INVESTMENT ANALYSIS FOR THE AGRICULTURALIST

by

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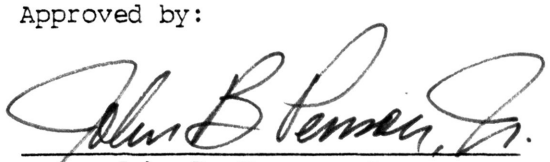
Submitted in Partial Fulfillment of the Requirements of the
University Undergraduate Fellow Program

1984-1985

Approved by:



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April 1985

ABSTRACT

Investment Analysis for the Agriculturalist (April 1985)

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Farmers and ranchers are annually confronted by a variety of investment and financing decisions that will affect the financial structure and performance of their firm for many years to come. The purpose of this project is to develop a decision-specific simulation model capable of assessing the feasibility of a specific investment. The model will incorporate the factors that influence an investment's performance and demonstrate how a change in those factors affects investment decisions.

ACKNOWLEDGEMENTS

I would like to express my sincerest appreciation to those persons who assisted me in the development of this Senior Honors thesis. Special recognition is given to the following:

Dr. John B. Penson, Jr., faculty advisor for his direction and friendship throughout the past year.

Mrs. Linda Conti, for her patience and many hours of hard work.

Ms. Ann Adair, for her assistance in preparing the data used in this study.

The Department of Agricultural Economics, for providing the facilities for this type of research.

The Texas Agricultural Extension Service for providing their valuable information.

Ms. Janet Nichols, my fiancee, for her encouragement and aid throughout the past year.

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CHAPTER I

INTRODUCTION

In recent years there has been an economic blight across the most productive farmland in the world. The problem goes beyond the fact that some farmers are bad managers and that some are unlucky when it comes to weather conditions. The problem is debt. Sky rocketing debt that is suffocating many farmers out of existence because too often liabilities cannot be met with farm earnings. The increased financial leveraged condition has produced significantly higher risk and lower liquidity for many farmers. Even so, those farmers who are considering expanding their operations in today's economic environment most know hot to evaluate investment opportunities and choose those which represent an effective use of their capital. The search for and the analysis of potential investment opportunities is becoming increasingly important in the managerial function.

Those farmers currently in financial difficulty acquired substantial amounts of debt in the mid 1970's under the conditions of a growing export market, rising commodity prices and appreciating farmland values that seemed unending. Agricultural lenders were eager to finance farmers because of their strong equity base in land. However, in recent periods due to a strong American dollar exports have dropped substantially. This dramatic decline in agri-

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The citations on the following pages follow the style of the *American Journal of Agricultural Economics*.

cultural exports combined with massive crop harvest has significantly increased the surplus of farm commodities. Excess supply of farm products has produced strong downward pressure on commodity prices.

The high real interest rates during the 1980s, which have contributed to the high value of the dollar, have also led to substantially high production costs. Interest payments in the mid-1970s represented only 8 percent of total cash operating expenses. In the 1980s, however, interest payments account for almost 20 percent of farmers' total cash operating expenses. The value of farmland is based upon the potential net earning power of the land; therefore, the decrease in farm product prices has lead to tumbling land values. This unforseen decline in farmland values has eroded the equity base of farmers and the collateral held by financial institutions. Many farmers' credit reserve has eroded to a point that they cannot obtain credit for their operating expenses in the upcoming year. Without the ability of the farmer to purchase seed, fertilizer, and other production inputs, financial institutions are faced with foreclosure on many farm loans. Agricultural lenders throughout the United States are confronted with the problem of acquiring farm assets in a saturated market. Land values have dropped 50 percent in many farming areas, which suggests lenders could recover only a fraction of their outstanding loans should they liquidate their holdings of farmland. This risk associated with farm loans is forcing farmers and their lenders to carefully examine agricultural investments.

The objective of this research project is to establish a systematic process for investment analysis. Farmer's investment opportunities normally include the purchase of farmland as well as the purchase and replacement of depreciable assets. Two main criteria are examined for each decision. The first criterion is the economic feasibility of the decision alternatives. For example, the after-tax net present value of the expected annual net cash flows will be calculated when assessing the potential profitability of an investment. The second criterion is the cash flow feasibility of the investment and its financing. Annual cash flows will be measured to examine the investment's ability to generate sufficient cash to meet the increase in uses of funds.

A Fortran simulation program which incorporates these budgeting techniques will be used. The program includes the factors thought to influence investment decisions. The program will evaluate investment alternatives for their profitability and for their cash flow feasibility. The project will be aimed at illustrating the applicability of a managerial tool that could be used by farmers as well as their lenders in analyzing investment alternatives. The research results will be made available to the Texas Agricultural Extension Service for possible adoption. The simulation model could also be used in the college classroom; it would allow the instructor to demonstrate and measure how changing conditions impact investment's performance. Finally, a journal paper will be written and submitted to the *Journal of Farm Managers and Rural Appraisers.*

CHAPTER II

REVIEW OF THE LITERATURE

There is need for sound investment analysis in agriculture. Each sector of our economy has this same need; however, in agriculture there are several factors that make this need for prudent analysis even more essential. First, uncertainty in agriculture is a way of life. This uncertainty is tied to biological as well as economic conditions. Investments based upon forecast of these conditions must be analyzed with caution. Second, assets brought into the agricultural sector are not readily convertible to other sectors of the economy in times of economic downturns. This inability for the asset to transverse markets reduces the flexibility of the farmer's portfolio. Third, large amounts of capital are required for the acquisition of farm assets. The magnitude of these investments in itself demands careful consideration.

There are three concepts that are considered in the analysis process. These concepts are, expectations, risk, and the time value of money.

Expectations

The concept of expectations is based upon one's belief as to how an investment will perform in the future. The expected performance is computed by using three approaches. These approaches are a realistic approach based on current evidence, an optimistic approach based on a greater performance, and a pessimistic approach

based on a lesser performance. A subjective probability is then assigned to each approach indicating its probability of occurrence. From this data the expected return can be calculated.

Risk

The risk concept is based upon the inherent risk perceived by the investor. There are several approaches to measure risk. Both approaches involve calculating the potential deviation from expected returns. This deviation is associated with the variability of returns based upon the subjective probabilities assigned to the potential outcomes of the investment. A standard deviation is then calculated. A second measure of risk is the coefficient of variation, or the standard deviation divided by the expected return. This latter measure of risk represents the risk per dollar of expected return.

Time Value of Money

The time value of money concept reflects the fact that a dollar today is worth more than a dollar in the future. This is because of the potential earning power of the dollar between now and the time of future repayment. The present value of a future payment is found using the following formula:

(1) Present Value = Future Value x Interest Factor
in year n (r = ? n = ?)

Suppose you expect to receive a payment of $100 one year from now

and you can earn 7 percent on this money if you had it to invest. The present value of this $100 is equal to:

(2) Present Value = Future Value x Interest Factor
in year n (r = 7% n = 1)

= $100 x 0.9346

= $93.46

Under these conditions, a payment of $100 one year from now is only worth $93.46 today if your opportunity rate of return is 7 percent. This same reasoning underlies the investment analysis procedure.

These concepts will be discussed in more detail later in this chapter.

Methods of Investment Analysis

The responsibilities of a manager of a firm are many. Of these responsibilities one's investment decisions have the greatest long run impact upon the business' economic performance. These investment decisions require careful consideration. A manager must analyze each investment opportunity for its potential benefit to his firm. There are many methods available for analyzing investments, however, for this study will discuss only three.

The Payback Period Method

The payback period method estimates the length of time required for an investment to pay for itself. The method estimates the time of repayment by dividing the initial investment cost by

its projected annual cash inflow. Individual investments can be analyzed and then compared according to their payback period, with the shortest time being the most favored. This method may be relevant to firms with low liquidity that must be concerned with a quick capital recovery.

The payback period method does have several shortcomings. First, the payback period method does not consider earnings past the payback period. Second, this method does not account for the timing of cash flows within or beyond the payback period. Third, the payback period does not measure profitability. It only estimates the time of recovery.

The Net Present Value Method

The net present value method of analysis discounts the stream of annual expected net cash flows from an investment to value these flows at a particular point in time. This method considers the timing and magnitude of the projected annual net cash flow stream. Each payment is discounted for time and risk to its present value and then summed (cash inflows being positive, cash outflows being negative) to yield a net present value. The expected resale value of the assets acquired at the planning horizon is included in the last year's expected net cash flow.

The investments being considered can be ranked and their performance estimated by the magnitude of each investment's net present value. The investment with the greatest positive net present value would be considered the most desirable, the investment with a

net present value of zero would be considered indifferent and any investment with a negative net present value would be considered an undesirable investment.

The net present value method of investment analysis requires the collection and identification of the proper information before it can be implemented. Baker, Barry and Hopkin (1983) list the information needed as:

1. The initial investment cost.
2. The expected annual net cash flows from the investment.
3. The expected resale value of the assets.
4. The length of the planning horizon.
5. The required rate of return, also called the cost of capital or the discount rate.

The Internal Rate of Return Method

The internal rate of return is the particular discount rate which would cause the net present value of a series of payments to equal zero. To find the internal rate of return for an investment, the same procedure as in the net present value method can be used. However, instead of solving for the net present value, the net present value is set equal to zero and one instead solves for the interest rate. The ranking of alternative investment projects is based on the relative value of the internal rate of return, with the largest being the most favored. The acceptance of the investment depends upon if the internal rate of return equaling or exceeding the farmer's required rate of return.

There is a close linkage between the net present value method and the internal rate of return method because they both account for the time value of money in much the same way. The internal rate of return method and the net present value method of analysis will usually give the same ranking of investments. Differences may arise due to the assumption made on the rate of return on the reinvestments. The internal rate of return method assumes the cash inflows can be invested at the same rate as the internal rate of return on the investment. Furthermore, this rate varies across the various investment projects but is constant over time. The net present value method, on the other hand, assumes that the funds are invested at the farmer's interest rate. The net present value method is more realistic if the interest rate for the funds reinvested is based on the farmer's annual opportunity cost of capital. The internal rate of return's advantages are that it can be compared against a common required rate of return, and that it expresses profitability in terms of a percentage, which is preferred by some managers.

Why Net Present Value Method Will Be Used

As stated earlier, there are many methods of investment analysis. Three of these methods have previously been discussed. However, for this study, the net present value method will be used. The net present value is thought to be the more appropriate method based on the following three criteria.

First, the net present value method does not require the

assumption of a single discount rate over the life of the project. As discussed, this improves the reliability of the estimate for the investment's profitability because the returns are assumed to be reinvested at the opportunity cost of capital for each point in time. Also, the possibility of changing the interest rate will facilitate the understanding of how changing conditions affect the performance of the investment. This benefits the study of investment analysis by demonstrating the relationship of how changing interest rates impact an investment's performance.

Second, the net present value method considers the time value of money. The time value of money is the rate of exchange between a present dollar for a future dollar. This consideration must be made for the analysis to be realistic. Since the earnings from an investment may be reinvested, one must rationally favor an investment in the quicker return than a comparable investment with a later return if the project involves equal annual returns.

Finally, the net present value method facilities accounting for one's attitude toward risk. The interest factor in the net present value method of analysis has three components. The components are a risk-free rate of return for time preference, a risk premium associated to one's acceptance of risk with the investment, and an inflation premium reflecting the expected rate of inflation.

These three factors are summed to yield the interest rate used to discount the cash flow stream. It is then possible to account for one's willingness to accept risk by lowering or raising the risk premium. As one's willingness to accept risk lowers, the risk

premium increases, thus increasing the required rate of return for that individual to accept risk. The net present value of an investment will decrease as the interest rate used to discount increases. This makes it possible for the risk associated with an investment to be reflected in the net present value and in the ranking of the investment.

With the possibility of changing interest rates, the risk premium may also be used to demonstrate how one's willingness to accept risk may influence investment decision. In the study of investment analysis, one will be able to see how that ranking of investments for an individual who is risk adverse differs from the ranking of the same investments for an individual who is risk neutral.

Factors That Determine An Investments Performance

This section deals with the factors that influence the performance of an investment. These factors can be categorized as potential income, cost of the investment, annual loan payments, risk, and tax implications.

Potential Income

The factors that determine the potential income from an investment are the expected annual revenue, the expected annual expenses, and the expected capital gain associated with the resale of the assets at the end of the investment. These factors can be illustrated by demonstrating how they would influence the investment in farmland. The expected annual revenue is the annual income

expected from the production of the land. The expected annual expense is the annual expected cost incurred from the production of the land. The expected annual revenue minus the expected annual expense yields the expected annual inflow or outflow of funds. The expected capital gain is the estimated resale value of the asset at the end of the planning horizon above the initial cost of the asset. This is usually applicable to investment in land. The capital gain is then income in the last year of the planning horizon.

Cost of the Asset

The cost of the asset should reflect all cash outlays involved with the purchase of the asset. These cash outlays should include the purchase price of the asset, and any miscellaneous fees incurred. Also in the cost of the asset is any estimated salvage value the asset may have at the end of its economic life or the planning horizon. This value is used in calculating the expected capital gain. If the project is entirely equity financed, this cost is subtracted from the present value of the cash flows. If debt financing is involved, only the downpayment is subtracted from the present value.

Annual Loan Payments

The annual loan payment includes the amount and the length of the loan, the rate charged for the loan, and the timing of the loan repayments. The repayment of the loan can be divided into two parts. One, the repayment of the principal which reflects the amount loaned and two, the repayment of the interest which reflects

the cost of debt capital. Both payments reduce the net present value of the investment.

Risk Associated with an Investment

The risk associated with an investment is based on the variability of returns, as stated earlier in this chapter. The following example presented by Penson, Lins and Klinefelter will explain the calculation process:

> From a particular investment, you believe you have a 10 percent chance of receiving as little as $1750, an 80 percent chance of receiving $2,000, and a 10 percent chance of receiving as much as $2,200 in returns in year one. Enter these values as shown in table 1. Multiplying these values results in column (3), then sum these results for the expected return for year one. This value should be entered in line (A). The next step is to determine the standard deviation of returns. Squaring the difference between the potential and the expected values in column (4), multiplying these squared differences by their chance of occurrence in column (2) and summing the resulting entries in column (5), determines that the variance of return is $10,226. Calculating the square root of this variance, we find in column (6) that the standard deviation would be $101. This value should be entered in line (B). The final step is the calculation of the risk per dollar of expected return. This is assessed by dividing the standard deviation of $101 on line (B) by the expected return on line (A). The result on line (C) is the risk per dollar of return. In this example, the risk per dollar of return of $.05 would indicate one could expect to earn as much as $1.05 or as little as $.95 for each dollar he expected to receive. This procedure can be performed for each year to determine the total risk per dollar of return.

The risk per dollar of return measures the riskiness of an investment. Once this is established, one must determine their risk premium required for the acceptance of the risk associated with the investment. This risk premium is added to the required risk-free rate of return and the expected rate of inflation to determine the

Table 1

	Potential Revenue Flow	Chance of Occurrence	Determination of the Expected Value	Squared Difference Between Potential and Expected Value	Determination of Variance	Determination of Standard Deviation
Approach	(1)	(2)	(3) (1X2(2)	(4) $[(1)-\text{line A}]^2$	(5) (2)X(4)	(6) $\sqrt{(5)}$
Pessimistic	$1750	10%	$175	$60,025	$6003	
Current Evidence	2000	80%	1600	25	20	
Optimistic	2200	10%	220	42,025	42.03	
Total		100%	$1995		$10,226 →	$\frac{\$101}{\sqrt{\$10,226}}$

A Expected Revenue $1995

B Expected Deviation of returns (6) $101

C Risk per dollar of expected return (line B ÷ A) $0.05

discount rate for the particular investment.

Tax Implications

Tax implications are involved in every investment. These implications include income taxes, investment tax credit, depreciation allowances, property taxes and various other factors. The aftertax cash flow is the revenue stream by which investments will be evaluated in this study. This is essential in investment analysis because the ranking of investments may differ greatly from an individual in a 20 percent tax bracket due to tax regulations.

Types of Investments a Farmer Would Consider

Purchase of Farmland

Of major concern to farmers and ranchers is the acquisition of land. It is important for agriculturalist to be able to accurately estimate the bid price they can economically justify for property. The value of farmland must be based upon its potential earning power. This earning power is of two sources. One is the net cash flow from the production of the land and the second is the capital gain at the time of resale.

The justified price for land can be calculated from the projected cash flows. These after-tax cash flows, when discounted to the present value, will yield the highest bid price for the land.

Purchase of Depreciable Assets

A farmer is often faced with the decision to purchase such depreciable assets as farm machinery, buildings, and breeding live-

stock. For each decision an investment analysis should be made. This analysis will determine that the investment is acceptable if the net present value is greater than zero.

Calculating the net present value of a depreciable asset requires identifying the value of the annual net cash flow and the appropriate interest factor. The calculation of the net present value for a depreciable asset is much like the calculation for land. However, for depreciable assets consideration should be given to investment tax credit and to depreciation allowances. These factors result in tax savings and thus increase an investments net present value.

Joint Investments

Joint investments are the combination of investments in land and investments in depreciable assets. Under many circumstances the two or more investments cannot be separated. The analysis for a joint investment is basically the same as for land and for depreciable assets in general. The one difference is the net present value must be summed together to be evaluated.

If a farmer was considering the acquisition of an additional two hundred acres of land, he may also purchase an additional tractor and other assets to farm these acres. These two investments would be inseparable. This is an example of a joint investment because the farmer would not make one investment without making the other.

Replacing Depreciable Assets

The optimal time of replacement for depreciable assets is important to the agriculturalist. To find this, the farmer must determine the year that the present value of replacement cost is the lowest. The information needed is the purchase price of the asset, the resale value at the end of year, the expected inflation rate, the repair cost including income lost from downtime, the depreciation allowances for the asset, and the discount rate.

The present value of replacement cost can be found by use of the following formula:

$$(3)\quad \text{Present Value of Replacement Cost} = \left[\text{Current Cost of the Asset} - \text{Resale Value}\right] \times \text{Inflation Rate} \times \left[\text{Repair Cost} - \text{Depreciation Allowances}\right] \div \text{Discount Rate}$$

From this formula, the present value of replacement costs can be found for each year of the asset's economic life. The optimal time to replace the asset will be the year that the present value of replacement is the lowest.

There are general rules that apply to the replacement time. The higher the discount rate used, the longer the replacement age

will be. The greater the expected inflation rate, the longer this age will be. The lower the expectation of repair cost also lengthens the replacement age.

Replacing Breeding Livestock

Ranchers must choose between two alternatives in replacing breeding livestock. They must choose whether to raise or to purchase their replacements. In this decision there are two points to consider one, the production side which is based upon person preference and two, the financial side which is based on maximizing after-tax profit. The financial side will be the viewpoint of this discussion.

With the raise strategy there is no investment tax credit or depreciation allowances. The cost of raising the replacement is an operating expense and is included as a deduction from taxable income. When the replacement is sold, it is considered a capital gain, assuming the requirements are met. As a capital gain only 40 percent of the sale value is taxable as ordinary income.

With the buy strategy there is investment tax credit and depreciation allowances which reduce taxes. The cost of keeping the replacement is an operating expense. When the replacement is sold, the sale price is 100 percent taxable income.

The decision to raise or buy replacement is determined to a large extent by ones marginal tax bracket. To illustrate this point assume $100 as a capital gain verses $100 as earned income, at a 20 percent and a 50 percent tax brackets.

Capital gain of $100:

tax rate 20% ($100 x 40%) X 20% = $8 in taxes
tax rate 50% ($100 x 40%) x 50% = $20 in taxes

Earned Income of $100:

tax rate 20% ($100 x 20%) = $20 in taxes
tax rate 50% ($200 x 50%) = $50 in taxes

It can be seen that the higher the tax bracket the more favorable the raise strategy becomes. To compare the buy strategy to the raise strategy, one must calculate the net present value of the after-tax cash flow. The strategy which yields the highest value is the more acceptable.

Other Considerations

This discussion of the types of investment has focused on one primary criterion. That criterion has been the economic feasibility of the investment. This has been measured by the magnitude of the net present value of the projected income stream. However, there is another criterion that must be considered. This is the cash flow feasibility of the investment. The cash flow feasibility is the ability of an investment to generate cash revenue to meet the additional demands for cash as they fall due.

An investment that is economically feasible is not always cash flow feasible. To determine if an investment is feasible from a cash flow standpoint, one must compare the timing of cash inflows to the timing of the cash outflows. This procedure will determine

if the cash received from an investment meets the cash obligations associated to it. If this is not the case, additional cash will be required. The additional funds must come from surplus cash or borrowing. An investment that is not feasible from a cash flow standpoint, if additional funds are not available, should be considered unacceptable.

Summary

The purpose of this chapter was to acquaint the reader with the concepts that underly investment analysis and to review the analysis procedure. The factors that are considered in the analysis process and how they influence an investment's performance were discussed. An outline was presented of the types of investments a farmer would consider. The outline described the data needed and the process involved to determine an investment's performance. Finally, the two criteria that an investment's performance is based upon were discussed. These criteria are the economic feasibility and the cash flow feasibility of the investment.

This information has been presented to give the reader an understanding of the overall methods and processes involved in this research. A knowledge of the material presented in this chapter will allow one to gain an insight to the working principles of the computer simulation model used in later chapters.

CHAPTER III

APPLICATION OF THE SIMULATION MODEL TO FARMLAND INVESTMENTS

The investment simulation model discussed in this paper was applied to the investment in farmland because of the importance of this investment to farmers. The model is applicable to other investment decisions; however, for this study only the farmland investment will be simulated due to time restraints. This maximum bid price simulation model was used to determine the maximum price a farmer could justify paying for land under a prescribed investment climate. This maximum bid price is determined in the model by substituting higher and higher bid prices for the property until the net cash flow stream from the property has a net present value of approximately zero. When the net present value is equal to zero, the net present value of the income stream is equal to the net present value of the cost associated with the investment. In this case, when the net present value of the cash flow stream is zero, a higher bid price cannot be unjustified.

The model was applied to the example of a Texas high plains dryland wheat farmer considering the acquisition of an additional 100 acres of tillable land in the 1975 period. The assumptions were made that the farmer had a beginning equity of $100,000, that he had no debt liabilities, that additional machinery would not be needed to produce the land and also that the farmer had a 3 to 1 leverage ratio. The simulation model was used to determine the max-

imum bid price this farmer could justify for the property under four different investment scenarios.

The four investment scenarios include an actual performance approach, with a fixed rate and a variable rate mortgage and a expected performance approach also with a fixed rate and variable rate mortgage. The actual performance is based on the actual yield and prices received for wheat, the actual appreciation in land values, and actual inflection and interest rates throughout the planning horizon years of 1975 to 1983. The expected performance is based upon the actual yield and prices received for wheat, the actual appreciation in land values, and the actual inflation and interest rates in the year of 1973 through 1975. This trend in the three year period prior to the investment was projected to continue throughout the planning horizon. The statistical data used in this simulation was provided by the Texas Agricultural Extension Service and the Dallas Federal Reserve Bank.

This investment simulation in farmland has attempted to reconstruct the investment decision of many farmers during the 1975 period. It was because of such investments that agricultural sector acquired a substantial amount of debt. The investment simulation has reproduced the investment of the farmer with imperfect information at the beginning of the planning horizon with the results of expected performance. The simulation has also reproduced the investment with perfect information at the end of the planning horizons by the actual performance as a measure of comparison. The results of this simulation are presented in Table 2.

Table 2 Investment Simulation of Farmland

	Actual Performance		Expected Performance	
	Fixed Rate Mortgage	Variable Rate Mortgage	Fixed Rate Mortgage	Variable Rate Mortgage
Maximum bid price per acre	419.00	412.00	1,624.00	1,447.00
Amount borrowed per acre	342.80	335.80	1,547.00	1,370.80
Total ending equity	111,492.00	97,114.00	160,646.00	130,962.00
Total ending debt	34,280.00	33,580.00	133,209.00	117,976.00

The results of this investment simulation yield three primary conclusions. First, by the comparison of the actual performance of the investment to that of the expected performance. It can be clearly seen that the imperfect information of the farmers concerning future political and economic trends, contributed directly to his over bidding the justifiable price for farmland. It is easy to understand why we currently have a crisis in agriculture when farmers as well as their lenders were willing to invest $1624 per acre for land that was worth $419 per acre. This problem of trying to service the loan used to acquire this over priced land is forcing many farmers out of business. The financial institutions that acquire this land as farmers default on their loans are faced with two serious decisions. They may choose to liquidate their holdings of farmland, but with current land values most could only recover a fraction of their outstanding debt. The other alternative for the financial institutions is to hold the farmland with the anticipation of higher land prices in the future. However, the financial institutions would then be faced with a reduced cash flow until the time of future liquidation. The severity of this risk associated with farm investments has contributed to the search for a better means of investment analysis in agriculture.

Second, by comparing variable rate mortgage to the fixed rate mortgage the effect of interest rate risk can be measured. This interest rate risk was shifted from the lender to the borrower by the use of the variable rate mortgages. With the variable rate mortgage during times of rising interest rates, the borrower is

continually exposed to rising and variable cost of production. From the results presented in Table 2, it can be assumed that a farmer can justify paying a higher rate of interest for a fixed rate mortgage than for a variable rate mortgage with a lower beginning rate of interest. Therefore it may also be assumed when a fixed rate mortgage is available at the same rate of interest as a variable rate mortgage that with the fixed rate mortgage the farmer can justify a higher maximum bid price for an investment.

Finally, from the results presented by the simulation model, it is evident that changing conditions can drastically alter the performance of an investment. The use of a simulation model, such as the one used in this study, would allow farmers and their lenders to quickly and easily evaluate how specific economic changes might alter the expected performance of a proposed investment. The use of such a model could aid in providing valuable foresight and allow one to adjust his investment decisions accordingly. The use of such a model would not make information more perfect nor would its use eliminate risk. However, the simulation model could provide a beneficial managerial tool that would assist in making prudent investment decisions.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study has examined a systematic process for analyzing investments in agriculture. This process has involved presenting the information required to perform the investment analysis as well as discussing the analysis procedure that may be used. In each of these investment situations the economic feasibility and the cash flow feasibility of the investment is considered. Also, a computer simulation model, which utilizes the budgeting techniques presented in this study, was applied to the investment in farmland. This simulation demonstrated how the use of such a managerial tool could aid investors in evaluating investments decisions in the presence of uncertainty.

The results of this study clearly indicate the dependence of agriculture on political, economic and biological forces. These forces will continue to change and shift throughout time; therefore, agriculturalists and their lenders must learn to account for this risk in their investment decisions. This allowance for uncertainty will reduce the possibility for the reoccurrence of the current economic dilemma facing the American farmer. This allotment for risk can be estimated with the aid of a simulation model by constructing the investments performance under varying conditions. It is important to note that the simulation model will not replace sound judgement. However, the use of such a managerial tool could allow agriculturalist to more accurately determine the justifiable

price of an investment.

The potential beneficators of this study include (1) the Texas Agricultural Extension Service who can provide this information to their clients and enable them to make more intelligent decisions (2) instructors of financial management who can use this information as a teaching aid and (3) students interested in observing a practical application of a simulation model used to analyze the impact of changing conditions upon an investment's performance.

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