performs the following functions:

1. Determine the end-of-year farm and non-farm total asset, debt and net worth values for each family member and entity.
2. Increment the age and years owned values for each asset owned.
3. Determine the ending market value of stock or shares owned by each family member based on the net worth of the corporation

or partnership and the proportion of the stock or shares owned. If the firm is a partnership or subchapter "S" corporation, the tax basis of each family member's stock or share is increased by the owner's share of undistributed taxable income.

4. The gift and gift tax Environment variables that denote gifts made or taxes paid within each of the previous three years are updated for gift transactions occurring during the simulation year.

Output Printed by the Simulation Model

Examples of the output tables printed by the simulation model are shown in Appendix B. The general types of output printed for each simulation year are:

1. Summary of cash flow and income tax information calculated for each asset sale.
2. Summary of asset gifts to each donee and gift taxes paid by each parent.
3. Summary of financial transactions for each asset purchased or replaced and remaining cash and unused real estate credit capacity available for each owner.
4. Sources and uses of funds statement resulting from the beginning of year asset ownership transfer, purchase and financial transactions for each owner.
5. Beginning of the year balance sheets for each owner.
6. Summary of net cash farm income, resource contributions, and compensations for each owner.
7. Summary of income tax flows for the farm business.

8. Summary of taxable income, deductions, and income and social security taxes paid by each family member.
9. Summary of all cash inflows, cash outflows and net cash available after taxes and consumption for each family member.
10. Summary of beginning values, ending values, and annual change in asset, debt and net worth for each owner.

If a death event occurs at the start of a simulation year, subroutine WILLD prints several tables showing the estate composition and value, the estate transfer costs, and the distribution of estate assets. The accumulated values and discounted values of gift and estate transfers and transfer costs are printed by the model at the end of each simulation run.

CHAPTER IV

DESCRIPTION OF THE CASE FARM DATA AND SIMULATION EXPERIMENTS CONDUCTED

The previous chapter described the initial and annual input data requirements for the simulation model. Values for variables which describe a farm firm and family situation are specified in four data files. Annual input data must be provided specifying values for decision variables representing the ownership transfer strategies and farm business arrangement to be tested during a simulation run. The purposes of this chapter are to describe the initial input data for the farm firm and family situation selected for this study and to outline the specific business arrangement and asset ownership transfer strategies to be simulated and analyzed. This sets the stage for the presentation of results in the subsequent chapters.

Data from an actual southwestern Oklahoma wheat and stocker cattle family farm operation are utilized to test the simulation model and to estimate the outcomes of various asset ownership transfer and business arrangement strategies. The case farm data were obtained through an informal interview conducted with the family during March, 1976, and by the use of the family's farm records for the 1975 calendar year. The initial interview session was structured to ascertain data pertaining to family characteristics, farm resource situation, previous estate planning, and objectives for the family. Although the farm situation

described in this chapter is a specific case, the nature and scope of the problem is typical of many other family farm operations.

Data Describing the Case Farm Situation

A summary of the basic data describing the case farm firm and family situation as well as the assumptions or procedures used in specifying the data are presented below. The initial input data values contained in the Asset, Environment, Buy Table and Flow files are presented in Appendix A.

Family Characteristics and Goals

The case farm family consists of the husband (age 42), the wife (age 38), a son (age 18) and two daughters (ages 15 and 13). The son's plans are to join with the father in the operation of the family farm. The two daughters have not made their career plans. It is assumed that the two daughters will pursue non-farm vocations and will not actively engage in the operation of the family farm. Thus, for model classification purposes, the son is the farm heir and the two daughters are non-farm heirs.

Although the parents are several years from retirement, they are well aware of the need for retirement and estate planning. In fact, as indicated during the interview, the major reason for their cooperation and willingness to provide data for this study is to obtain information concerning the impact of alternative farm business arrangements and asset ownership transfer strategies to aid in developing their long-range plans. The conclusions drawn from the interview session regarding the parent's long-range firm growth, retirement and estate

transfer objectives are described below.

Firm Growth Objectives. Although the current size of the farm business is large enough to provide a sufficient standard of living and retirement of existing debt for the parents, the family would like to provide for continued firm growth through acquisition of additional land. Cash available after consumption, income taxes and scheduled debt payments is currently being used to upgrade the machinery capacity and to build equity for land purchases. Acquisition of additional land via rental and purchase would increase utilization of the machinery investment and provide an operation large enough for two families. The parents are willing to continue to use their investable funds to expand the size of farm business, at least until they reach retirement age. However, they do not want to increase debt beyond the point where debt service requirements could not be supported from income available during retirement.

The farm business is a sole proprietorship. The parents are willing to consider multiple owner business arrangements that will help to accomplish their firm growth, retirement and estate transfer objectives.

Retirement Objectives. The parents want to make business plans that will allow them to retire at age 62 (husband's age in 20 years). In order to receive the maximum social security benefits available at age 62, they will minimize their active participation in the operation of the business by selling the non-real estate assets and by renting farm real estate to the son. The parents want to make plans that will provide for the transfer of control of their farm investment in a manner that is financially feasible for the son, equitable for the two

daughters, and at the same time provide sufficient income from rent or other earnings for their retirement years.

Estate Transfer Objectives. The parents desire to make estate transfer plans to provide for the following objectives:

1. Provide the surviving spouse with an adequate level and stable source of income.
2. The estate value passing to the children should be equally divided among all three children.
3. Provide farm heir with the opportunity for acquiring control of the farm business.
4. Provide enough estate liquidity to prevent the possibility of having to liquidate part of the farm business to pay estate settlement costs.
5. Maximize the value of equity transferred to the heirs.

The parents are willing to make lifetime gifts to the children provided their income is not reduced below the amount needed for family living and debt retirement. The husband has a will leaving his estate to the wife outright. The parents want to consider other alternatives that will reduce estate transfer costs and increase the value of equity transferred to the heirs.

Asset Ownership and Resource Availability

Table 17 shows the market value of assets owned, the amount of debt and the net worth for the parents as of January 1, 1976. The parent's beginning net worth is $561,674 which is 75.4 percent of total assets.

Table 17. Beginning Financial Statement for Case Farm Situation, January 1, 1976.

Item		Value
Farm Assets Owned		
501 acres cropland ($625/Ac.)	$313,125	
114 acres native pasture ($400/Ac.)	45,600	
24 acres waste and roads ($200/Ac.)	4,800	
Fences	5,920	
Buildings and other improvements	21,496	
Machinery and equipment	85,208	
Farm vehicles	19,178	
Current inventory	200,491	
Farm checking account	500	
Total farm assets		$696,318
Non-Farm Assets Owned		
House and automobile	$ 36,060	
One acre land	400	
Retirement annuity	1,500	
Cash value of life insurance	2,677	
Personal checking account	7,657	
Total non-farm assets		$ 48,294
Total Assets Owned		$744,612
Farm Debt		
Real estate loans	$ 77,500	
Operating loan	87,353	
Total farm debt		$164,853
Non-Farm Debt		
Home loan		$ 18,085
Total Debt		$182,938
NET WORTH		$561,674

A list of the individual asset items and the data values specified for each asset contained in the Asset file is shown in Appendix A, Table 61. Most of the data for the Asset file was obtained from the asset inventory and depreciation schedules contained in the family farm records. Market values of depreciable assets were estimated using the value equations presented in the previous chapter. Market values for land were based on the cost of 160 acres of land purchased by the husband during 1975. Current inventory items include stocker cattle purchased for resale, stored crops (wheat and hay) and cash investment in growing crops. The values of inventory items are the values specified in the family farm records for January 1, 1976.

Asset Ownership. Table 18 summarizes the beginning asset ownership situation. Most of the assets are owned by the husband outright. One 320-acre tract of land (the home place) and the farm home are owned by the husband and wife in joint tenancy. However, the husband contributed the funds to acquire these assets. The wife owns life insurance policies on the husband's life with a face value of $35,000. The husband makes an annual gift to the wife to make the premium payments. The only assets owned by the children are their checking and savings accounts.

Land Availability. The parents own three tracts of land consisting of 640 acres. The home place (tract number one) is 320 acres and the other two tracts are 160 acres each. One acre of the home place (location of the farm house) is classified as a "non-farm investment" type of asset. The farm operation also includes 11 tracts of rented land consisting of 1800 acres. One tract (number four) is 200 acres and the

other 10 tracts are 160 acres each. Table 19 shows a break down of land owned and rented by land use.

Table 18. Beginning Asset Ownership for Case Farm Situation, January 1, 1976.

Ownership Method	Value	Debt	Net Worth
Owned by husband outright	$511,619	$157,353	$354,266
Owned by husband in joint tenancy	230,316	25,585	204,731
Owned by wife outright	2,677	0	2,677
Total for the Parents	$744,612	$182,938	$516,674
Farm heir	1,000	0	1,000
Non-farm heirs	1,000	0	1,000
Total for the Family	$746,612	$182,612	$518,674

Table 19. Beginning Land Availability for Case Farm Situation.

Land Use	Owned	Leased	Total
		(acres)	
Crop	501	1,616	2,117
Pasture	114	133	247
Waste and Roads	24	51	75
Total	639	1,800	2,439

Labor and Management Availability. Table 20 shows the hours of labor available from the husband and the farm heir for each quarter of the year for selected time periods. It is assumed that the husband

Table 20. Projected Labor Availability from the Father and Son During Each Quarter for Selected Periods of Years.

Period of Time	Family Member	Age in Years	Hours of Labor Available				Total
			Quarter of Year				
			1	2	3	4	
Years 1-10	Father	41-51	480	538	535	488	2,041
	Son	18-27	582	653	649	592	2,476
	Total		1,062	1,191	1,184	1,080	4,517
Years 11-20	Father	52-61	450	504	501	459	1,914
	Son	28-37	550	616	613	559	2,338
	Total		1,000	1,120	1,114	1,018	4,252
Years 21-30	Father	62-71	135	135	135	135	540
	Son	38-47	518	579	577	526	2,200
	Total		653	714	712	661	2,740
Years 31-45	Father	72-86	0	0	0	0	0
	Son	48-62	475	532	529	484	2,020
	Total		475	532	529	484	2,020

will reduce the amount of labor available to 45 hours per month at retirement in order to receive the maximum social security benefits available for retirement at age 62. Upon the father's retirement, full time hired labor will be used to provide 2200 hours per year at $2.50 per hour. Seasonal labor will be hired as needed for $2.50 per hour.

During the first 10 years, the father will provide two-thirds of the management input and the son one third. During the next 10 years, until the father's retirement, the management input will be equally divided between the father and the son. After the father's retirement, the son will assume full management responsibility for the operation.

Farm Organization, Income and Expense

The farm enterprise organization is based on the number of acres of crop land operated. For each 100 acres of crop land, the enterprise organization includes 90 acres of wheat, 7.5 acres of grain sorghum, 2.5 acres of sudan hay and 30 stocker steers on winter wheat pasture.

The price levels, yields, and marketing plans for each of the enterprises are shown in Table 21. The yields and marketing assumptions are based on averages for the farm operation during previous years. The wheat, hay and stocker cattle prices are based on prices received during 1975 and the projected prices for 1976 presented in enterprise budgets for Southwest Oklahoma (Oklahoma Crop and Livestock Reporting Service 1976; Provence). The grain sorghum price is based on the average wheat to grain sorghum price ratio for the 1955 to 1974 period and a $3.30 per bushel wheat price (Oklahoma Crop and Livestock Reporting Service 1976; Collins and Ray).

Table 21. Projected Product Yields and Prices.

Crop	Projected Yield	Marketing Plan	Projected Prices
Wheat	24 bu. per acre	Sell 1/2 in July Sell 1/2 in January of next year	$3.30 per bushel
Grain Sorghum	2,600 pounds per acre	Sell at harvest in October	$3.72 per cwt.
Sudan Hay	2.5 tons per acre	Feed 1.8 tons to steers Sell 0.7 tons in December	$35.00 per ton
Stocker Steers	184.5 pounds of gain	Buy in October Sell in March	Buy: $40/cwt. Sell: $40/cwt.

The enterprise organization, prices, yields and marketing assumptions were used to derive the quarterly cash farm receipts which are shown on a 100 crop acre basis in Table 22. The cash farm receipts for the second quarter include miscellaneous income of one dollar per acre.

Table 22. Quarterly Cash Farm Receipts, Operating Expenses and Labor Requirements per 100 Acres of Cropland Operated.

Item	Quarter				Total
	1	2	3	4	
Cash farm receipts per 100 acres cropland (dollars)	10,578	100	3,564	787	15,029
Variable operating expense per 100 acres cropland (dollars)	568	1,075	2,001	5,282	8,926
Labor requirement per 100 acres cropland (hours)	34.02	39.96	47.88	58.14	180.0

Quarterly operating expenses excluding rent, labor, management and ownership costs are also shown in Table 22 on a 100 crop acre basis. These expenses were estimated using the family farm records and Enterprise Budgets for Southwest Oklahoma (Provence). When computing total cash farm expense, a miscellaneous overhead expense of $375 per quarter is added to the variable costs shown in Table 22.

Based on historical prices for the 1964-1974 period, the index of prices paid by farmers increased at an average annual rate equal to

approximately two-thirds the annual rate of increase in the index of Oklahoma land values (Blakley and Kastens; Collins and Ray; USDA 1975). For the simulation experiments performed in this study, land values are assumed to increase at an annual rate of five percent. The values for farm expenses and farm receipts shown in Table 22 are both assumed to increase by 3.33 percent per year.

The labor requirements per 100 acres of cropland shown in Table 22 include livestock and overhead labor in addition to labor required for crop machinery operations. The total quarterly labor requirements, cash farm receipts and cash farm expenses for the number of tracts currently operated (14) are specified in the Flow file (Table 64, Appendix A).

Rent expense for land is based on a one-third crop share lease with the land owner paying one-third of the fertilizer and hay harvesting expenses. A 160 acre tract of land containing 140 acres of cropland would rent for $3150 ($22.50 per acre). The rent expense for each tract of land is specified in the Flow file shown in Table 64, Appendix A. The rental rate is also assumed to increase at the rate of 3.33 percent per year.

As indicated in Chapter III, the simulation model estimates the values for asset ownership costs (interest on debt, property taxes and insurance premiums), principal payments on debt, depreciation for income tax purposes, and changes in the market value of assets based on the parameters specified by the user in the Asset and Buy Table files. The data values provided for these files for the cash farm situation are shown in Tables 61 and 63 of Appendix A. The values of resource services or contributions used to determine the share of farm income or rental income for each farm asset are shown in the Buy Table file.

These values were calculated using the approach suggested for determining equitable share rents (Davis and Maynard). The value of resource contributions specified for an asset represents the sum of interest on the average investment, average depreciation, property taxes and insurance expense. The opportunity rate of interest used in calculating interest on the average investment is 4 percent on land, 9 percent on other real estate assets and 10 percent on other farm assets.

The opportunity values for the owner's labor and management used in determining compensation for services provided are $4 per hour and 10 percent of net farm cash flows, respectively.

Firm Growth, Resource Requirements and Financing

The model is capable of simulating alternative firm growth and financing plans. However, since the major objective of this study is to investigate the impact of alternative asset ownership transfer strategies and farm business arrangements, the land rent, asset purchase and financing plans are not varied for the simulation experiments performed. The firm growth plans described below are based on the initial interview session with the farm family.

Rental of Additional Land. An additional 160 acres of land will be rented at the start of each three year period starting in year four. Each additional tract of land rented consists of 140 acres crop land, 14 acres pasture and 6 acres of waste and roads. Values for total cash receipts, variable operating expenses, hours of labor required, dollar value of inventory requirements, and maximum operating debt specified for each future size of farm, as measured by tracts of land operated (owned and rented), are shown in the Flow file (Appendix A, Table 64).

Renting additional land will require additional inventory investment. For an additional 160 acres, $17,280 of current inventory must be purchased by the operator. This consists of 42 stocker steers ($8,400), stored crops ($5,100), and cash investment in growing crops ($3,780). Inventory purchase costs and values are assumed to increase at an annual percentage rate of 3.33 percent.

Machinery and Equipment Requirements. The current machinery inventory is sufficient to operate one additional 160-acre tract of land. Machinery and livestock equipment requirements were estimated for each possible future size of farm operation resulting from the assumed land rental plan. A machinery complement selection computer program was used to determine the least cost crop machinery investment for selected acreages of cropland, given the specified operations that must be performed during various periods of the year (Kletke and Griffin). The machinery and equipment purchase requirements for each year are shown in Appendix A, Table 65. The purchase costs for machinery and equipment are specified in the Buy Table file in 1976 prices (Table 63, Appendix A). The purchase costs of machinery and equipment as well as other depreciable assets are assumed to increase at a 3.33 percent annual rate.

Replacement of Depreciable Farm Assets. Machinery and equipment are replaced by specifying a purchase decision for the year the asset age reaches its replacement age. The timing of replacements for each depreciable asset was determined based on previous replacement practices, future requirements to rent additional land and the rate of use. The timing of replacements assumed for the case farm situation is shown in

Appendix A, Table 65. The depreciation and investment credit assumptions used when specifying annual input data for purchase decisions are shown in Appendix A, Table 66.

Real Estate Purchases. It is assumed that an additional tract of land will be purchased at the beginning of each five year period starting in year five. The buyer specified for the purchase depends on the farm business arrangement used for the simulation run. Since the model is structured to purchase tracts that are being rented, purchasing additional land does not increase the number of acres operated or the non-real estate investment requirements.

The number of acres and the types of improvements to be purchased in each year are shown in Table 67 in Appendix A. The costs, in 1976 prices, for land and improvements on each tract of real estate purchased are specified in the Buy Table file (Table 63, Appendix A). Land purchase costs increase at an annual rate of five percent per year and the cost of improvements increase at 3.33 percent per year.

Financing Terms. When specifying purchase decisions, the financing terms must be provided. It is assumed that real estate asset purchases will be financed using a 25 percent down payment with the balance paid in 20 equal annual payments. The interest rate is nine percent. Other asset purchases are paid for in cash or by increasing the short term operating loan.

The maximum farm operating debt balance is equal to the value of current inventory owned. The interest rate on the operating loan is 10 percent. When the operating debt balance reaches the maximum balance, real estate and depreciable farm assets are refinanced. The

amount of funds obtained by refinancing depends on the maximum debt to asset ratio, the market value of the asset and the amount of debt currently secured by the asset. The maximum debt to asset ratios are 65 percent for real estate and 50 percent for depreciable assets. The interest rates are 9 and 10 percent respectively. The maturities are 20 years for real estate and 4 years for depreciable assets. The payment method for loans obtained by refinancing assets is constant payments on the principal.

The interest rate on savings accounts and on loans from the husband and farm heir to the corporation are five percent. The interest rate on personal short term debt is 10 percent.

Non-Farm Income

It is assumed that the two non-farm heirs will each receive a $15,000 (year one money value) annual non-farm salary starting in year eight. Non-farm salaries are adjusted for the annual increase in the cost of living which is set at 3.33 percent.

At age 62, the husband will start receiving social security benefits and payments from the retirement annuity. Social security benefits were estimated using the regulations and payment schedules in effect June, 1975. Assuming the husband continues to pay social security taxes on the maximum amount of earnings, the base level of social security benefits in year one money value will be $5,603 at age 65 or $4,482 adjusted for retirement at age 62 (U. S. Department of Health, Education and Welfare 1975). The wife will receive spouse benefits starting at age 62 and widow benefits, if she survives the husband. The benefit level and maximum earnings from employment are adjusted

for annual increases in the cost of living (3.33 percent).

The husband started contributions to the retirement fund annuity during 1975. Investments of $1,500 per year until age 62 (21 years) would provide income of approximately $9,582 per year for 10 years, assuming an earnings rate of seven percent.

Non-Farm Expense

Family Living Expenses. The amount of family living expenses for the parents during the time the children are living at home (years one through seven) is $14,824. This value was estimated using the family records for 1975. Due to the increase in the cost of living, family living expense is assumed to increase at 3.33 percent per year. At the eighth year, the ages of the children will be 25, 22 and 20 and the level of family living expenses for the parents is assumed to decline to $11,201 in year one money value. The reduction of approximately 24.5 percent was estimated using data from a summary of 1975 living expenses for families belonging to Kansas Farm Management Associations (Kansas Cooperative Extension Service). It is assumed that living expenses remain at this level (adjusted for inflation) until the death of one parent. Upon the death of one parent, family living expenses are assumed to be 70 percent of the level when both parents are living ($7,841). This percentage was estimated by an analysis of fixed and variable components of family living expense items shown in the Kansas data.

Family living expense for the children was based on the weighted average of family living expenses for Kansas farm families grouped according to the age of the oldest child. The weights were the assumed

number of years the children would be in a particular age category. The amount of family living expense specified for each younger member of the family is $10,115. It is assumed that the farm heir starts paying family living expenses in year four and the non-farm heirs in year eight.

Non-Farm Asset Ownership Costs. Non-farm assets owned by the parents include a retirement annuity, life insurance on the husband, personal checking account and personal assets (home and automobile). The annual premium payment made by the wife for the $35,000 life insurance policy on the husband's life is $1,068. It is assumed that an additional $150,000 whole life insurance policy on the husband will be purchased by the wife for an annual premium payment of $3,537 bringing the total life insurance premiums to $4,605. The parameters for calculating changes in the cash value of life insurance are specified in the Buy Table file shown in Appendix A, Table 63.

Parameters used to calculate repair, taxes and insurance on the farm home and non-farm automobile are shown in the Asset and Buy Table files. There is an $18,085 home mortgage balance requiring a constant total annual payment of $2,571. The mortgage will be paid off in 13 years. It is assumed that the automobile will be replaced every four years.

Income and Social Security Tax Information

Income and social security taxes are computed for each family member using regulations in effect for the 1976 tax year. Information on family members needed to compute income and social security taxes are stored in the Environment file (Appendix A, Table 62).

The proportion of family living expenses that are itemized deductions was estimated using the family's farm records and family living expense data for Kansas farm families (Kansas Cooperative Extension Service). While the children are living at home (years one through seven), 21 percent of the living expense for the parents is deductible. After year seven, 25 percent is deductible. It is assumed that 20 percent of the family living expense is deductible for the heirs.

The number of dependents and the tax return method for the parents and children are adjusted during the planning horizon. The parents file a joint tax return as long as both parents are living. The number of dependents claimed by the parents is four during years one through seven, and two thereafter. The farm heir files a single tax return and claims one dependent for years one through three and a joint return with three dependents thereafter. The non-farm heirs each file a joint return with three dependents starting in year eight.

The social security tax rates are 5.85 percent on employee earnings and 7.9 percent on self-employment earnings. The maximum earnings level on which taxes are paid is $15,300. This value is increased at the rate specified for the increase in the cost of living (3.33 percent per year).

Administrative Expense Parameters

Administrative expense rates associated with asset sales, gifts and purchases are specified in the Environment file for each type of asset (Appendix A, Table 62). For example, the administrative cost rate for transferring real estate is 1.75 percent for sales, 0.75

percent for gifts, and 0.6 percent for purchases. Rates are less for non-real estate farm asset and corporation stock transfers, and zero for cash and inventory transfers.

Simulation Experiments Conducted for the Case Farm Situation

The simulation model is structured to allow for the investigation of a wide range of values for many controllable and uncontrollable variables. The purpose of this section is to describe the values of controllable and uncontrollable variables selected for simulation experiments conducted for the case farm situation in this study. The types of asset ownership transfer decision alternatives evaluated are: lifetime transfers from the parents to the children, lifetime gifts from the husband to the wife, and transfers implemented at the deaths of the parents. The farm business arrangements simulated involve the proprietorship and corporation legal forms of business organization. Simulation experiments are also conducted to investigate the impact of the change in estate and gift tax laws made by the Tax Reform Act of 1976.

Simulation experiments are conducted using a 45 year planning horizon. The expected remaining lifetime for the husband given his current age (42) is approximately 30 years (U. S. Department of Health, Education and Welfare 1968). The wife (age 38) has an expected lifetime of approximately 40 years. All simulation experiments except those designed to investigate the impact of the timing and sequence of death events are performed assuming the death events occur according to these life expectancies.

The first simulation experiment (referred to as the base simulation experiment) is performed assuming no additional estate transfer plans are made. For the base simulation experiment, the proprietorship business arrangement is continued. There are no lifetime gifts to the children, and all of the husband's estate is transferred to the wife at the first death event. The farm business arrangement and ownership transfer strategies for the base experiment and other simulation experiments performed for this study are described below.

Farm Business Arrangements

Simulation experiments are conducted for three farm business arrangements. Two versions of the corporate form of business organization are compared to the modified proprietorship farm business arrangement. The details of each of the farm business arrangements simulated are presented below.

Proprietorship Farm Business Arrangement. A proprietorship is characterized by individual ownership and control of the farm assets. Initially the farm assets are owned by the husband. During the stage of the family farm life cycle when the husband and farm heir are both involved in the farm operation, there are two proprietorships coordinated by an operating agreement. The husband and farm heir both own individual assets and rent land, but machinery and equipment assets are used jointly, and labor and management responsibilities are shared. Over time, control of the farm assets owned by the husband is transferred to the farm heir by leasing arrangements and ownership transfers. At the husband's retirement, the farm business becomes a single proprietorship controlled by the farm heir.

The details of the operating agreement under the modified proprietorship arrangement are listed below:

1. By purchasing the required inventory investment, the farm heir initially rents 200 acres of land currently being rented by the husband.
2. The additional tracts of land rented (160 acres every three years starting in year four) are operated by the farm heir rather than the husband.
3. Through sales and/or gifts of the required inventory investment, the husband gradually rents all of the land currently operated to the farm heir. The sale transfers of inventory are implemented during the years the farm heir is not renting land from others or purchasing machinery and equipment. The amount and timing of transfers by gift depend upon the gift strategy simulated. At the husband's retirement (year 21) all of the remaining land rented and owned by the husband will be rented to the farm heir. However, the father may need to spread out the sale of inventory (stored wheat, etc.) over a two to three year period to avoid an excessive income tax liability in any one year.
4. Initially, the machinery and equipment owned by the husband will be used jointly by the husband and the farm heir. During the first nine years, the husband continues to purchase replacements for machinery and equipment. As the number of acres operated increases by rental of additional land, the farm heir purchases only the new items of machinery and livestock equipment required. Starting in year 10, the farm heir purchases

all of the new machinery and equipment required to replace existing assets or to expand the number of acres operated. As an item reaches replacement age, the husband sells the asset and the farm heir purchases the replacement.

5. A tract of land is purchased at the start of each five year period. The farm heir is given the first opportunity to purchase the land. If the farm heir does not have enough cash and unused credit capacity to make the required down payment, the husband purchases the land.
6. The distribution of farm income to the husband, farm heir and other family members, who may eventually own farm assets, is based on the proportion of total resource services provided. Land acquired by the wife and non-farm heirs via gift or inheritance is rented to the farm heir.

Corporation Farm Business Arrangements. The basic corporation business arrangement evaluated in this study is a regular corporation which owns all of the farm assets and has one type of stock. The details for the corporation farm business arrangement are:

1. At the start of the first simulation year, the husband transfers ownership of all farm assets to the corporation in a tax-free exchange. The corporation assumes all debt secured by the farm assets. Stock ownership is in joint tenancy and outright in the same proportions as the initial ownership of the farm assets. The farm heir contributes $500 cash in exchange for $500 stock. The market value, debt and basis of assets transferred to the corporation and the initial stock distribution are shown in Table 23.

Table 23. Assets Transferred to the Farm Corporation and the Stock Distribution When the Corporation Owns All Farm Assets.

Item	Value	Debt	Basis
Assets Owned by Husband			
Farm land	$363,525	$ 77,500	$171,328
Improvements	27,416	0	19,766
Machinery, equipment and vehicles	104,386	0	57,019
Inventory	177,936	0	24,420
Checking account and operating loan	6,156	87,353	6,156
Total	678,419	164,853	278,689
Assets Owned by Farm Heir	500	0	500
Total	678,919	164,853	279,189
Stock Distribution	Value[a]	Basis[b]	
Husband			
Joint Tenancy	187,856	63,025	
Outright	326,709	50,811	
Total	514,566	113,836	
Farm Heir	500	500	
Total	515,066	114,336	

[a]Value of stock is the total value of assets less total debt.

[b]Basis of stock is total basis of assets less total debt.

2. The corporation is taxed as a regular corporation using the tax rates that have been in effect since 1975.
3. Rentals and purchases of additional land and purchases of replacements for farm assets are made by the corporation.
4. Salaries paid for labor and management provided by the husband and farm heir during various periods of the planning horizon are shown in Table 24. The salaries are in year one money values. The base salary levels are adjusted for a 3.33 percent inflation rate.

Table 24. Salaries Paid to the Husband and Farm Heir by the Corporation When the Corporation Owns All Farm Assets.

Years	Salary	
	Husband	Farm Heir
1-10	$20,017	$15,300
11-20	20,017	20,017
21-30	2,670	28,714
31-45	0	30,845

5. Sales of stock from the husband to the farm heir are made at the start of each 10 year period (year 1, 11 and 21). Sales are financed by the parents with 10 equal annual installments (principal and interest) with six percent interest on the remaining balance. The amount purchased by the farm heir is

pre-specified based on the projected debt repayment capacity for the 10 year period. At the start of year one the farm heir purchases stock valued at $44,860. Since gift and estate transfers are divided equally among all heirs, sales of stock are necessary to allow the farm heir to eventually own 51 percent of the corporation stock. Sales of stock also increase the amount of cash available to the parents.

6. Dividends are paid during the first 10 years to increase the cash income for the parents while the children are living at home and while the home mortgage is being paid off. The dividend rate is 13 percent of the corporation net cash income. This amounts to approximately $5,510 during the first simulation year. Dividends are not paid after year 10.

In an additional simulation experiment performed for the corporation form of business organization, the husband maintains ownership of 480 acres (two tracts) of land. The market value of the land and improvements rented to the corporation is $289,751. Adjusting for the $7,500 remaining debt balance on the 480 acres, the value of the stock received by the husband is $232,315. The value of the equity for the corporation (total value of stock) is approximately 45 percent of the value when the corporation owns all the farm assets (Table 23).

The amount of land rent received by the husband is determined by the model based on the proportion of the total value of resource services provided. Since the parents have rental income, no dividends are paid by the corporation and the husband's salary is reduced from $20,017 to $15,300 during years 1 through 20. Since dividends are not available to increase repayment capacity, the amount of stock purchased by the

farm heir in year one is reduced from $44,860 to $40,585. The other assumptions outlined above for the corporation business arrangement are not changed for this simulation experiment.

Lifetime Ownership Transfers to the Children

A gift strategy is defined by specifying the amount and type of assets to be given to the children during each year of the planning horizon. Since the children are initially living at home and the parents have a substantial amount of debt, it is assumed that gifts to the children do not start until year eleven (husband's age is 52). Simulation experiments are performed to evaluate the following gift strategies.

1. The husband makes a $3,000 gift to each child each year starting in year 11. The annual gifts are continued by the surviving spouse. This amount is equal to the annual gift exclusions under both federal and Oklahoma gift tax laws.
2. The husband makes a gift of approximately $240,000 equally divided among all three children in year 11 plus $3,000 per child during each year after year 11. The annual gifts are continued by the surviving spouse.
3. Same as gift strategy number two, except the annual gifts are $6,000 per child per year while both parents are living and $3,000 per child when only one parent is living.
4. Same as gift strategy number three, except the gift in year 21 is $60,000 per child rather than $6,000 per child.

The simulation experiments performed and the type of assets given to the children depend on the farm business arrangement being simulated.

Gift strategies one, two and three are simulated for the proprietorship business arrangement. Farm inventory assets are given to the farm heir until the husband's retirement when the remaining inventory is sold to the farm heir. After the husband's retirement, cash gifts are made to the farm heir. Also, all of the annual $3,000 or $6,000 gifts to each of the non-farm heirs are cash. For the large gift in year 11 (strategies two and three), equal undivided interests in 160 acres of real estate are transferred to the two non-farm heirs.

The gift strategies that involve annual gifts of cash and large taxable gifts of income producing assets may create liquidity problems for the parents during their retirement years. An additional experiment is conducted using gift strategy three combined with a sale of real estate from the husband to the farm heir at the time of retirement.

Simulation experiments for gift strategies three and four are performed for the corporation business arrangements. All gifts made by the husband are stock in the corporation. When the husband owns 480 acres of real estate, the wife does not inherit stock assets. In this case, the annual gifts made by the wife after the husband's death are cash. In the other corporation simulation experiment, the wife makes gifts of stock assets.

Transfers at the Deaths of the Parents

An estate transfer (will) strategy describes the distribution of the estate value and estate assets to be implemented at the death of each parent. The distribution of a property owner's estate is controlled by the will and the property ownership methods used. Simulation experiments are performed to evaluate the following will strategies for the husband:

1. All of the estate to the surviving spouse outright.
2. One-half to the surviving spouse outright and the residual after payment of taxes equally divided among the children.
3. The proportion of the estate received by the surviving spouse is the amount that will equate the marginal estate tax rates for the husband's and wife's estates. The remaining portion of the estate after payment of estate taxes is equally divided among the children.
4. One-half of the estate to the surviving spouse outright and the residual after taxes to the spouse in a life estate with remainder interests equally divided among the three children.

At the death of the surviving spouse, the estate value is equally divided among the heirs. For all will strategies except strategy number one, the share of the husband's estate transferred to the spouse outright is not burdened with estate taxes. Estate taxes are paid from the portion of the estate received by the wife in life estate or prorated among the shares of the estate received by the heirs.

The portion of the husband's estate left to the surviving spouse under will strategy three is the amount that will equate the marginal federal estate tax rates for the parents' estates. If the husband owns the largest share of the combined equity for the parents and the husband precedes the wife in death, use of this strategy will minimize the combined value of federal estate taxes at both deaths. The marginal estate tax rates at each death event are equated by making transfers that will make the taxable estates equal or at least in the same estate tax bracket. Outright transfers to the surviving spouse, that do not exceed one-half of the husband's estate, reduce the husband's taxable

estate through the marital deduction and increase the taxable estate for the surviving spouse. The value of the taxable estate for the surviving spouse will depend on the value of property owned by the spouse prior to the husband's death, the number of years the spouse survives the husband, and the growth rate for the surviving spouse's estate.

For the simulation experiments performed in this study, the dollar amount of the husband's estate willed to the wife under will strategy three is determined as:

$$W = E_h - E_w (1 + r)^n / [1 + (1 + r)^n] \qquad (4\text{-}1)$$

where:

W = the dollar amount of the husband's estate willed to the wife,

E_h = the value of equity owned by the husband at the time of his death,

E_w = the value of equity owned by the wife at the time of the husband's death,

r = the average annual change in the value of the wife's estate expressed as a proportion of the value of her estate, and

n = the number of years the wife is expected to survive the husband.

The value of W estimated using equation (4-1) is the amount willed to the wife to equate the value of the husband's estate (E_h), after reduction for the marital deduction (W), with the value of the wife's estate at the expected time of her death $[(E_w + W)(1 + r)^n]$. Implementing will strategy three may require changing the property ownership method on assets owned in joint tenancy to outright ownership by the husband.

Simulation experiments are conducted to evaluate all four will strategies under the proprietorship business arrangement. Will

strategies two and three are both used in the simulation experiments for the corporation business arrangements.

In addition to specifying the distribution of each estate, the user must also provide information pertaining to the current use valuation of the estate, specific bequests and sales of estate assets, and the portion of the estate qualifying for installment payment of federal estate taxes. The procedures and assumptions made in specifying this information for the case farm and family situation are presented below.

Current Use Valuation of the Estate. The current use value appraisal of qualifying estate assets is utilized for all simulation experiments performed under the new estate tax law. The qualifications and procedures are discussed in Roush. The current use value of farm land is determined by dividing the average net rent (gross rent less taxes) for the five simulation years preceding the death event by the average effective Federal Land Bank interest rate. It is assumed that the average interest rate is nine percent. The dollar reduction in the estate value for current use valuation is specified as input for the estate transfer. The reduction cannot exceed $500,000.

The current use value of corporate stock owned by the decedent is determined based on the current use value of farm land owned by the corporation. The reduction in the value of farm land owned by the corporation for current use value appraisal is prorated among owners based on the proportion of the corporation stock owned. The decedent's portion of the reduction for current use valuation cannot exceed $500,000.

Bequests of Estate Assets. For each estate transfer strategy and each death event, the user must identify which specific assets are to be distributed to the surviving spouse (outright or in life estate), farm heir, and non-farm heirs. If the proportion of the estate distributed to a survivor by specific bequests exceeds the proportion specified by the estate transfer strategy, the user denotes which of the specific bequests are estate sales.

At the husband's death the wife receives the assets owned in joint tenancy (farm home and 320 acres of land, or stock) and the personal automobile. In addition to these assets the wife receives enough farm land or stock in corporation to satisfy the distribution specified by the will strategy. At each death event, the farm heir receives non-real estate farm assets plus enough farm real estate or stock in the corporation to satisfy the distribution specified by the will strategy. The two non-farm heirs receive any available estate cash and liquid assets plus the remaining farm real estate or stock.

Due to the difficulty of dividing farm assets, estate sales of some farm real estate may be necessary to satisfy the estate value distribution specified by the will strategy. It is assumed that the farm real estate cannot be divided into tracts smaller than 40 acres. If sales of real estate are necessary, the assets are purchased by the farm heir.

Sales of real estate or stock to the farm heir provide additional control of the farm business by the farm heir and provide additional cash to distribute to the non-farm heirs or to pay estate transfer costs. Under the proprietorship business arrangement, it is assumed that the farm heir purchases enough real estate from the estate to acquire

ownership of approximately one-half of the farm real estate owned by the parents. However, alternative levels of estate sales are simulated to determine the impact on the financial and liquidity positions of the farm and non-farm heirs.

Under the corporation business arrangement, a section 303 stock redemption is used to provide liquid funds to pay estate transfer costs. The qualifications that must be met for stock redemptions are discussed in Roush. It is also assumed that the farm heir purchases enough stock from the estate to own at least 51 percent of the total corporation stock.

Installment Payment of Federal Estate Taxes. For the purposes of determining the portion of federal estate taxes that can be paid in installments, the user must specify the value of the decedent's interest in a closely held business. For the proprietorship, this is the market value of farm assets reduced by the debt secured by the assets and the reduction for current use value appraisal. For the corporation, the interest in the closely held business is the market value of stock or shares owned by the decedent less the reduction for use value appraisal.

Lifetime Gifts to the Spouse

In all previously described simulation experiments, the husband makes a $5,000 annual cash gift to the wife to pay the premiums on insurance policies on the husband's life. Simulation experiments are conducted to determine the impact of making lifetime gifts of assets from the husband to the wife. Additional marital gifts are made during the first simulation year for the proprietorship business arrangement. In one simulation experiment, the husband gives 160 acres of real estate

to the wife utilizing the $100,000 marital gift deduction. For the other marital gift simulation experiment, 320 acres of real estate are given to the wife. In both simulation experiments, the remaining land owned in joint tenancy by the husband is changed to outright ownership.

For all marital gift simulation experiments, taxable gifts to the children are made based on gift strategy number two which is defined in a previous section. Also, will strategy number three which equates the marginal estate tax rates for the parents' estates is used.

Timing and Sequence of Death Events

The strategies described in previous sections are simulated assuming that husband's death occurs at the end of year 30 (age 72) and the wife's death occurs at the end of year 40 (age 78). The wife survives the husband by 10 years. These death events represent the average remaining lifetimes for the husband (age 42) and wife (age 38) specified in the Oklahoma Life Tables (U. S. Department of Health, Education and Welfare 1968).

Table 25 shows the probabilities associated with each parent living to the end of the selected simulation years given their present ages. As indicated in Chapter II, the timing and sequence of death events that occur may have a significant impact on the outcome for alternative estate transfer strategies. Simulation experiments are conducted to test the sensitivity of values of outcome variables to the timing of death events for will strategies two (one-half of the husband's estate to the wife) and three (equate the marginal estate tax rates). In one simulation experiment, the wife's death occurs at the end of year 40 (expected lifetime), but the husband's death occurs at the end of year

Table 25. Probabilities Associated With Husband or Wife Living to Specified Ages at the End of Selected Simulation Years.

Simulation Year	Husband's Age at end of Simulation Year	Probability of Oklahoma Male of Age 42 Living to end of Simulation Year[a]	Wife's Age at end of Simulation Year	Probability of Oklahoma Female of Age 38 Living to end of Simulation Year[a]
5	47	.9738	43	.9900
10	52	.9315	48	.9768
15	57	.8722	53	.9568
20	62	.7918	58	.9300
25	67	.6823	63	.8878
30	72	.5515	68	.8268
35	77	.4050	73	.7380
40	82	.2500	78	.6044
45	87	.1164	83	.4126
50	93	.0251	88	.2039

[a]Probabilities were computed using data from life tables for white males and females, Oklahoma, 1959-61 (U. S. Department of Health, Education and Welfare 1968). The probability of living to a specified future age is determined by dividing the value for the number of persons out of every 100,000 born that survive to the specified future age by the number of persons out of every 100,000 born that survive to the present age of the parent.

20 (age 62) rather than year 30 (age 72). The probability of the husband living to age 62 is 0.7918 compared to 0.5515 for age 72. In another simulation experiment, the husband's death occurs at the end of year 30 (expected lifetime) and the wife's death occurs at the end of year 35 (age 73) rather than year 40. The length of time the wife survives the husband is critical for determining the amount willed to the spouse under will strategy three.

Simulation experiments were also conducted to determine the sensitivity of the values for outcome variables for the marital gift strategies to the sequence of death events. The results for the simulation experiments performed when the husband dies first are compared to the results for simulation experiments performed when the wife dies at the end of year 30 (age 68) and the husband dies at the end of year 35 (age 77). Assuming the husband dies in year 35, the probability that the wife will precede the husband in death is 0.2620 (1.00 - 0.7380).

Tax Reform Act of 1976

The simulation experiments described in the previous sections are conducted using the federal and estate and gift tax laws implemented by the Tax Reform Act of 1976. To provide information to evaluate the long run impact of the changes in estate and gift tax laws, simulation experiments are conducted for selected will and gift strategies under the legal environment existing prior to the Tax Reform Act of 1976. The changes in the values for estate and gift transfer costs, income taxes on estate sales, and the present value of transfers to the heirs are estimated by performing simulation experiments for will strategies two and three (no gifts) and a combination of gift strategy three (taxable gifts) and will strategy two.

CHAPTER V

DESCRIPTION OF RESULTS FOR BASE SIMULATION EXPERIMENT AND ALTERNATIVE WILL STRATEGIES

The results of the simulation experiments performed for the case farm and family situation are presented and analyzed in four chapters. The purposes of this chapter are to present and analyze the results generated for the base simulation experiment and alternative ownership transfer strategies implemented at the parents' deaths. In Chapter VI, the results for alternative lifetime gift strategies are compared to the results for the base simulation experiment. The effects of the changes in the legal environment created by the Tax Reform Act of 1976 are evaluated in Chapter VII. The results for simulation experiments designed to test the sensitivity of selected gift and will strategies and transfer costs to the timing and sequence of death events are also presented in Chapter VII. Finally, Chapter VIII presents the results for simulation experiments performed to evaluate the corporation farm business arrangement.

Base Simulation Experiment

For the base simulation experiment, the farm firm is a modified proprietorship business arrangement, no lifetime gifts are made to the children and all of the husband's estate is willed to the wife. The

assumptions underlying the modified proprietorship business arrangement were outlined in the previous chapter. The results for the base simulation experiment are presented for the following areas: (1) firm resource ownership and control, (2) firm growth and liquidity, and (3) estate distributions and transfer costs.

Farm Resource Ownership and Control

Table 26 shows the percentages of selected farm resources owned or controlled by the husband and the farm heir for the beginning year and at the end of each five year period prior to the time of the husband's death. The last column of Table 26 shows the percentages of the total dollar amount of resource services provided by the husband and the farm heir.

Acres Operated and Inventory Investment. At the beginning simulation year, the farm operation consists of 2,440 acres of land (640 owned and 1,800 rented). Initially the farm heir rents 200 acres of cropland (8.2 percent of total acres operated). Based on the production and marketing plan for the case farm situation described in the previous chapter, each 100 acres of cropland operated requires a $12,342.75 inventory investment in year one money values. The $261,296 investment in inventory is the amount required for 2,117 acres of cropland.

Changes in the total acres of land operated reflect the additional 160 acres of land rented at the start of each three year period beginning in year four. For all simulation experiments using the proprietorship business arrangement, it is assumed that the farm heir rents the

Table 26. Resource Ownership and Control by the Husband and Farm Heir at the Beginning Year and at the End of Each Five Year Period for Base Simulation Experiment.

Item	Land Operated	Inventory Value	Machinery and Equipment Value	Land Owned	Real Estate Value	Family Labor	Family Management	Total Resource Contribution
	(Acres)	(Dollars)	(Dollars)	(Acres)	(Dollars)	(Hours)	(Percent)	(Percent)
Year 1								
Total	2,440	261,296	119,517	640	390,941	4,517	100.0	100.0
Percent by:								
Husband	91.8	90.6	100.0	100.0	100.0	45.2	66.7	87.0
Farm Heir	8.2	9.4	0.0	0.0	0.0	54.8	33.3	13.0
Year 5								
Total	2,600	328,161	99,472	840	654,699	4,517	100.0	100.0
Percent by:								
Husband	80.0	78.4	99.7	100.0	100.0	45.2	66.7	84.0
Farm Heir	20.0	21.6	0.3	0.0	0.0	54.8	33.3	16.0
Year 10								
Total	2,920	434,504	168,341	1,000	981,884	4,517	100.0	100.0
Percent by:								
Husband	71.2	69.7	77.3	100.0	100.0	45.2	66.7	79.0
Farm Heir	28.8	30.3	22.7	0.0	0.0	54.8	33.3	21.0
Year 15								
Total	3,080	540,074	185,241	1,160	1,451,850	4,252	100.0	100.0
Percent by:								
Husband	62.3	60.8	23.9	100.0	100.0	45.0	50.0	61.0
Farm Heir	37.7	39.2	76.1	0.0	0.0	55.0	50.0	39.0
Year 20								
Total	3,400	702,748	210,174	1,320	2,126,431	4,252	100.0	100.0
Percent by:								
Husband	51.8	49.8	3.0	100.0	100.0	45.0	50.0	49.0
Farm Heir	48.2	50.2	97.0	0.0	0.0	55.0	50.0	51.0
Year 25								
Total	3,720	906,168	267,275	1,480	3,034,683	2,740	100.0	100.0
Percent by:								
Husband	0.0	0.0	0.0	89.2	88.9	19.7	0.0	26.0
Farm Heir	100.0	100.0	100.0	10.8	11.1	80.3	100.0	74.0
Year 30								
Total	3,880	1,113,596	342,787	1,640	4,299,709	2,740	100.0	100.0
Percent by:								
Husband	0.0	0.0	0.0	80.5	80.4	19.7	0.0	25.0
Farm Heir	100.0	100.0	100.0	19.5	19.6	80.3	100.0	75.0

additional land. In addition, at the start of years 5, 14 and 20, the farm heir rents an additional 160 acre tract of land previously rented by the husband. The husband sells the inventory required for these tracts to the farm heir.

Just prior to the husband's planned retirement in year 21, the farm operation consists of 3,400 acres of land. The husband rents and owns 1,760 acres (51.8 percent) and the farm heir rents 1,640 acres (48.2 percent). At retirement, the land owned and rented by the husband is rented to the farm heir. The sale of inventory to the farm heir at retirement is spread out over three years (21, 22 and 23) to reduce the income tax liability for the husband.

Changes in the inventory value over time reflect increases in the price of inventory items (3.33 percent per year) as well as the additional inventory purchases required to operate the additional acres of cropland rented. Just prior to the husband's death in year 31, the farm heir operates 3,880 acres of land with a $1,113,596 investment in inventory.

Machinery and Equipment Investment. The initial market value of crop machinery and livestock equipment including the items purchased at the start of the first simulation year is $119,517. Changes in the value of machinery over time reflect purchases of additional machinery required by renting additional land, depreciation in market value, and replacement purchases. The initial crop machinery investment is adequate to operate the additional 160 acres of land rented in year four. Thus, depreciation exceeds replacement costs during the first five years and the market value of the machinery investment declines.

Starting in year ten, the husband sells machinery and equipment as specific items reach the replacement age. The farm heir purchases the replacement items and any additional machinery required to expand. As shown in Table 26, at the end of year 20, just prior to the husband's retirement, the farm heir owns 97 percent of the machinery and equipment investment.

Farm Real Estate Investment. The husband initially owns 640 acres of land with a market value including farm real estate improvements of $390,941. Changes in real estate values over time reflect appreciation on land (five percent per year) depreciation on improvements, replacement of improvements and purchases of real estate. For all simulation experiments, a tract of land previously rented is purchased at the start of each five year period beginning in year five. The first tract purchased is 200 acres. Thereafter, tracts purchased consist of 160 acres. The land is purchased by the farm heir if he has sufficient working capital (cash plus inventory less short-term operating debt) and unused real estate credit capacity to provide funds for the required down payment (25 percent of purchase cost). Otherwise, the husband purchases the real estate.

Using this criterion, the husband purchases land in years 5, 10, 15 and 20. At year 5, the farm heir does not have enough working capital to make the down payment. At years 10, 15 and 20, available working capital is used to acquire or reduce debt on machinery and equipment. Starting in year 25, the farm heir has sufficient working capital to purchase land. At the end of year 30, just prior to the time of the husband's death, the husband owns 1,320 acres of real estate valued at

approximately $3,457,000. The farm heir owns 320 acres valued at about $843,000.

Total Resource Contribution. The last column of Table 26 shows the percentages of resource services including labor and management provided by the husband and farm heir during the various years. At the beginning year, the husband is contributing approximately 87 percent of the value of farm resource services. Due to the sale transactions for the inventory and machinery resources and the changing proportions of labor and management provided, the share of resources provided by the husband declines to 49 percent in year 20 just prior to his retirement. The husband's labor and real estate contributions represent approximately 26 and 25 percent of the total value of resource services in years 25 and 30, respectively. These percentages are used to divide farm income between the husband and farm heir and to calculate rent for resources provided by the husband during retirement.

Firm Growth, Financial Structure and Liquidity

Table 27 shows the simulated values of equity, debt, cash and the ratio of debt to equity for each family member at the beginning simulation year and at the end of each five year period for the base simulation experiment. The total value of farm and non-farm assets owned is the sum of the debt and equity values. The value of cash includes the values of the checking and savings accounts.

Equity and Firm Growth. The initial combined net worth or equity for the family is $563,673. The $2,677 equity for the wife represents the cash value of insurance policies on the husband's life. During

Table 27. Firm Ownership, Financial Structure and Liquidity at Beginning Year and at End of Each Five Year Period for Base Simulation Experiment.

Item	Husband	Wife	Farm Heir	Non Farm Heir	Total
Beginning Year 1					
Equity	$558,996	$2,677	$ 1,000	$1,000	$563,673
Debt	227,532	0	24,686	0	252,218
Cash	1,500	0	1,000	1,000	3,500
Debt/Equity[a]	0.41	0.0	24.69	0.0	0.44
End Year 5					
Equity	$793,921	$22,978	$38,732	$1,000	$856,631
Debt	267,675	0	33,563	0	301,238
Cash	1,500	2,235	1,000	1,000	5,735
Debt/Equity	0.34	0.0	0.87	0.0	0.34
End Year 10					
Equity	$1,117,840	$44,206	$ 54,546	$13,920	$1,230,511
Debt	373,322	0	106,787	0	480,109
Cash	1,500	4,966	1,000	13,920	21,386
Debt/Equity	0.33	0.0	1.96	0.0	0.37
End Year 15					
Equity	$1,545,909	$66,158	$101,997	$38,196	$1,752,259
Debt	374,363	0	239,599	0	613,962
Cash	1,500	7,885	1,000	38,196	48,581
Debt/Equity	0.24	0.0	2.34	0.0	0.32
End Year 20					
Equity	$2,113,995	$88,611	$305,054	$65,058	$2,572,719
Debt	479,768	0	253,045	0	732,813
Cash	1,500	11,282	1,000	65,058	78,840
Debt/Equity	0.23	0.0	0.83	0.0	0.25
End Year 25					
Equity	$2,593,292	$116,748	$804,670	$92,417	$3,607,127
Debt	190,388	0	708,579	0	898,967
Cash	1,000	20,398	1,500	92,417	115,315
Debt/Equity	0.07	0.0	0.88	0.0	0.22
End Year 30					
Equity	$3,355,566	$172,182	$1,399,690	$117,191	$5,044,631
Debt	178,688	0	901,843	0	1,080,531
Cash	24,503	56,811	1,500	117,191	200,005
Debt/Equity	0.05	0.0	0.64	0.0	0.17

[a]The total family debt to equity ratio is determined by subtracting cash from debt and dividing by equity.

each simulation year the husband makes a $5,000 cash gift to the wife to pay the life insurance premiums. The premium payments on $185,000 of life insurance are $4,605. Thus, the wife's cash holdings increase by $395 per year plus the after-tax interest on accumulated savings. The two non-farm heirs are supported by the parents until year eight. Starting in year eight, they receive combined non-farm salaries of $30,000 per year.

Change in equity is one measure of firm growth. The value of equity for the husband increases from $558,996 at the beginning simulation year to $3,355,566 in year 30. As shown in Table 28 the combined equity of the parents increases at an average annual rate of 6.3 percent. Total equity for all family members increases at an average rate of 7.6 percent.

Table 28. Average Annual Percentage Change in Equity During Each Five Year Period.

Years	Average Annual Percentage Change in Equity			
	Parents	Farm Heir	Non-Farm Heirs	Total
1-5	7.78	107.78	0.00	8.73
6-10	7.30	7.09	69.33	7.51
11-15	6.77	13.34	22.37	7.33
16-20	6.44	24.50	11.24	7.98
21-25	4.23	21.42	7.27	6.99
26-30	5.42	11.71	4.86	6.94
1-30	6.32	27.31	23.01	7.58

At retirement (year 21) the parents' average rate of increase in equity is substantially lower. The parents' average rate of change in equity during years 21 to 25 is lower than the rate of change during years 26 to 30 due to the additional income taxes when inventory items are sold in years 21 through 23. In general the overall growth rates for the family decrease during the planning horizon. The reason for this is the higher marginal income tax rate as taxable income increases due to inflation (3.33 percent per year).

The levels of equity shown in Table 27 and the growth rates shown in Table 28 include appreciation on land. Table 29 shows the amount of appreciation on land during each five year period for the husband and farm heir. Subtracting appreciation from the ending equity results in average annual percentage change in equity during the 30 year period of 2.8 percent for the parents. The growth rate for the entire family after subtracting for appreciation in land is 5.3 percent. When appreciation is not included, the equity value for the parents increases only $20,957 during years 21 through 25.

Table 29. Land Appreciation Occurring During Each Five Year Period.

Years	Land Appreciation		
	Husband	Farm Heir	Total
1-5	$ 108,032	0.00	$ 108,032
6-10	179,710	0.00	179,710
11-15	272,452	0.00	272,452
16-20	402,437	0.00	402,437
21-25	569,582	$ 15,783	585,365
26-30	711,160	126,712	837,872
Total	2,243,373	142,495	2,385,868

Debt, Financial Structure and Liquidity. Table 27 also shows the amount of debt, the debt to equity ratio and the cash holdings for each family member. Prior to the husband's retirement, the amount of debt owed at the end of each succeeding five year period increases as a result of the purchases of real estate in the final year of each five year period. During the first four years of each five year period, the amount of debt owed by the husband declines. Due primarily to increases in land values, the debt to equity ratio is lower at the end of each succeeding five year period. Computing the debt to equity ratio after subtracting appreciation on land results in a debt to equity ratio of approximately 0.42 for the husband at the end of year 20 compared to 0.41 in year one. The $1,500 cash balance for the husband is the combined minimum balances for the farm and personal checking accounts.

At retirement, the level of debt for the parents declines substantially due to the sale of the inventory investment. Whether the ending debt balance of $178,688 is too large will depend on the parent's liquidity objective. During years 25 to 30, the husband accumulates an ending cash balance of $24,503 indicating that debt payments are made on schedule. However, the combined cash and savings for the parents at the end of year 30 is less than the amount of debt owed.

The debt to equity ratio for the farm heir is very large at the beginning year. However, the debt is self-liquidating since it is used to acquire inventory which is sold during the first year. During the years when the farm heir is purchasing machinery and equipment (years 10 to 20), the debt to equity ratio is greater than one at the end of every year until the end of year 20. The debt to equity ratio for the farm heir is 0.64 at the end of year 30.

At the end of the 30 year period, the non-farm heirs have accumulated cash holdings of $117,191. This represents the accumulated annual savings from the non-farm salaries after family living expenses and income taxes are paid.

Estate Distributions and Transfer Costs

For the base simulation experiment all of the husband's estate is left to the wife at the husband's death which is assumed to occur at the end of year 30. At the wife's death, 10 years later, the estate value is equally distributed among the three heirs (one-third to one farm heir and two-thirds to two non-farm heirs). Table 30 summarizes the results for the estate transfers at each death event.

Husband's Death. The value of assets owned by the husband at the end of year 30 is $3,534,254. The home, farm improvements and 320 acres of land valued at $826,014 are owned in joint tenancy. However, the entire value is included in the husband's estate. The life insurance policies owned by the wife are not included in the husband's estate. The proceeds ($185,000) are paid directly to the wife.

In calculating the taxable estate for federal tax purposes, the estate value of part of the farm land is reduced from its market value to its current use value as allowed by the Tax Reform Act of 1976. Based on the simulation results for the case farm situation, the average net rent on farm land during the five years preceding the husband's death is approximately 1.8 percent of the market value of land owned at the end of year 30. Assuming a nine percent average effective Federal Land Bank interest rate, the current use value of farm land would be

Table 30. Estate Transfers and Costs at Death of Husband and Wife for Base Simulation Experiment.

Item	Husband's Death	Wife's Death
Estate Value	$3,534,254	$5,639,001
Debt	178,688	289,008
Net Estate	3,355,566	5,349,993
Estate Expense		
Administrative	$ 82,115	$ 151,873
Federal tax	402,941	1,937,712
Oklahoma tax	47,150	407,631
Total	542,207	2,497,216
Liquidity Requirement	$720,895	$2,786,224
Liquidity Available		
Cash[a]	$ 24,503	$ 47,089
Life insurance	185,000	0
Sales[b]	0	120,359
Sales expense[c]	0	9,585
Total	209,503	157,863
Net Liquidity	-511,392	-2,628,361
Transfers		
Spouse:		
Acres	1,320	0
Assets	$3,509,746	0
Cash[d]	-511,392	0
Net value	2,998,354	0
Farm Heir[e]:		
Acres	0	480
Assets	0	$1,992,271
Cash	0	-1,045,117
Net value	0	947,154
Non-Farm Heirs:		
Acres	0	840
Assets	0	$3,599,639
Cash[f]	0	-1,703,602
Net value	0	1,896,037

[a]Includes sale of personal automobile at second death event.

[b]Real estate purchased by farm heir from the estate.

[c]Sales expense includes federal and Oklahoma income taxes and administrative expense.

[d]Cash includes life insurance proceeds payable to spouse but not included in husband's estate.

[e]Acres and assets include real estate purchased from estate. The cost of real estate purchased is subtracted from cash.

[f]Cash includes proceeds from sale of real estate to farm heir.

approximately 20 percent of market value. Thus, full utilization of the $500,000 maximum reduction from market value requires estate ownership of at least $625,000 [500,000/(1-.20)] of qualifying farmland. This assumes that the simulated rent and values are consistent with rent and values on comparable land in the area. The 1,320 acres of land owned by the husband has a market value of $3,358,172 and for federal estate tax purposes its estate value is reduced to $2,858,172.

At the husband's death, total estate transfer costs (taxes and administrative expenses) are $542,207. The total cash needs (liquidity requirement), including debt are $720,895. Liquidity available is $209,503 which includes $24,503 estate cash and $185,000 life insurance proceeds. In this simulation experiment, no sales of assets are made to create additional liquidity. Thus, there is a net liquidity deficit of $511,392.

The spouse receives the 1,320 acres of land and the other assets owned by the husband (home and personal automobile) for a total asset distribution of $3,509,746. However, the spouse must furnish funds to cover the liquidity deficit of $511,392. Thus, the net value transferred to the spouse including the life insurance proceeds is $2,998,354.

Prior to the husband's death, the spouse had a cash balance of $56,811. Thus, to cover the estate liquidity deficit and maintain a $500 minimum cash balance, the wife needs to borrow $455,081 (511,392 - 56,811 + 500). Under the Tax Reform Act of 1976, part of the federal estate taxes for estates that include a qualifying interest in a farm or closely held business can be paid in installments over a 15 year period. The interest rate is four percent on up to $298,800 federal estate taxes and seven percent on the balance. In this simulation

experiment, the wife uses the installment payment option on all $402,941 of federal estate taxes. An additional $52,140 is borrowed on land to cover the estate liquidity deficit.

The top portion of Table 31 shows the values of equity, debt, cash and the debt to equity ratio for each family member at year 31, just after the estate transfer for the husband, and at the end of year 40, just prior to the wife's death. Immediately after the husband's death, the wife owns 1,320 acres of land with an equity of $3,055,164 and owes $455,082. During the next 10 years, the wife's estate increases at an average annual rate of 5.76 percent and just prior to her death owns estate equity of $5,349,993. At the end of year 40, the wife owes debt of $289,008. However, her cash balances have increased from $500 to $30,407 indicating that sufficient cash earnings are available to retire the debt on schedule.

Wife's Death. The simulation results for the estate transfer at the wife's death at the end of year 40 are shown in the second column of Table 30. Again the maximum reduction for use value appraisal is used for federal estate tax purposes. Since the wife receives all of the husband's estate, which continues to increase in value, and since there is no marital deduction available for the wife's estate, the total taxes at the wife's death are more than five times higher than the taxes at the husband's death. Total estate transfer costs are nearly 2.5 million dollars or nearly 47 percent of the wife's net estate. Total liquidity requirements including debt are $2,786,224. The amount of estate cash available ($47,089) includes cash from the sale of the personal automobile.

Table 31. Firm Ownership, Financial Structure and Liquidity After Death Events of Husband and Wife for Base Simulation Experiment.

Item	Wife	Farm Heir	Non-Farm Heirs	Total
Beginning Year 31				
Acres owned	1,320	320	0	1,640
Equity	$3,055,164	$1,399,690	$117,191	$4,572,045
Debt	455,082	990,948	0	1,446,030
Cash	500	1,500	117,191	119,191
Debt/Equity	0.15	0.71	0.00	0.29
End Year 40				
Acres owned	1,320	640	0	1,960
Equity	$5,349,993	$3,380,894	$139,609	$8,870,497
Debt	289,008	1,513,650	0	1,802,658
Cash	30,407	1,500	139,609	171,516
Debt/Equity	0.05	0.45	0.00	0.18
Beginning Year 41				
Acres owned	0	1,120	840	1,960
Equity	0	$4,328,051	$2,035,648	$6,363,699
Debt	0	2,764,911	1,564,991	4,329,902
Cash	0	1,500	1,000	2,500
Debt/Equity	0	0.64	0.77	0.68
End Year 45				
Acres owned	0	1,280	840	2,120
Equity	0	$6,433,254	$2,876,157	$9,309,412
Debt	0	3,020,846	1,722,288	4,743,134
Cash	0	1,500	1,000	2,500
Debt/Equity	0	0.47	0.60	0.51

In this simulation experiment, sales of assets to create liquidity are held to a minimum level. The farm heir receives the home ($24,169 including one acre of land) and enough land to satisfy his one-third share of total estate assets. The non-farm heirs receive the estate cash and the remaining land. It is assumed that the land is not divided into tracts smaller than 40 acres. To meet this constraint and also maintain the desired value distribution, the farm heir purchases approximately 27 acres of one tract of land ($120,359). The distribution of land is 480 acres to the farm heir and 840 acres to the non-farm heirs.

The net value of the estate received by the heirs is reduced by the costs associated with selling the land. The $9,585 selling expense includes $3,120 administrative costs and $6,465 federal and Oklahoma income taxes. The income tax liability results because, under the Tax Reform Act of 1976, the basis of property inherited is not stepped up to the estate value. In order to minimize income taxes, the tract of land sold is the last tract purchased by the parents.

After sales of land to the farm heir, the net liquidity deficit is $2,628,361. The heirs use the federal estate tax installment option to finance part of this deficit. The cash deficit incurred by the farm heir is increased while the cash deficit incurred by the non-farm heirs is reduced by the purchase of land from the estate.

The impact of estate transfer costs on the heirs' liquidity and financial structure is shown in the bottom one-half of Table 31. The farm heir's debt to equity ratio is increased from 0.45 just prior to the wife's death to 0.64 just after the wife's death. However, his debt to equity ratio declines to 0.47 by the end of year 45. During this five year period (years 41 to 45), total debt for the farm heir

increased by 255,935. However, an additional 160 acre tract to real estate costing $828,128 was purchased at the beginning of year 45. Thus, it appears that the farm heir can support the additional debt required to pay his share of estate transfer costs and the land purchases from the estate.

The non-farm heirs who have $139,609 liquid holdings just prior to the wife's death are forced to borrow over $1.5 million to pay their share of costs. As shown in Table 31, the non-farm heirs cannot support this level of debt from their cash earnings. The debt balance increases by $157,297 during years 41 through 45. Although the net worth is increasing due to appreciation in land, the liquidity position is deteriorating.

Estate Transfer Summary. Simulation results for the base simulation experiment indicate that estate transfer costs for the case farm situation are very large when all of the husband's estate is willed to the surviving spouse. At the husband's death, estate taxes and administrative costs are only 16 percent of the net estate. Due to the marital deduction, only one-half of the estate is subject to federal estate taxes. However, at the wife's death there is no marital deduction. Thus, approximately one-half of the estate is subject to federal estate taxes at both death events. At the wife's death, total estate transfer costs are nearly 47 percent of her net estate.

The net value of transfers to both heirs is approximately $2,843,191 which is 53.1 percent of the wife's net estate. The net present value of transfers to the heirs, assuming a seven percent discount rate, is $189,869. As shown in Table 31, the ending combined

equity for the heirs is $9,309,412. The overall debt to equity ratio at the end of the planning horizon is .51.

Alternative Levels of Estate Sales for the Base Simulation Experiment

The purpose of this section is to examine the impact of estate sales of real estate to the farm heir to create additional liquidity to pay estate transfer costs.

Sales of Land at the Husband's Death

The base simulation experiment is modified to sell a 160-acre tract of real estate at the husband's death to the farm heir. The value of real estate sold is $446,295. Selling expense including income taxes is $37,690 which is approximately 8.4 percent of the value sold. The impact of the estate sale on the wife's and farm heir's equity, debt and liquidity positions can be seen by comparing the simulation results shown in Table 32 to the results for the base simulation experiment shown in the top one-half of Table 31.

Total family equity at the beginning of year 31 just after the husband's death is lower by the amount of the selling expenses ($37,690). The net liquidity position (cash minus debt) for the wife is improved by about $411,283. Only the four percent portion of the installment payment of federal estate taxes is used since the spouse has the cash to pay the rest of the estate expenses. The debt to equity ratio for the farm heir increased from 0.71 to 1.03 as a result of the real estate purchase.

Table 32. Firm Ownership, Financial Structure and Liquidity After Death of Husband for Base Simulation Experiment When 160 Acres of Land is Sold to the Farm Heir.

Item	Wife	Farm Heir	Non-Farm Heirs	Total
Beginning Year 31				
Acres owned	1,160	480	0	1,640
Equity	$3,020,155	$1,397,012	$117,191	$4,534,358
Debt	298,800	1,439,921	0	1,738,721
Cash	255,501	1,500	117,191	374,192
Debt/Equity	0.10	1.03	0.00	0.30
End Year 40				
Acres owned	1,160	800	0	1,960
Equity	$5,097,750	$3,604,563	$139,609	$8,841,924
Debt	119,520	1,997,975	0	2,117,495
Cash	316,672	1,500	139,609	457,781
Debt/Equity	0.02	0.55	0.00	0.19

At the end of year 40, the wife's net estate (equity) is $252,243 smaller due to the sale of land which appreciates in value. However, the wife's net liquidity position (cash minus debt) is a positive $197,152 with the sale compared to a negative $258,601 with no sales. The farm heir's debt to equity ratio is .55 with sales compared to .45 without sales. The total family equity is $28,573 less with sales compared to no sales. Due to the financial and income tax effects, part of the $37,690 selling expenses are recovered during the 10 year period.

As a result of the $252,243 smaller estate, transfer costs will be lower at the wife's death. At the wife's death, administrative expenses and estate taxes are reduced by $169,033 due to the $252,243

smaller estate. The overall impact of the sale on the net value of transfers and ending equity for the heirs is discussed later.

Sales of Land at the Wife's Death

To create additional liquidity for the non-farm heirs, additional estate sales are also made at the wife's death. Two alternative levels of sales are simulated. The first sales strategy is based on an assumed land ownership goal. Sales of enough land are made to the farm heir to result in a land distribution of 680 acres to the farm heir and 640 acres to the non-farm heirs. With this strategy, $424,452 of real estate is purchased by the farm heir. Selling expenses are $53,941 (12.7 percent).

The second sale strategy is based on an assumed liquidity goal for the non-farm heirs. The objective is to sell enough real estate to the farm heir to reduce the debt service requirement for the non-farm heirs to the amount of net after-tax cash earnings from inherited assets. In other words, the non-farm heirs are willing to assume debt provided the amortized payments are not greater than their repayment capacity. With this sale strategy, $1,082,851 of real estate is sold to the farm heir. Selling expenses are $164,617 (15.2 percent). The resulting distribution of the parents' land is 840 acres to the farm heir and 480 acres to the non-farm heirs.

Both of the sale strategies for the wife's death are simulated assuming the 160 acre tract of land is sold at the husband's death. Table 33 summarizes the simulation results of key variables for these two sale strategies compared to the minimum sales strategy used in the base simulation experiment.

Table 33. Summary of Results for Alternative Estate Sale Strategies for the Base Simulation Experiment.

Item	Minimum Sales	Land Ownership Goal	Liquidity Goal
Value of Sales			
Husband's death	$ 0	$ 446,295	$ 446,295
Wife's death	120,359	424,452	1,082,851
Selling expenses	9,585	91,631	202,307
Taxes and administrative costs at both deaths	3,039,422	2,870,389	2,870,389
Net present value of transfers to heirs	189,869	180,999	173,608
Acres Transferred			
Farm heir	480	680	840
Non-farm heirs	840	640	480
Ending Equity			
Farm heir	6,433,254	6,797,649	6,878,681
Non-farm heirs	2,876,157	2,676,471	2,485,983
Total	9,309,412	9,474,122	9,364,666
Ending Debt			
Farm heir	3,020,846	3,728,564	4,524,963
Non-farm heirs	1,722,288	849,858	167,773
Total	4,743,134	4,578,422	4,692,736
Debt to Equity Ratio			
Farm heir	.47	.55	.66
Non-farm heirs	.60	.32	.07
Total	.51	.48	.50
Cash Available for Debt Reduction During Years 41-45			
Farm heir	-255,935	-299,387	-367,839
Non-farm heirs	-157,297	-45,232	+24,439

If the family objectives are to maximize the net present value of transfers to the heirs and divide land ownership in approximately equal shares, the minimum sales strategy would be chosen. However, the objective of maximizing the net present value of transfers ignores the impact of the estate transfer costs on future firm growth and liquidity for the heirs. The appreciation on land sold to the farm heir at the husband's death that escapes estate taxation at the wife's death is not measured by the value of transfers. Thus, the combined ending equity for the heirs is lower for the minimum sales strategy compared to the strategies with greater sales.

If the objective is to maintain the liquidity position for the non-farm heirs, the strategy with the largest level of sales would be chosen (liquidity goal). The ending debt for the non-farm heirs is substantially lower than the debt for the other two strategies. Also, this is the only sale strategy shown where the cash available for debt reduction during years 41 through 45 is positive for the non-farm heirs. The cost of increased liquidity is reduced land ownership and equity for the non-farm heirs, and an increased debt level and debt to equity ratio for the farm heir. The liquidity goal sales strategy results in a higher combined ending equity for the heirs compared to minimum sales strategy but a lower ending equity compared to the land ownership goal sales strategy.

If the objective is to maximize the combined ending net worth of the heirs, the land ownership goal sales strategy would be chosen. The cost of the increased land ownership and equity for the non-farm heirs is reduced liquidity. During years 41 to 45, the non-farm heirs do not generate enough cash to reduce debt as shown by the negative value for cash available for debt reduction.

Evaluating the alternative estate sale strategies involves an interpersonal comparison of utilities. For the base simulation experiment, it appears that sales somewhere between the level of sales for the land ownership and liquidity goals might maximize the family utility function. One means of increasing the liquidity for the non-farm heirs without sacrificing land ownership is to reduce the liquidity requirement. This may be accomplished using alternative will strategies or lifetime gifts.

Alternative Will Strategies

Simulation results for three alternative will strategies are compared to the base simulation experiment results. The starting point for the additional simulation experiments is the end of year 30 for the base simulation experiment. Will strategy number one is leaving all the estate to the wife as specified for the base experiment. Will strategy two specifies that one-half the estate is left to the wife outright and one-half goes to the children.

Will strategy number three attempts to equate the marginal estate tax rates at each death by using the procedure described in Chapter IV. In the base simulation experiment, the wife's estate grew at an annual percentage rate of approximately 5.4 percent after the husband's death. Given this rate of growth and the amount of property owned by the spouse, the parents' taxable estates are within the same tax bracket if the husband leaves the wife approximately 35 percent of his estate. The other 65 percent goes to the three children.

Will strategy four leaves one-half the estate to the wife outright and one-half to the wife in a life estate with the remainder interest

going to the heirs at her death. This simulation experiment is conducted to estimate the impact of using a life estate or life beneficiary trust for the portion of the estate not qualifying for the marital deduction.

In each simulation experiment, the estate sale strategy is based on the assumed land ownership goal described in the preceding section of this chapter. Table 34 shows the values for estate transfer costs, estate liquidity and estate transfers at each death for each will strategy.

Estate Transfer Costs at Husband's Death

Since the husband's estate is the same for each will strategy, the administrative expenses are constant ($82,115) at his death. Federal estate taxes are $156,696 higher for strategy three compared to other strategies because only 35 percent of the estate qualifies for the marital deduction. In all other strategies, the maximum marital deduction of 50 percent is taken. Exactly 50 percent of the net estate is willed to the spouse in strategies two and four.

The marital deduction under Oklahoma estate tax law is 100 percent of the amount willed to spouse outright. In will strategy one, the value of Oklahoma estate taxes is equal to the credit for state death taxes allowed in computing federal estate taxes. Oklahoma also allows a deduction for the surviving spouse's interest in a life estate. Thus, Oklahoma estate taxes at the husband's death are lower for strategy four compared to strategy two.

Total estate transfer expenses at the husband's death are highest for will strategy three because the amount willed to the spouse is the

Table 34. Estate Transfers, Transfer Costs and Liquidity for Alternative Will Strategies, No Gifts.

Item	Will Strategy One (All to Wife)		Will Strategy Two (50 Percent to Wife Outright)		Will Strategy Three (35 Percent to Wife Outright)		Will Strategy Four (Life Estate)[a]	
	Husband's Death	Wife's Death	Husband's Death	Wife's Death	Husband's Death	Wife's Death	Husband's Death	Wife's Death
Estate Value	$3,534,254	$5,217,271	$3,534,254	$2,995,470	$3,534,254	$2,137,480	$3,534,254	$3,287,529
Debt	178,688	119,521	178,688	0	178,688	0	178,688	119,520
Net Estate	3,355,566	5,097,750	3,355,566	2,995,470	3,355,566	2,137,480	3,355,566	3,168,009
Estate Expense								
Administrative	82,115	143,196	82,115	87,043	82,115	64,735	82,115	105,491
Federal Tax	402,941	1,798,750	402,941	802,455	559,637	472,479	402,941	868,133
Oklahoma Tax	57,150	386,237	111,388	213,074	150,619	146,220	66,421	225,414
Total	542,206	2,328,183	596,444	1,102,572	792,371	683,434	551,447	1,199,038
Liquidity Requirement	720,894	2,447,704	775,132	1,102,572	971,059	683,434	730,135	1,318,558
Liquidity Available								
Cash	24,503	333,352	24,503	355,596	24,503	335,240	24,503	277,171
Life Insurance	185,000	0	185,000	0	185,000	0	185,000	0
Sales	446,295	424,452	403,451	289,826	528,341	99,549	446,295	420,455
Selling Expense	37,690	53,941	42,752	56,402	58,869	15,687	48,990	80,890
Total	618,108	703,863	570,202	589,020	678,975	419,102	606,808	616,736
Net Liquidity	-102,786	-1,743,841	-204,930	-513,552	-292,084	-264,332	-123,327	-701,822
Transfers								
Wife:								
Acres	1,160	0	640	0	440	0	1,160	0
Assets	3,063,452	0	1,677,055	0	1,164,343	0	3,063,451	0
Cash	-100,109	0	120,742	0	141,464	0	-120,680	0
Net Value	2,963,343	0	1,797,797	0	1,305,807	0	2,942,771	0
Farm Heir:								
Acres	160	520	360	320	480	200	160	520
Assets	446,295	2,128,476	992,508	1,284,282	1,293,495	811,740	446,295	2,134,575
Cash	-448,973	-1,225,057	-626,177	-673,336	-834,367	-332,734	-448,973	-884,146
Net Value	- 2,678	903,419	366,331	610,945	459,128	479,006	- 2,678	1,250,428
Non-Farm Heirs:								
Acres	0	640	320	320	400	240	0	640
Assets	0	2,755,441	840,188	1,355,595	1,051,913	990,505	0	2,749,341
Cash	0	-943,235	-102,909	-130,044	-127,531	- 31,156	0	-238,130
Net Value	0	1,812,206	737,283	1,225,551	924,382	959,349	0	2,511,211

[a]One-half to wife outright and one-half to wife in a life estate.

smallest. Costs are lowest when the entire estate is passed to the spouse (will strategy one). Due to the lower Oklahoma estate taxes, total costs for the life estate strategy (four) are lower than for the strategy leaving one-half to the children (two).

The differences in liquidity requirements correspond directly to the differences in estate transfer costs. To provide additional liquidity for the spouse, 160 acres of real estate valued at $446,295 is sold to the farm heir in will strategies one and four. The higher value of selling expenses in will strategy four compared to will strategy one is due to the smaller increase in the carryover basis of the asset for estate taxes paid. Although more Oklahoma estate taxes are paid under will strategy four, the value of assets subject to Oklahoma estate taxes is zero under will strategy one. The net effect is a smaller increase in the basis and a larger capital gain for will strategy four compared to will strategy one.

Sales of land to the farm heir are also made for strategies two and three to provide liquidity for the wife and non-farm heirs. The level of sales of the husband's death is higher for strategy three compared to strategy four because the estate taxes to be paid by the non-farm heirs at the husband's death are larger. The two non-farm heirs pay two-thirds of the estate taxes.

The distribution of land, physical assets and cash to the wife and heirs at the husband's death for each will strategy is shown at the bottom of Table 34. The transfers shown include the adjustments for sales of real estate to the farm heir. For will strategy four, the distribution to the spouse includes $1,160,340 of real estate which is in a life estate. The amount in life estate is approximately

one-half the estate reduced by one-half of the administrative expenses and debt, and all of the estate taxes. At the wife's death, the real estate held in a life estate interest is not included in the wife's taxable estate.

The negative figures for cash transfers represent the amount of the estate liquidity deficit to be covered by each survivor by reducing savings or by borrowing. The negative cash for the farm heir includes funds to purchase real estate from the estate.

Firm Growth and Liquidity for the Wife

Table 35 shows the values for acres owned, equity, debt, cash and debt to equity ratio for each family member at the beginning of year 31, just after the husband's death, and at the end of year 40, just prior to the wife's death. The wife's equity is higher for will strategies one and four compared to two and three. However, her liquidity position is more desirable in strategies two and three. For each will strategy, the wife's cash holdings increase during the 10 year period following the husband's death. Thus, the surviving spouse has sufficient income without liquidating assets even when she receives only 35 percent of the husband's estate (will strategy three). The change in the wife's net liquidity position (cash minus debt) during the ten year period measures the amount of after tax cash earnings for the wife. The amount of cash income available to reduce debt or to increase liquid asset balances averages approximately $24,000 per year under will strategy one compared to $12,000 under will strategy three. However, the increase in cash holdings after debt retirement averages only $6,100 per year under will strategy one.

Table 35. Firm Ownership, Financial Structure and Liquidity for the Family Members After the Death of the Husband and Wife for Alternative Will Strategies.

Item	WILL STRATEGY ONE: All to Wife				WILL STRATEGY TWO: 50 Percent to Wife			
	Wife	Farm Heirs	Non Farm Heirs	Total	Wife	Farm Heir	Non Farm Heirs	Total
Beginning Year 31								
Acres owned	1,160	480	0	1,640	640	680	320	1,640
Equity	$3,020,155	$1,397,012	$117,191	$4,534,358	$1,854,609	$1,766,018	$854,474	$4,475,101
Debt	298,800	1,439,921	0	1,738,721	0	1,617,123	199,180	1,816,303
Cash	255,501	1,500	117,191	374,192	177,553	1,500	213,467	392,520
Debt/Equity	0.10	1.03	0.00	0.30	0.00	0.92	0.23	0.32
End Year 40								
Acres owned	1,160	800	0	1,960	640	1,000	320	1,960
Equity	$5,097,750	$3,604,563	$139,609	$8,841,924	$2,995,470	$4,318,669	$1,481,141	$8,795,281
Debt	119,520	1,997,975	0	2,117,495	0	2,169,023	79,672	2,248,695
Cash	316,672	1,500	139,609	457,781	338,914	1,500	201,925	542,339
Debt/Equity	0.02	0.55	0.00	0.19	0.00	0.50	0.05	0.19
Beginning Year 41								
Acres owned	0	1,320	640	1,960	0	1,320	640	1,960
Equity	0	$4,507,985	$1,951,814	$6,459,799	0	$4,929,608	$2,706,691	$7,636,299
Debt	0	3,429,177	804,626	4,233,803	0	3,048,507	265,602	3,314,109
Cash	0	1,500	1,000	2,500	0	1,500	257,813	259,313
Debt/Equity	0	0.76	0.41	0.66	0	0.62	0.10	0.40
End Year 45								
Acres Owned	0	1,480	640	2,120	0	1,480	640	2,120
Equity	0	$6,797,649	$2,676,471	$9,474,122	0	$7,268,590	$3,530,495	$10,799,086
Debt	0	3,728,564	849,858	4,578,422	0	3,324,310	159,365	3,483,675
Cash	0	1,500	1,000	2,500	0	1,500	231,218	232,718
Debt/Equity	0	0.55	0.32	0.48	0	0.46	0.05	0.30

Table 35. (Continued)

Item	WILL STRATEGY THREE: 35 Percent to Wife				WILL STRATEGY FOUR: Life Estate			
	Wife	Farm Heir	Non Farm Heirs	Total	Wife	Farm Heir	Non Farm Heirs	Total
Beginning Year 31								
Acres owned	440	800	400	1,640	1,160	480	0	1,640
Equity	$1,362,618	$1,858,815	$1,041,574	$4,263,007	$2,999,583	$1,397,012	$117,191	$4,513,786
Debt	0	1,825,313	199,185	2,024,498	298,800	1,439,921	0	1,738,721
Cash	198,275	1,500	188,845	388,620	234,928	1,500	117,191	353,619
Debt/Equity	0.00	0.98	0.19	0.38	0.10	1.03	0.00	0.31
End Year 40								
Acres owned	440	1,120	400	1,960	1,160	800	0	1,960
Equity	$2,137,480	$4,571,960	$1,817,556	$8,526,999	$5,041,568	$3,604,563	$139,609	$8,785,741
Debt	0	2,412,434	79,674	2,492,108	119,520	1,997,975	0	2,117,495
Cash	318,558	1,500	197,413	517,471	260,489	1,500	139,609	401,598
Debt/Equity	0.00	0.53	0.04	0.23	0.02	0.55	0.00	0.20
Beginning Year 41								
Acres owned	0	1,320	640	1,960	0	1,320	640	1,960
Equity	0	$5,050,958	$2,776,898	$7,827,856	0	$4,854,986	$2,650,818	$7,505,804
Debt	0	2,951,316	265,604	3,216,920	0	3,088,268	199,209	3,287,477
Cash	0	1,500	352,187	353,687	0	1,500	100,689	102,189
Debt/Equity	0	0.58	0.10	0.37	0	0.64	0.08	0.42
End Year 45								
Acres owned	0	1,480	640	2,120	0	1,480	640	2,120
Equity	0	$7,402,871	$3,599,220	$11,002,091	0	$7,176,404	$3,477,949	$10,654,353
Debt	0	3,225,620	159,366	3,334,986	0	3,357,808	146,807	3,503,895
Cash	0	1,500	335,541	337,041	0	1,500	106,710	108,210
Debt/Equity	0	0.44	0.04	0.28	0	0.47	0.04	0.32

Estate Transfer Costs at Wife's Death

Estate transfer costs at the wife's death (Table 34) increase at an increasing rate as the size of the net estate increases. Estate transfer costs expressed as a percent of the wife's net estate are 46, 37, 32 and 38 for will strategies one, two, three and four, respectively. The combined dollar amount of transfer costs at both deaths is lowest for will strategy three. Estate taxes are minimized with this strategy because the marginal estate tax rates are equal for the husband's and wife's estates. The marginal federal estate tax rate is 45 percent. Due to the growth in the wife's estate, combined estate taxes are substantially lower when the spouse receives less than one-half of the estate, and the maximum marital deduction is not utilized at the husband's death. The maximum marital deduction is used at the husband's death in strategies one, two and four.

A comparison of total estate transfer costs does not give consideration to the return that could be earned on the savings in transfer costs at the first death when the maximum marital deduction is taken. Thus, for will strategy three to be more satisfactory than will strategy two, the savings in transfer costs at the second death ($419,138) must be greater than the increased transfer costs at the first death ($195,927) plus the opportunity cost on the increased transfer costs. If the opportunity cost rate is 7.9 percent, the discounted value of transfer costs for strategies two and three would be nearly equal. If the opportunity cost rate is less than 7.9 percent, based on the timing and amount of transfer costs, strategy three would be preferred over strategy two. These two strategies will be evaluated further in terms

of the present value of transfers to heirs and the ending net worth of the heirs.

The potential estate tax saving of strategy three over strategy two also depends on the growth rate for the wife's estate and the length of her life span. The impact of the timing of the wife's death is evaluated in Chapter VII.

The combined value of transfer costs at both deaths is larger for strategy four (life estate) compared to strategy two by $51,469. The saving in Oklahoma estate taxes at the first death is more than offset by increased administrative costs and taxes at the second death. Administrative costs at the second death for will strategy four include $10,918 to terminate the life estate. However, estate transfer costs are substantially reduced by transferring the portion of the husband's estate that does not qualify for the marital deduction to the wife in a life estate (strategy four) rather than outright (strategy one).

Liquidity requirements at the wife's death are reduced by at least one million dollars by will strategies two, three and four compared to will strategy one. The sales strategy for each of the will strategies is based on achieving the land ownership goal. The final distribution of land is 680 acres to the farm heir and 640 acres to non-farm heirs. The land, total asset and cash transfers to each of the heirs are shown at the bottom of Table 34. The net liquidity deficit at the wife's death is smallest for will strategy three compared to all other will strategies.

Net Value of Transfers to the Heirs

Table 36 summarizes the net value of transfers to the heirs at

both death events for each will strategy. The total value of transfers does not reflect the timing of transfers and the opportunity cost concept. The value of transfers are discounted to obtain the net present value (Year 0) using a seven percent discount rate. Seven percent is approximately the average annual percentage growth rate in the combined equity of the heirs during years 41 through 45.

Table 36. Total Value and Present Value of Transfers to the Heirs for Alternative Will Strategies.

Item	Will Strategy One	Two	Three	Four
Value of Transfers				
Year 31	$ -2,678[a]	$1,103,614	$1,383,510	$ -2,678[a]
Year 41	2,715,625	1,836,496	1,438,355	3,761,639
Total	2,712,947	2,940,110	2,821,865	3,758,961
Present Value of Transfers	180,999	267,620	277,802	250,852

[a]The farm heir's administrative expense to purchase real estate from the estate.

Assuming a seven percent discount rate, the net present value of transfers is highest for will strategy three reflecting the benefit of increased transfers at the first death event. The discount rate that would equate the net present value of transfers for will strategy two and three is approximately 3.6 percent. If the after-tax rate of return on the additional value of transfers is greater than 3.6 percent, will

strategy three would be preferred over will strategy two. The annual growth rate in equity for the heirs during years 41 to 45 averages about seven percent.

The net present value of transfers is $16,768 higher for strategy two compared to will strategy four. Given the size of this estate, the wife does not need additional income above that provided by the property received outright. However, leaving part of the estate to the spouse in a life estate would be useful in situations where the wife needs additional income and financial security or in cases where the children cannot manage the real estate.

Firm Growth and Liquidity After Both Deaths

The net present value of transfers does not measure the impact that estate transfer costs have on the firm growth, financial structure and liquidity for the heirs. The present value criterion reflects a subjective discount rate representing the opportunity rate of return for the heirs. The ending equity for the heirs is a direct result of the simulated rates of return. However, the ranking of will strategies based on ending net worth of the heirs is consistent with the ranking based on the present value of transfers criterion. The net worth values at the end of year 45 are shown in Table 35. The ending equity is $203,005 higher for will strategy three compared to two and $1,527,969 compared to strategy one. The increase in the combined equity for the heirs during the last five years of planning horizon is $159,912 higher for will strategy three compared to strategy one. Since the ending land ownership is constant among all strategies, differences in the increase in equity reflect additional cash income after taxes for the heirs.

The net liquidity position (cash minus debt) at the end of year 45 for the non-farm heirs is highest for will strategy three. The net liquidity position for will strategy three is $176,175 compared to -$848,858 in the base simulation experiment (strategy one). For all strategies except number one, the non-farm heirs were able to reduce debt.

The ending value of debt and the debt to equity ratio for the farm heir are lowest for will strategy three. The ending debt for the farm heir is $502,944 lower for will strategy three compared to will strategy one. The ending debt to equity ratio for the farm heir is 0.44 for will strategy three compared to 0.55 for strategy one. Based on the size of the case farm estate, the simulated growth, and the timing and sequence of death events, the will strategy leaving 35 percent of the estate to the spouse appears to be superior to other strategies simulated when no gifts are made. The impact of will strategies two and three will be evaluated in the next chapter using simulation experiments involving lifetime gifts.

CHAPTER VI

DESCRIPTION OF SIMULATION RESULTS FOR ALTERNATIVE GIFT STRATEGIES

In this chapter, the results for simulation experiments which include lifetime gifts to the children, combinations of gifts and sales to the children, and gifts from the husband to the wife are presented and analyzed. The alternative gift strategies simulated for the case farm and family situation under the proprietorship business arrangement were described in Chapter IV.

Lifetime Gifts to the Children

The timing and value of lifetime gifts made to the children for the three gift strategies simulated for the proprietorship business arrangement are illustrated in Table 37. Gifts to the children are not made prior to year 11. The values of gifts shown for each period are equally divided among the three children.

For strategy one, gifts are equal to the $3,000 annual exclusions. In years 11 through 22, the farm heir receives annual gifts of inventory assets (growing wheat, stocker cattle, etc.) with a market value of $3,000. The farm heir receives $3,000 cash from the husband during the years 23 through 30. During years 11 through 30, the two non-farm heirs receive $6,000 cash each year. After the husband's death, the wife makes annual cash gifts during years 31 through 40 of $3,000 and $6,000

Table 37. Total and Present Value of Gift Transfers and Gift Transfer Costs for Alternative Gift Strategies.

Item	Gift Strategy One	Two	Three
Value of Gifts During:			
Year 11	$ 9,000	$241,132	$241,132
Years 12-30	171,000	171,000	342,000
Years 31-40	90,000	90,000	90,000
Total	270,000	502,132	673,132
Present Value of Gifts[a]	60,748	178,752	226,039
Taxable Gifts			
Federal	0	223,132	223,132
Oklahoma	0	232,132	403,132
Gift Transfer Costs			
Gift tax			
Oklahoma	0	11,628	22,654
Federal	0	0	0
Administrative costs	0	1,206	1,206
Total	0	12,834	23,860
Present Value of Costs[a]	0	6,524	9,557

[a]Seven percent discount rate.

to the farm heir and non-farm heirs, respectively. The total value of lifetime gifts made to the children under gift strategy one is $270,000. Assuming a seven percent discount rate, the present value of gift transfers is $60,748.

Under gift strategy two, a taxable gift is made at the beginning of year 11. The two non-farm heirs receive 160 acres of land with a market value of $160,755. The farm heir receives current inventory valued at $80,377. After year 11, the gifts are the same as those described for gift strategy one with one exception. The gift to the farm heir in year 22 is cash rather than inventory. Due to additional gifts of inventory in year 11, the husband completes sales of inventory during retirement at the beginning of year 22 rather than year 23. The total value of gifts made to the children under gift strategy two is $502,132. With a seven percent discount rate, the present value of gift transfers is $178,752.

Gift strategy three has the same gift to the children in year 11 as gift strategy two. In gift strategy three, the annual gifts are $6,000 to each child during years 12 through 30. Gifts to the farm heir during years 11 through year 20 are inventory. Annual gifts to the farm heir after year 20 and annual gifts to the non-farm heirs after year 11 are cash. The total value of gifts for gift strategy three is $673,132. Assuming a seven percent discount rate, the present value of the gifts is $226,039.

Gift Transfer Costs

The values for taxable gifts, gift taxes and administrative costs are also shown in Table 37. Administrative costs are paid on the real

estate transfers. Since gifts are equal to the $3,000 annual exclusions, for gift strategy one, there are no taxable gifts nor gift taxes.

Under strategies two and three, the gift in year 11 is taxable. For federal gift tax purposes, the gift is split between the husband and wife, and the taxable gift is $111,566 (.5 x 241,132 - 9,000) for each parent. However, each parent has a $47,000 unified credit, and no federal gift tax is due. Each spouse uses $27,270 of the credit. For Oklahoma gift tax purposes, the parents cannot split the gift since the gift is the husband's property. The Oklahoma taxable gift is $232,132 (241,132 - 9,000), and the Oklahoma gift tax due in year 11 is $11,628.

Under gift strategy three, the annual $6,000 gift to each child is split between the parents and covered by the annual exclusion. However, during years 12 through 30, there is a $9,000 Oklahoma taxable gift each year, and a total of $11,026 additional Oklahoma taxes are due over this period for gift strategy three. Assuming a seven percent discount rate, the present value of gift transfer costs is $9,557 for gift strategy three compared to $6,524 for gift strategy two.

Farm Resource Ownership and Control

Gifts of inventory and real estate assets redistribute the ownership and control of the farm firm. The effects of the alternative gift strategies on farm resource ownership and control are illustrated in Table 38. The simulation results for the alternative gift strategies are compared to the results for the base simulation experiment (no gifts). The simulation results for the first ten years when gifts are not made are shown for the base simulation experiment in Table 26 of Chapter V.

Table 38. Farm Resource Ownership and Control by Husband and Farm Heir at End of Years 15, 20, 25 and 30 for Alternative Gift Strategies.

Item	Year 15		Year 20		Year 25		Year 30	
	Husband	Farm Heir	Husband	Farm Heir	Husband	Farm Heir	Husband	Farm Heir
Acres Owned								
No Gifts	1160	0	1320	0	1320	160	1320	320
Gift Strategy One	1160	0	1160	160	1160	320	1160	480
Gift Strategy Two	840	160	840	320	840	480	840	640
Gift Strategy Three	840	160	840	320	840	480	840	640
Percent of Real Estate Value Owned								
No Gifts	100	0	100	0	88.9	11.1	80.4	19.6
Gift Strategy One	100	0	86.3	13.7	77.0	23.0	70.0	30.0
Gift Strategy Two	72.1	13.9	62.3	25.6	55.6	33.7	50.7	39.5
Gift Strategy Three	72.1	13.9	62.3	25.6	55.6	33.7	50.7	39.5
Percent of Inventory Value Owned								
No Gifts	60.8	39.2	49.8	50.2	0.0	100.0	0.0	100.0
Gift Strategy One	57.7	42.2	44.7	55.3	0.0	100.0	0.0	100.0
Gift Strategy Two	40.9	59.1	29.4	70.6	0.0	100.0	0.0	100.0
Gift Strategy Three	38.5	61.5	24.9	75.1	0.0	100.0	0.0	100.0
Percent of Total Resource Services Provided								
No Gifts	61.0	39.0	49.0	51.0	26.0	74.0	25.0	75.0
Gift Strategy One	60.0	40.0	44.0	56.0	23.0	77.0	21.0	79.0
Gift Strategy Two	50.0	47.0	34.0	63.0	17.0	80.0	15.0	82.0
Gift Strategy Three	49.0	48.0	33.0	64.0	17.0	80.0	15.0	82.0
Total Acres of Farm Land Owned	1160		1320		1480		1640	
Total Acres of Crops Operated	2677		2957		3237		3377	

Real Estate Ownership. As shown in Table 38, lifetime gifts from the husband to the farm heir, allow the farm heir to purchase land earlier in the planning horizon compared to the base simulation experiment (no gifts). Under strategy one, the 3,000 annual gifts allow the farm heir to purchase the 160 acre tract of land in year 20. The strategies which include the taxable gifts in year 11 (strategies two and three) allow the farm heir to purchase the land starting in year 15. The percentages of the total real estate market value owned by the husband and farm heir for gift strategies two and three total to less than 100 percent because 160 acres is given to the non-farm heirs in year 11. At the end of year 30, just prior to the husband's death, the husband's estate includes 840 acres of land for gift strategies two and three compared to 1,320 acres for the no gift strategy. The 840 acres of land owned by the husband is slightly over 50 percent of the total farm real estate value.

Inventory Investment and Acres Operated. The total acres of cropland operated (rented and owned) at the end of each five year period prior to the husband's death is also shown in Table 38. The percentages of the total cropland operated by the husband and farm heir are the same as the percentages of inventory owned. Just prior to the husband's retirement (end of year 20), the farm heir owns 75.1 percent of the inventory investment under gift strategy three compared to 50.2 percent for the base simulation experiment. As a result of the reduced ownership of inventory, the husband's income tax liability at retirement will be reduced substantially.

Total Farm Resource Contribution. The percentage of resource services, including labor and management, provided by the husband and farm heir for each gift strategy simulated are also shown in Table 38. The percent of resources contributed and share of cash farm income for the husband at the end of year 20 is reduced from 49 percent for the no gift strategy to 33 percent under gift strategy three. Just prior to the husband's death, the husband's land and labor contributions represent 15 percent of the total resource services under gift strategies two and three compared to 25 percent for the base simulation experiment. The 160 acres of land rented to the farm firm by the non-farm heirs for strategies two and three represent approximately three percent of all resource services.

Firm Growth and Liquidity

The levels of equity, debt and cash for each family member at the end of years 15, 20, 25 and 30 resulting from each gift simulation experiment are shown in Table 39. To evaluate the impact of lifetime gifts, these results can be compared to those for the base simulation experiment shown in Table 27 of Chapter V.

Firm Growth. Total equity for the family at the end of year 30 when no gifts are made is $5,044,631 compared to $5,059,334, $5,108,396 and $5,068,837 for gift strategies one, two and three, respectively. The differences are due to changes in the total after-tax cash income for the family resulting from the financial and income tax effects of gifts. The additional $9,000 annual gifts for gift strategy three over strategy two do not increase combined family equity. Additional gift

Table 39. Firm Ownership, Financial Structure and Liquidity at the End of Years 15, 20, 25 and 30 for the Gift Strategies Simulated.

Item	Gift Strategy One ($9,000 Annual Gifts)					Gift Strategy Two (Taxable Gift and $9,000 Annual Gifts)				
	Husband	Wife	Farm Heir	Non-Farm Heirs	Total	Husband	Wife	Farm Heir	Non-Farm Heirs	Total
End Year 15										
Acres owned	1,160	0	0	0	1,160	840	0	160	160	1,160
Equity	$1,495,531	$66,167	$122,280	$71,300	$1,755,277	$1,165,157	$66,203	$242,993	$284,633	$1,758,984
Debt	408,162	0	235,896	0	644,058	242,493	0	407,784	0	650,277
Cash	1,500	7,894	1,000	71,300	81,694	1,500	7,930	1,000	81,188	91,618
Debt/Equity	0.27	0.00	1.93	0.00	0.32	0.21	0.00	1.68	0.00	0.32
End Year 20										
Acres owned	1,160	0	160	0	1,320	840	0	320	160	1,320
Equity	$1,994,470	$88,632	$360,459	$136,414	$2,579,975	$1,523,573	$88,700	$558,222	$424,836	$2,595,332
Debt	273,627	0	523,307	0	796,934	124,325	0	687,991	0	812,316
Cash	1,500	11,303	1,000	136,414	150,217	1,500	11,371	1,000	167,085	180,956
Debt/Equity	0.14	0.00	1.45	0.00	0.25	0.08	0.00	1.23	0.00	0.24
End Year 25										
Acres owned	1,160	0	320	0	1,480	840	0	480	160	1,480
Equity	$2,379,553	$116,778	$908,812	$207,102	$3,612,247	$1,788,587	$117,049	$1,158,810	$589,891	$3,654,338
Debt	57,064	0	963,353	0	1,020,417	3,029	0	1,036,706	0	1,039,735
Cash	12,856	20,428	1,500	207,102	241,886	18,079	20,699	1,500	263,016	303,294
Debt/Equity	0.02	0.00	1.06	0.00	0.22	0.00	0.00	0.89	0.00	0.20
End Year 30										
Acres owned	1,160	0	480	0	1,640	840	0	640	160	1,640
Equity	$3,008,333	$172,241	$1,598,700	$280,058	$5,059,334	$2,216,330	$172,942	$1,938,325	$780,799	$5,108,396
Debt	78,576	0	1,149,125	0	1,227,701	30,451	0	1,219,728	0	1,250,179
Cash	23,452	56,870	1,500	280,058	361,880	17,003	57,571	1,500	357,347	433,421
Debt/Equity	0.03	0.00	0.71	0.00	0.17	0.01	0.00	0.63	0.00	0.16

Table 39. (Continued)

Item	Gift Strategy Three (Taxable Gift and $18,000 Annual Gifts)				
	Husband	Wife	Farm Heir	Non-Farm Heirs	Total
End Year 15					
Acres owned	840	0	160	160	1,160
Equity	$1,122,404	$66,211	$258,332	$310,564	$1,757,509
Debt	272,216	0	405,475	0	677,691
Cash	1,500	7,938	1,000	107,119	117,557
Debt/Equity	0.24	0.00	1.57	0.00	0.32
End Year 20					
Acres owned	840	0	320	160	1,320
Equity	$1,416,745	$88,756	$600,179	$487,300	$2,592,980
Debt	199,241	0	677,948	0	877,189
Cash	1,500	11,427	1,000	229,548	243,475
Debt/Equity	0.14	0.00	1.13	0.00	0.24
End Year 25					
Acres owned	840	0	480	160	1,480
Equity	$1,611,651	$117,736	$1,220,312	$693,192	$3,642,532
Debt	162,887	0	975,205	0	1,138,092
Cash	1,000	21,026	1,500	366,317	389,843
Debt/Equity	0.10	0.00	0.80	0.00	0.21
End Year 30					
Acres owned	840	0	640	160	1,640
Equity	$1,944,089	$174,284	$2,021,913	$928,552	$5,068,837
Debt	291,338	0	1,136,140	0	1,427,523
Cash	5,694	58,913	1,500	505,099	571,206
Debt/Equity	0.15	0.00	0.56	0.00	0.17

transfer costs of $11,026 are paid under gift strategy three compared to strategy two.

The value of the equity for the husband at the end of year 30 is $347,233 lower under gift strategy one compared to the base simulation experiment. Thus, for each dollar of gifts made, the husband's ending equity is reduced by approximately $1.93 (347,233 ÷ 180,000 gifts made during years 11 through 30). The husband's net estate is reduced by the amount of the gift, plus the earnings on the cash and inventory given away. Also, the husband's ending estate does not include the appreciation on the 160 acres of land that the farm heir is able to purchase in year 20.

Under gift strategy two, $232,132 of additional gifts are made in year 11 compared to gift strategy one. The gift includes 160 acres of real estate to non-farm heirs. The additional gifts of inventory allow the farm heir to purchase 160 acres of land in year 15. The reduction in the husband's estate for each dollar of additional gifts is $3.41. Part of this additional estate value reduction is due to the gift transfer costs and the opportunity earnings on the cash used to pay these costs.

Under gift strategy three, $171,000 additional gifts ($9,000 per year for years 12 through 30) are made compared to strategy two. These gifts are inventory and cash. The distribution of land ownership for gift strategy three is the same as gift strategy two. Therefore, no change in the distribution of appreciation on land results from the additional gifts. The reduction in the husband's estate for each dollar of additional gifts is only $1.59. The increase in the combined equity for the heirs per dollar of additional gifts received under gift

strategy three over gift strategy two is $1.35. It appears that the after-tax rate of return to the heirs on the additional annual gifts is smaller than the after-tax rate of return for the husband. Also, the gift transfer costs are $11,026 higher for strategy three compared to strategy two.

The increase in equity for the wife at the end of year 30, as the level of gifts is increased, reflects the reduction in the average income tax rate for the parents. Gifts reduce the taxable income for the the parents. The wife's before-tax income is not affected by gifts made by the husband. However, the husband and wife file a joint income tax return, and the lower average tax rate increases the wife's after-tax cash income.

Liquidity and Financial Structure. Lifetime gifts to the children reduce the cash earnings for the parents. However, since the gifts allow the farm heir to purchase additional tracts of land rather than the husband, the amount of income required by the parents for debt reduction is reduced. At the end of year 20, just prior to retirement, the amounts of debt owed by the husband are $273,627 for gift strategy one and $124,325 for strategy two (Table 39) compared to $479,768 when no gifts are made (Table 27).

During years 26 through 30, the annual cash gifts ($9,000 per year for gift strategies one and two and $18,000 per year for strategy three) require the parents to increase debt. For gift strategy three, the debt owed by the husband at the end of year 30 is $291,383 which is higher than the level of debt owned at the end of year 30 for the base simulation experiment ($178,688). Additional liquidity is needed by the parents if large cash gifts are to be made.

Gifts to the farm heir provide additional equity which is leveraged to purchase land. As a result, the total debt is higher for the farm heir in the gift simulation experiments compared to the base simulation experiment. At the end of year 30, the amount of debt owed by the farm heir is $1,149,125 for gift strategy one, $1,219,728 for strategy two and $1,136,140 for strategy three compared to $901,843 for the base simulation experiment. Although more land is purchased, the additional gifts under gift strategy three result in a lower level of debt for the farm heir compared to gift strategy one. The debt to equity ratio for the farm heir at the end of year 30 is 0.64 in the base simulation experiment. The ending debt to equity ratio is lower than 0.64 for gift strategies two and three, but higher for strategy one.

At the end of year 30, the amount of cash for non-farm heirs is $117,191 for the base simulation experiment (Table 27). Due to the cash gifts and earnings on gifts, the cash holdings are $280,058, $357,347 and $505,099 for gift strategies one, two and three, respectively.

Estate Transfer Costs and Value of Transfers

Table 40 shows the impact of the gift strategies on the size of the parents' estates, estate transfer costs, estate liquidity and the net value of transfers to the heirs for alternative gift strategies. For all of the gift simulation experiments, will strategy two (50 percent to the wife and 50 percent to the children) is used. Thus, the impact of gifts can be determined by comparing these results to the simulation results for will strategy two when no gifts were made

Table 40. Estate Transfers, Transfer Costs and Liquidity for Alternative Gift Strategies Under Will Strategy Two.

Item	Gift Strategy One ($9,000 Annual Gifts)		Gift Strategy Two (Taxable Gift and $9,000 Annual Gifts)		Gift Strategy Three (Taxable Gift and $18,000 Annual Gifts)	
	Husband's Death	Wife's Death	Husband's Death	Wife's Death	Husband's Death	Wife's Death
Estate Value	$3,086,909	$2,604,793	$2,246,781	$1,934,020	$2,235,472	$1,766,470
Debt	78,576	0	30,451	0	291,383	0
Net Estate	3,008,333	2,604,793	2,216,329	1,934,020	1,944,088	1,766,470
Estate Expense						
Administrative	71,836	76,885	50,642	59,445	46,826	55,089
Federal Tax	341,914	645,866	252,743	446,467	206,832	386,739
Oklahoma Tax	97,860	182,633	67,028	130,366	56,847	117,310
Total	511,610	905,384	370,413	636,278	310,505	559,138
Liquidity Requirements	590,186	905,384	400,864	636,278	601,888	559,138
Liquidity Available						
Cash	23,452	284,590	17,003	298,851	5,695	131,301
Life Insurance	185,000	0	185,000	0	185,000	0
Sales	225,626	113,410	65,546	170,115	65,546	226,820
Selling Expense	26,574	17,747	6,942	31,092	7,610	45,568
Total	407,504	380,253	260,607	437,874	248,631	312,553
Net Liquidity	- 182,682	- 525,131	- 140,257	- 198,404	- 353,257	- 246,585
Net Value of Transfers						
Spouse	1,638,412	0	1,263,996	0	1,129,441	0
Farm Heir	338,075	560,044	253,112	421,492	226,959	386,309
Non-Farm Heirs	678,654	1,121,615	506,885	845,152	454,567	775,453
Total Value of Transfers to the Heirs						
By Will	2,698,388		2,026,614		1,843,288	
By Gift	270,000		502,132		673,132	
Total	2,968,388		2,528,746		2,516,420	
Net Present Value of Transfers to the Heirs (Seven Percent Discount Rate)	306,615		363,174		393,152	

(Table 34). In all gift simulation experiments, the land distribution to the heirs is the same. The non-farm heirs own 640 acres of land after the wife's death. Both the husband's and the wife's estates contain enough real estate to utilize the maximum reduction for current use value appraisal.

Total estate taxes and administrative costs at the husband's death are $596,444 under will strategy two for the base simulation experiment (no gifts). Due to the reduction in the husband's net estate, total estate expenses are reduced to $511,610 for gift strategy one, $370,413 for strategy two and $310,505 for strategy three. Although $27,270 of the $47,000 unified estate and gift tax credit is used in making gifts under strategies two and three, federal estate taxes are lower for these strategies compared to strategy one.

Due to the higher level of debt for gift strategy three, the estate liquidity requirements at the husband's death are higher than the liquidity requirements for gift strategies one and two. The value of estate sales are substantially lower for all gift strategies compared to the base simulation experiment.

Total estate expenses at the wife's death ate $1,102,572 under will strategy two when no gifts are made (Table 34) compared to $559,138 under gift strategy three. However, for all of the gift strategies, federal estate taxes at the wife's death are substantially higher than federal estate taxes at the husband's death, indicating that total combined estate transfer costs at both deaths could be reduced by willing less to the spouse to equate the marginal estate tax rates of the parents' estates.

Table 40 also shows the total and present value of gift and will transfers to the heirs for each gift strategy. These results are shown for the base simulation experiment in Table 36. For the base simulation experiment (will strategy two), the present value of transfers assuming a seven percent discount rate is $267,620. The present value of transfers, which reflects the timing of transfers, increases as the level of gifts is increased. The present value of transfers for strategy three is $125,532 higher than the present value for the base experiment.

Ending Equity and Liquidity

One area of concern, when the parents make a large amount of lifetime gifts, is the financial security for the surviving spouse. Table 41 shows the level of cash holdings for the wife at the beginning of year 31, just after the husband's death, and at the end of year 40, just prior to the wife's death, for the base simulation experiment and for each gift strategy. With the exception of gift strategy three, the level of the wife's cash is greater at the beginning of year 31 when gifts are made compared to when no gifts are made. Under strategy three, the level of cash at the beginning of year 31 is lower than other strategies due to the higher liquidity deficit for the husband's estate.

For each of the gift strategies, the wife makes $9,000 cash gifts to the children each year. Also, the wife receives less rent from real estate under the gift strategies compared to the base simulation experiment. For the base simulation experiment, the wife owns 640 acres of land compared to 560 acres for gift strategy one and 400 acres for gift strategies two and three. Thus, the amount of cash available

for savings (increase in cash holdings) during the 10 year period is reduced as the level of gifts increase. For strategy three, the level of cash held decreases by $13,993. Given this average rate of decrease ($1,400/year), the ending level of cash holdings would sustain the wife for many years beyond her expected lifetime.

Table 41. Summary of Liquidity and Ending Equity for Alternative Gift Strategies Compared to the Base Simulation Experiment Under Will Strategy Two.

Item	Gift Strategy			
	No Gifts	One	Two	Three
Cash Holdings for Spouse				
Beginning Year 31	$ 177,553	$ 209,971	$ 261,826	$ 128,612
End Year 40	338,914	267,908	282,169	114,619
Increase	161,361	57,937	20,343	-13,993
Equity for Heirs End of Year 45				
Combined	10,799,086	11,199,408	11,755,823	11,841,099
Farm Heir	7,268,590	7,570,803	7,822,621	7,858,222
Non-farm Heirs	3,530,495	3,628,604	3,933,198	3,982,877
Ending Net Liquidity Position for Non-farm Heirs[a]	71,853	175,203	510,156	559,834
Ending Debt to Equity Ratio for Farm Heir	0.45	0.40	0.36	0.35

[a]Net liquidity position is cash minus debt.

The reduced estate transfer costs and the earlier transfers to heirs resulting from higher levels of gifts, increases the ending

equity of the heirs. The ending net worth of the heirs (year 45) is $11,841,099 for gift strategy three compared to $10,799,086 when no gifts are made. Comparing strategy two to strategy one indicates that the $232,132 additional gift in year 11 increases the ending net worth of the heirs by $556,413 (a $2.40 increase for each one dollar of gifts).

The net liquidity position (cash minus debt) for the non-farm heirs is increased and the debt to equity ratio for the farm heir is reduced as the level of gifts is increased. The non-farm heirs are able to meet debt payments on schedule and increase cash holdings for strategies two and three.

Impact of Will Strategy When Gifts are Made

In the previous chapter, it is shown that willing less than one-half of the husband's estate to the wife (will strategy three) reduces total estate transfer costs and increases the net present value of transfers and the ending equity for the heirs. An additional simulation experiment is conducted for gift strategy two (taxable gifts and $9,000 annual gifts) to evaluate the impact of willing the spouse less than one-half of the husband's estate in an attempt to equate the marginal estate tax rates for the parents' taxable estates and reduce transfer costs.

Based on the value of the wife's equity prior to the husband's death and the rate of growth in the wife's estate during years 31 through 40 under gift strategy two, willing the spouse approximately 34 percent of the husband's estate would equate the marginal estate tax rates. However, approximately 37 percent of the husband's assets are

owned in joint tenancy. Thus, including the value of the personal automobile, the minimum value of assets that can be passed to the spouse is $843,381 (approximately 37.5 percent of the husband's estate).

Table 42 compares the results of this simulation experiment (will strategy three) to the results for the simulation experiment leaving one-half of the husband's estate to the wife (will strategy two). When 37.5 percent of the husband's estate is left to the wife, total estate transfer costs at the husband's death are $94,559 higher compared to total costs when 50 percent is left to the wife. This is due to the smaller marital deduction used in computing federal and Oklahoma estate taxes. However, since the wife inherits a smaller estate, total transfer costs are $203,005 lower at her death for will strategy three compared to will strategy two. The maximum reduction for use value appraisal of farm land ($500,000) is used for both simulation experiments. Under will strategy two, the marginal federal estate tax rate is 39 percent for the husband's estate compared to 43 percent for the wife's estate. Under will strategy three, the marginal federal estate tax rate is 41 percent at each death event.

Under will strategy three, the heirs receive a larger dollar amount of transfers at the first death event compared to will strategy two. Assuming a seven percent discount rate, the net present value of transfers for will strategy three is $369,772 compared to $363,174 for will strategy two. If the discount rate used is less than 3.4 percent, the net present value of transfers is greater for will strategy two compared to will strategy three. The combined equity for the heirs at the end of year 45 is $82,620 greater for will strategy three compared to will strategy two.

Table 42. Estate Transfer Costs, Liquidity and Financial Structure for Will Strategy Two and Will Strategy Three When Gift Strategy Two is Used.

Item	Will Strategy Two (50 percent to Wife) Husband's Death	Will Strategy Two (50 percent to Wife) Wife's Death	Will Strategy Three (37.5 percent to wife) Husband's Death	Will Strategy Three (37.5 percent to wife) Wife's Death
Net Estate Value	$2,216,329	$1,934,020	$2,216,329	$1,487,235
Estate Expense				
Administrative	50,642	59,445	50,642	47,829
Federal Tax	252,743	446,467	325,698	289,892
Oklahoma Taxes	67,028	130,366	88,632	95,552
Total	370,413	636,278	464,972	433,273
Estate Sales	65,546	170,115	78,655	158,774
Selling Expense	6,942	31,092	8,605	30,351
Value of Transfers to the Heirs				
Gifts	$ 502,132		$ 502,132	
Husband's Death	759,970		933,740	
Wife's Death	1,266,644		1,023,610	
Total	2,528,746		2,459,482	
Net Present Value	363,174		369,772	
Combined Equity for Heirs at End of Year 45	11,755,821		11,838,441	
Cash Holdings for Wife				
Beginning Year 31	261,826		208,197	
End Year 40	282,169		186,274	
Amount of Increase	20,343		-21,923	
Ending Net Liquidity Position for Non-Farm Heirs	$510,156		$571,981	
Ending Debt to Equity Ratio for Farm Heir	0.36		0.35	

Table 42 also shows the impact of will strategy three on the liquidity position for the surviving spouse. Leaving the wife a smaller estate reduces the cash income for the spouse. The wife receives rent income from 400 acres under will strategy two compared to 320 acres under will strategy three. During the 10-year period after the husband's death, the wife reduces her cash holdings by $21,923 in order to make the annual $9,000 cash gifts to the children under will strategy three. However, at the end of year 40, the wife still has $186,274 cash. For will strategy two the wife also makes the $9,000 annual cash gifts, but is able to increase her cash holdings by $20,343.

The use of the will strategy to equate the marginal estate tax rates for the parents' estates has a greater impact on total transfer costs when gifts are not made as a result of the larger taxable estates. Based on the simulation results shown in the previous chapter (Table 34), total estate transfer costs at both deaths are reduced by $223,221 for will strategy three compared to will strategy two when no gifts are made. As shown in Table 42, total transfer costs at both deaths are reduced by $108,446 for will strategy three compared to will strategy two. Also, when no gifts are made and will strategy three is used, the wife is able to increase her cash holdings following the husband's death.

Combining Lifetime Sales and Gifts

As indicated by the results for gift strategy three, making the $18,000 annual cash gifts to the heirs requires additional borrowing during the parents' retirement years. However, the present value of transfers and the ending net worth of the heirs is highest for gift

strategy three. One way to improve the parents' liquidity for gift making is to sell some of the land at retirement to the farm heir.

A simulation experiment is conducted to determine the impact of selling land to the farm heir at the beginning of year 21. Gift strategy three and will strategy two (50 percent to the wife) are used in this simulation experiment. The farm heir purchases 120 acres of real estate valued at $200,149 from the parents. Installment payments are used to spread the taxable income resulting from the capital gain over a 10 year period. The total long term gain is $105,484. Since the husband has high taxable income in year 21 resulting from the sale of inventory at retirement, there is no down payment on the sale. The annual payment including six percent interest is approximately $27,194.

Table 43 shows the distributions of land ownership, equity, debt and cash holdings at the end of year 30 resulting from the sale simulation experiment. Comparison of these results to the results for gift strategy three in Table 39 will show the impact of the sale transfer. The husband's equity at the end of year 30 under the sale strategy is $1,833,036 which is $111,053 lower than the ending equity when no sales are made. However, the husband's ending debt is $188,659 lower for the sale strategy. The husband's net liquidity position (cash + remaining installment loan balance - debt) at the end of year 30 for the sale strategy is $216,675 higher than his net liquidity position when no sales are made. Since the selling price of the land is $200,149, this indicates that, during the 10-year period following the sale, the cash earnings from the interest on the loan more than offset the reduced rent income and the increased income taxes resulting from the sale.

Table 43. Firm Ownership, Financial Structure and Liquidity at the End of Year 30 for Gift Strategy Three and Sale of 120 Acres of Land at Retirement.

Item	Husband	Wife	Farm Heir	Non-Farm Heirs	Total
Acres Owned	720	0	760	160	1,640
Equity	$1,833,036	$173,644	$2,117,755	$928,552	$5,052,988
Debt	102,724	0	1,368,024	0	1,470,748
Cash[a]	33,710	58,273	1,500	505,099	598,582
Debt/Equity	0.06	0.00	0.64	0.00	0.17

[a]Cash includes the last principal payment on the loan ($25,650) which is due at the beginning of year 31.

Comparing the ending debt for the farm heir shown in Table 43 to the ending debt under gift strategy three shown in Table 39 indicates that the farm heir does not have enough cash available to pay for the land during the 10 year period. His ending debt is $231,884 higher which is larger than the original purchase cost of the land ($200,149). Thus, the farm heir is forced to borrow on equity on other land to make the installment payments. The ending debt to equity ratio for the farm heir is 0.64 for the sale strategy compared to 0.56 for the no sale strategy. The ending equity for the farm heir is $95,842 higher when the sale is made compared to when no sales are made. The $95,842 increase in equity is less than the appreciation on the additional land.

Total estate transfer costs at the husband's death when the sale of land is made are $282,785. At the wife's death the estate transfer

costs are $476,960. Total estate transfer costs at both deaths including estate selling expenses are $148,961 lower for the sale simulation experiment compared to the transfer costs for gift strategy three when no sales are made. However, due to the smaller estates, the net present value of transfers to the heirs is lower. The net present value of transfers to the heirs including gifts is $385,157 for the sale strategy compared to $393,152 for the no sale strategy (Table 40, Gift Strategy Three).

Selling land at retirement improves the estate liquidity situation. Since the farm heir had already purchased 120 acres of land from the parents, the value of estate sales required to achieve the same ending land ownership distribution is $101,814 for the sale strategy compared to $292,366 for the no sale strategy. As a result of the reduced estate liquidity requirements, the cash held by the spouse at the beginning of year 31, just after the husband's death, is $287,988 for the sale simulation experiment compared to $128,612 for the no sale experiment (Table 41).

Table 44 summarizes the equity, financial structure and liquidity information at the end of year 45 for the sale experiment compared to the same experiment without sales. Although the net present value of transfers to the heirs is $7,995 lower when the parents sell land at retirement, the combined equity of the heirs at the end of year 45 is $126,984 higher for the sale simulation experiment compared to the no sale experiment. The 120 acres sold to the farm heir is not included in the value of transfers, but is included in the ending equity for the heirs.

Table 44. Equity, Debt and Liquidity at the End of Year 45 for Gift Strategy Three When Sales of Land are Made at Retirement Compared to the Same Gift Strategy Without Sales.

Item	Sales of Land at Retirement			No Sales at Retirement		
	Farm Heir	Non-Farm Heirs	Total	Farm Heir	Non-Farm Heirs	Total
Acres	1,480	640	2,120	1,480	640	2,120
Equity	$8,124,380	$3,843,702	$11,968,083	$7,858,222	$3,982,877	$11,841,099
Debt	2,568,221	124,299	2,692,520	2,770,272	155,196	2,925,468
Cash	1,500	609,068	610,568	1,500	715,030	716,530
Debt/Equity	0.32	0.03	0.17	0.35	0.04	0.19

Impact of Marital Gifts

For all the previously described simulation experiments, the husband makes $5,000 annual gifts to the wife to cover the premiums on the husband's life insurance owned by the wife. Two simulation experiments are conducted to investigate the impact of additional marital gifts. One simulation experiment is conducted where the husband gives the wife a one-half undivided interest in the home farm (320 acres and improvements) at the beginning simulation year. The 320 acres is currently owned in joint tenancy with rights of survivorship. At the time of the marital gift, the method of property ownership is changed to tenancy in common. An undivided one-half interest in the 320 acres will be included in each parent's estate.

The total value of the gift transfer at year one, including the $5,000 cash gift, is $102,678. Under the Tax Reform Act of 1976, there is an unlimited $100,000 gift tax marital deduction in addition to the $3,000 annual exclusion. Thus, there are no federal gift taxes due on the transfer. All gift transfers to a spouse are exempt from gift taxes under Oklahoma law. The administrative cost for the gift transfer and the change in ownership method is approximately $1,466.

The wife receives rent for the contribution of the real estate to the farm business. Thus, the cash income for the wife is increased and cash income for the husband decreased as a result of the gift. Initially, the additional cash income for the wife is not large enough to cover the cost of the life insurance premiums without a cash gift from the husband. The $5,000 annual cash gift from the husband to the wife is continued through year ten. After year ten, the husband does not make annual cash gifts to the wife in this simulation experiment.

The husband continues to make lifetime gifts to the children. A large gift is made in year 11 ($241,132), and annual gifts of $9,000 are made during years 12 through 40 (gift strategy two).

Another simulation experiment is conducted where the husband gives the wife an additional 160 acres valued at $94,395. Thus, the total gift of real estate at the first simulation year is 320 acres valued at $192,073. Since the wife receives additional rent income, the annual cash gift to the wife during the first ten years is reduced from $5,000 to $2,500. Thus, the total gift at year one is $194,573. Under the Tax Reform Act of 1976, the taxable gift is $91,573 (194,573 - 100,000 - 3,000). Tentative federal gift taxes are $21,440. However, $21,440 of the husband's $47,000 unified credit is used and no gift taxes are due. Administrative costs are $2,173. Since the husband's income is lower due to the gift of additional land, the wife makes $3,000 of the annual $9,000 gifts made to the children under gift strategy two.

Firm Growth and Liquidity for the Parents

The simulation results for the first 30 years of the planning horizon for each marital gift strategy are shown in Table 45. At the beginning year, the husband's equity is decreased by the amount of the gift of real estate, plus the administrative expenses. The wife's equity is increased by the value of the gift. During the first 10 years, the wife's cash holdings increase $4,966 when marital gifts are only $5,000 per year. However, when marital gifts include the 160 acres of land, the wife's cash holdings increase $43,385 reflecting the additional after-tax cash income from rent of real estate. Cash holdings for the wife at the end of year 10 are $42,180 for the 320

Table 45. Equity, Debt and Liquidity for the Parents at the Beginning Year and at the End of Years 10, 20 and 30 for Alternative Marital Gift Strategies.

Item	$5000 Annual Cash Gift to Wife			Gift of 160 Acres to Wife			Gift of 320 Acres to Wife		
	Husband	Wife	Total	Husband	Wife	Total	Husband	Wife	Total
Beginning Year 1									
Equity	$558,996	$2,677	$561,673	$459,852	$100,355	$560,207	$364,750	$194,750	$559,500
Debt	227,532	0	227,532	228,998	0	228,998	229,706	0	229,706
Cash	1,500	0	1,500	1,500	0	1,500	1,500	0	1,500
End Year 10									
Equity	$1,117,840	$44,206	$1,162,046	$921,616	$231,541	$1,153,157	$764,297	$386,237	$1,150,534
Debt	373,322	0	373,322	420,628	0	420,628	422,048	0	422,048
Cash	1,500	4,966	6,466	1,500	43,385	44,885	1,500	42,180	43,680
End Year 20									
Equity	$1,523,573	$88,700	$1,612,273	$1,236,264	$353,562	$1,589,826	$961,264	$608,660	$1,569,924
Debt	124,325	0	124,325	175,279	0	175,279	200,059	0	200,059
Cash	1,500	11,371	12,871	1,500	39,878	41,378	1,500	44,757	46,257
End Year 30									
Equity	$2,216,330	$172,942	$2,389,272	$1,762,409	$592,175	$2,354,584	$1,298,736	$1,026,542	$2,325,278
Debt	30,451	0	30,451	80,533	0	80,533	124,506	0	124,506
Cash	17,003	57,571	74,574	8,000	81,975	89,975	0	104,637	104,637

acre gift strategy compared to $43,385 for the 160 acre marital gift strategy. The additional rent does not quite offset the $2,500 reduction in the annual cash gift.

The additional cash earnings for the wife earn five percent in a savings account. However, due to the reduced rent income, the amount of debt owed by the husband at the end of each 10 year period is higher as the amount of the marital gift is increased. The interest rate on debt is nine percent. Due to this financial effect and the gift transfer costs, the combined equity for the parents at the end of year 30 is $34,688 lower for the 160 acre marital gift and $63,994 lower for the 320 acre marital gift compared to the equity for the $5,000 annual marital gift strategy.

In terms of total family equity, part of the decrease in the parents' equity is offset by an increase in the farm heir's equity. When land is owned by the wife and rented to the farm business rather than owned and operated by the husband, the farm heir's share of farm income increases relative to the husband's share. At the end of year 30, the farm heir's ending equity is $6,842 higher under the 160 acre marital gift and $12,851 higher under the 320 acre marital gift compared to the $5,000 annual marital gift strategy.

The larger debt for the husband under the 320 acre marital gift strategy is partially due to the payment of $8,805 federal gift taxes in year 11. Part of the husband's $47,000 unified credit ($21,440) is used to make the marital gift and is not available when taxable gifts are made to the children in year 11. Under the 160 acre marital gift strategy, the marital gift does not affect the cost of making lifetime gifts to the children because the marital gift is less than the $100,000 marital deduction.

The net liquidity position (cash minus debt) at the end of year 30 is $59,105 lower for the husband and $24,404 higher for the wife when the 160 acre gift is made compared to the $5,000 annual gifts. When the 320 acre gift is made and the wife makes one-third of the annual lifetime gifts to the children, the net liquidity position at the end of year 30 is $111,058 lower for the husband and $47,006 higher for the wife compared to the $5,000 annual gift strategy. The liquidity distribution for the parents could be modified by additional adjustments in the portion of gifts made to the children by the husband and wife.

Changes in estate ownership between the husband and wife will require changes in their wills. At the end of year 30, the wife owns 44 percent of the parents' net estate under the 320 acre marital gift strategy compared to 25 percent and 7 percent for the 160 acre and $5,000 annual gift strategies, respectively.

Estate Transfer Costs and Value of Transfers

Table 46 shows the simulated values for estate transfer costs and value of transfers to the heirs for the marital gift strategies. The will strategy that attempts to equate the marginal estate tax rates for the parents' estates (will strategy three) is used. Under the annual $5,000 marital gift strategy, the wife receives the personal auto and all of the assets owned in joint tenancy which includes 320 acres of land. This represents approximately 37.5 percent of the husband's estate value. For the strategy which includes the marital gift of 160 acres of land, the wife receives 18 percent of the husband's estate (farm home, personal auto and 80 acres of land). Under the 320

Table 46. Estate Transfer Costs, Value of Transfers, Equity and Liquidity for Alternative Marital Gift Strategies Using Will Strategy Three and Gift Strategy Two.

Item	$5000 Annual Gift to Wife		Gift of 160 Acres to Wife		Gift of 320 Acres to Wife	
	Husband's Death	Wife's Death	Husband's Death	Wife's Death	Husband's Death	Wife's Death
Net Estate	$2,216,329	$1,487,235	$1,762,409	$1,298,800	$1,298,736	$1,621,894
Estate Expenses						
Administrative	50,642	47,829	53,941	42,929	42,436	51,330
Federal Tax	325,698	289,892	308,135	226,418	243,128	336,322
Oklahoma Tax	88,632	95,552	92,475	80,870	76,884	106,045
Total	464,972	433,273	454,551	350,217	362,448	493,697
Estate Sales	78,655	158,774	109,625	102,825	49,159	113,410
Selling Expense	8,605	30,351	14,039	16,979	4,670	17,609
Value of Transfers						
Gifts	$ 502,132		$ 502,132		$ 502,132	
Husband's Death	933,740		989,438		881,599	
Wife's Death	1,023,610		931,603		1,110,587	
Total	2,459,482		2,423,173		2,494,318	
Net Present Value	369,772		370,944		368,730	
Combined Equity for Heirs at End of Year 45	11,838,441		11,912,935		11,878,323	
Cash Holdings for Wife						
Beginning year 31	208,197		299,148		285,936	
End year 40	186,274		273,831		287,538	
Amount of increase	-21,923		-25,317		+1,602	
Ending Net Liquidity Position for Non-Farm Heirs	571,981		588,342		504,810	
Ending Debt to Equity Ratio for Farm Heir	0.354		0.345		0.341	

acre marital gift strategy, the expected value of the wife's estate at her death exceeds the value of the husband's net estate at his death, and based on the will decision rule used, the wife would not receive any of the husband's estate. However, the farm home which is owned in joint tenancy and the personal auto is willed to the wife. The wife receives approximately four percent of the husband's estate.

Total estate expenses at the husband's death are lowest for the 320 acre marital gift strategy which has the smallest estate value. Administrative expense is higher for the 160 acre gift strategy than the annual gift strategy despite the smaller estate because a smaller portion of the estate is owned in joint tenancy. Oklahoma estate taxes are higher at the husband's death for the 160 acre marital gift strategy compared to the $5,000 annual gift strategy. The smaller estate for the 160 acre marital gift is more than offset by a smaller marital deduction resulting in a larger taxable estate.

The value of the wife's estate at the time of her death is largest for the 320 acre marital gift compared to the other marital gift strategies. The wife owns the same number of acres of land (320) for the annual and the 320 acre marital gift strategies. However, her accumulated cash holdings are greater under the 320 acre gift strategy. Only 240 acres of land is owned by the wife for the 160 acre gift strategy. Total estate transfer expenses at the wife's death vary according to the value of the estate.

Compared to the annual gift strategy, combined transfer expenses at both deaths, including selling expenses, are $101,415 lower for the 160 acre land gift strategy and $58,777 lower for the 320 acre land gift strategy. For the 320 acre marital gift strategy, federal estate

taxes could be reduced by reducing the wife's estate and increasing the husband's estate. The marginal estate tax rate is higher for the wife's estate. Thus, a slightly smaller marital gift would reduce total federal estate taxes.

Assuming a seven percent discount rate, the net present value of transfers is highest for the 160 acre gift strategy and lowest for the 320 acre gift strategy. However, the range in the present value of transfers is only $2,214. Compared to the annual gift strategy, the combined equity for the heirs at the end of year 45 is $74,494 higher for the 160 acre land gift strategy and $39,882 higher for the 320 acre marital gift.

As shown by the change in cash holdings, the cash income for the surviving spouse is sufficient to cover the $9,000 annual cash gifts to the children only for the 320 acre gift strategy. Since the spouse owns 80 acres less land after the husband's death, the decrease in cash holdings is greatest for the 160 acre land gift strategy. However, the ending cash holdings for the spouse is $87,557 greater for the 160 acre land gift strategy compared to annual marital gifts due to the earlier accumulation of cash income.

Based on these simulation results, a marital gift which utilizes the $100,000 federal gift tax marital deduction reduces total estate transfer costs and increases the ending net worth of the heirs. However, marital gifts above $100,000 are taxable and use up the unified estate and gift tax credit. Making a taxable marital gift results in higher transfer costs, a lower present value of transfers, and a lower ending net worth for the heirs compared to making the $100,000 marital

gift. These same marital gift strategies are re-evaluated in the next chapter using results from simulation experiments where the husband survives the wife.

CHAPTER VII

RESULTS FOR SIMULATION EXPERIMENTS PERFORMED TO EVALUATE THE EFFECTS OF THE TIMING OF DEATH EVENTS AND THE TAX REFORM ACT OF 1976

The purpose of this chapter is to describe the results for simulation experiments performed to evaluate (1) the impact of the timing and sequence of death events and (2) the impact of the Tax Reform Act of 1976. The simulation results presented in Chapter V and Chapter VI are based on the assumptions that the husband's death occurs at the end of year 30 and the wife survives the husband by 10 years. The timing and sequence of death events that actually occur will have an impact on the estate transfer costs, the value of transfers, and the future financial growth and liquidity of the firm and its owners. The results for simulation experiments designed to test the sensitivity of the values for these outcome variables to the timing and sequence of death events are presented and analyzed in the first section of this chapter.

The impact of the changes in federal estate and gift tax laws made by the Tax Reform Act of 1976 is analyzed in the second section of this chapter. The estate, gift and liquidation expenses are computed for selected gift and will strategies under the legal environment existing prior to the change in the federal estate and gift tax laws and compared to the results presented in Chapters V and VI.

Impact of Timing and Sequence of Death Events

Simulation results are presented below for death events that include: (1) an early death for the husband, (2) a shorter survival period for the wife and (3) the husband surviving the wife.

Early Death for the Husband

Simulation experiments are performed where the husband's death occurs at age 62 (year 20) rather than age 72 (year 30). Based on Life Tables for Oklahoma, the probability of a white male of age 42 dying prior to age 62 is approximately 0.21 (see Table 25, Chapter IV). The probability of a death prior to age 72 is approximately 0.45. It is assumed that the wife's death occurs at the end of year 40 (age 78). Thus, the wife survives the husband by 20 years.

Table 47 shows the simulation results for will strategies two and three. Gift strategy two (taxable gifts and $9,000 annual gifts) is utilized in both simulation experiments. At the end of year 20, the husband's net estate (equity) is $1,523,573. The value of assets is $1,646,398 and debt is $122,825. Since the husband's death occurs prior to his retirement, the estate includes $206,547 inventory in addition to the 840 acres of land. The estate also includes a retirement annuity valued at $62,297. Under the Tax Reform Act of 1976, the value of the future annuity payments to the spouse are not included in the decedent's taxable estate (U. S. Congress 1976, Sec. 2009).

Under will strategy two, the wife receives 50 percent of the estate. Assets received by the wife include 400 acres of real estate, the retirement annuity, the home and the personal automobile. Under

Table 47. Estate Transfer Costs, Transfers, Ending Equity and Financial Structure for Will Strategies Two and Three When Gift Strategy Two is Used and Husband's Death Occurs at the End of Year 20.

Item	Will Strategy Two (50 percent to Wife) Husband's Death	Will Strategy Two (50 percent to Wife) Wife's Death	Will Strategy Three (35.2 percent to Wife) Husband's Death	Will Strategy Three (35.2 percent to Wife) Wife's Death
Net Estate Value	$1,523,573	$1,822,773	$1,523,573	$1,312,571
Estate Transfer Costs				
Administrative	37,185	56,553	37,185	43,288
Federal Tax	126,405	406,810	171,617	231,005
Oklahoma Tax	39,418	121,698	54,668	81,943
Total	203,008	585,061	263,470	356,236
Estate Sales	206,547	204,138	197,128	216,739
Selling Expense	80,708	38,185	76,333	44,614
Value of Transfers to the Heirs				
Gifts	$ 502,132		$ 502,132	
Husband's Death	508,707		648,918	
Wife's Death	1,199,523		911,723	
Total	2,210,362		2,062,773	
Net Present Value	390,317		407,330	
Combined Equity for Heirs at the End of Year 45	11,991,392		12,116,163	
Cash Holdings for Wife				
Beginning year 21	205,371		142,662	
End year 30	188,187		89,719	
End year 40	170,923		11,610	
Ending Net Liquidity Position for Non-Farm Heirs	660,197		735,321	
Ending Debt to Equity Ratio for Farm Heir	0.344		0.334	

will strategy three, the wife receives the retirement annuity, home, personal automobile and the 320 acres owned in joint tenancy for approximately 35.2 percent of the husband's estate. For both will strategies, the inventory included in the husband's estate is sold to the farm heir. Inventory sales are ordinary income and the income taxes (selling expense) per dollar of sales are substantially higher at the husband's death compared to the wife's death.

Total estate transfer costs at both deaths including selling expenses are $906,962 under will strategy two compared to $740,653 under will strategy three. The savings in estate transfer costs from use of will strategy three compared to strategy two are greater when the husband's death occurs at the end of year 20, rather than year 30. As shown in Table 42 (Chapter VI), the combined value of transfer costs at both deaths when the husband's death occurs at the end of year 30 is $1,044,725 for will strategy two and $928,596 for will strategy three. For a growing estate, the transfer cost saving from willing less than one-half to the spouse increases as the length of time the wife survives the husband increases.

As a result of the transfer cost savings and earlier transfers to the heirs, the values of the net present value of transfers and the ending equity for the heirs are higher for will strategy three compared to strategy two. The ending equity for the heirs is $124,771 higher for will strategy three than will strategy two. Compared to the death event in year 30 (Table 42), the present value of transfers and ending equity values are higher when the husband's death occurs in year 20. Also, the difference in ending equity between will strategy two and strategy three is greater for the husband's death in year 20 compared to year 30.

The wife must decrease her cash holdings after the husband's death in order to continue making the $9,000 annual cash gifts to the children. In addition to rent on land and interest on savings (from life insurance proceeds), the wife has income from the IRA annuity, during years 21 through 30, and social security widow benefits starting in year 23.[1] Under will strategy three, the spouse receives only 320 acres of land and her cash holdings decline to $11,610 by the end of year 40. If the wife survives more than one year beyond her expected life span (40 years), then she would need to borrow against the land or sell part of the land. As shown in Table 42, the wife has $186,274 cash remaining at her death under will strategy three when the husband's death does not occur until year 30.

To avoid the liquidity problem for the wife associated with an unexpected early death for the husband, the husband could initially specify in his will that the wife is to receive some land in a life estate in addition to 35 percent of the estate received outright. If the husband lives beyond his retirement age and the potential financial security for the surviving spouse is improved, he could change his will to leave the life estate portion to the children outright.

Timing of Wife's Death

Will strategy two and will strategy three are also simulated under the condition that the wife survives the husband by five years, rather than 10 years. The husband's death occurs at the end of year 30

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[1] Widow benefits are not available until the surviving spouse reaches age 60 in year 23.

(expected lifetime) and the wife's death occurs at the end of year 35 (age 73), rather than 40 (age 78). The probability of a 38 year old female dying prior to age 73 is 0.26. The probability of dying prior to age 78 is 0.40.

The simulation results are shown in Table 48. The estate transfer costs at the husband's death are the same as those shown in Table 42 (Chapter VI). However, since the wife survives the husband only five years, the value of the wife's estate and estate transfer costs are lower for the wife's death in year 35 compared to the values for the wife's death in year 40. Also, the present value of transfers and ending equity for the heirs are higher for the wife's death in year 35 despite the fewer number of years for making gifts to the children.

As shown by the values for estate transfer costs, present value of transfers, and ending equity for the heirs, will strategy three is still preferred to will strategy two when the wife's death occurs in year 35. However, since the wife survives the husband for five years rather than 10 years, the advantage of using will strategy three over strategy two is reduced. The reduction in total transfer costs at both deaths including selling expenses from using strategy three rather than strategy two is $58,955 when the wife's death occurs in year 35 (Table 48) compared to a reduction of $107,524 when the wife's death occurs in year 40 (Table 42). Under will strategy three, the ending net worth for the heirs is increased by $47,696 for the wife's death in year 35 compared to an increase of $82,620 for the wife's death in year 40.

Under will strategy three, approximately 37.5 percent of the husband's estate is willed to the wife. When the wife's death occurs in year 40, the marginal federal estate tax rate is 41 percent for both

Table 48. Estate Transfer Costs, Transfers, Ending Equity and Financial Structure for Will Strategies Two and Three When Gift Strategy Two is Used and the Wife's Death Occurs at the End of Year 35.

Item	Will Strategy Two (50 percent to Wife)		Will Strategy Three (37.5 percent to Wife)	
	Husband's Death	Wife's Death	Husband's Death	Wife's Death
Net Estate Value	$2,216,329	$1,594,492	$2,216,329	$1,245,578
Estate Transfer Costs				
Administrative	50,642	49,777	50,642	40,706
Federal Tax	252,743	327,171	325,698	208,977
Oklahoma Tax	67,028	103,977	88,632	76,790
Total	370,413	480,925	464,972	326,473
Estate Sales	65,546	128,966	78,655	119,510
Selling Expense	6,942	21,477	8,605	20,752
Value of Transfers to the Heirs				
Gifts	$ 457,132		$ 457,132	
Husband's Death	759,970		933,740	
Wife's Death	1,092,089		898,354	
Total	2,309,191		2,289,226	
Net Present Value	377,177		381,859	
Combined Equity of Heirs at the End of Year 45	11,905,937		11,953,633	
Cash Holdings for Wife				
Beginning Year 31	261,826		208,197	
End Year 40	262,422		190,628	
Change	+596		-17,569	
Ending Net Liquidity Position for Non-Farm Heirs	577,805		623,671	
Ending Debt to Equity Ratio for Farm Heir	0.345		0.343	

deaths. However, when the wife's death occurs in year 35, the marginal federal estate tax rate at her death is 39 percent. Thus, if the wife survives the husband by only 5 years, estate taxes could be reduced by leaving the wife more than the 37.5 percent of the husband's estate. If the share of the husband's estate willed to the wife is increased to approximately 42 percent (additional $100,000), the marginal federal estate tax rate for both parents would be 39 percent and total estate taxes could be reduced slightly.

Sequence of Death Events

In Chapter VI, it is shown that making gifts of approximately $100,000 (160 acres) to the wife reduces estate transfer costs by approximately $101,415 and increases the ending net worth by $74,494 compared to making only $5,000 annual marital gifts (Table 46). However, compared to the $100,000 gift, making marital gifts of nearly $200,000 resulted in approximately $42,638 higher transfer costs and a $34,612 lower ending equity. These results were simulated assuming that the wife survives the husband.

Simulation experiments are conducted using the same marital gift strategies assuming the husband survives the wife. It is assumed that the wife's death occurs at the end of year 30 (age 68) and the husband's death occurs at the end of year 35 (age 77). Under all three marital gift strategies, the husband owns more than one-half of the combined estates at the end of year 30 (Table 45, Chapter VI). Thus, it is assumed that the wife's will specifies that her entire estate passes directly to the children. The wife's estate consists of cash, savings, life insurance on the husband with $115,371 cash value

($185,000 face value), and real estate. The life insurance policies are divided equally among the children at the wife's death.

The values of the parents' estates, transfer costs and transfers for the three marital gift strategies are shown in Table 49. The husband, who owns the largest estate, cannot utilize the marital deduction when the wife dies first. The sizes of the parents' estates are most nearly equal under the 320 acre gift strategy. Under this strategy, total estate transfer costs for both deaths including selling expenses are $779,721 compared to $935,914 for the 160 acre gift strategy. Ending equity for the heirs is $129,256 higher under the 320 acre marital gift strategy compared to the 160 acre gift strategy.

The combined value of federal taxes is also lower as the marital gift is increased because more land is subject to the use value appraisal. When the husband dies first, the maximum current use value reduction is available for both the parents' estates. When the wife dies first, the maximum use value reduction can be utilized by both parents under the 320 acre marital gift strategy. The use value reduction is not available at the wife's death under the $5,000 annual gift strategy because the wife does not own any land. Assuming a two percent net rent and a nine percent effective interest rate, approximately $289,000 of the maximum use value reduction is used at the wife's death under the 160 acre marital gift strategy.

The net liquidity position (cash minus debt) for the husband is reduced as the size of the marital gift is increased reflecting the reduced rental income. Under the 160 and 320 acre marital gift strategies, the husband must increase debt to make the annual $9,000 cash gifts to the children.

Table 49. Estate Transfer Costs, Value of Transfers, Ending Equity and Liquidity for Alternative Marital Gift Strategies When Husband Survives the Wife Using Gift Strategy Two and Will Strategy Three.

Item	$5,000 Annual Gift to Wife		Gift of 160 Acres to Wife		Gift of 320 Acres to Wife	
	Wife's Death	Husband's Death	Wife's Death	Husband's Death	Wife's Death	Husband's Death
Net Estate Value	$172,942	$2,853,897	$592,175	$2,333,739	$1,026,542	$1,622,941
Estate Expenses						
Administrative	10,469	82,214	23,004	67,761	34,298	52,746
Federal Tax	31,374	791,693	68,841	561,300	137,458	365,398
Oklahoma Tax	3,848	200,307	29,592	154,346	60,118	106,016
Total	45,691	1,074,214	121,437	783,407	231,874	524,160
Estate Sales	0	253,093	39,483	174,956	90,811	76,674
Selling Expense	0	39,276	4,681	26,389	14,243	9,444
Value of Transfers						
Gifts	$ 457,132		$ 457,132		$ 457,132	
Wife's Death	11,881		350,681		665,054	
Husband's Death	1,902,566		1,617,289		1,274,332	
Total	2,371,579		2,425,102		2,396,518	
Net Present Value	354,815		372,603		381,778	
Combined Equity of Heirs at End of Year 45	11,544,202		11,764,466		11,893,722	
Net Liquidity Position for Husband						
Beginning year 31	-13,448		-72,532		-124,506	
End year 35	5,789		-80,194		-176,914	
Amount of increase	+19,237		-7,662		-52,408	
Ending Net Liquidity Position for Non-Farm Heirs	330,606		452,149		472,884	
Ending Debt to Equity Ratio for Farm Heir	0.366		0.348		0.333	

The results shown in Table 49 and Table 46 (Chapter VI) indicate that the ending net worth and present value of transfers is higher under the 160 acre marital gift strategy compared to the $5,000 marital gift strategy, regardless of the sequence of death events. Making taxable marital gifts (320 acre strategy) results in a larger present value of transfers and ending net worth compared to the 160 acre marital gift strategy only when the wife dies first. The reduction in net worth for the 320 acre marital gift compared to the 160 acre marital gift when the husband dies first is only $34,612 (Table 46). On the other hand, the increase in net worth for the 320 acre strategy compared to the 160 acre strategy when the wife dies first is $129,256 (Table 49). If the probability of the wife dying first is greater than 0.2113, the increase in equity weighted by the probability of the wife dying first is greater than the decrease in equity weighted by the probability of the husband dying first.[2]

Whether the husband should make the taxable marital gifts will depend on the ages and health of the parents and the probability associated with the wife dying first. For the case family situation, the wife is four years younger than the husband. For this simulation experiment, the husband's death occurs in year 35 (age 77). The probability that the wife's death will occur prior to year 35 (age 73) is 0.26 (see Table 25, Chapter IV). Given the present age for the husband (42), the average life expectancy is approximately 30 years. The probability that the wife's death will occur prior to year 30 is only 0.17.

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[2] ($129,256 x 0.2113) ≃ ($34,612 x 0.7887).

Impact of the Tax Reform Act of 1976

The Tax Reform Act of 1976 was implemented during the process of this study. The results presented in other sections of this study are simulated under the legal environment created by this act. In this section, the results for selected will and gift strategies simulated under the old federal estate and gift tax laws are compared to results simulated under the new law. Changes in the law analyzed include: (1) replacing the $60,000 estate exemption and $30,000 lifetime gift exemption with a single $47,000 unified tax credit, (2) replacing the separate federal estate and gift tax rate schedules with a new unified tax rate schedule, (3) allowing qualifed farm land to be valued for estate tax purposes based on current use rather than market value, and (4) the new rules for determining the income tax basis of inherited property. Since the estate transfers simulated in the study occur at the end of simulation years 30 and 40, the analysis focuses on the long run impact of the changes in the law.

At Death Transfers

The estate transfer costs and value of transfers to the heirs computed using the federal estate tax law prior to the Tax Reform Act of 1976 are shown in Table 50. The two will strategies are 50 percent and 35 percent, respectively, to the wife outright and the residual to the children (will strategies two and three). Since the wife's share of the estate is not burdened with estate taxes, the net value received by the spouse at the husband's death and the value of the wife's estate are the same under the old and new laws. The amount of real estate sold to the farm heir is also the same under the old and new law

Table 50. Estate Transfer Costs for Alternative Will Strategies (No Lifetime Gifts) Prior to Tax Reform Act of 1976 and Change Caused by New Law.

Item	WILL STRATEGY TWO: One-Half to Wife				WILL STRATEGY THREE: 35 Percent to Wife			
	Husband's Death		Wife's Death		Husband's Death		Wife's Death	
	Old Law	Change[a]	Old Law	Change[a]	Old Law	Change[a]	Old Law	Change[a]
Net Estate Value	$3,355,566		$2,995,470		$3,355,566		$2,137,480	
Estate Sales	403,451		289,826		528,341		99,549	
Federal Estate Tax	489,282	$ -86,341	1,008,925	$-206,470	677,375	$-117,738	654,607	$-182,128
Okla. Estate Tax	111,388	0	213,074	0	150,619	0	146,220	0
Administrative Expense	82,115	0	87,043	0	82,115	0	64,735	0
Sellings Expense[b]	9,481	+33,271	7,103	+ 49,299	12,416	+ 46,453	2,631	+ 13,056
Total Costs	$ 692,266	$ -53,070	$1,316,145	$-157,171	$ 922,525	$- 71,285	$ 868,193	$-169,072

Value of Transfers:	Both Deaths		Both Deaths	
	Old Law	Change[a]	Old Law	Change[a]
Husband's Death	$1,050,544	$+ 53,070	$1,312,225	$+ 71,285
Wife's Death	1,679,325	+157,171	1,269,283	+169,072
Total	2,729,869	+210,241	2,581,508	+240,357
Present Value				
7 Percent Discount Rate	$ 250,153	$+ 17,468	$ 257,146	$+ 20,655
3.5 Percent Discount Rate	798,437	+ 58,605	788,103	+ 68,100

[a]Amount of change is amount for new law (after Tax Reform Act of 1976) minus amount for old law.

[b]Under the old law selling expense is the administrative cost to make the sale. The change caused by the new law represents income taxes on the capital gain.

situations. The amounts shown in the change column of Table 50 are the increases (+) or decreases (-) resulting from the new law. No lifetime gifts are made in either simulation experiment.

For both will strategies and at both death events, federal estate taxes are lower and selling expenses are higher under the new law compared to the old law. Federal estate taxes are reduced more than selling expenses are increased. Thus, total costs are lower and the value of transfers are higher under the Tax Reform Act of 1976 for the case estate and the will strategies examined.

The transfer values are discounted using two alternative rates--7 and 3.5 percent. Since differences in value of transfers between the old and new law represent cash transfers, the 3.5 percent discount rate is more appropriate for evaluating the impact of the change in estate tax law. Based on results from other simulation experiments, the after tax rate of return on additional cash transfers for the heirs is approximately 3.5 percent. The seven percent rate is more appropriate for comparing alternative will strategies under the same legal environment, since differences in the timing of transfers represent both land and cash assets.

Assuming a 3.5 percent opportunity rate of return, the present value of the additional estate transfers due to the Tax Reform Act of 1976 is $58,605 (7.3 percent of the present value under the old law) for will strategy two and $68,100 (8.6 percent) for will strategy three. The increase in the value of transfers due to the new law is greater for will strategy three compared to will strategy two.

The advantage of using the will strategy leaving 35 percent, rather than 50 percent, to the wife is greater under the new law

compared to the old law. Assuming a seven percent discount rate, the increase in present value of transfers for will strategy three over strategy two is $10,180 under the new law and $6,993 under the old law.

Federal Estate Taxes. The change in federal estate taxes caused by the Tax Reform Act of 1976 can be allocated to the separate provisions of the law. The amounts of change in federal estate taxes caused by the various parts of the Tax Reform Act of 1976 for the two will strategies are shown in Table 51.

The decrease in federal estate taxes is due primarily to the current use value reduction in the taxable estate. Without the use value reduction, federal estate taxes, for the size of estate examined, would be higher under the new law. In all situations investigated, the $500,000 maximum use value reduction is utilized. In general, the reduction in estate taxes due to use value appraisal increases as the size of the taxable estate and marginal estate tax rate increase. For example, under will strategy two, the $500,000 reduction in the taxable estate results in $218,870 lower taxes at the wife's death. The marginal federal estate tax rate (under new law) is 41.0 percent after adjustment for the state death tax credit. On the other hand, the taxable estate for the wife under will strategy three is in a 38.6 percent bracket and the reduction in taxes due to use value appraisal is $192,128.

At the husband's death, the reduction in the taxable estate under the new law is actually less than the $500,000 use value reduction. This is because the use value is applied to assets received by the spouse and the resulting marital deduction is lower. It is assumed that the portion of the $500,000 use value reduction applied to assets

Table 51. Change in Federal Estate Taxes Resulting from Various Parts of the Tax Reform Act of 1976 for Will Strategy Two and Will Strategy Three (No Lifetime Gifts).

Item	Will Strategy Two 50 Percent to Wife		Will Strategy Three 35 Percent to Wife	
	Husband's Death	Wife's Death	Husband's Death	Wife's Death
Taxable Estate[a]:				
New law	$1,386,726	$2,408,427	$1,802,743	$1,572,745
Old law	1,636,726	2,908,427	2,127,743	2,072,745
Amount of change in federal taxes due to:				
Use value reduction	-93,941	-218,870	-127,738	-192,128
Replacing $60,000 exemption with $47,000 credit	-20,000	-15,200	-17,600	-17,600
Change in tax rate schedule	+27,600	+27,600	+27,600	+27,600
Net change	$ -86,341	$ -206,470	$ -117,738	$ -182,128

[a]Taxable estate before $60,000 exemption on old law and after current use value reduction on new law.

received by the wife is based on the percentage of the estate the spouse receives. Thus, the taxable estate at the husband's death is reduced by only $250,000 under will strategy two and by $325,000 under will strategy three. This explains why the reduction in estate taxes due to use value appraisal is lower at the husband's death compared to the wife's death despite the larger taxable estate at the husband's death under will strategy three.

At both death events and for both will strategies, replacing the $60,000 exemption under the old law with the $47,000 tax credit under the new law results in a reduction in federal estate taxes. The amount of taxes saved by the $60,000 exemption depends on the size of the taxable estate or the marginal estate tax rate. The value of the $47,000 tax credit is constant over all sizes of estates. Replacing the $60,000 exemption with the $47,000 credit will always result in lower taxes since the maximum marginal estate tax rate under the old law is 77 percent.

The marginal tax rate is 45 percent at the husband's death for will strategy two. Thus the $60,000 exemption is worth $27,000. Replacing the $60,000 exemption with the $47,000 credit results in a $20,000 net tax savings. At the wife's death, the marginal tax rate is 53 percent making the exemption worth $31,800 and the amount of tax savings from using the credit equal to $15,200. For will strategy three, the marginal estate tax rate is the same (49 percent) at each death event. In general the larger the taxable estate, the smaller the amount of savings due to replacing the $60,000 exemption with the credit.

For large taxable estates such as the one examined, the increase in estate taxes due to the change in the estate tax rate schedules more than offsets the reduction in estate taxes due to the $47,000 credit. Comparing the tax rate schedules for the old and new law indicates that marginal estate tax rates are higher under the new law for each taxable estate tax bracket less than $1,500,000. For taxable estates between $1,500,000 and $3,000,000 the marginal tax rates are the same. Above $3,000,000 the marginal tax rate is again higher under the new law. The $27,600 increase in estate taxes resulting from the change in rate schedules represents the difference in accumulated estate taxes on a $1,500,000 taxable estate (before subtracting the use value reduction and $60,000 exemption).

In general, the combined effect of the change in the rate schedule and replacing the exemption with the credit results in higher estate taxes under the new law if the taxable estate (before $60,000 exemption) is greater than $1,175,000. For smaller estates, the reduction in taxes due to the credit is greater than the increase in taxes due to the change in tax rates. For estates that do not qualify for use value appraisal, the Tax Reform Act of 1976 would result in higher taxes compared to the old law if the estate is larger than $1,175,000. In estates that do not contain enough qualifying real estate to use the maximum use value reduction ($500,000), the amount of estate tax savings resulting from the new law would be lower than the amount of savings shown for the case farm situation.

Liquidation Expenses. The values for the change in selling expense due to the Tax Reform Act of 1976 (Table 50) reflect income

taxes on the sale of real estate to the farm heir. Under the old law, the income tax basis of estate assets is increased to the appraised value for estate tax purposes. Thus, there would be no taxable gain on sales of estate assets. The costs shown for the old law are buying and selling transaction expenses. Under the new law, the income tax basis of estate assets is the deceased owner's basis adjusted for appreciation occurring prior to 1977 and for estate taxes paid.

The amount of income tax on estate sales depends on several factors. Due to the progressive income tax rates, taxes increase at an increasing rate as the amount of gain increases. Given a constant appreciation rate, the amount of gain increases as the length of time the asset is owned increases. The amount of gain also depends on the adjustments made to the income tax basis. The basis of an asset purchased prior to 1977 is increased for the portion of total appreciation occuring prior to 1977. However, under the formula used, the calculated amount of appreciation may be less than the actual appreciation. In determining appreciation, the total appreciation is assumed to occur at a constant linear rate over time. Also, the total appreciation is determined using the estate value which may be the current use value rather than market value. The basis is also adjusted for estate taxes paid on the appreciation in the value of the asset occurring after 1976. Thus, the amount of estate taxes paid affect the income tax basis. An asset used for the marital deduction is not subject to estate tax, and therefore the basis is not increased for estate taxes paid.

As shown in Table 50, the increase in selling expenses due to the new law is highest for will strategy two at the wife's death. Income

taxes (federal and Oklahoma) are $49,299 which is approximately 17 percent of the value sold. Approximately 58.5 percent of the selling price is gain of which one-half is taxable. Although, the value of sales is smaller at the wife's death compared to the husband's death, income taxes are higher because the asset is owned longer than the asset sold at the husband's death (purchased earlier and sold later), the asset is valued at use value rather than market value, and the asset is used for the marital deduction at the husband's death.

For the situations examined, the increased selling expenses are more than offset by the lower federal estate taxes, and the net effect of the new law is a reduction in total costs. However, in situations where the estate does not qualify for use value appraisal and/or heirs are unable or unwilling to borrow to provide estate liquidity, increased sales may cause the total transfer costs to be greater under the new law compared to the old law.

Lifetime Gifts

The Tax Reform Act of 1976 replaces the $30,000 lifetime gift exemption with a $47,000 unified estate and gift tax credit. Also, the gift tax rate schedule is the same as the estate tax rate schedule. Under the old law, gift tax rates were three-fourths of the estate tax rates.

Gift strategy three which includes a taxable gift in year 11, $6,000 annual gifts to each child from year 12 to year 30 and $3,000 annual gifts per child from year 31 to year 40 is used to show the impact of the new law. The gift in year 11 is $241,132 divided equal among all children. The gift is split between the parents for federal

estate tax purposes. Under the old law, the taxable gift in year 11 for each parent is $81,566 ($241,132 x 0.5 - 9,000 - 30,000). Federal gift taxes due are $23,308. Under the new law, the taxable gift for each parent is $111,566 (241,132 x 0.5 - 9,000). Tentative gift taxes are $54,540. However, no federal taxes are due because each parent uses $27,270 of the $47,000 unified credit.

The gift tax savings under the new law in year 11 result in a $54,126 larger estate for the husband in year 31 compared to his estate value under the old law. The wife's equity in year 31 is $369 lower under the new law due to the higher average income tax rate resulting from the gift tax savings for the husband. At the wife's death, her estate is $33,094 larger under the new law reflecting the additional transfers from the husband and growth. Will strategy two (one-half to the wife) is used in this simulation experiment.

The estate transfer costs for gift strategy three under the old law and the increase or decrease in costs resulting from the new law are shown in Table 52. The reduction in total estate transfer costs under the new law is $30,125 at the husband's death and $75,363 at the wife's death. The increases in Oklahoma estate taxes and administrative costs under the new law are due to the larger estates resulting from the gift tax savings. Assuming a 3.5 percent discount rate, the net present value of transfers is increased by $47,904 (5.6 percent) under the new law.

Based on the present value of transfers, making taxable gifts increase the value of transfers to the heirs under both the old and new laws. However, the increase in the present value of transfers due to making gifts is slightly smaller under the new law. Under the old

Table 52. Estate Transfer Costs for Gift Strategy Three and Will Strategy Two Prior to Tax Reform Act of 1976 and Changes Caused by the New Law.

Item	Husband's Death		Wife's Death	
	Old Law	Change[a]	Old Law	Change[a]
Net Estate Value	$1,889,962	$+54,126	$1,733,376	$ +33,094
Estate Sales	65,546	0	233,947	-7,127
Federal Estate Tax	245,792	-38,960	505,318	-118,579
Oklahoma Estate Tax	54,846	+2,001	114,732	+2,578
Administrative	46,062	+764	54,229	+860
Selling Expense	1,540	+6,070	5,790	+39,778
Total Estate Expense	348,240	-30,125	680,069	-75,363

Value of Transfers	Both Deaths	
	Old Law	Change[a]
Gift	$ 673,132	$ 0
Husband's Death	623,956	57,570
Wife's Death	1,053,305	108,457
Total	2,350,393	166,027
Present Value		
7 Percent Discount Rate	378,346	14,806
3.5 Percent Discount Rate	861,826	47,904

[a]Change is amount for new law minus amount for old law.

law, the net present value of transfers (seven percent discount rate) is $128,193 higher for gift strategy three (Table 52) compared to no gifts (Table 50, will strategy two). Under the new law, the net present value of transfers is $125,531 higher when taxable gifts are made.

In Table 53 the reduction in federal estate taxes due to the Tax Reform Act of 1976 is attributed to the various provisions of the law. At the husband's death, the reduction in federal estate taxes under the new law is $38,960. The reduction is $118,579 at the wife's death. The reduction in estate taxes due to use value appraisal is approximately $100,000 lower at the husband's death than at the wife's death reflecting a smaller reduction in the taxable estate and a lower marginal tax rate. At the husband's death, the increase in taxes resulting from the change in the tax rate schedule (item three) is less than the decrease in estate taxes due to replacing the exemption with the $47,000 credit (item two). However, the wife's taxable estate is greater than $1,175,000, and the net effect of these two provisions of the law is an increase in taxes.

The sum of the first three items represents the change in taxes due to changes in estate tax law (without changes in gift tax law). The total reduction due to the change in the estate tax law is $90,249 at the husband's death and $176,133 at the wife's death. The sum of items four and five represent the increase in federal estate taxes resulting from the change in the gift tax law. Under the new law, taxable gifts are added to the taxable estate to determine tentative estate taxes. Based on the marginal tax rates at their deaths, estate taxes are $42,483 higher and $47,201 higher at the husband's death and wife's death, respectively, due to the use of the unified credit to make gifts.

Table 53. Change in Federal Estate Taxes Resulting from Various Parts of the Tax Reform Act of 1976 for Gift Strategy Three and Will Strategy Two.

Item	Husband's Death	Wife's Death
Taxable Estate[a]		
New Law	$698,631	$1,211,381
Old Law	921,950	1,679,147
Change in Federal Estate Tax Due to:		
1. Use value reduction	-83,988	-183,733
2. Replacing $60,000 exemption with $47,000 credit	-24,800	-20,000
3. Change in estate tax rates	+18,539	+27,600
4. Use of credit for gifts	+42,483	+47,201
5. Larger estate due to gift tax savings	+8,805	+10,353
Net Change	$-38,960	$-118,579

[a]Taxable estate after reduction for use value appraisal on new law and before subtraction of $60,000 exemption on old law.

Under the old law, use of the $30,000 gift exemption did not affect the marginal estate tax rate on the remaining estate.

Under the new law, the parents' estates are also larger due to the gift tax savings in year 11. Due to the larger estates, federal taxes are $8,805 higher at the husband's death and $10,353 higher at the wife's death. As shown in Table 52, the larger estates also increase Oklahoma estate taxes and administrative costs. Thus, due to the change in the gift tax law, estate transfer costs are $54,053 higher at the husband's death and $60,992 higher at the wife's death. However, the lower federal estate tax resulting from the use value appraisal more than offsets the higher estate tax due to the new gift tax law.

This discussion of the Tax Reform Act of 1976 focuses on the long-run impact of the changes in the federal estate and gift tax laws. The estate transfers simulated occur 30 and 40 years after 1976. The savings in estate transfer costs due to the new law will be smaller for estates that will not contain enough qualifying farm land to use the maximum use value appraisal reduction. For gift tax purposes, assets are valued at market value rather than use value. If an estate does not contain enough real estate to use the maximum use value reduction, making taxable gifts of farm land could result in higher total transfer costs compared to total costs when the farm land is transferred at the owner's death.

Cost of Marital Gifts

The Tax Reform Act of 1976 also changed the tax law affecting gifts between spouses. The marital gift deduction under the old law is one-half the marital gift. A marital gift strategy examined in

Chapter VI involved a $97,678 gift of land from the husband to the wife, plus a $5,000 cash gift. Under the new law, the $100,000 marital gift deduction and annual exclusion cover the gift. No gift tax is paid and none of the $47,000 credit is used.

Under the law prior to the Tax Reform Act of 1976, a taxable gift of $18,339 [0.5(97,678 + 5,000) - 3,000 - 30,000] would result. Federal gift taxes at year one under the old gift tax law are $1,063. Since the $30,000 lifetime exemption is used, federal gift taxes on the $241,132 gift to the children in year 11 would be $32,843 compared to $23,309 without the marital gift and zero under the new gift tax law. Thus, for this marital gift and taxable lifetime gift strategy, the new tax law results in $1,063 fewer gift taxes in year one and $32,843 fewer taxes in year 11. The modification in the gift marital deduction reduces the cost of making the first $100,000 gift to the spouse. However, under the new law, additional marital gifts exceeding the $3,000 annual exclusions are taxable. For marital gifts of $200,000 or larger, the marital deduction is the same under the new and old law.

CHAPTER VIII

DESCRIPTION OF RESULTS FOR THE CORPORATION FARM BUSINESS ARRANGEMENTS

Simulation experiments were conducted for the case farm situation to evaluate the impact of the corporate form of business organization upon the firm growth and estate transfer processes. Simulation results are presented for two types of corporation business arrangements. For the first corporation business arrangement (corporation one), all of the farm assets owned by the family are transferred to the corporation in exchange for shares of stock at the beginning of year one. For the second corporation business arrangement (corporation two), the parents retain ownership of 480 acres of land and the farm improvements. The other 160 acres of land and the non-real estate farm assets owned by the parents are transferred to the corporation. The salaries paid by the corporation to the husband and farm heir, the dividend policy, and other assumptions used to simulate the corporation arrangement are described in Chapter IV.

The corporation is a regular corporation subject to the current (1975-1977) federal and Oklahoma income tax rates. Federal income tax rates for the corporation are: 20 percent on the first $25,000 taxable income, 22 percent on the next $25,000, and 48 percent on taxable income above $50,000. Oklahoma taxes include a four percent income tax rate and a corporate franchise tax.

The farm heir purchases corporation stock from the husband at the start of simulation years 1, 11, and 21. The stock is paid for in 10 equal installments which are computed using a six percent interest rate. The amount of stock purchased is based on the repayment capacity of the farm heir. For corporation one, the farm heir purchases $44,860, $41,924 and $157,055 of stock in years 1, 11 and 21 respectively. For corporation two, the farm heir purchases $40,585 of stock rather than $44,860 during year one since he does not have any dividend income.

In the first section of this chapter, the simulation results for corporation one are compared to the simulation results for the proprietorship business arrangement. Gift strategy three which includes gifts to the children of $241,132 in year 11, $18,000 per year for years 12 to 30 and $9,000 per year for years 31 to 40 is used for both business arrangements. The amount of the gift taxes paid under gift strategy three is shown in Table 37 of Chapter VI. Will strategy two (50 percent to the wife) is used to compare the corporation and proprietorship arrangements. In computing federal estate taxes, the value of the estate is reduced by $500,000 for the use value appraisal of the decedent's share of the land owned by the corporation. The installment payment option, a stock redemption and sales of stock to the farm heir are used to provide additional liquidity.

In the next section of this chapter, the simulation results for corporation one and corporation two (husband rents 480 acres to the corporation) are compared. In the final two sections of this chapter, simulation results are analyzed for will strategy three (equate marginal estate tax rates) and gift strategy four, respectively, for corporation one. Under gift strategy four, the value of gifts to the

children in year 21 is increased by $162,000 over the value for strategy three.

Comparison of Corporation and Proprietorship Business Arrangements

The simulation results for the first 30 years for the corporation (one) farm business arrangement are summarized in Table 54. The levels of equity, debt and cash for years 1, 5 and 10 can be compared to the values under the proprietorship business arrangement shown in Table 27 (Chapter V). For years 15 through 30, the values shown in Table 54 for the corporation arrangement should be compared to those in Table 39 (Chapter VI) under gift strategy three for the proprietorship.

The beginning combined equity for the family is $563,673 for the proprietorship business arrangement. The $1,224 lower equity under the corporate form reflects the $1,000 organizational expense and $224 administrative expense paid by the husband when stock valued at $44,860 is sold to the farm heir.

The debt owed by the husband is the home mortgage. The excess cash held at the beginning of each year by the husband and farm heir is loaned to the corporation during the year at a five percent interest rate. The balances of these short term loans to the corporation are included in the cash balances shown in Table 54. The $44,860 debt for the farm heir represents the purchase of stock from the husband.

The value of equity for corporation equity is the net value (asset value minus debt) transferred to the corporation less the $1,000 organizational expense. It also represents the combined value of stock owned by the family members. After the sale of stock to the farm heir,

Table 54. Firm Ownership, Financial Structure and Liquidity at Beginning Year and at End of Each Five Year Period for Corporation Farm Business Arrangement Under Gift Strategy Three (Corporation Owns All Farm Assets).

Item	Husband	Wife	Farm Heir	Non-Farm Heirs	Family Total	Corporation
Beginning Year 1						
Percent of Stock	91.2	0.0	8.8	0.0	100.0	
Equity	$557,860	$2,677	$ 912	$1,000	$562,449	$514,065
Debt	18,085	0	44,860	0	62,945	258,688
Cash	24,331	0	500	1,000	25,831	1,000
End Year 5						
Percent of Stock	91.2	0.0	8.8	0.0	100.0	
Equity	$782,070	$23,015	$58,881	$1,000	$864,966	$768,791
Debt	12,438	0	25,674	0	38,112	314,528
Cash	18,677	2,272	16,851	1,000	38,800	1,000
End Year 10						
Percent of Stock	91.2	0.0	8.8	0.0	100.0	
Equity	$1,081,994	$44,231	$98,426	$13,920	$1,238,569	$1,079,978
Debt	5,798	0	5,749	0	11,547	505,741
Cash	31,909	4,991	9,066	13,920	59,886	1,000
End Year 15						
Percent of Stock	59.5	0.0	22.0	18.5	100.0	
Equity	$1,092,178	$66,550	$342,990	$335,947	$1,837,664	$1,670,780
Debt	0	0	23,994	0	23,994	570,374
Cash	26,565	8,276	14,104	38,196	87,141	1,000
End Year 20						
Percent of Stock	54.8	0.0	23.5	21.7	100.0	
Equity	$1,472,111	$89,527	$596,333	$590,848	$2,748,818	$2,422,564
Debt	0	0	5,373	0	5,373	617,759
Cash	30,203	12,198	31,422	65,058	138,881	1,000
End Year 25						
Percent of Stock	45.1	0.0	31.1	23.8	100.0	
Equity	$1,843,527	$118,853	$1,034,723	$937,172	$3,934,273	$3,542,568
Debt	0	0	89,885	0	89,885	666,726
Cash	71,218	22,502	23,068	92,417	209,205	1,000
End Year 30						
Percent of Stock	42.9	0.0	31.8	25.3	100.0	
Equity	$2,333,841	$177,046	$1,631,412	$1,406,315	$5,548,614	$5,091,830
Debt	0	0	20,128	0	20,128	665,234
Cash	78,027	61,675	30,800	117,191	287,693	1,000

the husband owns 91.2 percent, and the farm heir owns 8.8 percent of the corporation stock.

Income Taxes, Firm Growth and Liquidity

Pre-Retirement Years. At the end of year 10, the combined family equity is $1,238,569 for the corporation farm business arrangement compared to $1,230,511 for the proprietorship arrangement (Table 27). Thus, the corporation arrangement has a $8,058 advantage despite the lower beginning net worth.

The dividends paid during years one through ten and the payments on loans to finance stock sales provide additional cash income and liquidity for the parents. Even with the dividends, the amount of cash holdings for the husband declines during the first five simulation years from $24,331 to $18,677. The corporation does not pay dividends after year 10.

At the start of year 11, the farm heir purchases additional stock from the husband with a market value of $41,924. Also, the husband makes a taxable gift of stock valued at $241,132 to the children in year 11. Annual stock gifts with a market value of $18,000 begin in year 12 and continue for each year of the husband's remaining life span. At the end of year 20, just prior to the husband's retirement, the parents own 54.8 percent of the corporate stock, and the farm heir and the non-farm heirs own 23.5 percent and 21.7 percent, respectively.

At the end of year 20, total combined family equity is $2,748,818 under the corporation business arrangement (Table 54), compared to $2,592,980 for the proprietorship business arrangement (Table 39). The difference in the values for total family equity between the

proprietorship and corporation business arrangement result primarily from differences in federal and Oklahoma income taxes and social security taxes paid.

Figure 2 shows the total combined income and social security taxes paid by the corporation and family members during each simulation year for the corporation and proprietorship farm business arrangements. Social security taxes paid by the corporation, husband, and farm heir are higher in every year compared to self-employment taxes paid under the proprietorship arrangement. Total taxes paid under the corporation business arrangement also include the Oklahoma corporate franchise tax which is based on the tax bases of the assets owned by the corporation. This tax amounts to $239 during year one and increases to $1,245 at year 20.

During the first simulation year, federal and Oklahoma income taxes paid by family members are $982 higher for the proprietorship arrangement than federal and state income taxes paid by family members and the corporation for the corporate arrangement. However, social security taxes are $1,523 higher under the corporation business arrangement.

Total taxes paid are substantially higher during years seven and eight under the corporation business arrangement. During these years, a substantial amount of machinery and equipment is being replaced. The husband is in a higher tax bracket than the corporation entity and more of the available investment credit on asset purchases is utilized. However, the corporation can carry unused investment credit forward to subsequent years and achieves the tax savings after year eight.

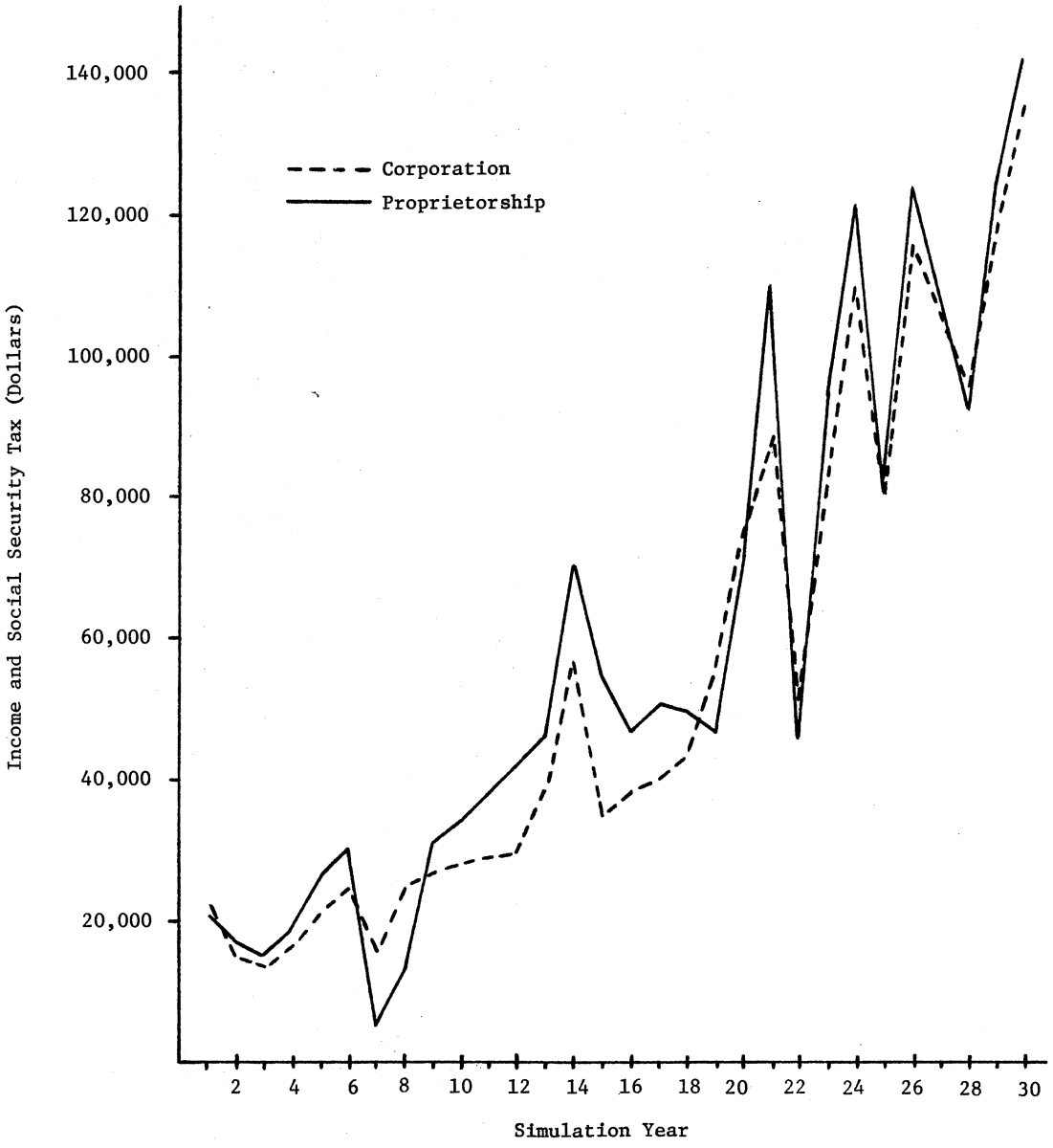

Figure 2. Income and Social Security Taxes Paid for the Proprietorship and Corporation Business Arrangements

During the first 10-year period, total accumulated taxes are $4,908 higher under the proprietorship business arrangement compared to the corporate business arrangement. Under the proprietorship business arrangement, the husband's marginal federal income tax rate is greater than 48 percent in every year except for years two, three, seven and eight. The farm heir's marginal federal income tax rate is greater than 22 percent during every year except year 10 when he is starting to purchase machinery and equipment. The marginal federal income tax rate for the corporation is 20 percent in seven of the first 10 years and 22 percent in the other three years. Under the corporation business arrangement, the husband reaches the 48 percent bracket only during the first year (sale of inventory), and the highest federal marginal income tax rate for the farm heir is 28 percent in year 10.

The total income tax liability is reduced by incorporating when part of the husband's income which is taxed at a high rate under the proprietorship arrangement can be retained by the corporation and taxed at a lower rate. Total income taxes under the corporation business arrangement could be reduced by eliminating the dividends during the first 10 years. However, the dividends are needed to provide income for the parents during the seven years the children are living at home.

Income taxes paid by the husband include taxes on sale transfers to the farm heir. Under the proprietorship arrangement, inventory is sold to the farm heir during years 5, 14, 20, 21 and 22. Also, the husband sells machinery and equipment during years 10 through 20. The income from inventory sales and the gain on machinery sales resulting from accumulated depreciation is taxed as ordinary income. Under the corporation arrangement, inter-family machinery and inventory transfers

are not necessary. Stock is sold to the farm heir at years 1, 11, and 21. The income from stock sales is long-term capital gain and under the installment method, the taxable income is spread out over a 10-year period.

During years 11 through 20, the total accumulated income and social security taxes paid are $78,393 lower for the corporation business arrangement compared to the proprietorship arrangement. As shown in Figure 2, the large tax savings result for the corporation arrangement in years 14 and 15. In year 14, the husband sells inventory to the farm heir under the proprietorship business arrangement. In year 15, the husband has a large amount of ordinary income from the sale of machinery. Also, the corporation can utilize more of the investment credit on machinery purchases in year 15 than the farm heir can under the proprietorship arrangement. Under the proprietorship business arrangement, the husband's marginal federal income tax rate is greater than 48 percent during years 11 through 20. The farm heir reaches the 48 percent bracket in year 19. The corporation is in the 48 percent bracket in years 14, 19 and 20 and is in the 22 percent bracket in the other seven years. As shown in Figure 2, total taxes paid are lower for the proprietorship business arrangement during years 19 and 20.

Retirement Years. At the beginning of year 21, the husband sells additional stock valued at $157,055 to the farm heir. The husband's cash holdings at the end of year 20 are $30,203 (Table 54). By the end of year 30, the husband's cash holdings have increased to $78,027. Under the proprietorship business arrangement, the husband's net liquidity position (cash minus debt) decreased by $87,948 between the end of year 20 and the end of year 30 (Table 39). Under the

proprietorship business arrangement the husband had to increase debt in order to make annual cash gifts to the children.

As shown by Figure 2, total taxes paid by the corporation and family members under the corporation business arrangement are smaller every year between years 21 and 30, except in years 22 and 28, compared to the proprietorship. The largest income tax saving for the corporation business arrangement occurs in year 21 when the husband sells the remaining inventory to the farm heir under the proprietorship business arrangement. Inter-family transfers of the ownership of inventory are not required for the corporation business arrangement. During years 21 through 30, the farm heir's marginal federal income tax rate is greater than 48 percent in every year, except year 21 (inventory purchases), under the proprietorship arrangement. The husband's marginal federal income tax rate ranges between 39 and 45, except in year 21, when he is in the 66 percent bracket. The marginal federal income tax rate for the corporation during years 21 through 30 is 48 percent. Under the corporation business arrangement, the husband is in the 32 percent income tax bracket and the farm heir's marginal income tax rates range from 48 to 55 percent. Thus, total income taxes for the corporation business arrangement could be reduced by paying the husband a higher salary and the farm heir a lower salary. However, a higher salary for the husband would reduce social security retirement benefits.

At the end of year 30, just prior to the husband's death, the total combined family equity under the corporation business arrangement is $5,548,614 compared to $5,068,837 under the proprietorship arrangement. The $479,777 higher equity under the corporation arrangement

results primarily from the income tax savings and the earnings resulting from the savings.

Comparing the values of equity at the end of year 30 in Table 54 and Table 39 (Chapter VI) indicates that the ending equity values for the husband, wife and non-farm heirs are higher under the corporation business arrangement compared to the proprietorship, but lower for the farm heir. At the end of year 30, the husband owns 42.9 percent of the corporate stock. Under the proprietorship arrangement, the husband owns 37.8 percent of the total market value of farm assets (840 acres of land). The farm heir owns 31.8 percent of the corporation stock. However, under the proprietorship business arrangement, the farm heir owns 54.8 percent of all the farm assets (640 acres of land and all other farm assets). The non-farm heirs own 25.3 percent of the stock compared to only 7.4 percent of the farm assets (160 acres).

At the end of year 30, the net liquidity position (cash minus debt) for the parents (husband and wife) is $366,478 higher under the corporation business arrangement compared to the proprietorship arrangement. Under the proprietorship arrangement, the farm heir has $1,136,140 debt. Under the corporation arrangement, the farm heir owes $20,128 and has cash holdings of $30,800. For the heirs, there is a trade-off between equity growth and liquidity for the two forms of business organization. The amount of savings held by the non-farm heirs is $387,908 lower under the corporation business arrangement compared to the proprietorship arrangement.

Under the proprietorship business arrangement, the debt to equity ratio for the farm heir at the end of year 30 is 0.56. The corporation debt to equity ratio is only 0.13. The low debt to equity ratio for

the corporation results from the retained cash farm income. It is necessary for the corporation to retain income rather than distribute it to the owners in order to reduce total family income taxes. Part of the corporation's unused credit capacity will be used when the heirs redeem stock to the corporation to obtain funds to pay estate transfer costs.

Estate Transfers and Ending Equity

For the purposes of comparing the corporation and proprietorship business arrangements during the estate transfer process, will strategy two (50 percent to the wife) is used. The simulation results for the corporation business arrangement are shown in Table 55. The simulation results for the proprietorship business arrangement are shown in Table 40 and Table 41 (Chapter VI). Due to the larger estate at the end of year 30, total estate expenses (taxes and administrative costs) are nearly $100,000 higher at the husband's death and approximately $230,000 higher at the wife's death under the corporation arrangement compared to the proprietorship arrangement. However, total liquidity requirements at the husband's death are larger under the proprietorship arrangement due to the debt against the husband's estate.

Under the corporation business arrangement, the stock inherited by the heirs does not pay dividends and therefore does not provide income to pay estate transfer costs. A stock redemption equal to the combined value of estate taxes and the heirs' portions of administrative expenses is used at each death to provide additional liquidity. The heirs pay an income tax on the capital gain resulting from sale of stock to the corporation. The selling expense shown in Table 55

Table 55. Estate Transfers, Transfer Costs, Ending Equity and Financial Structure for Corporation Farm Business Arrangement (Corporation Owns All Assets), Gift Strategy Three, Will Strategy Two.

Item	Husband's Death	Wife's Death
Net Estate Value	$2,333,840	$2,255,401
Estate Expenses		
Administrative	66,935	67,801
Federal Tax	270,052	566,317
Oklahoma Tax	71,076	155,408
Total	408,063	789,526
Estate Sales	160,000	160,038
Stock Redemption	374,584	789,554
Selling Expense	113,826	205,015

	Both Deaths
Value of Transfers	
Gifts	$ 673,132
Husband's Death	696,660
Wife's Death	1,260,861
Total	2,630,653
Net Present Value of Transfers	401,758
Cash Holdings for Wife	
Beginning Year 31	213,554
End Year 40	131,864

End Year 45	Farm Heir	Non-Farm Heirs	Total
Equity	$6,649,045	$6,162,944	$12,811,990
Debt	177,809	157,511	335,320
Cash	14,214	735,581	749,795
Percent of Stock	54.9	45.1	100.0

include income taxes on the stock redemption and income taxes on the direct sale of approximately $160,000 of stock to the farm heir. The estate sales of stock are made to provide the farm heir with at least 51 percent of the total corporation stock.

Total estate costs at both deaths including selling expenses are $1,516,430 under the corporation business arrangement and $922,821 under the proprietorship arrangement. However, the net present value of transfers including the lifetime gifts is $401,758 for the corporation compared to $393,152 for the proprietorship.

During the years 31 to 45, the savings in total income taxes paid under the corporation business arrangement continue to grow. This is because the farm and non-farm heirs marginal federal estate tax rates under the proprietorship arrangement are both above 48 percent and are increasing over time. The corporate marginal federal tax rate is 48 percent. Under the corporation business arrangement, some of the income that would be taxed to the heirs at rates greater than 48 percent is retained in the corporation. The income tax savings and the additional growth in stock values are not measured by the value of transfers to the heirs.

At the end of the 45 year planning horizon, the combined equity for the heirs is $12,811,990 for the corporation business arrangement compared to $11,841,099 for the proprietorship. Under the corporation arrangement, the farm heir's ending equity is $1,209,177 lower and the non-farm heirs' equity is $2,180,067 higher compared to the proprietorship arrangement. At the end of year 45, the farm heir owns 54.9 percent of the corporation assets compared to 75.6 percent of the total farm assets under the proprietorship farm business arrangement.

As shown in Table 55, the cash holdings for the wife declined from $213,554 to $131,864 when the farm business is a corporation. Under the proprietorship farm business arrangement, the wife's savings declined from $128,621 to $114,619. The spouse receives rent from farm real estate under the proprietorship arrangement. However, the annual gifts to the children are cash rather than stock. At the end of year 45, the net liquidity position (cash minus debt) for the non-farm heirs is $18,236 higher under the corporation business arrangement. Under the proprietorship business arrangement, the farm heir owes $2,769,257 with a debt to equity ratio of .35. For the corporation farm business arrangement, the farm heir has $14,214 cash and owes $177,809 debt. The ending debt to equity ratio for the corporation entity is .13.

Comparison of Alternative Corporation Arrangements

An additional corporation simulation experiment is performed to evaluate the impact of the parents renting part of the farm real estate to the corporation. This corporation business arrangement is referred to in the following discussion as corporation two. In this experiment, the husband retains ownership of the 480 acres of real estate. Most of the farm improvements are located on this land. The other 160 acres owned by the husband and all other farm assets are transferred to the farm corporation. The ownership method for the 480 acres of real estate owned by the husband is changed from joint tenancy to outright ownership by the husband to facilitate estate planning.

The value of real estate kept by the husband is $289,751. There is a mortgage on the real estate with a remaining balance of $7,500

which will be paid off during the next two years. The value of assets transferred to the corporation including the $500 contribution by the farm heir is $390,168. The corporation assumes $157,353 debt and the net value of contributions is $232,815. The net value of contributions for corporation one is $515,066.

The amount of rent received by the husband is calculated based on the proportion of resource services provided. At the first year, the rent is $11,978. To more nearly balance the taxable incomes of the corporation and the husband, the salary paid to the husband is reduced from $20,017 (corporation one) to $15,300 (social security tax earnings base). Since the husband has rental income, the corporation does not pay dividends to stockholders. Eliminating the dividends reduces the repayment capacity of the farm heir. The amount of stock purchased by the farm heir from the husband during year one is reduced from $44,860 to $40,585. Stock sales in year 11 and 21 are the same as those described earlier for corporation one.

Simulation results for corporation two are compared to the simulation results for corporation one shown in Table 54 and Table 55. Lifetime gift strategy number three and will strategy number two are used for both simulation experiments. Simulation results for the first 30 years of the planning horizon are summarized for corporation two in Table 56.

Income Taxes, Firm Growth and Liquidity

Pre-Retirement Years. At the end of the first 10 year period, the combined family equity under corporation two is $1,251,173 which is $12,604 higher than the family equity under corporation one (Table 54).

Table 56. Firm Ownership, Financial Structure and Liquidity at Beginning Year and at End of Each Five Year Period for Corporation Farm Business Arrangement, Gift Strategy Three (Parents Own 480 Acres).

Item	Husband	Wife	Farm Heir	Non-Farm Heirs	Family Total	Corporation
Beginning Year 1						
Percent of Stock	82.4	0.0	17.6	0.0	100.0	
Equity	$557,969	$2,677	$ 1,000	$ 824	$562,470	$231,815
Debt	25,585	0	40,585	0	66,170	251,188
Cash	24,352	0	500	1,000	25,852	1,000
End Year 5						
Percent of Stock	82.4	0.0	17.6	0.0	100.0	
Equity	$777,467	$23,015	$68,788	$1,000	$870,270	$421,982
Debt	12,438	0	23,228	0	35,666	297,663
Cash	6,416	2,273	17,547	1,000	27,236	1,000
End Year 10						
Percent of Stock	82.4	0.0	17.0	0.0	100.0	
Equity	$1,072,746	$44,237	$120,270	$13,920	$1,251,173	$656,272
Debt	5,798	0	5,201	0	10,990	475,722
Cash	13,883	4,997	9,657	13,920	42,457	1,000
End Year 15						
Percent of Stock	30.6	0.0	39.2	30.3	100.0	
Equity	$1,025,506	$66,487	$400,628	$354,361	$1,846,979	$1,044,739
Debt	764	0	24,003	0	24,767	556,395
Cash	21,414	8,214	15,417	38,196	83,241	1,000
End Year 20						
Percent of Stock	23.4	0.0	41.6	35.1	100.0	
Equity	$1,281,933	$89,293	$724,313	$652,719	$2,748,256	$1,676,267
Debt	584	0	5,375	0	5,959	641,130
Cash	52,331	11,964	32,918	65,058	162,271	1,000
End Year 25						
Percent of Stock	9.4	0.0	52.5	38.1	100.0	
Equity	$1,484,858	$118,038	$1,266,146	$1,059,643	$3,928,686	$2,537,437
Debt	314	0	89,884	0	90,198	755,054
Cash	153,432	21,687	24,737	92,417	292,273	1,000
End Year 30						
Percent of Stock	6.4	0.0	53.5	40.1	100.0	
Equity	$1,714,948	$174,406	$2,021,732	$1,625,556	$5,536,643	$3,756,798
Debt	135	0	20,127	0	20,262	798,900
Cash	200,648	59,035	32,648	117,191	409,522	1,000

Under corporation two, total accumulated taxes for the family and corporation during the first ten years are about $9,100 lower than total taxes under corporation one. Under corporation one dividends are paid. Dividends are not a deductible expense for the corporation and are taxable income to the husband and farm heir. Also, the Oklahoma corporation franchise tax is lower under corporation two because the corporation owns a smaller amount of real estate. Since the rent is a deduction and greater than the reduction in salary expense, income taxes are lower for the corporation entity under corporation two. Income taxes are also lower for the farm heir since he does not receive a dividend. Under corporation two, the husband receives rental income but has a lower salary and no dividends. Total taxes paid by both parents during the first ten years are about $950 lower under corporation two. Social security taxes paid are the same for the two corporation arrangements.

At the end of year 10, the cash holdings for both parents are $18,880 which is $18,020 lower than cash holdings under corporation one. The smaller savings reflect the slightly smaller after-tax cash income, the smaller sale of stock to the farm heir and purchases required to replace depreciable farm improvements on the 480 acres of real estate.

At the end of year 20, just prior to the husband's retirement, the total combined family equity under corporation two is $2,748,256 which is $562 lower than corporation one. Total taxes during years 11 through 20 are nearly $18,800 higher for corporation two. During this period dividends are not paid in either corporation arrangement. Under corporation two, the parents' marginal federal income tax rate

is greater than 48 percent starting in year 17. Under corporation one, the parents did not reach the 48 percent bracket. The corporation is in the 48 percent bracket during only one year under corporation two and during two years for corporation one. Total income taxes could be reduced under corporation two by paying the husband a smaller rent.

At the end of year 20, the net liquidity position for the parents is $21,310 higher under corporation two compared to corporation one reflecting rent income. However, the husband's net worth at the end of year 20 is $190,178 smaller under corporation two. This is because lifetime gifts and sales of stock made in year 1 and 11 remove a larger amount of future growth from the husband's estate under corporation two compared to corporation one. The average annual percentage change in the value of stock during the first twenty years is 10.40 percent when the corporation rents land from the parents (corporation two) compared to 8.06 percent when the corporation owns all the land (corporation one). As a result of the faster growth rate in stock values, the combined equity of the heirs is $1,377,032 under corporation two which is $189,851 higher than their equity under corporation one.

Retirement Years. At the end of year 30, just prior to the husband's death, the combined family equity under corporation two is $5,536,643 which is about $12,000 smaller than the level of family equity under corporation one. The difference is primarily due to higher total income taxes under corporation two. Income taxes for the corporation are lower under corporation two, but income taxes paid by the parents are higher. The parent's marginal federal income tax rate during retirement ranges between 50 and 53 percent under corporation two. Under corporation one, their marginal federal income tax rate is

around 32 percent. The corporation is in the 48 percent tax bracket every year for corporation one and in all but one year in corporation two.

Under corporation two, the husband's equity at the end of year 30 is $618,893 lower compared to corporation one. He owns only 6.4 percent of the corporation stock. However, including the 480 acres of land, he owns 26 percent of the total farm assets. Under corporation one, the husband owns nearly 43 percent of the stock. However, the husband's net liquidity position is $122,486 higher under corporation two. At the end of year 30, the farm heir owns 53.5 percent of the corporation stock compared to 31.8 percent under corporation two. The net worth of the heirs at the end of year 30 is $609,561 higher under corporation two compared to corporation one.

Estate Transfers and Ending Equity

The simulation results during the estate transfer process for corporation two are shown in Table 57. The values of the parents' estates are substantially smaller compared to their estates under the corporation arrangement where all the farm assets are owned by the corporation (Table 55). The wife receives 320 acres of land owned by the husband. The stock owned by the husband is willed to the farm heir, and the non-farm heirs receive 160 acres of land. Since the stock owned by the husband is less than 50 percent of his adjusted gross estate, the stock redemption cannot be used. There are no estate sales at the husband's death since the farm heir already owns 51 percent of the stock. The value of land is reduced by $500,000 for federal estate tax purposes for the use value appraisal. Total estate

Table 57. Estate Transfer Costs, Value of Transfers, Ending Equity and Financial Structure for Corporation Farm Business Arrangement (Parents Own 480 Acres of Real Estate), Gift Strategy Three, Will Strategy Two.

Item	Husband's Death	Wife's Death
Net Estate Value	$1,714,948	$1,518,411
Estate Expenses		
Administrative	51,702	48,639
Federal Tax	167,015	300,641
Oklahoma Tax	48,072	97,982
Total	266,789	447,262
Estate Sales	0	148,189
Selling Expense	0	27,626

	Both Deaths
Value of Transfers	
Gifts	$ 673,132
Husband's Death	616,538
Wife's Death	1,043,521
Total	2,333,191
Net Present Value of Transfers	376,718
Cash Holdings for Wife	
Beginning Year 31	232,280
End Year 40	217,450

End Year 45	Farm Heir	Non-Farm Heirs	Total
Equity	$7,342,362	$6,403,071	$13,745,433
Debt	60,596	121,209	181,805
Cash	89,469	509,753	599,222
Percent of Stock	59.8	40.2	100.0
Acres of Real Estate	160	320	480

transfer costs at the husband's death are $266,789 which is $255,100 less than the total costs including selling expenses under corporation one.

Since the wife does not own stock, the annual $9,000 gifts to the children during years 31 to 40 are cash gifts. However, the decline in the wife's cash holdings from year 31 to year 40 is $66,860 smaller under corporation two compared to corporation one because the wife receives rent income.

At the wife's death, the farm heir receives 160 acres and the two non-farm heirs receive 160 acres. The portion of the land received by the farm heir in excess of one-third of the estate market value is purchased from the estate. Total expenses at the wife's death, including income taxes on the land sale, are $474,888. Total estate transfer costs at both deaths are $774,753 smaller for corporation two compared to corporation one.

Due to the smaller estates, the net present value of transfers, including gifts, is $25,040 smaller under corporation two compared to corporation one. However, at the end of year 45, the combined net worth for the heirs is $13,745,433 under corporation two compared to $12,811,990 under corporation one. The higher values of equity owned by the heirs at the end of year 30 under corporation two are not included in the net present value of transfers. Also, during years 31 through 40, the after-tax cash income and annual increase in equity for the heirs are higher under corporation two compared to corporation one.

Since estate sales are smaller and the stock redemption is not used, the amount of cash holdings for the non-farm heirs is smaller under

corporation two compared to corporation one. The net liquidity position for the non-farm heirs is $388,544 under corporation two, compared to $578,070 under corporation one. However, due to the rental income, the non-farm heir's net liquidity position is increasing more rapidly under corporation two. The farm heir's net liquidity position is $192,468 higher under corporation two compared to corporation one. The farm heir's cash holdings are increasing, and he could purchase stock from the non-farm heirs to improve their liquidity position. At the end of year 45, the farm heir owns 59.8 percent of the stock. Including the land, he owns 55 percent of the value of all farm assets. Under corporation one, the farm heir owns nearly 55 percent of the stock in the corporation.

Impact of Will Strategy for the Corporation

An additional simulation experiment is performed for the corporation farm business arrangement to investigate the impact of will strategy three (equate the marginal estate tax rates). The business arrangement used is corporation one described in the first section of this chapter.

Under will strategy two, the marginal federal estate tax rate at the husband's death is 39 percent. The wife receives one-half the husband's estate and the marginal federal estate tax rate is 45 percent at her death. Under will strategy three, the wife receives 36 percent of the husband's estate. The estate transfer costs and resulting impact on the value of transfers are shown in Table 58. Total estate taxes and administrative costs at the husband's death are $520,806 under will strategy three compared to $408,063 under will strategy two (Table 55). At the wife's death, total transfer costs are $496,522

Table 58. Estate Transfers, Transfer Costs, Ending Equity and Financial Structure for Corporation Farm Business Arrangement (Corporation Owns All Farm Assets), Gift Strategy Three, Will Strategy Three.

Item	Husband's Death	Wife's Death
Net Estate Value	$2,333,840	$1,628,190
Estate Expenses		
Administrative	66,935	51,494
Federal Tax	357,405	338,492
Oklahoma Tax	96,466	106,536
Total	520,806	496,522
Estate Sales	160,000	159,883
Stock Redemption	496,624	496,469
Selling Expense	137,707	144,580

	Both Deaths
Value of Transfers	
Gifts	$ 673,132
Husband's Death	872,456
Wife's Death	987,089
Total	2,532,677
Net Present Value of Transfers	406,569
Cash Holdings for Wife	
Beginning Year 31	228,346
End Year 40	154,310

End Year 45	Farm Heir	Non-Farm Heirs	Total
Equity	$6,733,500	$6,280,849	$13,014,349
Debt	167,218	156,692	323,910
Cash	14,197	777,054	791,251
Percent of Stock	54.8	45.2	100.0

for will strategy three and $789,526 for will strategy two. Total costs at both deaths including selling expenses are $216,815 lower under will strategy three. For will strategy three, the marginal federal estate tax rate is 41 percent at both death events.

Due to the savings in estate transfer costs, the net present value of transfers to the heirs is $4,811 higher for will strategy three. The combined equity for the heirs at the end of year 45 is $202,359 higher for will strategy three. Leaving the wife a smaller portion of the husband's estate does not reduce her cash income since the stock received does not pay a dividend.

Impact of Gift Strategy for the Corporation

One advantage of the corporation business arrangement is the ease of dividing ownership interests in the farm business. Corporation stock is much easier to divide than land and other farm assets for making gifts to the children. Also, when dividends are not paid on stock, the parents do not sacrifice cash income during retirement by making gifts of stock, except to the extent of the gift transfer costs. A simulation experiment is conducted for the corporation business arrangement (corporation one) which includes $162,000 additional gifts of stock at the beginning of year 21 (gift strategy four). The gift in year 21 is $60,000 per child, rather than $6,000 per child as specified for gift strategy three. Under gift strategy three, there are no federal gift taxes due because tentative gift taxes are less than the $47,000 unified tax credit for each parent. Under gift strategy four, all of each parent's credit is used up and $10,842 federal gift taxes are due in year 21. Oklahoma gift taxes are $11,115 (a $10,530

increase) and administrative expenses are $900 (a $810 increase). Thus, total gift transfer costs are increased $22,182 in year 21. Also, due to the increase in accumulated gifts, Oklahoma gift taxes are $11 higher in year 23 and $45 per year higher during years 24 through 30 on the annual $18,000 gifts. Thus, total gift transfer costs are $22,508 higher due to the additional $162,000 gift.

Table 59 shows the impact of the gift and transfer costs on the level of equity, debt, savings and stock ownership for each family member at the end of years 25 and 30. The value of equity for the husband is $1,962,100 at the end of year 30 under gift strategy four compared to $2,333,841 under gift strategy three (Table 54). For each dollar of additional gift and gift transfer expense, the husband's ending equity is reduced by about $2.00 [($2,333,841 - 1,962,100) ÷ (162,000 + 22,508)]. However, due to the additional transfer costs, the total combined family equity at the end of year 30 is reduced by $32,145. The cash holdings for the husband are $47,435 under gift strategy four compared to $78,027 for gift strategy three. The cash holdings for the children are unchanged. However, as a result of the $162,000 additional gift, their combined equity is $339,474 higher. At the end of year 30, the husband owns 36.2 percent of the stock while the farm heir and non-farm heirs own 34.1 percent and 29.8 percent respectively. Under gift strategy three, the husband owns 42.9 percent of the stock.

Table 60 shows the estate transfer costs, estate transfers, and resulting ending equity and liquidity for gift strategy four. Will strategy number three leaving 36 percent of the husband's estate to the wife is used. Estate transfer costs and the value of transfers for the

Table 59. Firm Ownership, Financial Structure and Liquidity at End of Years 25 and 30 for Corporation Farm Business Arrangement (Corporation Owns All Farm Assets) When $162,000 Additional Stock Gifts are Made in Year 21 (Gift Strategy Four).

Item	Husband	Wife	Farm Heir	Non-Farm Heirs	Family Total
End Year 25					
Percent of Stock	38.4	0.0	33.3	28.3	100.0
Equity	$1,580,363	$118,881	$1,113,450	$1,094,899	$3,907,594
Debt	0	0	89,885	0	89,885
Cash	45,244	22,531	23,068	92,417	183,260
End Year 30					
Percent of Stock	36.2	0.0	34.1	29.8	100.0
Equity	$1,962,100	$177,168	$1,744,356	$1,632,845	$5,516,469
Debt	0	0	20,128	0	20,128
Cash	47,435	61,797	30,800	117,191	257,223

Table 60. Estate Transfers, Transfer Costs, Ending Equity and Financial Structure for Corporation Farm Business Arrangement (Corporation Owns All Farm Assets), Gift Strategy Four, Will Strategy Three.

Item	Husband's Death	Wife's Death
Net Estate Value	$1,962,099	$1,353,298
Estate Expenses		
Administrative	57,282	44,346
Federal Tax	303,399	270,771
Oklahoma Tax	77,927	85,116
Total	438,608	400,233
Estate Sales	159,923	160,000
Stock Redemption	417,867	400,184
Selling Expense	120,089	122,397

	Both Deaths
Value of Transfers	
Gifts	$ 835,132
Husband's Death	731,017
Wife's Death	830,668
Total	2,396,817
Net Present Value of Transfers	419,407
Cash Holdings for Wife	
Beginning Year 31	231,505
End Year 40	159,061

End Year 45	Farm Heir	Non-Farm Heirs	Total
Equity	$6,774,217	$6,480,854	$13,255,071
Debt	153,871	119,797	273,668
Cash	14,280	734,260	748,540
Percent of Stock	54.1	45.9	100.0

same will strategy under gift strategy three are shown in Table 58.

Due to the additional gifts to the children, both of the parents' estates are substantially reduced compared to gift strategy three. However, the parents still own enough stock in the farm corporation to use the maximum use value reduction. The husband owns 36.2 percent of the stock at his death. At the wife's death, she owns 12.1 percent of the stock. Based on the value of land owned by the corporation, a two percent net rent to land, and a nine percent effective interest rate, the wife would need to own approximately eight percent of the corporation stock to fully utilize the maximum use value reduction.

Total estate transfer costs at both deaths including selling expenses are $218,288 lower for gift strategy four compared to gift strategy three. Although the total dollar value of estate transfers is smaller, due to the additional lifetime gifts, the net present value of transfers including gifts is $12,838 higher under gift strategy four. The combined ending net worth of the heirs at year 45 is $240,722 higher when the additional lifetime gifts are made.

CHAPTER IX

SUMMARY AND CONCLUSIONS

Summary of the Problem and Procedures

In recent years a substantial amount of interest has been focused on the increasingly complex and costly problems of transferring the ownership and control of family farm firms between generations at the retirement or death of existing farm operators. The recent rapid increase in the value of farm real estate, the age distribution of farm operators, the lack of liquidity in farm estates, and the existence of multiple and competing objectives for the various members of the farm family increase the severity of the problem and make the planning process extremely complex. Without adequate long-range planning, family conflicts, economic losses and inefficient use of available capital resources can prevent the achievement of the retirement, business development and ownership transfer objectives of the farm family.

Previous research and extension publications have identified and evaluated several gift and estate transfer strategies that reduce ownership transfer costs. Ownership transfer costs include estate and gift taxes and the administrative expenses required to implement lifetime gift or at-death estate transfers. Transfer costs also include income taxes and other liquidation expenses resulting from the sale of assets to generate liquid funds to pay estate settlement costs. Major

changes in the federal laws that affect estate, gift and income taxes were recently implemented by the Tax Reform Act of 1976. The ownership transfer methods need to be evaluated under the legal environment created by this Act.

Most farm businesses are individually owned and operated sole proprietorships. Due to the increasing capital requirements in farming, many families are considering various types of family farm business arrangements to help younger members of the family obtain control of farm assets or to facilitate the estate transfer process. Farm business arrangement and asset ownership transfer decisions should be evaluated simultaneously.

In order to plan, farm families need information concerning how the use of alternative legal and financial tools will affect the achievement of their various goals and objectives. Thus, the primary purpose of this study is to provide information to Oklahoma farm families concerning the effects of implementing various asset ownership transfer methods and farm business arrangements on the magnitude of asset ownership transfer costs, the amount of income available for the parents during retirement, and the future financial positions of the family members.

The Simulation Model

The simulation model developed for this study is designed to represent the decision making environment and the economic activities for a family farm business during the time the parents will be transferring the control of the farm firm and ownership of farm assets to the younger members of the family. Data values describing the initial

farm firm and family situation are specified in external files. Farm and non-farm assets can be owned by both of the parents (husband and wife) under various property ownership methods (outright, joint tenancy or life estate), by farm heirs, by non-farm heirs, or by a corporation or partnership entity. The farm business arrangement to be simulated is specified by providing input data identifying the legal form of business organization, the specific farm assets to be transferred to a corporation or partnership entity, and the procedures for compensating family members for resources provided to the farm business.

Annual input data are supplied for each simulation year specifying changes in the family situation, modifications in the farm business arrangement, asset ownership transfer decisions, farm and non-farm asset purchases, financing terms, and land rent decisions. Asset ownership transfers can be made during any year of the parents' lifetimes by gift or sale. Transfers of asset ownership are also made at the time of the parents' deaths according to the will decisions, and the constraints provided by the form of property ownership. The years that death events are to occur are specified as input data.

For each year simulated, the model implements the decisions specified by annual input data and calculates the asset ownership transfer costs. The earnings from farm resources are determined and allocated to resource owners. Earnings from the farm business are combined with earnings from non-farm sources to determine cash flows and taxable income for each family member. The different procedures for determining income and social security taxes under proprietorship, partnership and corporation business organizations are included in the simulation model. At the end of the simulation year, the market values for the assets are

determined, and the cash and debt balances for each family member and the business entity are adjusted for the cash flows occurring during the year.

The values used to determine asset purchase costs, asset market values, farm income, farm expense, family living expense, and social security benefits are specified as initial input data. The rate of change in the values for each of these data variables due to inflation is also specified by the user.

Two versions of the model are used to accomodate federal estate and gift tax laws before and after the Tax Reform Act of 1976. The income tax, social security tax, and Oklahoma estate and gift tax regulations used by the model are those in effect for 1976.

The simulation model developed for this study focuses on generating the values for several outcome variables for selected values of decision variables, rather than determining the optimal values for decision variables by maximizing or minimizing the value for one outcome variable. This approach assumes that the farm family can compare the values for outcome variables projected for alternative ownership transfer strategies and farm business arrangements and make decisions that will maximize the joint family utility function. The specific outcome variables analyzed for the decision alternatives simulated in this study include: (1) the net present value of gift and estate transfers made to the heirs during the planning horizon, (2) the net worth of the heirs at the end of the planning horizon, and (3) changes in the liquidity and financial positions resulting from the after-tax cash income flows for each family member.

Case Farm Situation and Simulation Experiments

Data from a family farm situation in southwestern Oklahoma are used to test the simulation model and empirically evaluate alternative asset ownership transfer strategies and farm business arrangements. The family consists of the parents and three children. The ages of the husband and wife are 42 and 38, respectively. For planning purposes, it is assumed that the son (age 18) will farm and the two daughters (ages 13 and 15) will pursue non-farm vocations.

The farm operation consists of 2,440 acres, of which 640 acres are owned and 1,800 acres are rented. The main farm enterprises are wheat and stocker cattle. The beginning net worth (January 1, 1976) of the parents is $561,674. The total debt outstanding is $182,938. The 320-acre home farm and improvements valued at $230,316 are owned in joint tenancy between the husband and wife. The only assets owned outright by the wife are the insurance policies on the husband's life. The total face value of the life insurance policies is $185,000.

Simulation experiments are conducted for a 45-year planning horizon. In all simulation experiments, it is assumed that an additional 160 acres of land is rented every three years. Also, one of the tracts of land currently rented is purchased every five years. Land purchase costs and values increase at an annual rate of five percent. Other asset purchase costs, farm income, farm expenses, family living expense, non-farm salaries, and social security benefit levels increase at an annual rate of 3.33 percent.

For all simulation experiments, except those designed to evaluate the impact of the timing and sequence of the parents' death events, the husband's death occurs at age 72 (year 31) and the wife's death occurs

at age 78 (year 41). Based on Oklahoma life tables, the average remaining lifetimes are approximately 30 years for a male of age 42 and 40 years for a female of age 38.

Simulation experiments are conducted for a modified proprietorship and two corporation farm business arrangements. Under the modified proprietorship arrangement, the husband (father) and farm heir have separate ownership of farm assets. However, the machinery and equipment assets are jointly used, and the labor and management responsibilities are shared. During the 20-year period preceding the husband's retirement, all the land currently operated by the husband is eventually rented by the farm heir. Also, the additional land rented to expand the size of the farm is rented by the farm heir. During simulation years 10 through 20, the husband sells his machinery and equipment inventory, and the farm heir purchases the replacements and the additional machinery required to increase the number of acres operated.

Under the corporation farm business arrangements, the farm heir purchases stock from the husband at the start of each-10 year period. The purchases are financed by the husband with payments made in 10 annual installments. The husband and farm heir each receive a salary from the corporation. The corporation pays income taxes based on the federal and Oklahoma corporate tax rates in effect during 1976. In one corporation business arrangement, the ownership of all farm assets is transferred to the corporation. The corporation pays a dividend during the first 10 simulation years. In the other corporation business arrangement, 480 acres of real estate are rented to the corporation by the parents. Dividends are not paid.

The first simulation experiment conducted under the proprietorship business arrangement (base simulation experiment) represents the situation involving no additional estate planning by the parents. Lifetime gifts to the children are not made, and all of the estate is left to the wife outright at the husband's death. Additional simulation experiments are conducted to evaluate three alternative will strategies and three alternative lifetime gift strategies.[1] Simulation experiments are also conducted for a gift and sale combination and for two marital gift strategies. Two of the will strategies and the marital gift strategies are re-examined in simulation experiments that vary the time and sequence of the parents' deaths. Also, in order to evaluate the impact of the Tax Reform Act of 1976, simulation experiments are conducted for selected will and gift strategies under the legal environment existing prior to the Tax Reform Act of 1976.

Summary of Simulation Results

Base Simulation Experiment

Under the firm growth assumptions for this study, the number of acres operated increases from 2,440 to 3,400 by the end of year 20, just prior to the husband's retirement. The number of acres owned by the husband increases from 640 to 1,320 acres. At the end of year 20, the farm heir rents 1,640 acres (48.2 percent) of the total acres

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[1] In this study, a will strategy is defined as the proportion of the husband's estate value transferred to the wife at the husband's death. The proportion transferred to the wife depends on both the ownership method used when property is acquired and the bequests specified in the husband's will.

operated and owns nearly all of the farm machinery and equipment investment. Due to the cash and debt servicing requirements for purchasing machinery and inventory, the farm heir does not have enough cash and unused credit capacity to make the down payment required to purchase land until simulation year 25. The debt to equity ratio for the farm heir is 1.96 and 2.34 at the end of years 10 and 15, respectively. At the end of year 20, the farm heir has a net worth of $305,054 and a debt to equity ratio of 0.83. At the end of year 20, 49 percent of the total farm resource services are contributed by the husband and 51 percent by the farm heir.

At the end of year 30, just prior to the husband's death, the combined value of equity for the parents is $3,527,748. The amount of debt owed by the husband is $178,688. The average annual rate of increase in the parent's equity during the 30-year period is 6.32 percent. This includes appreciation on land owned by the husband. Excluding appreciation on farm land, the average annual growth in equity is only 2.8 percent. During the five year period after the husband's retirement, the average annual percentage increase in equity is only 4.23 percent. The lower growth rate is due to the higher income taxes resulting from the sale of inventory at the husband's retirement.

For the base simulation experiment, the entire estate is left to the wife at the husband's death. Since the maximum marital deduction is used, estate taxes and administrative costs are only 16 percent of the husband's net estate value. The real estate transferred to the wife continues to increase in value, and total estate expenses are nearly $2.5 million at the wife's death (47 percent of wife's net estate). The maximum reduction for current use value appraisal of real estate ($500,000) is used for both estates.

For all simulation experiments, the three heirs receive equal proportions of the total estate value. For the base simulation experiment, the farm heir receives 480 acres of real estate and the two non-farm heirs receive 840 acres. The non-farm heirs are unable to generate enough cash to service the debt claims on the wife's estate. During the five-year period following the wife's death, the non-farm heirs increase their total debt by $157,297.

If the farm heir purchases real estate from the parents' estates, the cash can be used to pay estate transfer costs or to distribute to the non-farm heirs. Results from additional simulation experiments indicate that a purchase of 200 acres of real estate from the parents' estates by the farm heir reduces the ending debt obligation for the non-farm heirs by more than one-half, and increases the debt to equity ratio for the farm heir from 0.47 to 0.55. For the non-farm heirs, the cost of increased liquidity is reduced land ownership and a lower ending net worth. Assuming the 200 acres of land is sold to the farm heir, the net present value of transfers to all heirs for the base simulation experiment is $180,999. The combined equity for the heirs is $9,474,122 at the end of year 45.

Impact of Will Strategy

Compared to leaving the entire estate to the wife outright (will strategy one), the total value of estate transfer costs at both deaths, including selling expense, is reduced by 36 percent when one-half of the estate is left to the wife outright with the residual after payment of estate taxes going to the wife in a life estate (will strategy four). A strategy leaving one-half to the wife outright and the residual

equally divided among the children (will strategy two) reduces total transfer costs by 39 percent compared to the base simulation experiment. At the wife's death, transfer costs are more than one million dollars higher when all of the husband's estate is left to the wife compared to either of the other two will strategies. The portion of the husband's estate left to the children or left to the wife in a life estate is not subject to estate tax again at the wife's death. Total estate transfer costs at the wife's death are slightly higher for the life estate strategy compared to leaving one-half of the husband's estate directly to the heirs.

Total estate taxes are minimized when the marginal estate tax rates are equated for the parents' estates. Based on the growth rate for the wife's estate and assuming the wife survives the husband by 10 years, leaving the wife 35 percent of the husband's estate outright would equate the marginal estate tax rates at each death event. Based on the average projected net rent for farm land for the five years preceding the wife's death and assuming a nine percent average interest rate, the wife owns enough farm land to utilize the maximum reduction for use value appraisal of real estate assets even when she inherits only 35 percent of the husband's estate. Using this strategy (will strategy three) and assuming the residual after payment of estate taxes is equally divided among the heirs, the value of total estate transfer costs at both deaths is nearly 48 percent lower than total costs for the base simulation experiment.

The net present value of transfers to the heirs for strategy three is $277,802 compared to $180,999, $267,620 and $250,802 for will strategies one, two and four, respectively. The ranking of will

strategies based on the values for the ending net worth of the heirs is the same as the ranking based on the net present values. The ending equity for the heirs is 16 percent ($1.5 million) higher when 35 percent of the husband's estate is left to the wife compared to leaving all of the estate to the wife.

Lifetime Gifts to the Children

Gifts from the husband equal to $3,000 to each child each year starting in year 11 (gift strategy one) reduce the net value of the husband's estate at the end of year 30 by $347,233 compared to the base simulation experiment (no gifts). No gift taxes are paid since the value of gifts are equal to the annual exclusions allowed under federal and Oklahoma law. The annual gifts allow the farm heir to start purchasing land in year 20 compared to year 25 when no gifts are made. The net liquidity position (cash minus debt) for the husband at the end of year 30 is increased by $101,061 since 160 fewer acres of real estate are purchased. Although the cash income for the parents is reduced by making gifts, the debt service requirements are reduced and their net liquidity position is improved. Since the marginal income tax rates for the heirs are smaller than the parents' marginal income tax rates, the combined equity for the family at the end of year 30 is $14,703 higher under gift strategy one compared to the no gift strategy.

Under gift strategy two, the gifts to the children in year 11 are $80,377 to each child rather than $3,000. The $3,000 annual gifts are continued after year 11. The gifts are made by the husband, but for federal gift tax purposes, the gift in year 11 is split between the

husband and wife. Each parent uses $27,270 of their unified estate and gift tax credit and no federal gift tax is due. Oklahoma gift tax equal to $11,628 are due in year 11. The gift in year 11 is 160 acres of real estate to the non-farm heirs and inventory to the farm heir.

Compared to gift strategy one, the $232,132 additional value of gifts reduces the husband's net estate value by $792,003. The farm heir can start purchasing farm land in year 15 rather than 20. Despite the payment of Oklahoma gift taxes, the combined equity for the family is $49,062 higher at the end of year 30 compared to gift strategy one. Gifts of inventory assets reduce the amount of inventory sales and the resulting income tax liability at the husband's retirement.

Gift strategy three is the same as gift strategy two, except the annual gifts after year 11 are increased to $6,000 per child. Assuming the parents split the gifts for tax purposes, there are no additional federal gift taxes. However, Oklahoma gift taxes are $11,026 higher than gift strategy two. Compared to gift strategy two, the $171,000 additional gifts reduce the husband's net estate value at the end of year 30 by $272,224. However, making the additional cash gifts and paying additional gift taxes forces the husband to increase debt. The net liquidity position (cash minus debt) for the husband at the end of year 30 is $272,241 lower for gift strategy three compared to gift strategy two. Due to the additional interest on borrowed funds and the additional Oklahoma gift taxes, the value of combined equity for the family at the end of year 30 is $39,559 lower for gift strategy three compared to gift strategy two.

For each gift strategy, the estates are transferred at the death of the husband assuming one-half of the husband's estate is left to the

wife and one-half goes to the heirs. Both parents own enough land under all gift strategies to use the maximum reduction for use value appraisal. Total estate transfer costs including selling expenses at both death events are smallest for gift strategy three reflecting the smallest net estate value. As a result of the larger lifetime gifts and the lower estate transfer costs, the net present value of transfers to the heirs is highest for gift strategy three. The same ranking of the gift strategies results when the ending net worth of the heirs is compared. Compared to the no gift strategy, the ending equity for the heirs is 4 percent, 9 percent and 10 percent higher for gift strategies one, two and three, respectively. The net present value of transfers for gift strategy three is $393,152 compared to $267,620 for the no gift strategy.

The impact of using will strategy three (equate the marginal estate tax rates), rather than will strategy two (50 percent to the wife) is investigated for gift strategy two. The net present value of transfers to the heirs is $6,598 higher for will strategy three compared to strategy two. Since the wife receives only 37.5 percent of the husband's estate, the value of the wife's savings account declines about $2,200 per year during the 10 years following the husband's death. However, the wife's savings account balance at her death in year 40 is $186,274.

Will strategies two and three are investigated further by performing simulation experiments varying the timing of the parents' death events. When the wife survives the husband by only 5 years, rather than 10, the net present value of transfers for will strategy three (37.5 percent to wife) is only $4,682 higher than the net present

value for will strategy two (50 percent to wife). When the husband's death occurs in year 20, rather than in year 30, and the wife survives the husband by 20 years, rather than 10, the net present value of transfers for will strategy three is $17,013 higher than the present value for will strategy two. However, the ending cash balance for the wife is reduced to $11,610 under will strategy three compared to $170,923 for will strategy two. Making a will to equate the marginal estate tax rates of the parents and leaving the wife less than one-half of the estate may create liquidity problems for the surviving spouse when the husband's death occurs several years earlier than expected. The wife may have to reduce the amount of gifts to the children or sell some of the real estate.

Combination of Sale and Gift

The simulation results for gift strategy three indicate that the parents must increase borrowing during retirement to make the $18,000 annual cash gifts. Selling 120 acres of real estate for approximately $200,000 at the time of the husband's retirement to the farm heir using a 10-year installment sale provides additional liquidity for the parents. Despite the additional income taxes, the net liquidity position for the husband at the end of year 30 is increased by nearly $217,000 over gift strategy three without sales. Also, since the future appreciation is not included in the husband's estate, the value of the estate and the resulting estate transfer costs are lower. However, the farm heir's repayment capacity is less than the additional debt servicing requirements, and additional funds must be borrowed to make the payments to the husband. Compared to gift strategy three

without the sale, the ending equity of the heirs is $126,984 higher. However, the net present value of transfers to the heirs is $7,995 lower. The value of transfers to the heirs does not include the earnings and appreciation on the land sold to the farm heir.

Marital Gifts

For the case farm situation nearly all the assets are owned by the husband. The only assets owned by the wife are the insurance policies on the husband's life. The husband makes a $5,000 annual gift to the wife to provide funds for payment of the premiums. Two simulation experiments are conducted to determine the impact of making additional lifetime marital gifts. One experiment involves a gift of 160 acres of real estate valued at $97,678 to the wife during the first simulation year. To implement this gift, the joint tenancy is terminated, and the wife receives an undivided one-half interest in the 320 acre home farm. In the other simulation experiment, 320 acres valued at $192,073 is given to the wife. For both of these simulation experiments, the parents make a taxable gift to the chilcren during year 11 and $3,000 annual gifts to each child after year 11 (gift strategy two).

The marital gift of 160 acres utilizes the $100,000 marital deduction allowed under the Tax Reform Act of 1976 and no gift taxes are due. The gift of 320 acres requires use of $21,440 of the husband's unified gift and estate tax credit. Due to the use of the credit to make marital gifts, taxes on the gift to the children in year 11 are $8,805 higher compared to the other marital gift strategies.

The will strategy which attempts to equate the marginal estate tax rates for the parents' estates is used on all marital gift simulation

experiments. Compared to making the $5,000 annual marital gifts, making a marital gift of 160 acres, reduces the value of total estate transfer costs at both deaths by $101,415, increases the net present value of transfers by $1,172, and increases the ending equity of the heirs by $74,494. Compared to the 160 acre gift strategy, the 320 acre marital gift increases the value of total transfer costs by $42,638, decreases the net present value of transfers by $2,214, and decreases the ending equity for the heirs by $34,612. Taxable marital gifts that exceed the $100,000 marital deduction use up part of the unified credit, increase the cost of making taxable gifts to the children, and increase estate taxes.

Results from simulation experiments where the husband survives the wife indicate that the larger marital gifts reduce the combined value of total transfer costs at both deaths, increase the present value of transfers, and increase the ending equity for the heirs. The estate tax marital deduction is not available to reduce the value of the husband's taxable estate when the wife dies first. Marital gifts of land allow a more equal division of the total estate value between the parents prior to their deaths. Also, when the wife dies first and does not own real estate, her estate value cannot be reduced by use value appraisal. Compared to making the $5,000 annual cash gifts, the net present value of transfers is $17,788 higher, and the ending equity for the heirs is $220,264 higher for the 160 acre marital gift. The net present value of transfers is $9,175 higher, and the ending equity for the heirs is $129,256 higher for the 320 acre marital gift compared to the 160 acre marital gift.

The net present value of transfers and the ending equity for the heirs are both higher for the 160 acre marital gift than for the $5,000 annual marital gifts regardless of the sequence of death events. However, whether marital gifts above the $100,000 marital deduction (320-acre marital gift) increase the net present value and ending equity depends on the sequence of death events that occur. If the probability of the husband surviving the wife is 21 percent, then the expected net present value of transfers determined by weighting the values for the two sequences of death events is nearly equal for the 160 acre and 320 acre marital gift strategies. Based on the simulation results for this case situation and these two sets of death events, the 320 acre gift strategy should be considered if the wife has a least a 21 percent probability of dying first. A complete analysis of the risk associated with death events would require projecting the results for the two marital gift strategies for all possible combinations of death events and weighting the values for outcome variables by the joint probabilities associated with each set of death events.

Tax Reform Act of 1976

The comparison of the results for simulation experiments performed under the legal environments before and after the implementation of the Tax Reform Act of 1976 indicates that federal estate taxes are lower under the new law when the reduction for current use value appraisal of farm real estate is used. However, if the reduction for use value appraisal is not used, federal estate taxes are higher under the new law when the taxable estate is larger than $1,175,000. For taxable estates smaller than $1,175,000, the savings in estate

taxes due to replacing the $60,000 exemption with the $47,000 credit is greater than the additional estate taxes resulting from the new rate schedule.

The amount of savings in federal estate taxes resulting from the use value appraisal of farm real estate increases as the taxable estate and marginal estate tax rate increases. For example, the decrease in federal estate taxes resulting from a $500,000 reduction in estate value is $218,870 for a $2,408,427 taxable estate and $192,128 for a $1,572,745 taxable estate. The reduction in estate taxes due to the use value appraisal more than offsets the increase in taxes resulting from the new rate schedule. For the $2,408,427 taxable estate, federal estate taxes are $206,470 lower under the new law compared to the old law. For the $1,572,745 taxable estate, the federal estate taxes are reduced by $182,128.

Under the Tax Reform Act of 1976, part of the reduction in federal estate taxes is offset by income taxes on assets sold by the estate to create liquid funds for payment of estate taxes. The basis of an asset can no longer be increased to the value of the asset used for estate tax purposes at the time of the owners' death. Under the new law, the basis of an estate asset is the basis for the decreased owner adjusted for appreciation occuring prior to 1977 and for estate taxes attributable to appreciation in the asset value occurring after 1976. The amount of capital gain income taxes due on sales of land valued at $289,826 at the wife's death is $49,299 (17 percent of the value sold). In general, income taxes paid on estate sales are larger for assets purchased earlier in the planning horizon, assets used to satisfy the marital deduction, assets reduced in value by the use value appraisal,

and sales made at the second death.

The ranking of alternative will strategies based on the net present value of transfers is the same under the new and old estate tax laws. Also, taxable gifts to the children increase the net present value of transfers under both the old and the new laws. However, the benefit of making taxable lifetime gifts is greater under the old law. Under the old law, gift tax rates were three-fourths of estate tax rates. There was also a separate $30,000 lifetime exemption for gifts made by each parent. Under the new law, gift tax rates are equal to estate tax rates, and the separate exemptions for gift and estate taxes are replaced by a single unified estate and gift tax credit.

Based on the simulation results for the taxable gift strategy (strategy three), the amount of gift taxes paid at the time of the gift is $23,308 lower under the new law because the $47,000 tax credit more than offsets the higher gift tax rates and the loss of the $30,000 exemption. However, due to the gift tax savings, the value of the parents estates are larger under the new law compared to the old law. Also, under the new law, the value of taxable gifts is added to the taxable estate to determine tentative estate taxes. Due to the change in the gift tax law, the combined value of estate transfer costs paid at the parents' deaths is $115,045 higher for the same gift strategy.

The increased federal estate taxes and other transfer costs resulting from the change in the gift tax law are more than offset by the savings in federal estate taxes resulting from the use value appraisal of estate assets. The net present value of transfers for gift strategy three and will strategy two is $14,806 higher under the new law compared to the old law.

Corporation Farm Business Arrangements

Compared to the proprietorship farm business arrangement, the combined after-tax growth in equity for the family is substantially higher when the farm business is incorporated. When the corporation owns all farm assets (corporation one), the value of equity for the family at the end of year 30, just prior to the husband's death, is $479,777 (9.5 percent) higher than family equity under the proprietorship arrangement. When the parents maintain ownership of 480 acres of land (corporation two), the combined family equity value is $467,805 (9.2 percent) higher than the family equity under the proprietorship arrangement. These simulation experiments were performed using the same dollar value and timing of lifetime gifts to the children (strategy three).

Differences in the growth in family equity are due primarily to differences in the total income and social security tax liability for the farm business arrangements. The total amount of social security taxes paid is higher under the corporation business arrangements. In general, the corporation arrangement results in income tax savings when the marginal income tax rates for the family members under the proprietorship are greater than the marginal tax rate for the corporation. During the first ten years, the parents need cash income above the amount provided by the salaries paid by the corporation. When the corporation owns all of the farm assets, dividends are not paid during the first ten years. Since the dividends cannot be deducted from the corporation taxable income and increase the marginal tax rate for the family members, the tax savings under the corporation business arrangement are small during the first ten years.

The total income tax liability is substantially greater under the proprietorship arrangement during the years when the husband has additional ordinary income due to inventory and machinery sales. Under the corporation arrangement, the inventory and machinery ownership does not need to be transferred at the retirement of the husband. Under the corporation business arrangement, the sales of stock from the husband to the farm heir are capital gain, rather than ordinary income, and qualify as an installment sale.

Compared to the proprietorship arrangement, the net present value of transfers to the heirs is $8,606 higher for corporation one and $16,434 lower for corporation two. However, the value of equity for the heirs at the end of year 45 is highest for corporation two. Compared to the proprietorship arrangement, the ending equity for the heirs is $970,891 higher for corporation one and $1,904,334 higher for corporation two. The higher ending equity for the heirs under corporation two (rent 480 acres to the corporation) results from the faster growth rate on stock acquired by lifetime transfers and from the smaller estate taxes. Also, the after-tax cash income and annual increase in equity for the heirs during years 31 to 45 are substantially higher for corporation two.

Since gifts of stock do not reduce the cash income for the parents, additional lifetime gifts can be made under the corporation arrangement. Additional taxable gifts of $162,000 equally divided among the heirs made during year 21 (gift strategy four) under corporation one increase the net present value of transfers by $12,838 and increase the ending equity for the heirs by $240,722 compared to gift strategy three.

Conclusions and Implications

The empirical results of this study indicate that successful achievement of the ownership transfer and business continuation objectives for families who operate growing commercial farm firms requires planning and implementing business arrangement and asset ownership transfer plans several years prior to the retirement of the parents. Assuming continued appreciation in the value of farm real estate, the value of the estates owned by farm operators who are currently in the growth stage of the family-firm life cycle will be several times higher at the time of the farm operator's death. The empirical results of this study also indicate that planning for the intergeneration farm business transfer requires simultaneous consideration of alternative farm business arrangements and alternative asset ownership transfer methods.

Based on the results for the simulation experiments conducted for the case farm and family situation, the net present value of transfers and the ending equity for the heirs can be increased by (1) incorporating the family farm business, (2) making taxable lifetime gifts of property to the children, (3) making marital gifts to utilize the $100,000 marital gift deduction, and (4) devising wills that equate the expected marginal estate tax rates for the parents' estates. Also, lifetime sales of assets from the parents to the farm heir will likely be needed to provide the parents with additional income and liquidity during retirement and to give the farm heir adequate control of the farm business assets. Strategies used to create liquid funds for payment of estate transfer costs include use of the installment payment option for federal estate taxes, use of a section 303 corporation

stock redemption, borrowing on equity in inherited assets, and sales of estate assets to the farm heir.

The specific numerical results of this study can be applied only to situations similar to the case farm and family situation. However, several conclusions can be drawn from the simulation results of this study concerning the impact of alternative ownership transfer methods, alternative farm business arrangements, and the Tax Reform Act of 1976. The results of this study also have several implications for farm families and the lawyers, accountants, management specialists, or other individuals that advise farm families.

The results of this study indicate that incorporating the family farm business reduces the total income tax liability and increases the total amount of equity accumulated by the family members during the planning horizon. The income tax savings result when part of the farm income can be retained by the corporation, and the income tax rate for the corporation is lower than the marginal income tax rates for the family members under the proprietorship arrangement. Thus, the amount of income tax savings resulting for the corporation farm business arrangement compared to the proprietorship arrangement will depend on the amount of income for the farm operation, the number of owner-employees, and how the taxable earnings are distributed among the family members and the corporation entity. The income tax savings must be large enough to offset the higher social security taxes and the administrative costs to organize the corporation. The amount of taxable income for the corporation and family members can be adjusted by changing the amount of salaries and rent paid by the corporation to the family members.

A problem encountered at the time of the estate transfer, under the corporation business arrangement, is the creation of liquidity to pay estate transfer costs. If dividends are not paid on stock, the heirs may not be able to generate enough cash to support the debt required to pay estate transfer costs. One way to generate liquidity for the heirs is to redeem stock in the corporation in exchange for funds to pay estate transfer costs. To avoid having the stock redemption treated as a dividend, plans must be made to insure that lifetime stock transfers do not disqualify the estate for a section 303 stock redemption.[2] Alternatively, part of the farm real estate might be kept by the parents rather than transferred to the corporation. The rent on the real estate inherited by the heirs could be used to service the debt required to pay estate transfer costs.

The simulation results for alternative gift strategies indicate that increasing the amount of lifetime gifts to the children increases the net present value of transfers and the ending equity for the heirs. Under the Tax Reform Act of 1976, the value of gifts made in any year exceeding the value of the annual exclusions for the parents ($3,000 per child for each parent) are added to the taxable estate for the purposes of determining federal estate taxes at the parents' deaths. However, gifts equal to the annual exclusions and the future appreciation and earnings on all gifts, including taxable gifts, are not subject to gift taxes nor estate taxes at the parents' deaths. The reduction in the market value of the parents' estates per dollar of gifts is

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[2]The value of stock included in the decedent's estate must exceed 50 percent of the adjusted gross estate. Other qualifications are listed in Roush.

greater for real estate and stock assets compared to cash assets due to the higher growth rates for corporation stock and real estate assets. The reduction in the market value of the parents' estate is also greater for gifts made early in the planning horizon compared to gifts made after the parents' retirement. The simulation results also indicate that gifts of income earning assets reduce the combined family income tax liability when the parents' marginal income tax rate is greater than the marginal income tax rates for the heirs.

Since gifts reduce the cash income available to the parents, the amount of gifts that can be made depends on the amount of liquidity available in the parents' estate and their income needs. If the gifts allow the farm heir to purchase real estate that would otherwise be purchased by the parents, the liquidity position of the parents may be improved by making gifts. However, large annual gifts of cash during retirement may require the parents to increase debt. Incorporating the farm business facilitates making lifetime gifts to the children. Shares of stock are easily divided into $3,000 or $6,000 units to utilize the annual gift exclusions. Also, gifts of stock do not reduce the parents' liquidity compared to gifts of cash.

The simulation results for alternative will strategies indicate that the combined value of estate taxes is lowest when the first parent to die leaves just enough property to the surviving spouse to equate the marginal federal estate tax rates for the parents' estates. The amount willed to the surviving spouse depends on the distribution of estate ownership between the parents, the expected number of years the spouse survives the first parent to die, and the expected growth rate for the surviving spouse's estate. Use of this will strategy may require

changing the ownership method on some of the property owned in joint tenancy to outright ownership.

In devising the will strategy, consideration must be given to the income and liquidity needs of the surviving spouse. Leaving the wife with a relatively small estate may create liquidity problems for the surviving spouse, expecially if she survives the husband for a longer period than expected. Since the will should be made early in the planning horizon, the parents need to continuously review their wills and make modifications when needed due to changes in the estate, income or family situations.

Estate taxes can be minimized by using the strategy described above only if the parent owning the largest portion of the combined estate dies first. If the husband owns nearly all of the combined estate value and the wife dies first, the marital deduction is not available to reduce his taxable estate. Lifetime marital gifts can be used to reduce the risk of higher estate transfer costs when the spouse owning the smallest portion of the combined estate dies first. The results for this study indicate that making marital gifts from the husband to the wife up to the amount of the $100,000 marital deduction increases the net present value of transfers and ending equity of the heirs regardless of which parent dies first. Making taxable marital gifts ($200,000) results in an additional reduction in the combined value of estate transfer costs when the wife dies first. However, since the taxable marital gift uses part of the husband's unified credit available for making gifts to the children and for estate taxes, the net present value of transfers and ending equity for the heirs are reduced when the husband dies first. Thus, whether or not taxable

marital gifts should be made will depend upon the probabilities associated with the possible sequences of death events for the parents.

Use of the $100,000 marital deduction should be considered early in the planning horizon when farm couples start acquiring ownership of property. When the total combined value of equity for the parents is $200,000 or less, a tax free marital gift could be used to create equal ownership of the property between the husband and wife. The future earnings from the property could be equally divided and used to acquire equal interests in additional property.

The results of this study indicate that the values for estate transfer costs are lower and the values for the net present value of transfers are higher for all will and gift strategies simulated under the legal environment created by the Tax Reform Act of 1976 compared to the respective values for the same strategies simulated under the former federal estate and gift tax laws. In general, the combination of replacing the $60,000 estate exemption with the $47,000 credit and changing the estate tax rate schedule makes federal estate taxes larger for taxable estates that exceed $1,175,000. However, for the simulation experiments performed in this study, the federal estate tax savings due to the current use value appraisal of real estate and corporation stock more than offset the higher estate taxes resulting from changing the estate tax rate schedule.

Since the separate exemptions for gift and estate taxes and the lower gift tax rates are replaced with a single unified estate and gift tax credit and a single unified estate and gift tax rate schedule, the benefits of making taxable gifts to the children are reduced by the Tax Reform Act of 1976. However, due to the reduction in the value

of the remaining estate assets resulting from use value appraisal, the net present value of transfers to the heirs is higher under the new law compared to the old law for the same gift strategy.

Careful planning will be required to insure that the estate meets the qualifications for the use value appraisal benefits both before and after the deaths of the parents. The law provides for a recapture of part or all of the tax savings due to use value appraisal, if within 15 years after the decedent's death, the heirs sell the qualifying property or if the heirs rent the qualifying property to a non-family member.

In estate situations where the qualifications for current use value appraisal cannot be met and where the value of the taxable estate is greater than $1,175,000, the value of federal estate taxes would be higher under the Tax Reform Act of 1976. For example, an estate would not qualify for current use value appraisal if none of the members of the decedent's family could operate the farm after the husband's retirement or death. Also, in this situation the heirs may want to sell the inherited farm assets. Under the Tax Reform Act of 1976, a substantial amount of income taxes would be due if the property is sold several years after 1976.

The current use value of qualifying farm land is determined by dividing the average net rent on comparable land by the average effective Federal Land Bank interest rate. Averages are determined using the five years preceding the death event. Assuming the average net rent is three percent of the market value of the land and the average effective interest rate is nine percent, the use value of the land is one-third of the market value. Thus, to fully utilize the $500,000

maximum reduction for use value appraisal, each parent would need to own qualifying assets with a market value of at least $750,000. Assuming a constant interest rate, if the market value of land continues to increase at a faster rate than the net rent on land, over time an increasing number of farm estates can use the maximum reduction for use value appraisal.

The conclusions of this study concerning the use of taxable gifts are limited to estates that will contain enough qualifying assets to utilize the $500,000 maximum reduction for use value appraisal at the time of the parents' deaths. For gift tax purposes, property is valued at its market value at the time of the gift. If the market value of the property at the time of the gift is less than its future value for estate tax purposes, then making the gift will reduce transfer costs. If the asset will quality for use value appraisal and the estate will not contain enough other assets to fully utilize the maximum reduction for use value appraisal at the parents' deaths, then the value of the taxable gift may be greater than the value of the asset for estate tax purposes. For example, real estate valued at $100,000 at the time of the gift, appreciating at an average annual rate of five percent, would have a market value of $162,889 ten years later. The value of the gift for gift tax purposes would be $100,000. Assuming a death ten years after the gift and assuming that the current use value is one-third of market value, the estate tax value of the property would be only $54,296. If the estate does not contain enough other assets to use the maximum reduction for use value appraisal, transfer costs would be increased by making the gift. The gift decision depends on the values for factors that affect use value determination, the rate

of appreciation in value for the asset, and the expected remaining life span of the donor. If the projected values of the parents' estates will not be large enough to fully utilize the $500,000 use value reduction, then the parents may want to consider making gifts of assets that will not qualify for use value appraisal.

Application of the Simulation Model

The potential application of the simulation model to provide information needed by farm families to evaluate alternative asset ownership transfer strategies and farm business arrangements is demonstrated by the results presented for the case farm and family situation of this study. The individual farm firm and family situation and the unique objectives of the family must be considered when planning asset ownership transfer and business arrangement strategies. The simulation model constructed for this study allows flexibility in the specification of input data to represent individual farm firm and family situations.

Potential users of the model include extension farm management specialists, private management consultants, lawyers, accountants, and life insurance agents. In order to provide potential users access to the simulation model, procedures and input forms need to be developed for obtaining the values for data which are specified in the four files required by the model. Procedures also need to be developed to help the farm family and/or their farm management and estate planning advisors to select and specify values for input data variables to represent the alternative strategies to be evaluated.

The simulation model is most useful for analyzing long range business development, retirement and ownership transfer plans. The ownership transfer strategies suggested in this study, other research studies, and extension publications can be analyzed for individual farm and family situations using the simulation model. The model can also be used to determine the feasibility of various operating arrangements between the parents and younger members of the family. The impact of the farm business arrangement on the future income and financial positions for both the parents and children can be projected by the model. Alternative farm and non-farm investment strategies for the parents during retirement can be simulated. Also, alternative means of providing liquidity to pay estate transfer costs, including life insurance, borrowing, and sales can be analyzed.

Based on a $360 per hour charge for computer time, the cost to operate the simulation model averages about $3.00 per simulation year. The cost for any one year depends on the number of asset ownership transfers and asset purchase transactions that are implemented. For a 45-year planning horizon the computer cost to simulate a business arrangement, a lifetime gift strategy, and a will strategy averages about $135. The values for variables that are transferred from one simulation year to the next are saved on a disk file at the end of a simulation run. Alternative will strategies can be evaluated by running the simulation model for a planning horizon starting at the year the first death event occurs. For example, if the first death event occurs in year 31 and the planning horizon is 45 years, alternative will strategies could be investigated by using the results saved at the end of year 30 and running the simulation model for 15 years for each will strategy.

Recommendations for Further Study

The individual farm and family situation must be considered when applying the results of the simulation experiments conducted for this study. Also, the numerical results are dependent upon the specific assumptions made about future trends in land values, asset purchase costs, farm income, farm expenses, family living expenses and social security benefits. The ownership transfer and business arrangement strategies investigated for the case farm firm and family situation of this study need to be evaluated for farms with a smaller initial equity and for families with older parents and a different number of children. Also, the sensitivity of the results for alternative farm business arrangements and ownership transfer strategies to different inflation rates, farm income trends, and rates of change in land values needs to be empirically determined.

The simulation model can be used to empirically evaluate several types of business arrangements, firm growth, retirement and estate transfer strategies that are not analyzed in this study. The partnership form of business organization is not empirically evaluated in this study. Under the modified proprietorship arrangement used in this study, the proportion of the total resource contributions provided by the farm heir increases over time as the husband liquidates his inventory and machinery investment and as the farm heir acquires ownership of the inventory and machinery investments and rents additional land. Under the corporation business arrangement, the farm heir acquires additional control of the farm business by purchasing stock from the husband. Additional research is needed to study the feasibility of alternative establishment and firm growth strategies for the younger

members of the family under proprietorship, partnership and corporation business arrangements.

In this study, only one class of stock in the corporation is issued to the family members. The use of two classes of stock for corporation ownership may facilitate estate planning and reduce estate transfer costs. The parents could maintain ownership of the preferred stock that pays a dividend. The common stock that increases in value as the corporation net worth grows could be given to the children to reduce the size of the parents' taxable estates.

In this study, it is assumed that the corporation owned by the farm and non-farm heirs would continue after the deaths of the parents. Additional research is needed to investigate the problems and costs of liquidating a corporation. Due to family conflicts, it may not be possible to continue the joint family operation. The costs of dismantling alternative forms of multi-owner business arrangements should be compared.

In this study, the husband makes an annual investment in a tax sheltered retirement annuity. The annuity investment reduces income taxes for the parents prior to retirement and provides a source of income to supplement social security benefits during the retirement years. The simulation model could be used to compare the benefits of the investment in the retirement annuity to other non-farm investment opportunities.

Additional research is also needed to study the economics of life insurance purchases. For this study, the wife owns $185,000 of insurance on the husband's life. Additional simulation experiments need to be conducted to investigate alternative amounts of life insurance on

both the husband and wife and different owners and beneficiaries of the policies. The alternative means of providing liquidity at the death of a parent (sales of assets, borrowing, installment payment of federal estate taxes and life insurance) need to be compared.

The use of gneration skipping transfers are not investigated in this study. The simulation results for this study indicate that the taxable estates for the heirs will be very large. To reduce the size of the heirs' taxable estates, the parents could leave part of their estates to the heirs in a life estate with remainder interest to the grandchildren. Under the Tax Reform Act of 1976, generation skipping transfers are limited to $250,000 for each heir (U. S. Congress 1976, Sec. 2006). Transfers exceeding $250,000 that skip a generation are subject to estate taxation at the death of the heir.

The legal aspects of the simulation model will need to be modified as additional regulations or rulings are issued concerning the provisions of the Tax Reform Act of 1976. At this time regulations clarifying the procedures for applying the special use valuation rules to partnership interests and corporation stock owned by a decedent have not been issued.

Also, the legal and tax parameters of the simulation model could be modified to determine the impact of potential changes in income, estate, and gift tax laws that are not included in the Tax Reform Act of 1976. Specific policy questions, such as eliminating the 50 percent deduction for long-term capital gains, eliminating income taxes on dividends paid by a corporation, or taxing unrealized capital gains at the death of a property owner could be evaluated.

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APPENDIX A

INPUT DATA FOR CASE FARM SITUATION

The initial input data for the simulation model are stored in four disk files. The Asset, Environment, Buy Table and Flow files are described in Chapter III. The values shown on the computer output in Table 61 through Table 64 in this appendix represent the initial input data stored on the disk files for the case farm and family situation of this study. The definitions of the data variables for each of the files are specified in Chapter III (Table 4 to Table 10).

Table 65 shows the non-real estate asset requirements for the case farm situation based on the firm growth plan specified in Chapter IV. Table 66 identifies the tax depreciation and investment credit assumption used for purchased assets. Table 67 shows the number of acres of land and the types of improvements contained on each tract of real estate owned. The timing of real estate asset purchases assumed for the case farm situation is also shown.

Table 61. Asset File Data Values for the Case Farm Situation.

A LIST OF ASSETS OWNED BY (3) HUSBAND

ASSET NUMBER	1 14	2 15	3 16	4 17	5 18	6 19	7 20	8	9	10 NAME	11	12	13
1002	94075.00 160.00	22000.00 0.0	0.0 99.00	22000.00 0.0	0.0 0.0	-72075.00 0.0	22000.00 0.0	8.00 LAND 2	8.00	0.0	0.0	2.00	1.00
1002	320.00 1.00	0.0 2.00	0.0 10.00	1775.00 0.0	1775.00 0.0	1455.00 0.0	1775.00 0.0	18.00 FENCE 2	8.00	0.0	0.0	2.00	2.00
1003	97450.00 160.00	94500.00 0.0	70000.00 99.00	94500.00 0.0	0.0 1.00	-2950.00 3500.00	94500.00 0.00	1.00 LAND 3	1.00	0.0	0.0	3.00	1.00
1003	1760.00 1.00	1714.28 3.00	0.0 7.00	2000.00 0.0	285.71 0.0	240.00 0.0	2000.00 0.0	9.00 FENCE 3	1.00	200.00	0.0	3.00	2.00
1003	300.00 1.00	642.85 3.00	0.0 7.00	750.00 0.0	107.14 0.0	450.00 0.0	750.00 0.0	20.00 POND 3	1.00	75.00	0.0	9.00	3.00
1003	1680.00 1.00	1714.20 3.00	0.0 7.00	2000.00 0.0	285.71 0.0	320.00 0.0	2000.00 0.0	11.00 HAY BARN 3	1.00	200.00	0.0	3.00	3.00
1101	23024.00 1.00	13659.74 4.00	0.0 7.00	31500.00 0.0	11116.88 0.0	8476.00 0.0	19821.30 0.0	2.00 175 H.P. TRACTOR	2.00	1734.36	0.0	1.00	2.00
1102	14256.50 1.00	4945.17 4.00	0.0 7.00	14533.00 0.0	9587.83 0.0	236.50 0.0	11626.40 0.0	3.00 150 H.P. TRACTOR	3.00	1017.31	0.0	1.00	3.00
1103	7206.70 1.00	359.72 1.00	0.0 2.00	2398.04 359.72	2038.32 0.0	-4808.66 0.0	2398.04 0.0	7.00 90 H.P. TRACTOR	7.00	0.0	0.0	2.00	1.00
1104	2677.76 1.00	502.91 4.00	0.0 7.00	800.00 0.0	297.09 0.0	-2077.76 0.0	640.00 0.0	1.00 30 H.P. TRACTOR	1.00	80.00	0.0	2.00	4.00
1105	17802.78 1.00	11430.47 4.00	0.0 7.00	28000.00 0.0	16569.53 0.0	10197.22 0.0	22400.00 0.0	2.00 COMBINE	2.00	1960.00	0.0	3.00	3.00
1106	7434.00 1.00	4809.36 4.00	0.0 7.00	11781.00 0.0	6971.64 0.0	4347.00 0.0	9424.80 0.0	2.00 74 CHEVY TRUCK	2.00	824.67	0.0	4.00	1.00
1107	1593.75 1.00	829.04 3.00	0.0 7.00	1600.00 0.0	770.96 0.0	6.25 0.0	1450.75 0.0	11.00 2 TON TRUCK	3.00	112.00	0.0	4.00	2.00
1108	1964.60 1.00	2050.47 3.00	0.0 7.00	3900.00 0.0	1894.53 0.0	1905.40 0.0	3588.27 0.0	3.00 3/4 TON PICKUP	3.00	273.00	0.0	5.00	1.00
1109	1484.33 1.00	211.50 1.00	0.0 7.00	2115.00 211.50	1903.50 0.0	630.67 0.0	2115.00 0.0	4.00 1/2 TON PICKUP	4.00	148.05	0.0	5.00	3.00
1110	555.47 1.00	381.55 3.00	0.0 3.00	550.00 0.0	168.05 0.0	-9.47 0.0	550.00 0.0	12.00 4 WHEEL DRIVE PICKUP	1.00	12.83	0.0	4.00	4.00
1111	3111.48 1.00	5183.42 3.00	0.0 3.00	5400.00 1500.00	216.58 0.0	2288.52 0.0	5400.00 0.0	1.00 CUSTOM PICKUP	1.00	180.00	0.0	5.00	2.00
1112	3000.00 0.67	1643.22 3.00	0.0 5.00	4170.00 770.00	2526.78 0.0	1170.00 0.0	4170.00 0.0	3.00 2/3 CAR	3.00	194.60	0.0	5.00	4.00

Table 61. (Continued)

A LIST OF ASSETS OWNED BY (3) HUSBAND (CONT.)

ASSET NUMBER	1 14	2 15	3 16	4 17	5 18	6 19	7 20	8	9 NAME	10	11	12	13
1113	2875.57 1.00	1759.44 4.00	0.0 7.00	3273.85 0.0	1514.41 0.0	398.28 0.0	2619.08 0.0	2.00 30 FOOT SWEEP	2.00	229.16	0.0	8.00	2.00
1114	1692.00 1.00	1238.08 3.00	0.0 7.00	2500.00 0.0	1261.92 0.0	808.00 0.0	2166.64 0.0	3.00 26 FOOT CHISEL	3.00	175.00	0.0	7.00	3.00
1115	2456.40 1.00	2666.91 4.00	0.0 7.00	4000.00 0.0	1333.09 0.0	1543.60 0.0	3200.00 0.0	1.00 32 FOOT CHISEL	1.00	400.00	0.0	7.00	2.00
1116	329.39 1.00	142.49 3.00	0.0 7.00	275.00 0.0	132.51 0.0	-54.09 0.0	249.34 0.0	3.00 HARROW	3.00	19.25	0.0	9.00	2.00
1117	1046.93 1.00	606.67 3.00	0.0 7.00	1225.00 0.0	618.33 0.0	178.07 0.0	1061.62 0.0	3.00 22 FOOT OX	3.00	85.75	0.0	6.00	2.00
1118	3316.50 1.00	205.00 1.00	0.0 2.00	2050.00 205.00	1845.00 0.0	-1266.50 0.0	2050.00 0.0	5.00 32 FOOT DRILL	5.00	0.0	0.0	10.00	1.00
1119	534.00 1.00	400.00 4.00	0.0 7.00	600.00 0.0	200.00 0.0	66.00 0.0	480.00 0.0	1.00 PLANTER	1.00	60.00	0.0	12.00	3.00
1120	669.06 1.00	314.32 4.00	0.0 7.00	500.00 0.0	185.68 0.0	-169.06 0.0	400.00 0.0	1.00 SHREADER	1.00	50.00	0.0	14.00	2.00
1121	423.00 2.00	414.52 3.00	0.0 7.00	800.00 0.0	385.48 0.0	377.00 0.0	725.41 0.0	3.00 NURSE TRAILER	3.00	56.00	0.0	11.00	1.00
1122	317.25 1.00	359.05 3.00	0.0 7.00	725.00 0.0	365.95 0.0	407.75 0.0	628.32 0.0	3.00 GRAIN DRYER	3.00	50.75	0.0	11.00	3.00
1123	118.83 1.00	110.77 3.00	0.0 5.00	162.10 0.0	51.33 0.0	43.27 0.0	162.10 0.0	2.00 FUEL TANK 1	2.00	7.56	0.0	15.00	1.00
1124	105.75 1.00	108.20 3.00	0.0 7.00	200.00 0.0	91.80 0.0	94.25 0.0	189.35 0.0	3.00 FUEL TANK 2	3.00	14.00	0.0	15.00	1.00
1125	142.59 1.00	236.47 3.00	0.0 7.00	279.76 0.0	43.29 0.0	137.17 0.0	279.76 0.0	2.00 AIR COMPRESSOR	2.00	19.58	0.0	15.00	2.00
1126	105.75 1.00	121.50 3.00	0.0 7.00	224.59 0.0	103.09 0.0	118.84 0.0	212.59 0.0	3.00 TOOL SET	3.00	15.72	3.00	15.00	3.00
1127	63.45 1.00	60.28 3.00	0.0 7.00	123.60 0.0	63.32 0.0	60.15 0.0	105.42 0.0	3.00 RADIO TOWER	3.00	8.65	0.0	16.00	1.00
1128	76.14 1.00	105.45 3.00	0.0 7.00	195.00 0.0	89.51 0.0	13.37 0.0	184.59 0.0	3.00 2-WAY RADIO 1	3.00	13.65	0.0	16.00	2.00
1129	85.55 1.00	125.92 3.00	0.0 5.00	184.27 0.0	58.35 0.0	98.72 0.0	184.27 0.0	2.00 2-WAY RADIO 2	2.00	8.59	0.0	16.00	2.00
1130	61.79 1.00	104.95 3.00	0.0 7.00	125.94 0.0	20.99 0.0	64.15 0.0	125.94 0.0	2.00 CALCULATOR	2.00	8.81	0.0	16.00	3.00

Table 61. (Continued)

A LIST OF ASSETS OWNED BY (3) HUSBAND (CONT.)

ASSET NUMBER	1 14	2 15	3 16	4 17	5 18	6 19	7 20	8	9	10 NAME	11	12	13
1131	472.90 1.00	108.00 3.00	0.0 8.00	1350.00 108.00	1242.00 0.0	877.10 0.0	1080.00 0.0	9.00 SCRAPER	9.00	94.50	0.0	17.00	3.00
1132	559.13 1.00	56.28 1.00	0.0 2.00	562.75 56.28	506.47 0.0	3.62 0.0	562.75 0.0	6.00 DOZER	6.00	0.0	0.0	17.00	2.00
1401	525.00 3.00	75.00 1.00	0.0 2.00	750.00 75.00	675.00 0.0	225.00 0.0	750.00 0.0	6.00 FEED EQUIPMENT 1	6.00	0.0	0.0	2.00	1.00
1402	251.67 1.00	207.38 3.00	0.0 7.00	325.00 0.0	52.62 0.0	33.33 0.0	260.00 0.0	2.00 FEED EQUIPMENT 2	2.00	18.20	0.0	2.00	1.00
1403	1222.32 1.00	220.78 1.00	0.0 3.00	2207.88 220.78	1987.10 0.0	985.56 0.0	2207.88 0.0	4.00 STOCK TRAILER	4.00	51.51	0.0	1.00	3.00
1404	1480.50 1.00	1262.85 3.00	0.0 7.00	2550.00 0.0	1287.15 0.0	1069.50 0.0	2210.00 0.0	3.00 GRINDER	3.00	178.50	0.0	1.00	1.00
1405	466.67 4.00	0.0 1.00	0.0 5.00	1050.00 0.0	1050.00 0.0	583.33 0.0	1050.00 0.0	8.00 FEED EQUIPMENT 3	8.00	0.0	0.0	2.00	1.00
1406	233.33 4.00	0.0 1.00	0.0 5.00	1000.00 0.0	1000.00 0.0	766.67 0.0	1000.00 0.0	10.00 FEED EQUIPMENT 4	10.00	0.0	0.0	2.00	1.00
1407	0.0 3.00	0.0 1.00	0.0 5.00	700.00 0.0	700.00 0.0	700.00 0.0	700.00 0.0	12.00 FEED EQUIPMENT 5	12.00	0.0	0.0	2.00	1.00
1408	149.10 1.00	0.0 1.00	0.0 5.00	420.00 0.0	420.00 0.0	270.00 0.0	420.00 0.0	6.00 WORKING CHUTE	6.00	0.0	0.0	3.00	1.00
1409	120.00 2.00	0.0 1.00	0.0 5.00	250.00 0.0	250.00 0.0	130.00 0.0	250.00 0.0	6.00 WATER TANKS 1	6.00	0.0	0.0	2.00	3.00
1410	60.00 2.00	0.0 1.00	0.0 5.00	230.00 0.0	230.00 0.0	170.00 0.0	230.00 0.0	8.00 WATER TANKS 2	8.00	0.0	0.0	2.00	3.00
1411	0.0 1.00	0.0 1.00	0.0 5.00	100.00 0.0	100.00 0.0	100.00 0.0	100.00 0.0	10.00 WATER TANKS 3	10.00	0.0	0.0	2.00	3.00
1601	6156.54 0.0	6156.54 0.0	87353.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 FARM CHECK 1	0.0	0.0	0.0	1.00	1.00
2101	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.05	0.0 SAVINGS 1	0.0	0.0	0.0	1.00	1.00
2201	2000.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 CHECKING 1	0.0	0.0	0.0	1.00	1.00
2502	1500.00 0.33	0.0 0.0	0.0 0.0	2500.00 0.0	0.0 0.0	1000.00 0.0	2500.00 0.0	3.00 1/3 CAR	3.00	0.0	0.0	2.00	1.00
1501	177936.00 0.0	24420.00 0.0	0.0 0.0	0.0 0.0	24420.00 0.0	0.0 0.0	0.0 0.0	0.0 INVENTORY 1	0.0	0.0	0.0	1.00	1.00
1503	22555.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 WHEAT (INVENTORY 3)	0.0	0.0	0.0	1.00	1.00
2001	1500.00 1.50	0.0 0.0	0.0 0.0	1500.00 0.0	0.0 0.0	0.0 826.40	21.00 0.0	1.00 RETIREMENT ANNUITY	1.00	0.0	0.0	1.00	2.00

Table 61. (Continued)

A LIST OF ASSETS OWNED BY (4) HUSBAND

ASSET NUMBER	1 14	2 15	3 16	4 17	5 18	6 19	7 20	8	9	10	11	12	13
								NAME					
1001	172000.00	54828.13	7500.00	54823.13	0.0	-117171.87	54828.13	8.00	8.00	0.0	0.0	1.00	1.00
	319.00	0.0	99.00	0.0	1.00	4500.00	0.06	LAND 1					
1001	3840.00	0.0	0.0	4925.00	4925.00	1085.00	4925.00	8.00	8.00	0.0	0.0	1.00	2.00
	1.00	2.00	10.00	0.0	0.0	0.0	0.0	FENCE 1					
1001	11040.00	9111.40	0.0	11010.33	2798.93	870.33	11910.33	2.00	2.00	833.72	0.0	1.00	3.00
	1.00	3.00	10.00	0.0	0.0	0.0	0.0	STORAGE BUILDING 1					
1001	2852.33	2205.97	0.0	2921.82	715.85	69.82	2921.82	2.00	2.00	0.0	0.0	2.00	3.00
	1.00	1.00	10.00	0.0	0.0	0.0	0.0	SHOP BUILDING 1					
1001	240.00	184.38	0.0	307.49	123.11	67.49	294.44	2.00	2.00	14.34	0.0	5.00	3.00
	2.00	3.00	5.00	0.0	0.0	0.0	0.0	PUMP 1					
1001	440.00	354.26	0.0	472.23	121.33	32.23	472.23	3.00	3.00	33.06	0.0	6.00	3.00
	1.00	3.00	10.00	0.0	0.0	0.0	0.0	WATER LINE 1					
1001	880.00	516.41	0.0	82.21	465.80	102.21	903.70	3.00	3.00	68.75	0.0	4.00	3.00
	1.00	3.00	7.00	0.0	0.0	0.0	0.0	WELL 1					
1001	3840.00	3150.00	0.0	3500.00	350.00	-340.00	3500.00	2.00	2.00	0.0	0.0	7.00	3.00
	1.00	1.00	20.00	0.0	0.0	0.0	0.0	OFFICE 1					
1001	224.00	174.35	0.0	307.00	133.30	83.65	307.65	3.00	3.00	0.0	0.0	8.00	3.00
	1.00	1.00	5.00	0.0	0.0	0.0	0.0	FARM DRIVE 1					
2501	34560.00	0.0	18085.00	31500.00	0.0	-3060.00	31500.00	2.00	2.00	0.0	0.0	1.00	1.00
	1.00	0.0	0.0	0.0	2.00	2571.24	0.09	HOUSE					
1901	400.00	172.00	0.0	172.00	0.0	-228.00	172.00	8.00	8.00	0.0	0.0	2.00	4.00
	1.00	0.0	0.0	0.0	0.0	0.0	0.0	1 ACRE					

Table 61. (Continued)

A LIST OF ASSETS OWNED BY (7) WIFE

2102	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.05	0.0 SAVINGS 2	0.0	0.0	0.0	1.00	1.00
2202	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 CHECKING 2	0.0	0.0	0.0	1.00	1.00
2301	1114.80 5.00	0.0 0.0	0.0 0.0	0.0 0.0	5000.00 0.0	0.0 92.90	7.00 0.0	19.00 LIFE INSURANCE 23	19.00	0.0	0.0	2.00	1.00
2302	1561.90 10.00	0.0 0.0	0.0 0.0	0.0 0.0	10000.00 0.0	0.0 196.00	7.00 0.0	12.00 LIFE INSURANCE 30	12.00	0.0	0.0	2.00	2.00
2304	0.0 20.00	0.0 0.0	0.0 0.0	0.0 0.0	20000.00 0.0	0.0 479.60	7.00 0.0	1.00 LIFE INSURANCE 40	1.00	0.0	0.0	2.00	3.00

A LIST OF ASSETS OWNED BY (11) FARM HEIRS

1502	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 INVENTORY 2	0.0	0.0	0.0	1.00	1.00
1602	500.00 0.0	500.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 FARM CHECK 2	0.0	0.0	0.0	1.00	1.00
2103	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.05	0.0 SAVINGS 3	0.0	0.0	0.0	1.00	1.00
2203	500.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 CHECKING 3	0.0	0.0	0.0	1.00	1.00

A LIST OF ASSETS OWNED BY (12) NON-FARM HEIRS

2104	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.05	0.0 SAVINGS 4	0.0	0.0	0.0	1.00	1.00
2204	1000.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.10	0.0 CHECKING 4	0.0	0.0	0.0	1.00	1.00

Table 62. Environment File Data Values for the Case Farm Situation.

THIS IS THE STARTING ENVIRONMENT FOR THIS RUN. THE STARTING YEAR IS 0

	CORP.	PART.	HUSBAND			WIFE			FARM HEIRS	NON-FARM HEIRS
VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12
CBTA	0.0	0.0	0.0	18085.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TDEB	0.0	0.0	157353.00	7500.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TFVA	0.0	0.0	507289.00	195587.00	0.0	0.0	0.0	0.0	0.0	0.0	500.00	0.0
VALN	0.0	0.0	5000.00	34960.00	0.0	0.0	2677.00	0.0	0.0	0.0	500.00	1000.00
AFLT	0.0	0.0	0.0				0.0				0.0	0.0
AGE	0.0	0.0	41.00				37.00				17.00	13.00
BENF	0.0	0.0	5603.00				0.0				0.0	0.0
CMAX	0.0	0.0	2000.00				1000.00				1000.00	2000.00
CMIN	0.0	0.0	1000.00				500.00				500.00	1000.00
EAGE	0.0	0.0	71.00				77.00				0.0	0.0
DMAX	0.0	0.0	4000.00				2000.00				2000.00	4000.00
FDMX	200491.00	200491.00	200491.00				0.0				10000.00	0.0
FGT1	0.0	0.0	0.0				0.0				0.0	0.0
FGT2	0.0	0.0	0.0				0.0				0.0	0.0
FGT3	0.0	0.0	0.0				0.0				0.0	0.0
FMAX	3000.00	3000.00	2000.00				0.0				1000.00	0.0
FMIN	1000.00	1000.00	500.00				0.0				500.00	0.0
GIF1	0.0	0.0	0.0				0.0				0.0	0.0
GIF2	0.0	0.0	0.0				0.0				0.0	0.0
GIF3	0.0	0.0	0.0				0.0				0.0	0.0
ASLT	0.0	0.0	0.0				0.0				0.0	0.0
LUSE	0	0	2				0				2	0
MAXC	2000	4000	4000				2000				2000	2000
MLSE	0	0	2				0				2	0
NCEP	0	0	4				1				1	1
PAYL	0.0	0.0	0.0				0.0				0.0	0.0
PAYM	0.0	0.0	0.0				0.0				0.0	0.0
RAGE	0.0	0.0	62.00				62.00				0.0	0.0
RANK	0.0	0.0	1.00				0.0				1.00	0.0
RIRA	0.0	0.0	1500.00				0.0				0.0	0.0
SALN	0.0	0.0	0.0				0.0				0.0	0.0
SGT1	0.0	0.0	0.0				0.0				0.0	0.0
SGT2	0.0	0.0	0.0				0.0				0.0	0.0
SGT3	0.0	0.0	0.0				0.0				0.0	0.0
SSER	0.0	0.0	137700.00				0.0				0.0	0.0
TINC	0.0	0.0	0.0				0.0				0.0	0.0
TLGC	0.0	0.0	0.0				0.0				0.0	0.0
TSGC	0.0	0.0	0.0				0.0				0.0	0.0
TXRF	0.0	0.0	2.00				2.00				1.00	1.00
YEAR	0.0	0.0	20.00				0.0				0.0	0.0

Table 62. (Continued)

BELOW IS A LIST OF PERIODIC VARIABLES:

VARIABLE	PERIOD 1	2	3	4
ALBH	0.0	0.0	0.0	0.0
ALB1	582.00	653.00	649.00	592.00
ALB3	480.00	538.00	535.30	488.00
PRCD	0.25	0.25	0.25	0.25
PRCF	0.0	0.0	1.00	0.0
PRCI	0.0	0.0	0.0	1.00
PROM	0.25	0.25	0.25	0.25
PRCA	1.00	0.0	0.0	0.0
PRCR	0.50	0.0	0.50	0.0
PROT	0.0	0.0	0.0	1.00

BELOW IS A LIST OF VARIABLES THAT ARE ASSOCIATED WITH THE DIFFERENT ASSET TYPE

VARIABLE	ASSET TYPE 10	11	12	13	14	15	16	17	18	19	20	21	22	23
	24	25												
AEXG	0.008	0.005	0.005	0.005	0.005	0.0	0.0	0.005	0.005	0.005	0.005	0.0	0.0	0.005
	0.005	0.005												
AEXP	0.006	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.010	0.010	0.0	0.0	0.0
	0.0	0.001												
AEXS	0.017	0.001	0.001	0.001	0.001	0.0	0.0	0.005	0.0	0.020	0.020	0.0	0.0	0.0
	0.0	0.017												
DINT	0.090	0.100	0.100	0.100	0.100	0.050	0.100	0.100	0.100	0.100	0.100	0.050	0.100	0.100
	0.100	0.100												
DMAT	20.000	4.000	4.000	4.000	4.000	1.000	1.000	10.000	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	20.000												
RDAM	0.650	0.500	0.500	0.500	0.500	1.000	1.000	0.650	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0												

OTHER VARIABLES

AMGH	0.0	LYR	0	SETX	0.079
AMG3	0.667	MAXG	50000	SMAX	2760.000
AMG1	0.333	MSTD	2400	SRAT	0.050
CDIV	0.100	OWAG	4.000	SSWB	15300.000
COEX	1000.000	PDIV	0.100	STDR	0.160
CTAX	1.000	PGEX	0.0	STTS	0.0
ETAX	0.058	PMGT	0.100	SWAG	2.500
EXEM	750.000	PWAG	2.500	TPLC	3
FTTS	0.0	PWIT	0.500	TRLR	11
IFAP	0	PWEX	0.0	TWFX	0.0
ISTP	1	TGEX	0.0	ZRAT	0.070
ISTR	0	SAGE	0.0	ZTRR	0.033
LP	3	SCLI	0.023	ZTRX	0.033

Table 62. (Continued)

	FARM HEIRS	NON-FARM HEIRS
TOTAL VALUE OF GIFTS	0.0	0.0
TOTAL VALUE OF WILLS	0.0	0.0
PRESENT VALUE OF GIFTS	0.0	0.0
PRESENT VALUE OF WILLS	0.0	0.0

BELOW IS THE DATA ASSOCIATED WITH ASSET USE:

	OWNER											
ASSET TYPE	1	2	3	4	5	6	7	8	9	10	11	12
REAL ESTATE	2	2	2	2	2	2	1	1	1	1	2	1
CROP MACHINE	2	2	2	2	2	2	1	1	1	1	2	1
LIVESTOCK	2	2	2	2	2	2	1	1	1	1	2	1
NOT USED NOW	2	2	2	2	2	2	1	1	1	1	2	1
LVSK.ECLIP.	2	2	2	2	2	2	1	1	1	1	2	1
INVENTORY	2	2	2	2	2	2	1	1	1	1	2	1

PERCENT OF FAMILY LIVING EXPENSES TO BE USED IN AN ITEMIXED TAX RETURN

	NOT RETIRED	RETIRED
ONLY HUSBAND ALIVE	0.25	0.25
ONLY WIFE ALIVE	0.25	0.25
HUSBAND, IF BOTH ALIVE	0.21	0.25
WIFE, IF BOTH ALIVE	0.0	0.0
NO LIVING PARENTS	0.0	0.0

FAMILY LIVING EXPENSES

	NOT RETIRED	RETIRED
ONLY HUSBAND ALIVE	7841.00	7841.00
ONLY WIFE ALIVE	7841.00	7841.00
HUSBAND, IF BOTH ALIVE	14824.00	11201.00
WIFE, IF BOTH ALIVE	0.0	0.0
NO LIVING PARENTS	0.0	0.0

NUMBER OF FARM HEIRS: 1
NUMBER OF NON-FARM HEIRS: 2

Table 63. Buy Table File Data Values for the Case Farm Situation.

TABLE OR FILE AS INPUT — BUYING EXPENSE TABLE

10 1 1					
	539.17993	0.0	0.0	0.0	0.03330
	14.67000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	23.72000
10 1 2					
	6400.00000	0.0	0.0	0.0	0.03330
	620.80005	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	620.80005
10 1 3					
	12000.0000	0.0	0.0	0.0	0.03330
	1084.00000	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.01000	0.09000	1084.00000
10 2 1					
	587.96997	0.0	0.0	0.0	0.03330
	19.53999	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	25.87000
10 2 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 2 3					
	3100.00000	0.0	0.0	0.0	0.03330
	280.03003	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.01000	0.09000	280.03003
10 3 1					
	609.06006	0.0	0.0	0.0	0.03330
	21.66000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.80000
10 3 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 3 3					
	3000.00000	0.0	0.0	0.0	0.03330
	244.00000	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.01000	0.09000	244.00000
10 4 1					
	625.00000	0.0	0.0	0.0	0.03330
	22.50000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	27.50000
10 4 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 4 3					
	1000.00000	0.0	0.0	0.0	0.03330
	80.33000	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	80.33000
10 5 1					
	600.62988	0.0	0.0	0.0	0.03330
	20.81000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.42999
10 5 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 5 3					
	160.00000	0.0	0.0	0.0	0.03330
	23.52000	10.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	23.52000
10 6 1					
	590.78003	0.0	0.0	0.0	0.03330
	19.83000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	25.99001

Table 63. (Continued)

10 6 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 6 3					
	500.00000	0.0	0.0	0.0	0.03330
	40.17000	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	40.17000
10 7 1					
	611.71997	0.0	0.0	0.0	0.03330
	21.80000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.92000
10 7 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 7 3					
	4000.00000	0.0	0.0	0.0	0.03330
	317.06006	40.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.20000	0.00400	0.01140	0.09000	317.95996
10 8 1					
	611.71997	0.0	0.0	0.0	0.03330
	21.80000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.92000
10 8 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 8 3					
	320.00000	0.0	0.0	0.0	0.03330
	47.03999	10.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	47.03999
10 9 1					
	587.96997	0.0	0.0	0.0	0.03330
	19.55000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	25.87000
10 9 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	310.39990
10 9 3					
	1500.00000	0.0	0.0	0.0	0.03330
	108.00000	25.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	108.00000
10 10 1					
	497.96997	0.0	0.0	0.0	0.03330
	11.25000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	21.91000
10 10 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 11 1					
	595.00000	0.0	0.0	0.0	0.03330
	20.25000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.17999
10 11 2					
	3200.00000	0.0	0.0	0.0	0.03330
	310.39990	20.00000	2.00000	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.09000	310.39990
10 12 1					
	595.00000	0.0	0.0	0.0	0.03330
	20.25000	99.00000	3.00000	0.05000	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00400	0.0	0.04000	26.17999

Table 63. (Continued)

10 12 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 13 1					
618.36011	0.0	0.0	0.0	0.03330	
22.14999	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	27.21001	
10 13 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 14 1					
618.36011	0.0	0.0	0.0	0.03330	
22.14999	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	27.21001	
10 14 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 15 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	
10 15 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 16 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	
10 16 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 17 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	
10 17 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 18 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	
10 18 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 19 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	
10 19 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
10 20 1					
589.37588	0.0	0.0	0.0	0.03330	
19.69000	99.00000	3.00000	0.05000	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.04000	25.92999	

Table 63. (Continued)

10 20 2					
3200.00000	0.0	0.0	0.0	0.03330	
310.39990	20.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00400	0.0	0.09000	310.39990	
11 1 1					
48000.0000	0.0	0.0	0.0	0.03330	
7924.05859	10.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.30000	0.00500	0.00400	0.10000	7924.05859	
11 1 2					
40000.0000	0.0	0.0	0.0	0.03330	
5951.64062	10.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.30000	0.00500	0.00400	0.10000	5951.64062	
11 1 3					
27000.0000	0.0	0.0	0.0	0.03330	
3567.37988	12.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.00400	0.10000	3567.37988	
11 1 4					
21000.0000	0.0	0.0	0.0	0.03330	
2774.62988	12.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.00400	0.10000	2774.62988	
11 2 1					
19000.0000	0.0	0.0	0.0	0.03330	
2434.37988	12.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.0	0.10000	2434.37988	
11 2 4					
4600.00000	0.0	0.0	0.0	0.03330	
541.64990	15.00000	1.00000	0.68000	0.92000	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.00500	0.0	0.10000	541.64990	
11 3 3					
35000.0000	0.0	0.0	0.0	0.03330	
5689.19922	8.00000	1.00000	0.63500	0.89500	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.00400	0.10000	5689.19922	
11 4 1					
15000.0000	0.0	0.0	0.0	0.03330	
2350.60010	10.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.15000	0.00500	0.00320	0.10000	2350.60010	
11 4 2					
12500.0000	0.0	0.0	0.0	0.03330	
1695.63989	12.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.10000	0.00500	0.00320	0.10000	1695.63989	
11 4 3					
5780.00000	0.0	0.0	0.0	0.03330	
999.71997	10.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.20000	0.00500	0.01000	0.10000	999.71997	
11 4 4					
5100.00000	0.0	0.0	0.0	0.03330	
822.12012	10.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.20000	0.00500	0.01000	0.10000	882.12012	
11 5 1					
4680.00000	0.0	0.0	0.0	0.03330	
924.50000	10.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.01000	0.10000	924.50000	
11 5 2					
5400.00000	0.0	0.0	0.0	0.03330	
1326.68994	8.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.35000	0.00500	0.01000	0.10000	1326.68994	
11 5 3					
4050.00000	0.0	0.0	0.0	0.03330	
802.78003	8.00000	1.00000	0.67000	0.86000	
1.00000	0.03330	0.0	0.0	0.0	
0.25000	0.00500	0.01000	0.10000	802.78003	
11 5 4					
7500.00000	0.0	0.0	0.0	0.03330	
1082.50000	6.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.20000	0.00500	0.03000	0.10000	1082.50000	

Table 63. (Continued)

11	6	1				
			3080.00000	0.0	0.0	0.0	0.03330
			404.29004	12.00300	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	404.29004
11	6	2				
			2475.00000	0.0	0.0	0.0	0.03330
			324.87012	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	324.87012
11	6	3				
			2070.00000	0.0	0.0	0.0	0.03330
			271.71997	12.00300	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	271.71997
11	6	4				
			1645.00000	0.0	0.0	0.0	0.03330
			215.92999	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	215.92999
11	7	1				
			5300.00000	0.0	0.0	0.0	0.03330
			1209.14990	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.35000	0.00500	0.0	0.10000	1209.14990
11	7	2				
			4600.00000	0.0	0.0	0.0	0.03330
			660.57007	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.20000	0.00500	0.0	0.10000	660.57007
11	7	3				
			4000.00000	0.0	0.0	0.0	0.03330
			548.06006	12.00300	1.00000	0.60000	0.88500
			1.00300	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	548.06006
11	7	4				
			3500.00000	0.0	0.0	0.0	0.03330
			459.41992	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	459.41992
11	8	1				
			7025.00000	0.0	0.0	0.0	0.03330
			1227.30005	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.25000	0.00500	0.0	0.10000	1227.30005
11	8	2				
			6050.00000	0.0	0.0	0.0	0.03330
			970.28003	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.25000	0.00500	0.0	0.10000	970.28003
11	8	3				
			5300.00000	0.0	0.0	0.0	0.03330
			761.13989	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.20000	0.00500	0.0	0.10000	761.13989
11	8	4				
			4475.00000	0.0	0.0	0.0	0.03330
			635.34009	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.20000	0.00500	0.0	0.10000	635.34009
11	9	1				
			953.00000	0.0	0.0	0.0	0.03330
			147.75000	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.20000	0.00500	0.0	0.10000	147.75000
11	9	2				
			778.00000	0.0	0.0	0.0	0.03330
			111.71001	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.20000	0.00500	0.0	0.10000	111.71001
11	9	3				
			630.00000	0.0	0.0	0.0	0.03330
			82.69000	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	82.69000
11	9	4				
			475.00000	0.0	0.0	0.0	0.03330
			62.35001	12.00000	1.00000	0.60000	0.88500
			1.00000	0.03330	0.0	0.0	0.0
			0.15000	0.00500	0.0	0.10000	62.35001

Table 63. (Continued)

11 10 1					
	9900.00000	0.0	0.0	0.0	0.03330
	2010.48999	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.30000	0.00500	0.0	0.10000	2010.48999
11 10 2					
	7300.00000	0.0	0.0	0.0	0.03330
	1351.38989	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.30000	0.00500	0.0	0.10000	1351.38989
11 10 3					
	5000.00000	0.0	0.0	0.0	0.03330
	718.06006	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.20000	0.00500	0.0	0.10000	718.06006
11 11 1					
	500.00000	0.0	0.0	0.0	0.03330
	65.62000	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	65.62000
11 11 2					
	2000.00000	0.0	0.0	0.0	0.03330
	261.39990	11.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	261.39990
11 11 3					
	750.00000	0.0	0.0	0.0	0.03330
	98.85001	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	98.85001
11 12 1					
	7158.00000	0.0	0.0	0.0	0.03330
	939.59009	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	939.59009
11 13 1					
	2958.00000	0.0	0.0	0.0	0.03330
	388.28003	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	388.28003
11 14 1					
	3450.00000	0.0	0.0	0.0	0.03330
	454.87012	12.00000	1.00000	0.56000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.10000	0.00500	0.0	0.10000	454.87012
11 14 2					
	1350.00000	0.0	0.0	0.0	0.03330
	234.69000	8.00000	1.00000	0.56000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.20000	0.00500	0.0	0.10000	234.69000
11 15 1					
	250.00000	0.0	0.0	0.0	0.03330
	35.89999	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	35.89999
11 15 2					
	300.00000	0.0	0.0	0.0	0.03330
	43.09000	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	43.09000
11 15 3					
	250.00000	0.0	0.0	0.0	0.03330
	38.13000	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00500	0.0	0.10000	38.13000
11 16 1					
	150.00000	0.0	0.0	0.0	0.03330
	12.88000	30.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00500	0.0	0.10000	12.88000
11 16 2					
	180.00000	0.0	0.0	0.0	0.03330
	25.84000	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	25.84000
11 16 3					
	130.00000	0.0	0.0	0.0	0.03330
	18.67999	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	18.67999

Table 63. (Continued)

11 17 1					
	2350.CCCCC	0.0	0.0	0.0	0.03330
	308.46997	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	308.46997
11 17 2					
	1875.00000	0.0	0.0	0.0	0.03330
	269.27002	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	269.27002
11 17 3					
	2250.00000	0.0	0.0	0.0	0.03330
	295.34009	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	295.34009
14 1 1					
	3500.00000	0.0	0.0	0.0	0.03330
	502.64990	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.20000	0.00500	0.0	0.10000	502.64990
14 1 3					
	3000.00000	0.0	0.0	0.0	0.03330
	609.26001	10.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.30000	0.00500	0.0	0.10000	609.26001
14 2 1					
	350.00000	0.0	0.0	0.0	0.03330
	47.45000	12.00000	2.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00500	0.0	0.10000	47.45000
14 2 3					
	150.00000	0.0	0.0	0.0	0.03330
	22.88000	10.00000	2.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00500	0.0	0.10000	22.88000
14 3 1					
	500.00000	0.0	0.0	0.0	0.03330
	65.64000	12.00000	1.00000	0.60000	0.88500
	1.00000	0.03330	0.0	0.0	0.0
	0.15000	0.00500	0.0	0.10000	65.64000
15 1 1					
	1.00000	0.0	0.0	0.0	0.0
	0.10000	0.0	0.0	0.0	0.0
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.00500	0.0	0.10000	0.0
16 1 1					
	1.00000	0.0	0.0	0.0	0.0
	0.10000	0.0	0.0	0.0	0.0
	1.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.10000	0.0
19 1 1					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	2.00000	0.0	0.06000	0.0
	1.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0
19 1 2					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	5.00000	0.0	0.07000	0.0
	1.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0
19 1 3					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	10.00000	0.0	0.07500	0.0
	1.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0
19 1 4					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	99.00000	0.0	0.07000	0.0
	1.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0
19 2 1					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	10.00000	0.0	0.04400	0.03100
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0
19 2 2					
	1000.00000	0.0	0.0	0.0	0.0
	0.0	10.00000	0.0	0.01400	0.12000
	1.00000	0.03330	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0

Table 63. (Continued)

19 2 3					
1000.00000	0.0	0.0	0.0	0.0	
0.0	99.00000	0.0	0.03000	0.05000	
1.00000	0.03330	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
19 2 4					
400.00000	0.0	0.0	0.0	0.0	
0.0	99.00000	0.0	0.0	0.05000	
1.00000	0.05000	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 1 1					
1000.00000	16.89999	0.07000	0.0	0.0	
62.00000	99.00000	19.20000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 1 2					
1000.00000	10.00000	0.07000	0.0	0.0	
62.00000	10.00000	10.00000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 2 1					
1000.00000	20.30000	0.07000	0.0	0.0	
62.00000	99.00000	22.80000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 2 2					
1000.00000	10.00000	0.07000	0.0	0.0	
62.00000	10.00000	10.00000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 3 1					
1000.00000	26.50000	0.07000	0.0	0.0	
62.00000	99.00000	26.50000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
20 3 2					
1000.00000	15.00000	0.07000	0.0	0.0	
62.00000	15.00000	15.00000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
23 1 1					
0.0	0.0	0.0	0.0	0.0	
10.00000	10.00000	9.14000	0.0	0.0	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
23 2 1					
0.0	0.0	0.0	0.0	0.86330	
99.00000	99.00000	18.58000	0.85480	0.86190	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
23 2 2					
0.0	0.65310	0.73470	0.98310	0.84690	
99.00000	99.00000	19.60001	0.89290	0.88770	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
23 2 3					
0.0	0.94870	0.80900	0.83400	0.85070	
99.00000	99.00000	23.98000	0.83400	0.83400	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
23 2 4					
0.0	0.75840	0.79750	0.82100	0.82100	
99.00000	99.00000	25.58000	0.82100	0.82100	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
24 2 1					
0.0	0.75200	0.81050	0.87890	0.90820	
99.00000	99.00000	20.48000	0.91800	0.89840	
1.00000	0.0	0.0	0.0	0.0	
0.0	0.0	0.0	0.0	0.0	
25 1 1					
360000.0000	0.0	0.00500	0.0	0.0	
0.0	40.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.20000	0.00400	0.01140	0.0	0.0	
25 2 1					
7500.00000	0.0	0.16000	0.0	0.0	
0.0	6.00000	2.00000	0.0	0.0	
1.00000	0.03330	0.0	0.0	0.0	
0.20000	0.00500	0.03000	0.0	0.0	

THE PURCHASE TABLE HAS BEEN BUILT

Table 64. Flow File Data Values for the Case Farm Situation.

TABLE OR FILE AS INPUT — FLOW TABLE

```
RECORD NUMBER -   1
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   6274.00
     0.03    319.00      0.0       0.0

RECORD NUMBER -   2
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3127.50
     0.03    160.00      0.0       0.0

RECORD NUMBER -   3
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3600.00
     0.03    160.00      0.0       0.0

RECORD NUMBER -   4
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   4500.00
     0.03    200.00      0.0       0.0

RECORD NUMBER -   5
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3330.00
     0.03    160.00      0.0       0.0

RECORD NUMBER -   6
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3172.50
     0.03    160.00      0.0       0.0

RECORD NUMBER -   7
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3487.50
     0.03    160.00      0.0       0.0

RECORD NUMBER -   8
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3487.50
     0.03    160.00      0.0       0.0

RECORD NUMBER -   9
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3127.50
     0.03    160.00      0.0       0.0

RECORD NUMBER -  10
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   1800.00
     0.03    160.00      0.0       0.0

RECORD NUMBER -  11
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3240.00
     0.03    160.00      0.0       0.0

RECORD NUMBER -  12
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3240.00
     0.03    160.00      0.0       0.0

RECORD NUMBER -  13
     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
     0.0       0.0       0.0       0.0       0.0       0.0       0.0   3543.75
     0.03    160.00      0.0       0.0

RECORD NUMBER -  14
223935.00  2117.00 75450.00 16653.00 12405.00 23131.00 42742.00112205.00
   720.00   846.00  1014.00  1231.00261296.00101616.00     0.0   3543.75
     0.03   160.00261296.00     0.0

RECORD NUMBER -  15
238744.00  2257.00 80439.00 17755.00 13201.00 24636.00 45544.00119600.00
   768.00   902.00  1081.00  1312.00278576.00108336.00     0.0   3150.00
     0.03   160.00278576.00     0.0
```

Table 64. (Continued)

```
RECORD NUMBER -  16
253553.00  2397.00  85429.00  18856.00  13996.00  26141.00  48345.00126996.00
   815.00   958.00   1148.00   1394.00295856.00115056.00      0.0    3150.00
     0.03   160.00295856.00       0.0

RECORD NUMBER -  17
268363.00  2537.00  90419.00  19957.00  14792.00  27646.00  51147.00143391.00
   863.00  1014.00   1215.00   1475.00313136.00121776.00      0.0    3150.00
     0.03   160.00313136.00       0.0

RECORD NUMBER -  18
283172.00  2677.00  95408.00  21059.00  15587.00  29151.00  53949.00141786.00
   911.00  1070.00   1282.00   1556.00330415.00128496.00      0.0    3150.00
     0.03   160.00330415.00       0.0

RECORD NUMBER -  19
297981.00  2817.00100398.00  22160.00  16383.00  30656.00  56751.00149182.00
   958.00  1126.00   1349.00   1638.00347695.00135216.00      0.0    3150.00
     0.03   160.00347695.00       0.0

RECORD NUMBER -  20
312790.00  2957.00105387.00  23261.00  17178.00  32161.00  59553.00156577.00
   989.00  1182.00   1416.00   1719.00364975.00141936.00      0.0    3150.00
     0.03   160.00364975.00       0.0

RECORD NUMBER -  21
327599.00  3097.00110377.00  24363.00  17974.00  33666.00  62354.00163973.00
  1054.00  1238.00   1483.00   1801.00382255.00148656.00      0.0    3150.00
     0.03   160.00382255.00       0.0

RECORD NUMBER -  22
342408.00  3237.00115367.00  25464.00  18770.00  35171.00  65156.00171368.00
  1101.00  1294.00   1550.00   1882.00399535.00155376.00      0.0    3150.00
     0.03   160.00399535.00       0.0

RECORD NUMBER -  23
357217.00  3377.00120356.00  26565.00  19565.00  36676.00  67958.00178764.00
  1149.00  1349.00   1617.00   1963.00416815.00162096.00      0.0    3150.00
     0.03   160.00416815.00       0.0

RECORD NUMBER -  24
372027.00  3517.00125346.00  27666.00  20361.00  38181.00  70760.00186159.00
  1196.00  1405.00   1684.00   2045.00434095.00168816.00      0.0    3150.00
     0.03   160.00434095.00       0.0

RECORD NUMBER -  25
386836.00  3657.00130335.00  28768.00  21156.00  39686.00  73561.00193555.00
  1244.00  1461.00   1751.00   2126.00451374.00175536.00      0.0    3150.00
     0.03   160.00451374.00       0.0

RECORD NUMBER -  26
401645.00  3797.00135325.00  29869.00  21952.00  41190.00  76363.00200950.00
  1291.00  1517.00   1818.00   2208.00468654.00182256.00      0.0    3150.00
     0.03   160.00468654.00       0.0
RECORD NUMBER -  27
416454.00  3937.00140315.00  30970.00  22747.00  42695.00  79165.00208345.00
  1339.00  1573.00   1885.00   2289.00485934.00188976.00      0.0    3150.00
     0.03   160.00485934.00       0.0

RECORD NUMBER -  28
431263.00  4077.00145304.00  32072.00  23543.00  44200.00  81967.00213741.00
  1387.00  1629.00   1952.00   2370.00503214.00195696.00      0.0    3150.00
     0.03   160.00503214.00       0.0

RECORD NUMBER -  29
446072.00  4217.00150294.00  33173.00  24339.00  45705.00  84769.00223136.00
  1435.00  1685.00   2019.00   2452.00520494.00202416.00      0.0    3150.00
     0.03   160.00520494.00       0.0

RECORD NUMBER -  30
460881.00  4357.00155283.00  34274.00  25134.00  47210.00  87570.00230532.00
  1482.00  1741.00   2086.00   2533.00537774.00209136.00      0.0    3150.00
     0.03   160.00537774.00       0.0
```

Table 65. Non-Real Estate Farm Asset Requirements for the Case Farm Situation.

Non-Real Estate Asset	Simulation Year Additional Tract of Land is Rented															Average Replacement Age
	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	
	(Number of items required)															(Years)
Inventory (15-1-1)[a]	2117[b]	2257	2397	2537	2677	2817	2957	3097	3237	3377	3517	3657	3797	3937	4077	0
225 hp. Tractor (11-1-1)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	5.67
175 hp. Tractor (11-1-2)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	9.67
150 hp. Tractor (11-1-3)	1	1	1	0	0	0	0	1	1	2	2	2	3	3	2	12.00
125 hp. Tractor (11-1-4)	0	0	0	1	1	1	1	0	0	1	1	1	0	0	0	10.50
100 hp. Tractor (11-2-1)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13.00
30 hp. Tractor (11-2-4)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	14.00
Combine (11-3-3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8.17
Tandom Truck (11-4-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9.00
Single-axle Truck (11-4-2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
3/4 T., 4-W.D. P.U. (11-4-3)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	8.00
½ T., 4-W.D. P.U. (11-4-4)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8.00
3/4 T. Pick-Up (11-5-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6.00
½ T. P.U. #1 (11-5-2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4.00
½ T. P.U. #2 (11-5-3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6.00
Car (farm share) (11-5-4)	.67	.67	.67	.67	.67	.67	.67	0	0	0	0	0	0	0	0	4.00
22' Deep Chisel (11-6-2)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	10.00
18' Deep Chisel (11-6-3)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	12.00
14' Deep Chisel (11-6-4)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	12.00
40' Chisel Plow (11-7-1)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	4.00
32' Chisel Plow (11-7-2)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	9.67
26' Chisel Plow (11-7-3)	1	1	0	0	0	0	0	0	1	2	2	2	3	3	2	9.00
20' Chisel Plow (11-7-4)	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	10.50
38' Sweep Plow (11-8-1)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	7.00
30' Sweep Plow (11-8-2)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8.00

Table 65. (Continued)

Non-Real Estate Asset	Simulation Year Additional Tract of Land is Rented															Average Replacement Age
	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	
	(Number of items required)															(Years)
20' Sweep Plow (11-8-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8.00
40' Harrow Plow (11-9-1)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	8.00
32' Harrow Plow (11-9-2)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9.00
26' Harrow Plow (11-9-3)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	12.00
32' Grain Drill (11-10-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	5.00
24' Grain Drill (11-10-2)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	6.00
16' Grain Drill (11-10-3)	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	12.00
Fertilizer Equip. (11-11-1)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	12.00
Grain Auger (11-11-2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11.00
Grain Dryer (11-11-3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
6 Row Planter (11-12-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
6 Row Cultivator (11-13-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
15' Shreader (11-14-1)	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
6' Shreader (11-14-2)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7.00
Fuel Tank (11-15-1)	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	10.00
Air Compressor (11-15-2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10.00
Misc. Tools (11-15-3)	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	10.00
Radio Tower (11-16-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30.00
Two-way Radio (11-16-2)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	10.00
Calculator (11-16-3)	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	10.00
Front End Loader (11-17-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
Dozer (11-17-2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10.00
Scraper (11-17-3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00
Feed Grinder (14-1-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10.00
Stock Trailor (14-1-3)	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	5.00
Feed Equip. (14-2-1)	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	12.00
Water Tank (14-2-3)	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10.00
Working Chute (14-3-1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12.00

[a]Numbers in parentheses are the asset type, item and description codes used in Buy Table and Asset files.

[b]Number of items required are specified in acres of crop land. For each acre of crop land a $123.43 investment in inventory is required.

Table 66. Depreciation and Investment Credit Information on Asset Purchases for the Case Farm Situation.

Purchased Asset	Depreciation Method[a]	Useful Life (Years)	Additional First Year Depreciation[b]	Investment Credit[b]
Fences	S	10		X
Farm Buildings	S	15		
Livestock Water Wells	S	10		X
Water Pumps	S	5		X
Water Line	S	15		X
Farm Driveway	S	5		
Farm Pond	S	10		
4-Wheel Drive Tractors	D	7	X	X
2-Wheel Drive Tractors	D	8	X	X
Combine	D	7	X	X
Tandom Truck	D	7	X	X
Single Axle Truck	D	8	X	X
4-Wheel Drive Pickups	D	7	X	X
3/4 Ton Pickup	S	6		X
1/2 Ton Pickup	S	4		X
Car (Farm Share)	S	4		X
Deep Chisel Plows	D	8	X	X
40' Chisel Plow	D	4		X
Other Chisel Plows	D	7	X	X
Sweep Plows	D	7	X	X
Harrow Plows	D	7	X	X
32' Grain Drill	D	5		X
24' Grain Drill	D	6	X	X
16' Grain Drill	D	7	X	X
Row Planter	D	8	X	X
Row Cultivator	D	8	X	X
Shreader	D	8	X	X
Grain Auger	D	8	X	X
Grain Dryer	D	8	X	X
Dozer	S	8	X	X
Scraper	S	8	X	X
Front End Loader	S	8	X	X
Fertilizer Equipment	D	7	X	X
Feed Grinder	D	7	X	X
Feed Equipment	S	8		X
Livestock Water Tanks	S	7		X
Livestock Trailor	S	5		X
Livestock Working Chute	S	8		X
Fuel Tank	S	7		X
Shop Equipment Items	S	7		X
Two-Way Radios	S	7		X
Radio Tower	S	15		

[a] Straight line depreciation method is denoted by (S) and double declining balance method is denoted by (D). The salvage value used to compute straight line depreciation is specified in Table 63.

[b] An (X) denotes investment credit or additional first year depreciation is taken.

Table 67. Real Estate Assets Owned and Purchases for the Case Farm Situation.

Simulation Year Purchased	Land			Improvements		
	Asset Codes	Total Land (acres)	Crop Land (acres)	Item	Asset Code	Replacement Age (Years Owned)
(-8)[a]	10- 1-1	320	208	Fence	10- 1-2	20
(-2)				Storage Building	10- 1-3	30
(-2)				Shop Building	10- 2-3	30
(-3)				2 Water Pumps	10- 5-3	10
(-3)				Water Well	10- 4-3	30
(-3)				Water Line	10- 6-3	30
(-3)				Farm Driveway	10- 8-3	10
(-8)	10- 2-1	160	139	Fence	10- 2-2	10
(-1)	10- 3-1	160	154	Fence	10- 3-2	12
(-1)				Hay Barn	10- 3-3	20
(-1)				Farm Pond	10- 9-3	21
5	10- 4-1	200	200	Fence	10- 4-2	20
5				Water Well	10- 4-3	30
10	10- 5-1	160	148	Fence	10- 5-2	20
15	10- 6-1	160	141	Fence	10- 6-2	20
20	10- 7-1	160	155	Fence	10- 7-2	20
				Water Well	10- 4-3	30
				Storage Building	10- 1-3	30
25	10- 8-1	160	155	Fence	10- 8-2	20
30	10- 9-1	160	139	Fence	10- 9-2	20
35	10-10-1	160	75	Fence	10-10-2	20
				Water Well	10- 4-3	30
40	10-11-1	160	144	Fence	10-11-2	20
45	10-12-1	160	144	Fence	10-12-2	20

[a]A negative year indicates the number of years owned for assets purchased prior to the first simulation year.

APPENDIX B

COMPUTER OUTPUT

In Table 68, a sample of the computer output for the proprietorship farm business arrangement is shown. The output values presented are for simulation year 11. A marital gift of 160 acres to the wife was made in simulation year one. As shown on the first page of Table 68, a taxable gift is made to the heirs at the start of year 11.

A sample of the computer output printed when a death event occurs is shown in Table 69. The values shown are for the husband's death which occurs at the end of year 30. The farm business arrangement is a corporation. A sample of the additional computer output printed when the business arrangement is a corporation is also shown in Table 69.

Table 68. Computer Output for Simulation Year 11 Under Proprietorship Business Arrangement, 160 Acre Marital Gift to Wife and Gift Strategy Two.

ASSET SALES (11)

ASSET NUMBER	FROM OWNER	ASSET NUMBER	TO OWNER	VALUE DOLLARS	L.T. GAIN DOLLARS	S.T.GAIN DOLLARS	ORD.GAIN DOLLARS	ADMIN EX DOLLARS	DOWN PAYMENT	LOAN BALANCE	CASH RECD BY SELLER	INST. SALE	CASH PAID BY BUYER
1110	HUSBAND		EXTERNAL	1418.70	0.0	0.0	328.23	1.42	0.0	0.0	1417.29	NO	0.0
1114	HUSBAND		EXTERNAL	2706.82	0.0	0.0	446.24	2.71	0.0	0.0	2704.11	NO	0.0
1402	HUSBAND		EXTERNAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NO	0.0
1411	HUSBAND		EXTERNAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NO	0.0

GIFT DECISIONS - PERIOD(11)

ASSET	FROM	TO	ASSET	VALUE
1007	(3)HUSBAND	(12)NON-FARM HEIRS	1008	156536.44
1007	(3)HUSBAND	(12)NON-FARM HEIRS	1008	4218.25
1501	(3)HUSBAND	(11)FARM HEIRS	1502	80377.37

GIFT TRANSFER SUMMARY

	FROM HUSBAND	FROM WIFE	TOTAL
VALUE TO:			
HUSBAND	0.0	0.0	0.0
WIFE	0.0	0.0	0.0
FARM HEIRS	80377.37	0.0	80377.37
NON - FARM HEIRS	160754.69	0.0	160754.69
TOTALS	241132.06	0.0	241132.06
TRANSFER COSTS			
FEDERAL GIFT TAX	8804.49	0.0	8804.49
OKLA. GIFT TAX	11627.92	0.0	11627.92
ADMINISTRATIVE	1205.66	0.0	1205.66
TOTALS	21638.07	0.0	21638.07
TOTAL CASH PAID INCLUDING DEBT	134424.00	0.0	134424.00
ACCUMULATED GIFTS			
FEDERAL	203139.12	111566.00	
STATE	232132.06	0.0	

Table 68. (Continued)

ASSET PURCHASED	OWNER	ASSET ITEM CODE	ASSET DESC. CODE	IS ASSET REPLACED	UNITS PURCHASED	PURCHASE COST	VALUE	YEARS OWNED	ASSET REPLACED BASIS	DOWN PAYMENT	BUYING EXPENSE	CASH PAID BY BUYER	CASH AVAILABLE FOR PURCHASES
1143	FARM HEIRS	4	4	NO	1.0	7076.68	0.0	0	0.0	7076.68	0.0	7076.68	118403.69
1144	FARM HEIRS	7	1	NO	1.0	7354.20	0.0	0	0.0	7354.20	0.0	7354.20	111327.30
1416	FARM HEIRS	2	1	NO	1.0	485.65	0.0	0	0.0	485.65	0.0	485.65	103972.75
1417	FARM HEIRS	2	3	NO	1.0	208.14	0.0	0	0.0	208.14	0.0	208.14	103487.06

SOURCES AND USES OF FUNDS FROM SALE, GIFT, PURCHASE, LOAN AND DEBT TRANSACTIONS

	CORPORATION OR PARTNERSHIP	HUSBAND	WIFE	FARM HEIRS	NON FARM HEIRS
SOURCES					
LOAN PAYMENTS	0.0	0.0	0.0	0.0	0.0
SALES	0.0	4121.40	0.0	0.0	0.0
NON FARM INVESTMENTS	0.0	0.0	0.0	0.0	0.0
LIFE INS BENF	0.0	0.0	0.0	0.0	0.0
TOTAL SOURCES	0.0	4121.40	0.0	0.0	0.0
USES					
DEBT PAYMENTS	0.0	11333.14	0.0	3607.97	0.0
GIFT EXP.	0.0	134424.00	0.0	0.0	0.0
PURCHASES	0.0	0.0	0.0	15124.66	0.0
TOTAL USES	0.0	145757.12	0.0	18732.63	0.0
NEI	0.0	-141635.69	0.0	-18732.63	0.0

Table 68. (Continued)

BALANCE SHEET AFTER TRANSFERS FOR THE (3)HUSBAND

ASSET	ASSET VALUE	DEBT BALANCE	NET WORTH
REAL ESTATE	516311.56	135258.19	381053.37
MACHINERY	128525.06	0.0	128525.06
LIVESTOCK	0.0	0.0	0.0
EQUIPMENT	6890.07	0.0	6890.07
INVENTORY	222594.44	0.0	222594.44
FARM ACCOUNT	500.00	296557.69	-296057.69
TOTAL FARM ASSETS	874820.69	431815.87	443004.81
STOCKS OR SHARE	0.0	0.0	0.0
LOANS	0.0	0.0	0.0
NON FARM INV.	0.0	0.0	0.0
ANNUITY	23675.34	0.0	23675.34
SAVINGS ACCOUNT	0.0	0.0	0.0
CHECKING ACCOUNT	1000.00	4000.00	-3000.00
LIFE INS ON HUSBAND	0.0	0.0	0.0
LIFE INS ON WIFE	0.0	0.0	0.0
PERSONAL ASSETS	2976.37	0.0	2976.37
TOTAL NON FARM	27651.71	4000.00	23651.71
TOTAL	902472.37	435815.87	466656.50

BALANCE SHEET AFTER TRANSFERS FOR THE (4)HUSBAND

ASSET	ASSET VALUE	DEBT BALANCE	NET WORTH
REAL ESTATE	0.0	0.0	0.0
MACHINERY	0.0	0.0	0.0
LIVESTOCK	0.0	0.0	0.0
EQUIPMENT	0.0	0.0	0.0
INVENTORY	0.0	0.0	0.0
FARM ACCOUNT	0.0	0.0	0.0
TOTAL FARM ASSETS	0.0	0.0	0.0
STOCKS OR SHARE	0.0	0.0	0.0
LOANS	0.0	0.0	0.0
NON FARM INV.	651.55	0.0	651.55
ANNUITY	0.0	0.0	0.0
SAVINGS ACCOUNT	0.0	0.0	0.0
CHECKING ACCOUNT	0.0	0.0	0.0
LIFE INS ON HUSBAND	0.0	0.0	0.0
LIFE INS ON WIFE	0.0	0.0	0.0
PERSONAL ASSETS	37964.32	3749.07	34215.25
TOTAL NON FARM	38615.87	3749.07	34866.80
TOTAL	38615.87	3749.07	34866.80

Table 68. (Continued)

BALANCE SHEET AFTER TRANSFERS FOR THE (7)WIFE

ASSET	ASSET VALUE	DEBT BALANCE	NET WORTH
REAL ESTATE	304817.50	0.0	304817.50
MACHINERY	0.0	0.0	0.0
LIVESTOCK	0.0	0.0	0.0
EQUIPMENT	0.0	0.0	0.0
INVENTORY	0.0	0.0	0.0
FARM ACCOUNT	0.0	0.0	0.0
TOTAL FARM ASSETS	304817.50	0.0	304817.50
STOCKS OR SHARE	0.0	0.0	0.0
LOANS	0.0	0.0	0.0
NON FARM INV.	0.0	0.0	0.0
ANNUITY	0.0	0.0	0.0
SAVINGS ACCOUNT	41180.22	0.0	41180.22
CHECKING ACCOUNT	1000.00	0.0	1000.00
LIFE INS ON HUSBAND	39239.51	0.0	39239.51
LIFE INS ON WIFE	0.0	0.0	0.0
PERSONAL ASSETS	0.0	0.0	0.0
TOTAL NON FARM	81419.69	0.0	81419.69
TOTAL	386237.19	0.0	386237.19

Table 68. (Continued)

BALANCE SHEET AFTER TRANSFERS FOR THE (11)FARM HEIRS

ASSET	ASSET VALUE	DEBT BALANCE	NET WORTH
REAL ESTATE	0.0	0.0	0.0
MACHINERY	42135.18	20117.25	22017.93
LIVESTOCK	0.0	0.0	0.0
EQUIPMENT	1789.98	0.0	1789.98
INVENTORY	211909.81	0.0	211909.81
FARM ACCOUNT	500.00	98337.31	-97837.31
TOTAL FARM ASSETS	256334.50	118454.31	137880.19
STOCKS OR SHARE	0.0	0.0	0.0
LOANS	0.0	0.0	0.0
NON FARM INV.	0.0	0.0	0.0
ANNUITY	0.0	0.0	0.0
SAVINGS ACCOUNT	0.0	0.0	0.0
CHECKING ACCOUNT	500.00	2000.00	-1500.00
LIFE INS ON HUSBAND	0.0	0.0	0.0
LIFE INS ON WIFE	0.0	0.0	0.0
PERSONAL ASSETS	0.0	0.0	0.0
TOTAL NON FARM	500.00	2000.00	-1500.00
TOTAL	256834.50	120454.31	136380.19

BALANCE SHEET AFTER TRANSFERS FOR THE (12)NON-FARM HEIRS

ASSET	ASSET VALUE	DEBT BALANCE	NET WORTH
REAL ESTATE	160754.69	0.0	160754.69
MACHINERY	0.0	0.0	0.0
LIVESTOCK	0.0	0.0	0.0
EQUIPMENT	0.0	0.0	0.0
INVENTORY	0.0	0.0	0.0
FARM ACCOUNT	0.0	0.0	0.0
TOTAL FARM ASSETS	160754.69	0.0	160754.69
STOCKS OR SHARE	0.0	0.0	0.0
LOANS	0.0	0.0	0.0
NON FARM INV.	0.0	0.0	0.0
ANNUITY	0.0	0.0	0.0
SAVINGS ACCOUNT	11920.14	0.0	11920.14
CHECKING ACCOUNT	2000.00	0.0	2000.00
LIFE INS ON HUSBAND	0.0	0.0	0.0
LIFE INS ON WIFE	0.0	0.0	0.0
PERSONAL ASSETS	0.0	0.0	0.0
TOTAL NON FARM	13920.14	0.0	13920.14
TOTAL	174674.81	0.0	174674.81

Table 68. (Continued)

PROPRIETORSHIP FARM FLOWS

YEAR 11

FARM CASH FLOWS:

CASH FARM INCOME BEFORE DISTRIBUTIONS	106866.87
RENT PAID TO OWNERS	15035.65
CASH BEFORE WITHDRAWALS	91831.19
WITHDRAWALS	55449.64
NET CASH FLOW	36381.54

DISTRIBUTIONS:	HUSBAND	WIFE	FARM HEIRS	NON FARM HEIRS
RENT	0.0	10171.37	0.0	4864.28
CASH FARM INCOME	56450.25	0.0	35381.03	0.0
WITHDRAWALS	36081.16	0.0	19368.49	0.0

PROPRIETORSHIP FARM TAX FLOWS:	HUSBAND	FARM HEIRS	TOTAL
CASH FARM INCOME	56450.25	35381.03	91831.25
REGULAR DEPRECIATION	8411.17	12027.72	20438.89
TAXABLE FARM INCOME	48039.09	23353.30	71392.31
ADDITIONAL FIRST YEAR DEPR	0.0	1415.34	1415.34
OWNER CONTRIBUTIONS: PROPORTION	0.68	0.32	

Table 68. (Continued)

	INCOME TAX FLOWS YEAR 11			
	HUSBAND	WIFE	FARM HEIRS	NON FARM HEIRS
FARM INCOME	48039.09	0.0	23353.30	0.0
RENTAL INCOME	0.0	10171.37	0.0	4864.28
FARM SALARIES	0.0	0.0	0.0	0.0
INTEREST INCOME	168.38	2137.23	20.83	971.80
ANNUITY PAYMENTS	0.0	0.0	0.0	0.0
NON FARM SALARIES	0.0	0.0	0.0	41627.54
ORDINARY GAIN	774.46	0.0	0.0	0.0
DIVIDEND INCOME	0.0	0.0	0.0	0.0
CORPORATE INCOME	0.0	0.0	0.0	0.0
PARTNERSHIP INCOME	0.0	0.0	0.0	0.0
EXPENSES ON RENTAL PROPERTY AND STOCK	0.0	1308.88	0.0	643.02
LESS RETIREMENT FUND INVESTMENT	1500.00	0.0	0.0	0.0
TOTAL ORDINARY INCOME	47481.93	10999.71	23374.13	46820.60
TOTAL LONG TERM GAIN	0.0	0.0	0.0	0.0
TOTAL SHORT TERM GAIN	0.0	0.0	0.0	0.0
TOTAL ADDITIONAL FIRST YEAR DEPR.	0.0	0.0	1415.34	0.0
TOTAL INVESTMENT CREDIT TAKEN	0.0	0.0	4722.04	0.0
TOTAL INVESTMENT CREDIT RECAPTURE	0.0	0.0	0.0	0.0
TOTAL ITEMIZED DEDUCTIONS	4489.74	0.0	2873.75	5614.16
TAX RETURN METHOD	2.00	2.00	2.00	2.00
NUMBER OF DEPENDENTS	2	1	3	3
AGE	52.00	46.00	28.00	24.00
FEDERAL INCOME TAX PAID	14825.26	3434.44	0.0	7657.12
STATE INCOME TAX PAID	2143.05	496.46	500.10	1182.39
LONG TERM GAIN CARRY OVER	0.0	0.0	0.0	0.0
SHORT TERM GAIN CARRY OVER	0.0	0.0	0.0	0.0
INVESTMENT CREDIT CARRYOVER	0.0	0.0	1228.52	0.0

Table 68. (Continued)

OWNER CASH FLOWS
YEAR (11)

	HUSBAND	WIFE	FARM HEIRS	NON-FARM HEIRS
INFLOWS:				
FARM WITHDRAWALS	36081.16	0.0	19368.49	0.0
DIVIDENDS	0.0	0.0	0.0	0.0
RENT(INTERNAL)	0.0	10171.37	0.0	4864.28
RENT(EXTERNAL)	0.0	0.0	0.0	0.0
LABOR SALARY	0.0	0.0	0.0	0.0
MANAGEMENT SALARY	0.0	0.0	0.0	0.0
INTEREST	168.38	2137.23	20.83	971.80
NON-FARM SALARY	0.0	0.0	0.0	41627.54
ANNUITY PAYMENT	0.0	0.0	0.0	0.0
SOCIAL SECURITY BENEFITS	0.0	0.0	0.0	0.0
TOTAL CASH INFLOWS	36249.54	12308.60	19389.32	47463.62
OUTFLOWS:				
PROPERTY TAXES	0.0	1219.27	0.0	643.02
PROPERTY INSURANCE	0.0	89.61	0.0	0.0
PROPERTY INTEREST	0.0	0.0	0.0	0.0
PERSONAL INTEREST	100.00	0.0	66.67	0.0
FARM STOCK INTEREST	0.0	0.0	0.0	0.0
RETIREMENT FUND EXPENSES	1500.00	0.0	0.0	0.0
PERSONAL ASSET EXPENSES	1762.21	0.0	0.0	0.0
FAMILY LIVING EXPENSES	15542.34	0.0	14035.42	28070.84
LIFE INSURANCE PREMIUMS	0.0	4605.50	0.0	0.0
TOTAL CASH OUTFLOWS	18904.55	5914.38	14102.09	28713.85
NET CASH FLOW BEFORE TAXES	17344.99	6394.22	5287.23	18749.77
SOCIAL SECURITY TAXES	1677.17	0.0	1677.17	2435.21
FEDERAL INCOME TAXES	14825.26	3434.44	0.0	7657.12
OKLAHOMA INCOME TAXES	2143.05	496.46	509.10	1182.39
NET CASH FLOW AFTER TAXES	-1300.49	2463.32	3109.96	7475.05

Table 68. (Continued)

COMPARATIVE BALANCE SHEET
YEAR (11)

		BEGINNING			ENDING			CHANGE
		ASSET VALUE	DEBT BALANCE	NET WORTH	ASSET VALUE	DEBT BALANCE	NET WORTH	NET WORTH
HUSBAND								
(3)	FARM	874820.69	431815.87	443004.81	896243.69	411446.56	484797.12	41792.31
	NON-FARM	27651.71	4000.00	23651.71	42102.74	16968.31	25134.43	1482.72
	TOTAL	902472.37	435815.87	466656.50	938346.37	428414.81	509931.56	43275.06
(4)	FARM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NON-FARM	38615.87	3749.07	34866.80	38880.32	3749.07	35131.25	264.45
	TOTAL	38615.37	3749.07	34866.80	38880.32	3749.07	35131.25	264.45
	FARM TOTAL	874820.69	431815.87	443004.81	896243.69	411446.56	484797.12	41792.31
	NON-FARM TOTA	66267.56	7749.07	58518.50	80983.06	20717.37	60265.69	1747.19
	TOTAL	941088.25	439564.94	501523.31	977226.75	432163.94	545062.81	43539.50
WIFE								
(7)	FARM	304817.50	0.0	304817.50	318828.00	0.0	318828.00	14010.50
	NON-FARM	81419.69	0.0	81419.69	91618.50	3930.90	87687.56	6267.87
	TOTAL	386237.19	0.0	386237.19	410446.50	3930.90	406515.56	20278.37
	FARM TOTAL	304817.50	0.0	304817.50	318828.00	0.0	318828.00	14010.50
	NON-FARM TOTA	81419.69	0.0	81419.69	91618.50	3930.90	87687.56	6267.87
	TOTAL	386237.19	0.0	386237.19	410446.50	3930.90	406515.56	20278.37
FARM HEIRS								
(11)	FARM	256234.50	118454.31	137880.19	255251.00	102441.69	152809.31	14929.12
	NON-FARM	500.00	2000.00	-1500.00	2110.06	500.10	1609.96	3109.96
	TOTAL	256834.50	120454.31	136380.19	257361.00	102941.75	154419.25	18039.06
NON-FARM HEIRS								
(12)	FARM	160754.69	0.0	160754.69	168492.44	0.0	168492.44	7737.75
	NON-FARM	13920.14	0.0	13920.14	30234.69	8839.50	21395.19	7475.05
	TOTAL	174674.81	0.0	174674.81	198727.12	8839.50	189887.62	15212.81
TOTAL FOR ALL OWNERS								
	FARM TOTAL	1596726.00	550270.19	1046455.81	1638814.00	513888.25	1124925.00	78469.19
	NON-FARM TOTA	162107.37	9749.07	152358.25	204946.25	33987.87	170958.37	18600.12
	GRAND TOTAL	1758833.00	560019.25	1198813.00	1843760.00	547876.06	1295883.00	97070.00

Table 69. Computer Output for Estate Transfer at Husband's Death and Corporation Business Arrangement.

WILL TRANSFERS (30)

DEATH OF PARENT HUSBAND

NUMBER OF PARENTS 1

AGE OF DECEASED 71.

AGE OF SPOUSE 67.

	ESTATE SIZE VALUE	CENT	NET
OUTRIGHT			
FARM ASSETS	1201361.00	134.76	1201226.00
NON FARM ASSETS	477369.75	0.0	477369.75
JOINT TENANCY			
FARM ASSETS	0.0	0.0	0.0
NON FARM ASSETS	36353.24	0.0	36353.24
TOTAL ESTATE	1715083.00	134.76	1714948.00
LIFE ESTATE WITH REMAINDER TO FARM HEIRS			
FARM ASSETS	0.0	0.0	0.0
NON FARM ASSETS	0.0	0.0	0.0
LIFE ESTATE WITH REMAINDER TO NON FARM HEIRS			
FARM ASSETS	0.0	0.0	0.0
NON FARM ASSETS	0.0	0.0	0.0
GIFTS WITHIN THREE YEARS OF DEATH	0.0		

WILL DECISIONS

ASSET	FROM	TO	ASSET	VALUE
1701	(3)HUSBAND	(11)FARM HEIRS	1701	239228.37
1001	(3)HUSBAND	(7)WIFE	1001	743355.75
1001	(3)HUSBAND	(7)WIFE	1001	1709.85
1001	(3)HUSBAND	(7)WIFE	1001	29494.95
1001	(3)HUSBAND	(7)WIFE	1001	7619.52
1001	(3)HUSBAND	(7)WIFE	1001	683.94
1001	(3)HUSBAND	(7)WIFE	1001	0.0
1001	(3)HUSBAND	(7)WIFE	1001	2351.05
1001	(3)HUSBAND	(7)WIFE	1001	3847.17
1001	(3)HUSBAND	(7)WIFE	1001	598.45
1002	(3)HUSBAND	(12)NON-FARM HEIRS	1002	406575.62
1002	(3)HUSBAND	(12)NON-FARM HEIRS	1002	5129.55
2502	(3)HUSBAND	(7)WIFE	2502	17365.68
1804	(3)HUSBAND	(11)FARM HEIRS	1804	20127.40

Table 69. (Continued)

ESTATE DISTRIBUTIONS

SPOUSE	0.500
LIFE ESTATE FARM HEIRS	0.0
NON FARM HEIRS	0.0
FARM HEIRS	0.167
NON FARM HEIRS	0.333
CHARITABLE CONTRIBUTIONS	0.0

VALUE OF THE GROSS ESTATE		1715083.00
SPECIFIC BEQUEST	1514437.00	
PLUS LIQUIDATIONS	200648.37	
SELLING EXPNSES	0.0	
LESS ESTATE DEBT	134.76	1714950.0
ESTATE TAXES		215086.37
ADMINISTRATIVE EXPENSE		51702.48
NET VALUE TRANSFERRED		1448161.00

WILL TRANSFER SUMMARY

VALUE TO:	ASSET BEQUEST	EXPENSE	TAXES	NET VALUE TRANSFERRED
SPOUSE (OUTRIGHT)	843379.31	25851.24	0.0	831623.67
SPOUSE (LIFE ESTATE) FARM HEIRS	0.0	0.0	0.0	0.0
NON FARM HEIRS	0.0	0.0	0.0	0.0
FARM HEIRS	259355.75	8618.80	71709.75	205553.50
NON FARM HEIRS	411705.12	17232.43	143376.50	410983.75
CHARITY	0.0	0.0	0.0	0.0
TOTAL	1514437.00	51702.48	215086.37	1448161.00

TRANSFER COSTS

FEDERAL ESTATE TAXES	167014.75
OKLAHOMA ESTATE TAXES	48071.67
ADMINISTRATIVE *	51702.48
SELLING EXPENSES	0.0
TOTAL COSTS	266788.81

* INCLUDES ATTORNEY FEES, FUNNERAL EXPENSE, COURT COSTS, AND OTHER EXPENSES BUT DOES NOT INCLUDE EXECUTORS FEE - ($ 42977.07)

Table 69. (Continued)

ESTATE TRANSFER SUMMARY
YEAR (31)

	FARM HEIRS	NON-FARM HEIRS	TOTAL
ACCUMULATED VALUE OF GIFTS	197377.31	394754.69	592132.00
ACCUMULATED VALUE OF TRANSFERS AT DEATH	205553.50	410983.75	616537.25
TOTAL TRANSFER	402930.81	805738.44	1208669.00
ACCUMULATED GIFT EXPENSES		25569.16	
ACCUMULATED WILL EXPENSES		266788.81	
TOTAL EXPENSES		292357.94	
PRESENT VALUE OF TRANSFERS*			
BY GIFT	72778.94	145557.69	218336.62
BY WILL	27003.64	53991.08	80994.69
TOTAL	99782.56	199548.75	299331.31
PRESENT VALUE OF TRANSFER COST*			
GIFTS		10029.45	
WILL		35048.14	
TOTAL		45077.59	

* DISCOUNT RATE IS 7.00 PERCENT

CORPORATION FARM FLOWS
YEAR 31

CORPORATION CASH FLOWS:

CASH FARM INCOME BEFORE DISTRIBUTIONS	346575.12
LABOR SALARIES TO OWNERS	26983.61
MANAGEMENT SALARIES TO OWNERS	55423.26
RENT PAID TO OWNERS	0.0
CASH FLOW BEFORE TAXES	264168.19
TAXES	49845.29
CASH FLOW BEFORE DIVIDENDS	214322.87
FIXED DIVIDENDS	0.0
VARIABLE DIVIDENDS	0.0
NET CASH FLOW	214322.87

Table 69. (Continued)

CORPORATION TAX FLOW - TAX METHOD:(3.)	
CASH FARM INCOME	2C0909.69
AMMORT. ORG EXPENSE	0.0
REGULAR DEPRECIATION	68314.19
ADD. FIRST YEAR DEPR.	2000.00
NET LONG TERM GAIN	0.0
NET SHORT TERM GAIN	0.0
ORDINARY GAIN	0.0
CORP. FRANCA. TAX	2948.58
OKLA. CORP TAX	5105.87
TAXABLE INCOME	122541.06
FEDERAL CORP. TAXES	41790.84

INVESTMENT CREDIT TAKEN	3528.86
INVESTMENT CREDIT RECAPTURE	0.0
TOTAL LONG TERM GAIN	0.0
TOTAL SHORT TERM GAIN	0.0
TOTAL SHORT TERM GAIN CARRY OVER	0.0
INVESTMENT CREDIT CARRY OVER	0.0

CORPORATE OWNERSHIP:

	HUSBAND	WIFE	FARM HEIRS	NON FARM HEIRS	TOTAL
COMMON STOCK	0.0	0.0	2248440.00	1508365.00	3756805.00
PREFERRED STOCK	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	2248440.00	1508365.00	3756805.00

DISTRIBUTIONS:	HUSBAND	WIFE	FARM HEIRS	NON FARM HEIRS
RENT	0.0	24316.84	0.0	10729.84
LABOR SALARY	0.0	0.0	26983.61	0.0
MGMT SALARY	0.0	0.0	55423.26	0.0
DIVIDENDS	0.0	0.0	0.0	0.0
TOTAL	0.0	24316.84	82406.81	10729.84

VITA

Clint Edward Roush

Candidate for the Degree of

Doctor of Philosophy

Thesis: ECONOMIC EVALUATION OF ASSET OWNERSHIP TRANSFER METHODS AND FAMILY FARM BUSINESS ARRANGEMENTS AFTER THE TAX REFORM ACT OF 1976

Major Field: Agricultural Economics

Biographical:

Personal Data: Born at Clinton, Oklahoma, January 24, 1947, the son of Harold and Essie Roush.

Education: Graduated from Arapaho High School, Arapaho, Oklahoma, in May, 1965; received the Bachelor of Science degree from Oklahoma State University with a major in Agricultural Economics in May, 1969; received the Master of Science degree from Oklahoma State University in Agricultural Economics in December, 1972; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in May, 1978.

Professional Experience: Beef Department, Wilson Certified Foods, Oklahoma City, Oklahoma, November, 1969, to August, 1970; N.D.E.A. Fellowship and Graduate Research Assistant, Department of Agricultural Economics, Oklahoma State University, September, 1970, to August, 1973; Extension Farm Management Specialist, Department of Agricultural Economics, Oklahoma State University from September, 1973, to present.

Organizations: American Agricultural Economics Association, Southern Agricultural Economics Association, Oklahoma Chapter of American Society of Farm Managers and Rural Appraisers, Alpha Zeta, and Phi Kappa Phi.