TAX BREAKS IN U.S. AGRICULTURE:

WHO BENEFITS, WHO LOSES ?

by

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ABSTRACT

U.S. farmers face difficult economic times in the 1980s as net farm income declines, farm debt increases, and more farmers are forced out of business each year. The trend is toward fewer and larger farms. A corollary is that if the trend continues, the family farm as it is known today will cease to occupy a place in American agriculture.

Federal tax benefits have influenced the shift toward fewer and larger farms. In the process, these tax breaks have unintentionally hurt family farms. This thesis compares the cash flows and investment decisions of two hypothetical farms, one large and one small, under different assumptions of tax policy. It demonstrates that present policy favors large farms over small farms and favors capital-intensive farms over less capital-intensive ones. Policy-makers should recognize the impact of tax breaks on the trends in agriculture.

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TAX BREAKS IN U.S. AGRICULTURE:

WHO BENEFITS, WHO LOSES?

1.-INTRODUCTION

The 1980's have ushered in another era of hard times in U.S. agriculture--in a history of hard times interspersed with golden years. Today, many family-sized farms, those with gross annual incomes of between $40,000 and $100,000, that have been profitable in the past are no longer able to compete in the agricultural sector. High costs of doing business combined with low commodity prices threaten the long-term viability of many farms and ranches. Increasing numbers of farmers, particularly those with small or average-sized farms, must sell their businesses or declare bankruptcy because they cannot generate enough income to cover their costs and pay their debts.

Operations feeling the worst crunch seem to be farms who expanded during the booming agricultural economy of the 1970's. They expanded by increasing debts and today find those debts extremely difficult to service in the face of low commodity prices.

If present trends continue, the place of the family farm in agriculture will virtually disappear. This paper will illustrate how federal tax policy is helping to make farming more profitable for large farmers at the expense of small

farmers. However, tax policy is only one of a myriad of factors that determine the structure of agriculture. Section 1 of this paper reviews the recent history of U.S. agriculture in the 1970's to set the stage for an understanding of how existing tax policy can be seen as a continuation of expansionary production policies of recent decades.

Section 2 will examine the question of why farmers expanded their production and debt so rapidly in the 1970's, along with evaluating historical features of agriculture so that we can understand the 1980's in light of the past. In particular, this section sets the stage for viewing existing federal tax policy as a part of the doctrine of abundance, a policy approach springing from the optimistic belief that unlimited world demand exists for U.S. food and fiber. This philosophy is out of step with reality, as excess U.S. commodities pile up and overseas markets rely more heavily on non-U.S. production.

Section 3 will describe the tax policy of the 1980's, and treat it as an extension of the philosophy that we need to develop markets, rather than control agricultural production, to solve the historic problem of oversupply. Tax policy is aimed at increasing agricultural production through tax breaks that cheapen certain costs in agriculture--in particular, those of capital items. This section will discuss how tax breaks may lead to oversupply of agricultural goods and at the same time may encourage farmers to increase their debts, thus exacerbating the cost-price squeeze that farmers already face.

Tax breaks may also cause inequities for small farmers in comparison to large farmers because tax breaks give large farmers disproportionate advantages. In addition, tax breaks may encourage capital-intensive farming because the breaks are aimed at capital items rather than labor or other inputs.

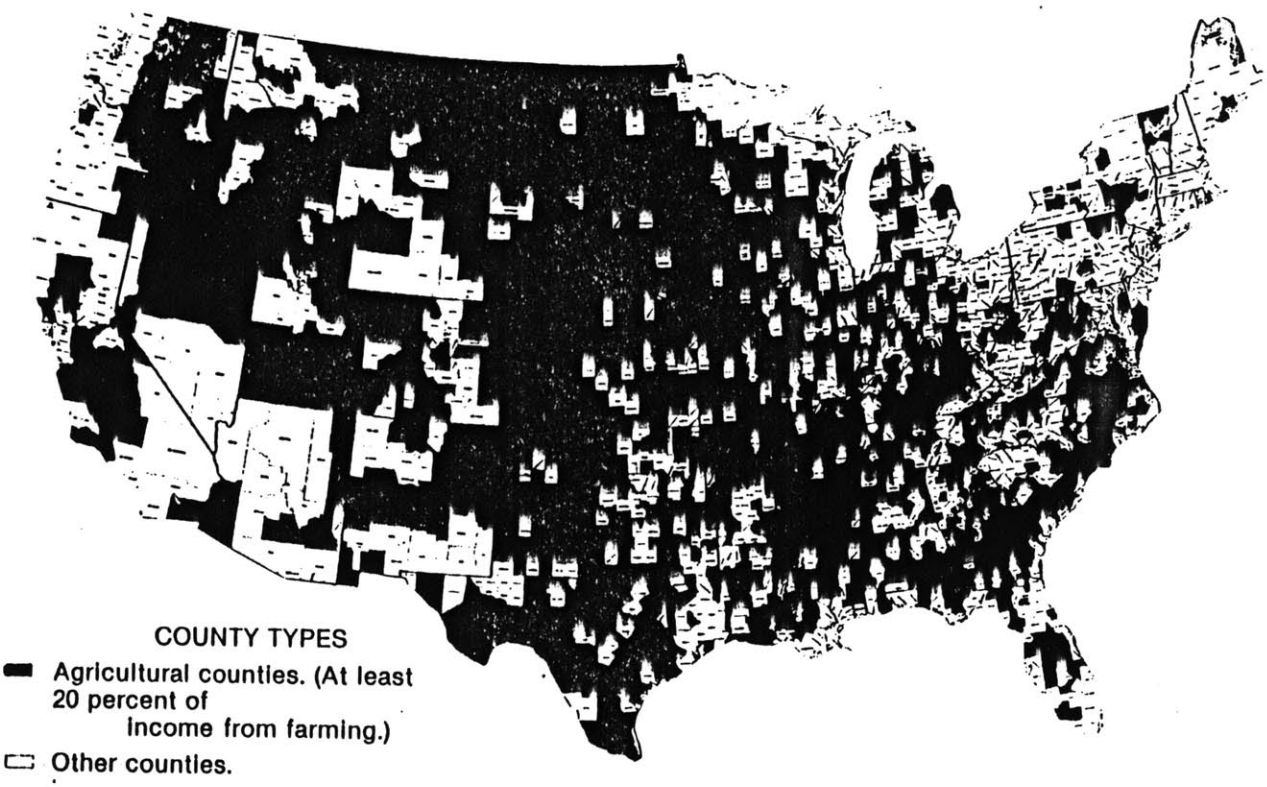
Section 4 will show that, based on representative income tax returns, large farms in general enjoy greater tax savings proportionately than do small farms. In addition, the more capital-intensive the farm is, the greater tax benefits it receives. In addition, as large farms invest more, they produce more, and the resulting greater production drives down the price for all farmers. In a competitive situation, large farmers are better able to compete than small farmers because the tax policy serves to lower their costs more than it does for small farmers.

U.S. agriculture has historically been unstable: increases in efficiency have cut the numbers of farmers necessary to produce the commodities demanded by the country and abroad. The numbers of farmers have been declining, and farmers are a decreasing percentage of the U.S. population. The increases in efficiency come with the greater use of technology, making agriculture more capital-intensive over time, so that one-third the hours of labor is necessary on farms today compared with only 25 years ago (USDA, Economic Research Service, Economic Indicators of the Farm Sector: Production and Efficiency Statistics, annual).

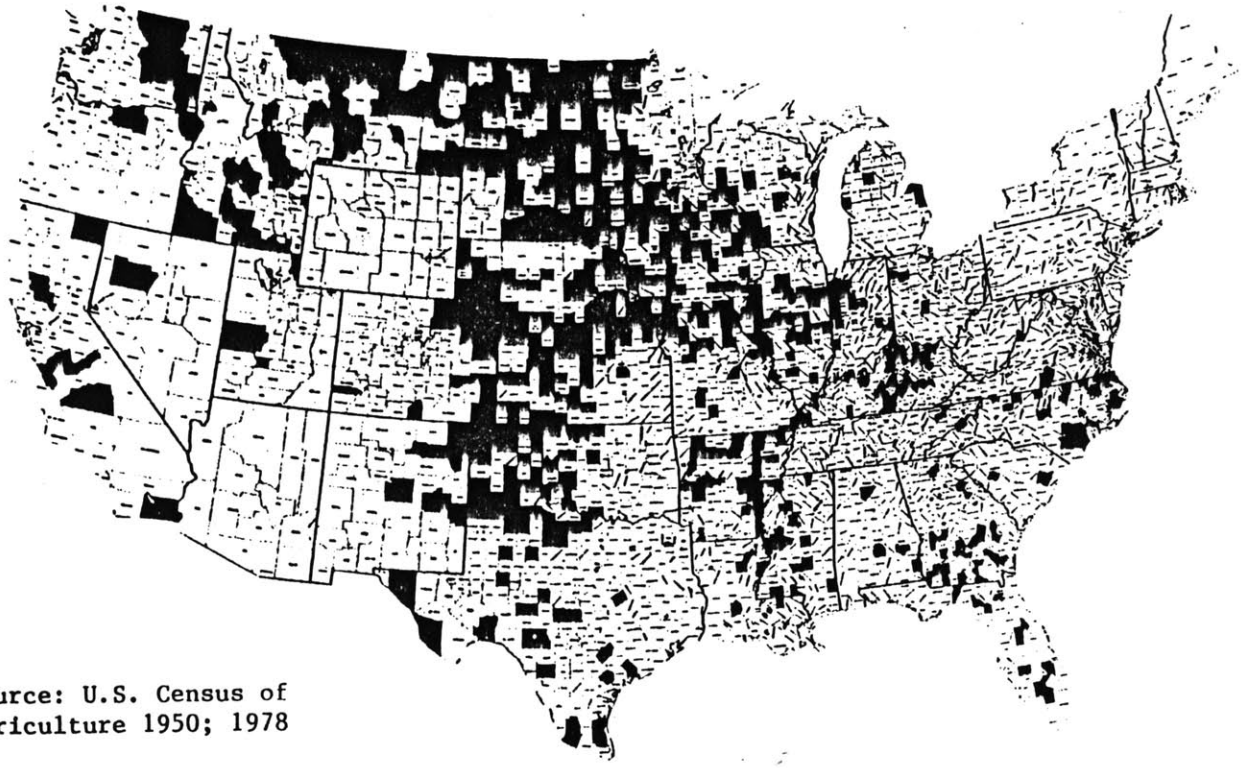
Agriculture typically follows a "boom and bust" pattern,

or a series of good years followed by "dust bowl" years. This cyclic pattern is partly a result of farming's dependence on weather and partly due to economic conditions unique to agriculture. After the profitable 1970's, the 1980's appear to be another depressed time in agriculture, particularly for family-sized farms. This paper will show how tax policy contributes to hard times for small farmers.

Agricultural Counties, 1950

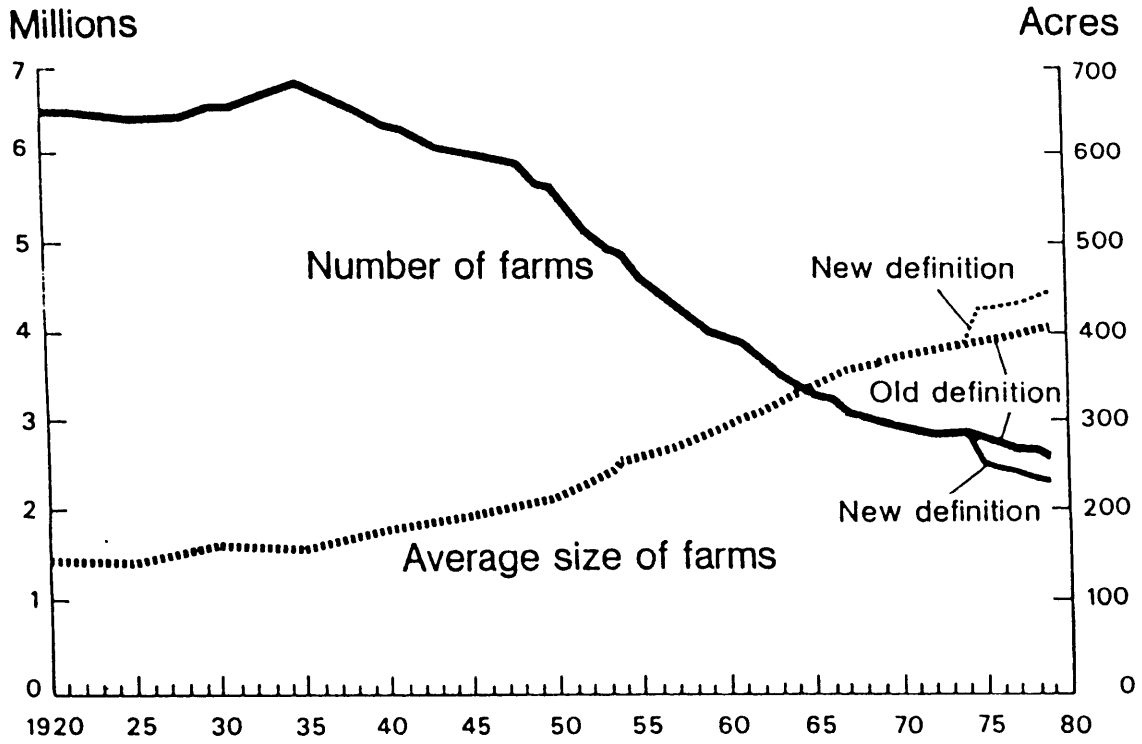


Agricultural Counties, 1975-1977



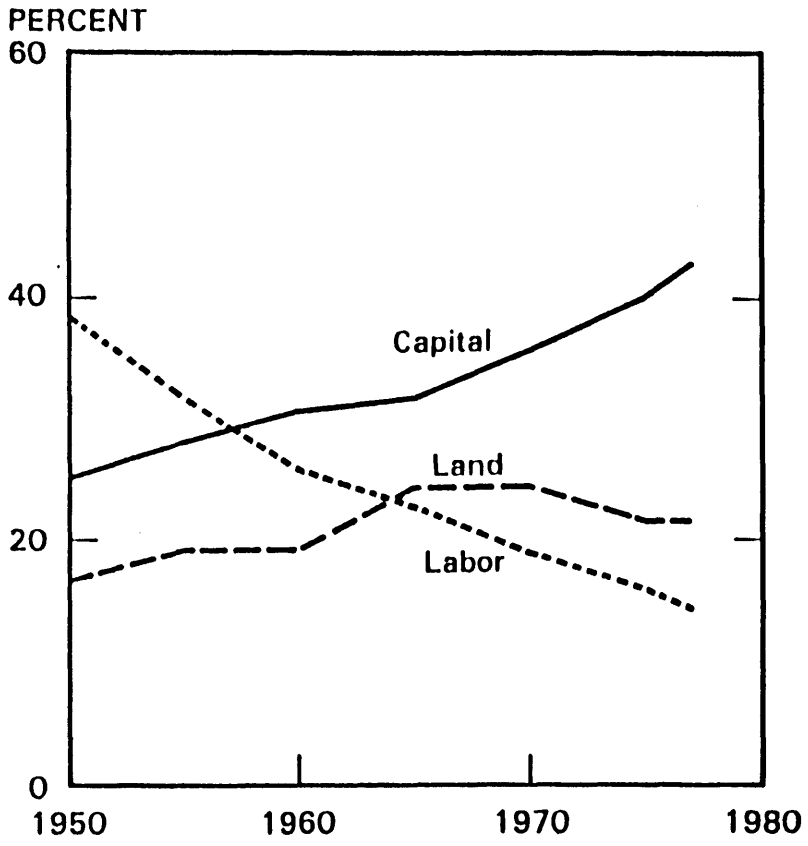
Source: U.S. Census of Agriculture 1950; 1978

Number and Average Size of Farms



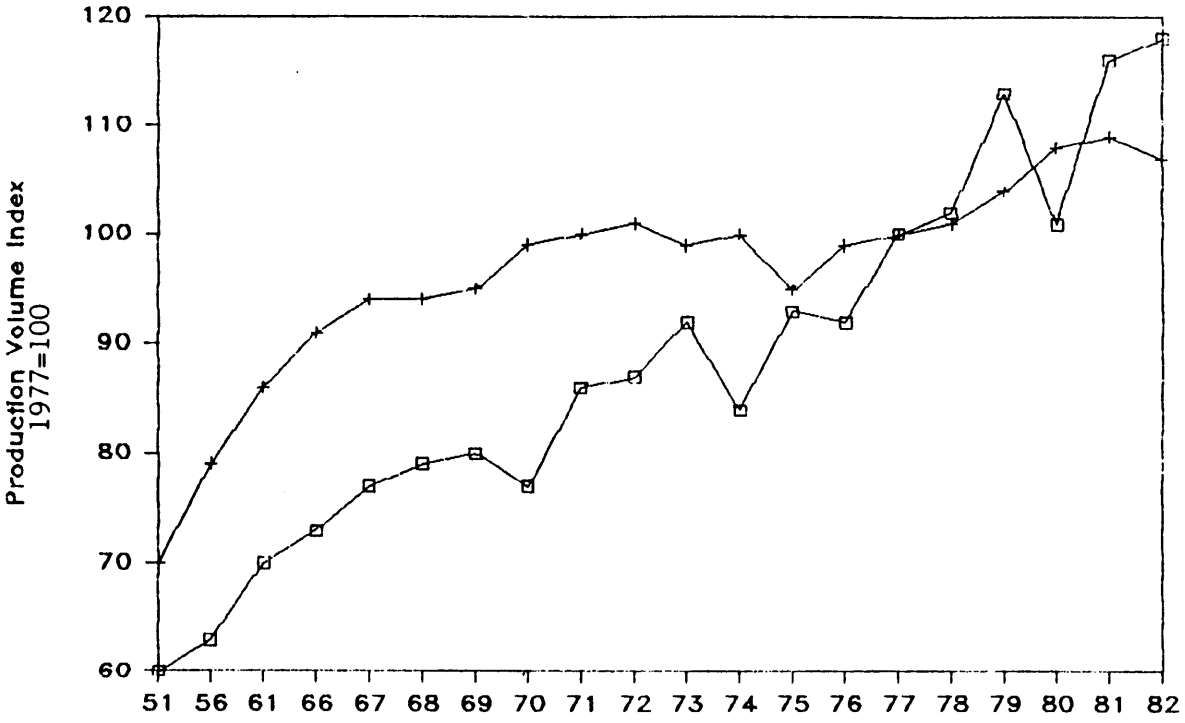
Sources: Average size of farms 1920-50 from 1964 Census of Agriculture.
All other data from Crop Reporting Board, USDA.

RESOURCES USED IN FARMING



Source: The Structure of Agriculture, U.S.D.A.

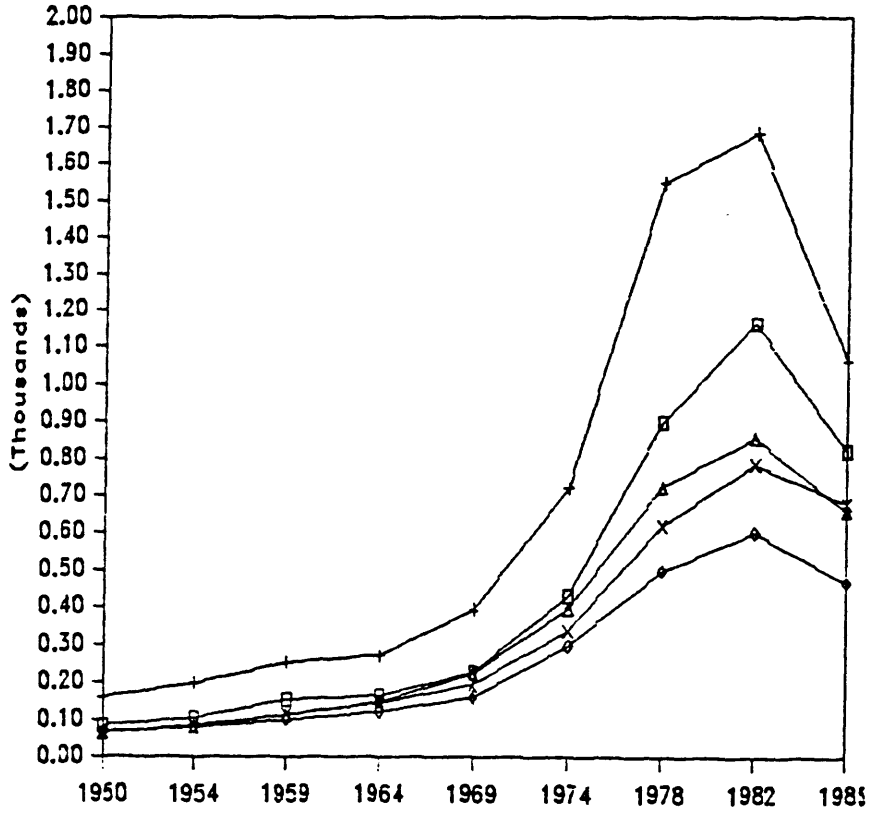
FARM PRODUCTIVITY HAS RISEN



Source: 1984 Fact Book of Agriculture, U.S.D.A.

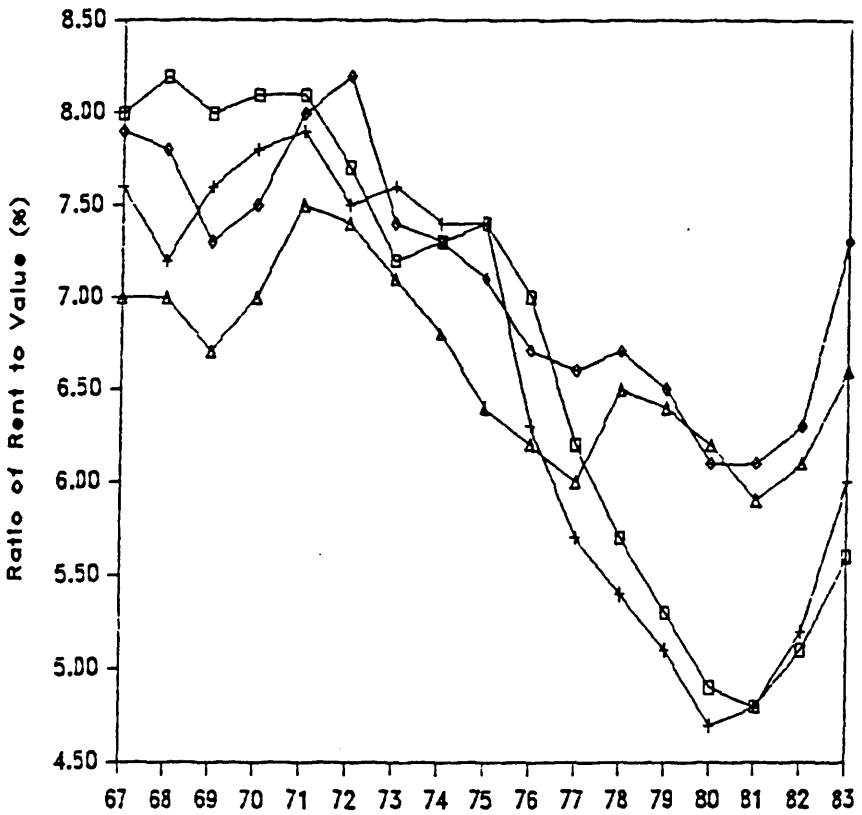
As farmland went up in value, the ability to pay for it from crops was reduced.

VALUE OF FARMLAND AND BUILDINGS
1950 - 1985



□ MINNESOTA + IOWA ◇ KANSAS △ MISSOURI × U.S.

RETURN ON INVESTMENT IN LAND
1967 - 1983



□ MINNESOTA + IOWA ◇ MISSOURI △ KANSAS

Source: 1982 U.S. Census of Agriculture
Farm Real Estate Values 1985, U. S. Dept. of Agriculture

2.- RECENT HISTORY OF U.S. AGRICULTURE: THE 1970s

2.1.- Current Difficult Times

A shift in the structure of agriculture is occurring--a shift that has been steady, but has reached newsworthy proportions today, perhaps because it is finally affecting the people seen as the bedrock of agriculture: the family farmers. However, both public awareness and awareness of the farmers themselves comes late; it may be that the concept of U.S. agriculture as we know it, composed of family farmers, and the policy guided at helping those farmers, is a distorted vision of reality. Things have already changed, and the face of agriculture is increasingly dominated by large corporate farms.

U.S farmers are in serious economic condition today. As shown below, debts are high and incomes low, meaning that farmers are again caught in a cost-price squeeze. Table 1 reflects aggregate figures for U.S. farming. The debt to asset ratio for all farms was 21.6% in 1984, making it the highest since 1940, when it was 21.1%. At the same time, income return as a percent of equity reflected an all-time low of 0.5%, from a high in 1950 of 5.9%. 1984 net farm income in constant 1967 dollars was at a record low of $5.4 billion. In current dollars, net farm income has actually declined since 1981, while gross farm debt continues to rise (see Table 1).

TABLE 1. FARM INCOME AND DEBT

Year	Debt/Asset Ratio (all farms)	Income Return (% of equity)	Net Farm Income (bil. 1967 $)	Net Farm Income (bil. current $)	Gross Farm Debt (bil. current $)
1940	21.1	3.4	10.7	4.5	8.7
1945	9.9	4.8	22.8	12.3	7.4
1950	10.6	5.9	18.9	13.6	11.2
1955	11.9	2.3	14.1	11.3	16.0
1960	13.0	2.7	13.0	11.5	22.5
1965	16.4	4.4	13.6	12.9	33.7
1970	18.1	3.5	12.4	14.4	48.9
1975	17.2	4.9	15.8	25.5	75.8
1980	17.0	1.3	8.6	21.2	154.9
1981	17.2	2.1	11.4	31.0	170.0
1982	19.2	1.3	7.7	22.3	188.5
1983	21.5	0.5	5.4	16.1	202.8
1984	21.6	na	na	na	201.0

(Sources: 1984 Agricultural Statistics, USDA Economic Indicators of the Farm Sector, ERS, USDA)

Table 2 reflects the trends in farm size and importance in terms of value of production: large farms' share of the total market is growing rapidly, while the family farm class, defined as producing between $40,000 and $100,000 gross income per year, continues to fall. (Note: Table 2 is not adjusted for inflation. However, when values are adjusted to constant 1967 dollars with a producers' price index, in 1982, farms producing over $100,000 as measured in 1967 dollars made up 47.6% of total value of production).

Total farm debt in current dollars was $46.25 billion in 1970. In 1984 farm debt had grown to $201.0 billion, and the largest single amount, $45 billion, was held by the family farmer group (sales of $40,000 to $100,000). This group comprised 16% of total farms, produced 17% of the value of production, and held 22% of the farm debt. At the same time,

the largest group, that with sales of $500,000 and over, made up one percent of farmers, produced 34% of the total value of production, and held 18% of the farm debt (USDA, ERS, Economic Indicators of the Farm Sector, 1984). (See Table 3).

TABLE 2. VALUES OF SALES BY ECONOMIC CLASS OF FARM (in millions current $)

CLASS OF FARM (Value of Farm Products Sold)		1964	% of Farms	1969	% of Farms	1974	% of Farms	1978	% of Farms	1982	% of Farms
less than	$2,500	1,143	3.3%	935	2.1%	697	0.9%	705	0.7%	558	0.4%
$2,500	$4,999	1,611	4.6%	1,346	3.0%	982	1.2%	1,191	1.1%	999	0.8%
$5,000	$9,999	3,653	10.4%	2,814	6.2%	2,138	2.6%	2,361	2.2%	2,008	1.5%
$10,000	$19,999	6,614	18.8%	5,693	12.5%	4,460	5.5%	4,425	4.1%	3,694	2.8%
$20,000	$39,999	7,114	20.2%	9,267	20.4%	9,247	11.4%	8,788	8.1%	7,142	5.4%
$40,000	$99,999	6,474	18.4%	10,073	22.2%	20,072	24.7%	23,059	21.4%	21,642	16.4%
$100,000	or more	8,538	24.3%	15,282	33.7%	43,694	53.8%	67,339	62.4%	95,545	72.6%
$100,000	$249,999									32,930	25.0%
$250,000	$499,999									19,851	15.1%
$500,000	or more									42,764	32.5%
Total Farm Production		35,147	100.0%	45,410	100.0%	81,290	100.0%	107,868	100.0%	131,588	100.0%

(Source: U.S. Bureau of the Census, Census of Agriculture: 1978 and 1982)

TABLE 3. TOTAL FARM DEBT (billion current $)

CLASS OF FARM (Value of Farm Products Sold)		1980	% Farms	1981	% Farms	1982	% Farms	1983	% Farms	1984	% Farms
less than	$5,000	8.5	5.5%	9.2	5.4%	9.8	5.2%	10.3	5.1%	10.6	5.3%
$5,000	$9,999	5.2	3.4%	5.7	3.4%	6.3	3.3%	6.5	3.2%	6.6	3.3%
$10,000	$19,999	7.5	4.8%	8.1	4.7%	8.8	4.7%	9.4	4.6%	9.4	4.7%
$20,000	$39,999	12.1	7.8%	12.9	7.6%	14.1	7.5%	15.2	7.5%	15.2	7.6%
$40,000	$99,999	34.4	22.2%	37.7	22.2%	42.1	22.3%	45.9	22.6%	45.1	22.4%
$100,000	$199,999	30.4	19.6%	34.0	20.0%	38.3	20.3%	41.2	20.3%	40.5	20.1%
$200,000	$499,999	27.6	17.8%	30.8	18.1%	34.8	18.4%	37.4	18.4%	36.8	18.3%
$500,000	or more	29.2	18.9%	31.6	18.6%	34.6	18.3%	36.9	18.2%	36.8	18.3%
All Farms		154.9	100.0%	170.0	100.0%	188.5	100.0%	202.8	100.0%	201.0	100.0%

(Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983)

2.2.- Background of Oversupply

Many factors contribute to the difficulty that farmers face. This section will discuss certain institutional features that affect trends in agriculture.

Agriculture has suffered from chronic overproduction. Economists see the problem as excess production capacity: too many resources produce too much product at a given level of prices. According to economists Cochrane and Ryan (1976), the underlying economic conditions which often contribute to oversupply are:

1.- Technological innovation in agriculture that has outdistanced innovation in other sectors of the economy, thus leading to rapid increases in agricultural productivity.

2.- The economic structure of the industry, in which for the most part there are many producers, none of whom have the power to influence market price through the sale of their commodity.

3.- The aggregrate inelasticity of the demand for food, meaning that the quantity of food demanded is relatively fixed--a given population needs a certain amount of food, and price has only a minor effect on demand.

4.- The difficulty of producers to shift in and out of farming due to the great reliance on specialized, expensive fixed capital (land and machinery), or what Samuelson (1964) refers to as the aggregate inelasticity of supply in agriculture.

Therefore, when productivity increases as a result of improved technology, farmers produce more with the same amount of resources, price falls because supply outstrips demand, and farm incomes fall. The result is an unstable economic environment in which the long-term trend is toward fewer farmers producing more output, as farmers less able to compete are forced out of business.

2.3.- Expansion of Production in the 1970s

Federal agricultural policy has encouraged expansion. For example, decades of government programs have been aimed at expanding production through greater efficiency. In addition, the system of price supports, primarily intended to stabilize farm income, also serves to encourage greater production.

2.3.1.- Doctrine of Abundance

In the post-World War II period at least two dominant ideologies governed the way people saw the farm problem. The first, New Deal scarcity economics, arose from the desire to avoid repeating the combination of huge crop surpluses and accompanying low prices that existed during the Depression (Matusow, 1970). Adherents of the concept believed in supply management, or limiting supply, to offset the effects of continued productivity increases arising from technological improvement.

The second ideology, referred to as the doctrine of

abundance, was based on the concept that it was not necessary to limit output, that instead the answer was to ensure that demand increased at least as fast as supply, thus maintaining price levels (Matusow, 1970). Proponents looked primarily toward expanding world markets for U.S. products.

Since the 1930's federal policy has followed a mix of the two concepts, both supporting crop prices and attempting to build world markets in order to control the cyclic swings of scarcity/high prices and overproduction/low prices. However, price supports alone, without effective controls on production, only make the problem of overproduction worse. The government has put price supports in place but has failed to control production adequately.

In fact, in recent decades federal policy has held price supports in place and simultaneously urged U.S. farmers to increase production, aiming at the world market. During the 1970's in particular, farmers saw a bright future in expanding overseas markets, leading to hopes that all excess U.S. commodities would be demanded by world markets at good prices. Domestic prices were high due to relatively low stockpiles of crops, encouraging farmers to increase production.

2.3.2. - Increased Debt

Debt and expansion came into vogue for farmers, and large numbers jumped on the bandwagon, shrugging off the fear of debt instilled by the Depression years. U.S. farm policy again subscribed to the doctrine of abundance; Secretary of

Agriculture Earl Butz exhorted farmers to "plant fencerow to fencerow" to take advantage of the golden years ahead.

However, overseas demand for U.S. food products has not materialized to the levels predicted by policy-makers in the 1970's (Avery, 1985). One reason is the strong dollar, making U.S. exports expensive for other countries. Another is the U.S. use of embargoes on agricultural exports to express its position on political issues, as in the Russian wheat embargo, with the effect of raising doubts as to the dependability of supply of U.S. products. Most important is the recent unforseen growth of productivity in Asia and Europe, in which many countries have changed from net importers of agricultural goods to net exporters.

In the early 1980's production reached high levels, resulting in vast quantities of crops piling up in government and private storage, and commodity prices began to fall (USDA, 1984). As people saw farming becoming less profitable, the demand for land fell, and land prices dropped. However, the economy of the 1970s had been built on the expectation that land values would continue to rise, commodity prices would remain high, and agricultural exports would reach record levels (Farm Real Estate Market Developments, USDA, 1978). Farmers who expanded their operations at that time paid all-time high prices to purchase the land.

Thus, the current heavy farm debt is a legacy of the optimistic outlook of the 1970s. During the early 1980s farmers' borrowing capacity diminished as farmland values

declined, forcing them to rely more heavily on returns from current production to pay expenses (USDA, Farm Sector Review, 1983). Decreases in commodity prices in the 1980s make the land debt very difficult to service.

Another factor that has affected the character of agriculture is the Farm Credit System, the country's largest agricultural lender. Federally chartered and specifically set up to aid small farmers after the Depression, during the 1970s the System's expansionary credit policies encouraged substantial increases in farm debt. Today, because of the low profits in agriculture and large debts undermined by falling land prices, record numbers of Farm Credit banks are failing. The bank closings contribute to the vicious cycle by reducing credit availability to remaining farmers, and also by shifting loanable funds to other more profitable sectors of the economy.

Also, debt is the price of capital-intensification. Farm policy and economic circumstances have encouraged farmers to replace labor with capital, and debt is the consequence of doing so.

The current high debt loads will likely result in greater numbers of farms going out of business, especially from the middle size stratum. Family farms are at a disadvantage because they feel pressured to get bigger, yet may not be able to handle the necessary debt that accompanies increase in size. Many family-sized farms that have been profitable in the past are not able to compete today. In fact, the firms now

most at risk are some of the most efficient in the industry but suffer a critical weakness: they hold an excessive amount of debt as measured by the economic environment of the 1980s (Harl, 1985).

Debt to asset ratios are increasing for all farms, including large and small. Large farms hold the highest debt/asset ratios but also reflect the highest returns. (See Tables 4, 5, and 6.)

Trends that are appearing now are sharply higher bankruptcy rates among farmers, difficulty in obtaining credit, and record production causing low prices for crops and livestock. The net result is low farm incomes and lack of profitability.

The farmers best able to take advantage of technological improvements, credit opportunities, and federal subsidies such as large water projects, are large farmers or outside investors who control large amounts of money (Villarejo, 1981). The trend is for large farms to get larger and for wealth and production to be concentrated into the hands of a smaller percentage of farmers.

TABLE 4. DEBT TO ASSET RATIOS FOR ALL FARMS

CLASS OF FARM (Value of Farm Products Sold)		1980	1981	1982	1983	1984
less than	$5,000	12.4	12.4	13.9	14.7	15.1
$5,000	$9,999	11.8	12.0	13.3	14.3	14.6
$10,000	$19,999	12.7	12.8	14.4	15.6	15.7
$20,000	$39,999	12.8	12.8	14.4	15.8	15.9
$40,000	$99,999	15.2	15.4	17.3	19.5	19.4
$100,000	$199,999	16.7	17.1	19.1	21.6	21.5
$200,000	$499,999	19.9	20.4	22.6	25.7	27.0
$500,000	or more	30.4	30.2	32.4	36.5	36.6
All farms		17.0	17.2	19.2	21.5	21.6

(Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983)

TABLE 5. TOTAL RECEIPTS PER DOLLAR OF CAPITAL FOR DIFFERENT-SIZED FARMS

CLASS OF FARM (Value of Farm Products Sold)		1982
less than	$2,500	$0.01
$2,500	$9,999	$0.04
$10,000	$19,999	$0.06
$20,000	$24,999	$0.08
$25,000	$39,999	$0.09
$50,000	$99,999	$0.13
$100,000	$199,999	$0.16
$200,000	$249,999	$0.13
$250,000	$499,999	$0.15
$500,000	or more	$0.37

(Source: Economic Indicators of the Farm Sector: Farm Sector Review, 1983)

TOTAL 6. INCOME, EXPENSES AND RETURN FOR VARIOUS SIZED FARMS

CLASS OF FARM (Value of Farm Products Sold)	1980			1983		
	Total Income	Total Expense	Percent Return	Total Income	Total Expense	Percent Return
less than $5,000	2.4	4.9	(neg)	2.4	5.2	(neg)
$5,000 $9,999	2.7	3.7	(neg)	2.9	3.9	(neg)
$10,000 $19,999	4.6	5.4	(neg)	4.6	5.6	(neg)
$20,000 $39,999	8.8	9.3	(neg)	9.0	9.6	(neg)
$40,000 $99,999	26.9	26.0	3.3%	27.8	27.3	2.1%
$100,000 $199,999	26.4	23.7	11.4%	26.7	24.9	7.2%
$200,000 $499,999	25.9	22.1	17.2%	25.7	23.3	10.3%
$500,000 or more	41.5	29.1	42.4%	39.8	30.0	32.4%
All Farms	139.2	124.2	12.1%	139.0	129.8	7.1%

(Source: Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983)

3.- THE EFFECT OF 1980s TAX POLICY ON AGRICULTURE

3.1.- Description of Policy

Today U.S. agriculture is characterized by overproduction, a subsidy program of price supports, and a system of tax breaks that seems to favor large farms over small ones and to encourage overinvestment in agriculture. Just as federal farm policy has added to a chronic oversupply of agricultural products, federal tax incentives may also be adding to oversupply.

For purposes of this paper, tax breaks or benefits will be defined as provisions of federal tax policy that offer an income tax savings as a result of an agricultural operator's decision to sell production or to purchase or sell capital assets. Tax breaks work by allowing taxpayers to understate their true incomes or to create artificial losses when true economic losses do not exist.

Specifically, this paper examines the effects of the investment tax credit and the more generous depreciation rules known as accelerated cost recovery system (ACRS) provided for in the Economic Recovery Tax Act of 1981. The 1981 legislation represented a striking acceleration in cost recovery (Harl, 1985).

3.2.- Tax Policy: Encouraging Oversupply

Tax policy itself encourages debt and expansion, because it encourages investment in capital items. Tax breaks

encourage greater production of agricultural goods, when farmers already face depressed prices caused by oversupply. Second, tax policy also appears to give preference to large producers over small. The tax breaks give competitive advantages to farmers or investors in high income tax brackets over those in low tax brackets. They also appear to aid capital-intensive farms over less capital-intensive ones. As a result of these influences, federal tax policy may be unintentionally helping to speed the process by which family farms are replaced by larger operations.

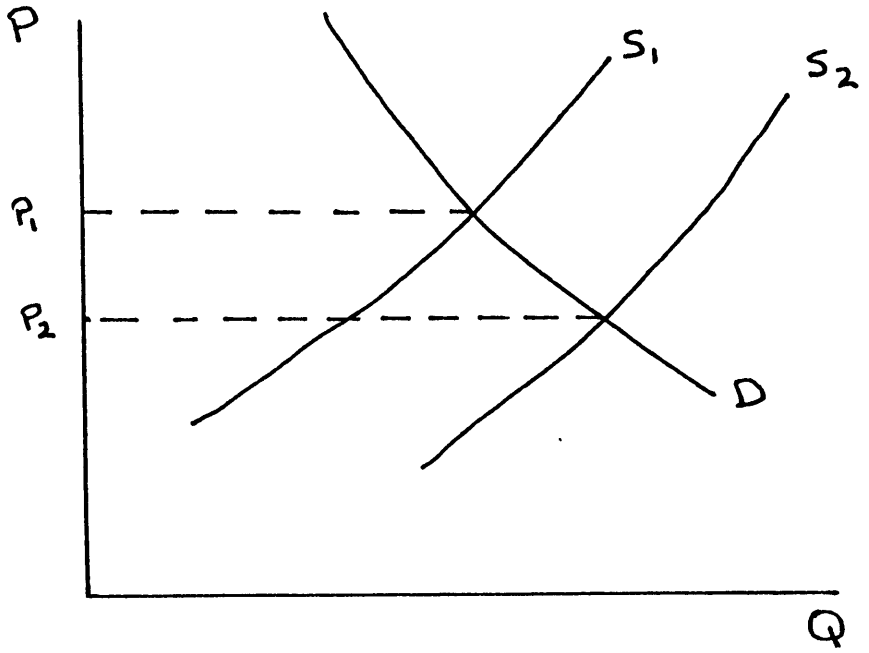
Excess production capacity causes low prices, thus reducing farm profitability, particularly of small or average-sized farms because they tend to have lower profit margins and less risk-taking ability than larger farms. The outcome is that the market squeezes out those least able to compete. Proponents of neoclassical economic theory describe this phenomenon as a normal functioning of the market, claiming that equilibrium is reached when inefficient producers are forced out.

However, this paper considers the situation of producers who are being forced out not because they are inefficient, but because they are unable to take advantage of benefits offered by federal tax law, an institution outside of the market. Or, rather than being inefficient, those marginal farmers being forced out of business are those that don't have the competitive advantage through tax benefits that larger farmers do.

U.S. federal tax policy encourages production by allowing tax breaks to certain agricultural activities. The breaks make investment in agriculture comparatively less costly than investment in other productive sectors.

3.3.- Effect of Tax Policy on Small Farms

The following graphs illustrate the situation. Graph 1 represents the supply and demand schedules for agricultural goods in general, with an equilibrium price and quantity of production. Because federal tax breaks reduce the cost of production, tax breaks essentially shift the supply curve out, since producers can afford to produce more of a commodity at that same price.



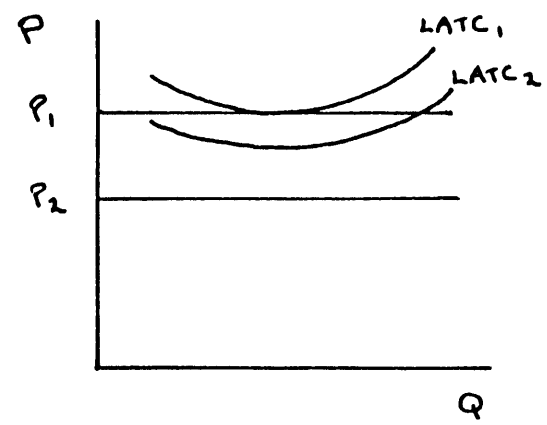
GRAPH 1. EFFECT OF TAX BENEFITS ON AGGREGATE SUPPLY AND DEMAND FOR AGRICULTURAL GOODS

The result is that, assuming no change in demand, the equilibrium price falls and the equilibrium quantity increases. These changes in price and quantity also occur when technological innovation increases, which leads to increased supply and decreased price. But federal tax policy is an institutional constraint, rather than a natural functioning of the market, and its effects must be judged in light of its policy aims. If the aim was to increase the quantity of agricultural output and lower prices, then it has accomplished its aims. But the argument must be carried one step further to determine who is benefited by such government action and who stands to lose; i.e., the equity question of federal tax policy.

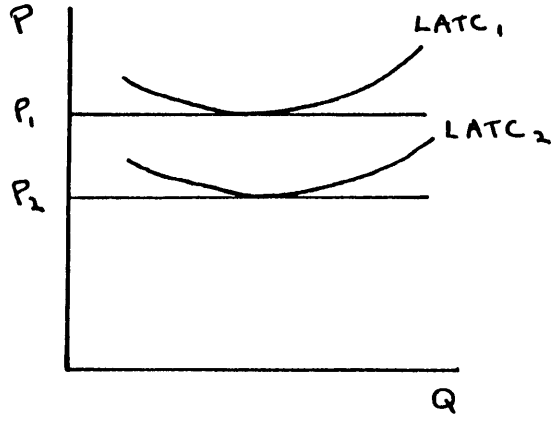
A simplistic assumption would be to say that the effect of federal tax breaks on individual farmers is identical, that they all face lower prices, but at the same time they all enjoy lower costs of production due to tax savings resulting from tax breaks. However, it appears that large farms, whose owners are in higher tax brackets, enjoy a greater proportion of the tax savings than do small farms. As a result, all farms face the same drop in price, but small farms fail to share equally in the reduced costs afforded by the tax breaks.

Graph 2 and 3, respectively, show the situations of a small farm and a large farm, where the small farm's costs remain the same or decline slightly as a result of tax breaks, but the large farm's costs decline proportionately more (LATC:

long-run average total cost). Therefore, the large farm's gross income declines less than that of the small farm.



GRAPH 2. EFFECT OF TAX BENEFITS ON A SMALL FARM



GRAPH 3. EFFECT OF TAX BENEFITS ON A LARGE FARM

Rather than the tax breaks aiding family farmers and ranchers, the breaks instead benefit large farms and investors in land and livestock who have sources of income outside of agriculture. Simply put, the tax breaks are of little use to a full-time farmer or rancher who typically makes little taxable income. However, the breaks are of considerable value to an operator who has a large taxable income, either from farming or from sources outside of agriculture, because these operators can take advantage of tax losses and avoid paying appreciable income taxes. In effect, it costs investors and large farmers less to produce the same commodity that a family farm does, because they can take advantage of tax breaks.

3.4.- Components of Federal Tax Policy

Following are the major tax benefits that affect agricultural producers. These benefits carry different implications based on whether a producer is in a high tax bracket or a low one. There is also a cumulative effect when a particular agricultural operation can take advantage of more than one benefit at a time.

1.- The investment tax credit--10% of the purchase price of capital goods can be written off as a direct tax credit, meaning that, if sufficient taxes are owed, the actual cost of the good is 90% of the stated purchase price.

2.- Accelerated depreciation--ordinarily, businesses apportion capital expenditures as offsets to income on a schedule that corresponds to the useful life of the item. However, under accelerated depreciation, a business is allowed to depreciate an item much faster than under, say, straight line depreciation based on its useful life. Accelerated depreciation is a strong incentive for operators in a high tax bracket to invest in capital items, because deductions are worth more the higher the tax bracket.

3.- The capital gains provision--certain capital goods, such as land and breeding livestock, are eligible for capital gains consideration when sold. Instead of taxing the profit from the sale of these items as ordinary income, items eligible for capital gains are taxed on only 40% of the difference between the cost and the sale price.

Therefore, investment in land or breeding herds becomes attractive, because investors can convert resources into a capital gain rather than ordinary income, thus avoiding taxes on 60% of the income.

4.- Cash accounting--agricultural producers are one of the few groups of taxpayers allowed to use cash accounting instead of accrual accounting. Cash accounting allows farmers to write off expenses of a productive activity in one year and receive income from that activity in a later year. Therefore, even though a taxpayer has actually made a profit, he can reduce his annual taxable income either by purchasing items before the end of the year or by delaying receipt of income until the next year. In effect, the farmer receives an interest-free loan in the amount of taxes not paid, because he can arbitrarily choose when he receives income or pays expenses.

5.- The interest deduction--all interest costs can be deducted directly from income. Since most farms borrow money to purchase their most expensive items, which are land and equipment, most of the initial payments is interest. Therefore, the deduction encourages debt-funded investment. And, taxpayers in high brackets receive a greater benefit then those in lower brackets, such as a small or beginning farmer, because the deductions are worth more. An example of the combined effect of two of these tax breaks is the following: expanding breeding herds gets a special tax benefit thanks to both cash accounting and

capital gains. The cost of raising breeding stock is expensed, or subtracted directly from income. Then, at the time of sale, the entire sale price is treated as a capital gain and is 60% exempt from tax.

So, taxpayers using cash accounting deduct 100% of the cost of raising a breeding or dairy animal but count only 40% of its sale price as income. This can create losses for tax purposes even from profitable operations. In addition, tax law encourages producers to expand the size of breeding herds, because income invested in raising breeding stock to add to the herd is not taxed until sale of the herd. Therefore, overproduction results.

TABLE 7. EFFECT OF CASH ACCOUNTING AND CAPITAL GAINS ON HIGH AND LOW BRACKET TAXPAYERS

Tax Bracket	20%	50%
Cost of Producing a Stock Cow	$500	$500
Sale price when culled	$400	$400
Before-tax Loss (Production Cost - Sale Price)	($100)	($100)
Tax Savings (Production costs x tax bracket)	$100	$250
Taxes on sale of the Cull Cow (Sale price x 40% x bracket)	$32	$80
Net tax Savings (Tax Savings from deducting production costs less taxes on sale)	$68	$170
Net After-tax profit or loss (net tax savings less before-tax loss)	($32)	$70

(Source: Center for Rural Affairs, 1985)

Both operations spend $500 to raise a stock cow and sell it for $400 when culled, for a net before-tax loss of $100. However, the 50% bracket taxpayer has a net tax savings of $170.50; after taxes he makes $70. But the 20% bracket taxpayer suffers an after-tax loss of $32 because his tax savings are much lower.

In summary, tax breaks add to the expansionary trend of agricultural production in the following ways:

1.- Subsidizing investment in capital items, thereby encouraging capital-intensive expansion,

2.- Encouraging replacement of labor with capital, because they make the cost of added capital relatively cheaper, thus further increasing debt,

3.- Giving a greater advantage to large and more capital-intensive farms than to smaller, less capital-intensive farms, thus weighting the scales against small and, especially, beginning farmers, and

4.- Encouraging increased farm debt, because debt is necessary to fund the investment that the tax breaks encourage; greater debt is the price farmers pay to take advantage of the tax breaks. Greater debt leads to greater risk as the debt to asset ratio increases in any business, and thus, greater chances for failure and bankruptcy.

4.- EFFECT OF TAX BREAKS ON SMALL AND LARGE FARMS

4.1.- The Hypothesis

This section tests the hypothesis that federal tax policy may have inequitable effects on small farms compared to large farms. The hypothesis is that the investment tax credit and the accelerated cost recovery system benefit large farms more than small, and that these two tax breaks give greater benefits to farms that are more capital-intensive than other farms. Therefore, tax breaks may be encouraging farms to become larger and more capital-intensive. The attached worksheets reflect use of a model to compare income, expenses, investment, and before-and-after tax profitability of two representative farms.

The model developed in this section provides a framework to answer the following questions:

1.- Do accelerated depreciation and investment tax credits provide an advantage to farmers over the alternative method of straight-line depreciation?

2.- Do these two tax breaks give different proportional benefits to different size classes of farms?

3.- Do these two tax breaks give differing benefits to farms that are more capital-intensive than to farms that are less capital-intensive?

4.2.- The Investment Tax Credit

The investment tax credit allows businesses a direct

credit against tax owed of 10% of the purchase price of most capital items. The ITC is a clear benefit to businesses because it reduces the tax burden, not simply as another before-tax expense, but as a direct and immediate credit against taxes owed. As a result, it is worth considerably more than other tax advantages that simply appear as increased expenses for tax purposes.

4.3.- Accelerated Depreciation

Depreciation is figured using formulas based on the cost of the capital expenditures. It is a non-cash expense and is important only because it reduces taxable income. It does so through producing a tax shield, which is defined as the taxes not paid as a result of the depreciation allowed. The tax shield is equal to the depreciation allowed multiplied by the tax bracket. Therefore, the higher the tax bracket (and also, the higher the depreciation), the less income tax is owed. The tax shield is often treated as a cash inflow.

The Accelerated Cost Recovery System (ACRS) rules for depreciation that were legislated in 1981 allow businesses to depreciate capital items more quickly than did the previous tax rules, thereby reducing the tax burden to businesses. Under ACRS, tangible property is depreciated over a three-year, five-year, 10-year, 15-year, or 18-year recovery period, depending on the type of property (IRS, 1984).

Under these provisions much of the depreciable real property in a farm or ranch operation is recoverable over five

years on an accelerated basis. Tile lines, fences, feeding floors, paved drives, grain bins, silos, livestock confinement facilities, outside power and light systems, and water distribution systems are all depreciable as five year property in addition to being eligible for 10 percent investment tax credit. Before the Economic Recovery Tax Act of 1981 became effective, these assets were depreciated over periods of 10 to 30 years (Harl, 1985).

Most assets placed in service after December 31, 1980, are depreciated using ACRS. These assets are known as recovery property, and the taxpayer may expense, or deduct directly against income, up to $5000 of the property (referred to as a Section 179 expense). This property is also eligible for the investment tax credit.

Before figuring the investment tax credit and the basis for depreciation, the taxpayer must reduce the amount of the investment by the amount of the Section 179 deduction. The resulting figure, which is the adjusted investment on the worksheet, is multiplied by 10% to arrive at the investment tax credit. Next, the adjusted basis for depreciation is figured by subtracting one-half the amount of the investment tax credit from the adjusted investment.

4.4.- The Model

To analyze the tax effects on the basis of individual farms, I constructed a model in which two farms are compared:

one a large farm and one a small farm. Four charts using the basic model illustrate four different sets of conditions (see Appendix 1). Chart I illustrates the first set of conditions. They are that both the large farm and the small farm invest the same percentage in capital items and in which ACRS and ITC are used to figure tax shields. In Chart II both farms invest the same proportion in capital items but tax shields are figured using the straight line method. Chart III reflects the condition that the large farm is more capital-intensive than the small, and that ACRS and ITC are used. Finally, in Chart IV the large farm is again more capital-intensive than the small but straight line depreciation is used in place of ACRS and the investment tax credit.

First, the model illustrates the before-tax net operating income. Second, it shows the effect on taxable income of depreciation and the investment tax credit. Next, it analyzes the value of depreciation tax shields. Finally, it shows after-tax net operating income, which includes the addition to income of the present value of depreciation tax shields. Because depreciation allowances set up a schedule of deductions each year, the present value of the depreciation is the value today of the discounted flow of income arising from those annual depreciation allowances.

The analysis is based on two 1984 federal income tax returns, one of a large farm with gross income of $560,000 (operator #1) and one of a small farm with a gross income that year of $80,000 (operator #2). Operator #1 represents large

farms in higher tax brackets. Because the accepted definition of a family farm is one that produces gross annual income of between $40,000 and $100,000, operator #2 is representative of a family farm.

TABLE 8. BEFORE-TAX NET OPERATING INCOME, HIGH AND LOW TAX BRACKET FARMS

	Operator #1	Operator #2
Income	$560,000	$80,000
Operating Expense	($404,000)	($57,700)
Capital Investment	($100,000)	($14,300)
Net Operating Income (NOI)	$156,000	$22,300
Ratio of NOI to Current Investment	156%	156%

(Source: Appendix, Chart I.)

4.4.1.- Before-Tax Net Operating Income

To illustrate the before-tax cash flow of the two farms, the table above is exerpted from Chart I in the appendix. Gross annual income for farm #1 is $560,000 and $80,000 for farm #2. Expenses are divided into operating expense and capital investment. Operating expenses are approximately 72% of gross income. Each farm spends the same proportion of total expenditures on capital ($100,000 for farm 1 and $14,300 for farm 2, each of which is approximately 20% of total expenditures).

The before-tax cash flow is simply gross income less all expenses. Net operating income is an arbitrary figure chosen as a measure of a firm's well-being. It reflects income after operating expenses only have been subtracted. Finally, the

ratio of net operating income to the current year's investment is used as an indicator of profitability. In the table above, the ratio is identical for both farms.

TABLE 9. DEPRECIATION TAX SHIELDS

	Operator #1	Operator #2
PV of Dep. Tax Shield	$33,002	$1,077
Section 179 Shield	$2,100	$700
ITC	$9,500	$930
TOTAL PV OF TAX SHIELDS	$44,602	$2,707
Present Value of DPS per $1 of Investment	$0.45	$0.19
Marginal Tax Rate	42.0%	14.0%
Discount rate used	7%	7%

(Source: Appendix, Chart I.)

4.4.2. - Depreciation Tax Shields

The depreciation tax shields are the value to the operator of receiving the tax breaks. The tax savings value of one year's capital investment can be found by finding the present value of the depreciation tax shields. This value is found by discounting the five year flow of tax shields back to the present (i.e., 1984). In Table 9 above, the present value of the total tax shields arising from the $100,000 investment by Operator #1 comes to $44,602. This figure comes from multiplying the allowable depreciation amounts in each year by the operator's marginal tax rate, then discounting those amounts to the present.

An important measure of analysis is the value of the depreciation tax shield per dollar of investment. This is

useful for a comparison of the effect of the tax breaks on the two farms. The principal criterion for determining the effect of tax breaks is the difference between the present value of one year's tax shield that results from a large farm's capital investment and that for a small farm. The differences suggest that large farms receive a greater present value of depreciation tax shields for each dollar invested than do small farms.

TABLE 10. AFTER-TAX NET OPERATING INCOME

	Operator #1	Operator #2
Net Operating Income	$156,000	$22,300
Less depreciation	$95,250	$13,835
Taxable income	$60,750	$8,465
Tax rate	25.5%	7.2%
Tax	$15,491	$609
ITC	$9,500	$930
Tax Owed	$5,991	$0
Marginal Tax Rate	42.0%	14.0%
After-tax NOI	$90,480	$19,178
Pres. Val. of DTS	$44,602	$2,707
After-tax profit	$135,082	$21,885
PV DTS/after-tax profit	33.0%	12.4%
Ratio of after-tax profit to investment	135.1%	153.0%

(Source: Appendix 1, Chart I.)

4.4.3.- After-Tax Net Operating Income

Using the marginal tax rate, after-tax net operating income is derived from net operating income. To estimate an after-tax measure of profit, the present value of the depreciation tax shield from the current year's investment is

added to the after-tax net operating income. From this point, a relevant comparison is what percentage of after-tax profit does the tax shield contribute. A differential percentage reflects greater benefit to one operator over another. Finally, the ratio of after-tax profit to investment provides a comparison between the two farms.

4.5.- Assumptions

Capital-intensiveness is defined in a relative way for purposes of this paper as the proportion of total expenses that a firm spends on capital items. If a firm spends a higher proportion of its total expenses on capital items than does another firm, the first firm is defined as the more capital-intensive of the two. It is also assumed that when a firm is more capital-intensive, it spends a lesser proportion of its total budget on labor inputs, thereby leaving total expenses unchanged. An assumption is that large farms are more capital-intensive than small.

For the sake of simplicity, all capital investment is assumed to fall into the category of "five-year property" under the ACRS tax rules.

It is assumed that the average useful life of the capital items purchased is 10 years. Therefore, when the straight line method of depreciation is employed, the value of the depreciation tax shield must be discounted over 10 years, compared with 5 years for accelerated depreciation.

It is assumed that the large farm is in a higher tax

bracket than the small farm. It is also assumed that both of the farms are organized as sole proprietorships andtherefore subject to the individual tax rates. However, some evidence suggests that more large farms than small incorporate, so extending the analysis to all farms is tenuous. For example, in 1982 corporate farms produced 34% of the value of farm products sold but made up only 2.7% of all farms by number. Individual or family farms produced 59% of the total value but made up 86.9% of total farms (1982 Census of Agriculture).

4.6.- Results

Results in the four cases support the hypotheses that tax breaks benefit large farmers over small, and capital-intensive farms over less capital-intensive farms.

The first question posed in the previous section asked if accelerated depreciation and the ITC give a larger advantage to an operator than does the straight line method of depreciation. In answer, we compare the large farm in Chart I under ACRS and ITC with the large farm in Chart II under straight line depreciation. We find that the new tax rules yield a $.45 return measured in present value of depreciation tax shields per dollar of investment, while the old rules yield a $.27 return for the same investment. Thus, the new rules clearly yield an advantage over the old rules. A similar relationship exists when we compare the value of the tax shields to the small operator under both sets of tax rules.

In addition, the after-tax profit of the large farm in Chart I was $135,082, compared with after-tax profit of $123,410 for the large farm in Chart II, leading to the conclusion that ACRS and ITC are worth more to producers than the straight-line method.

When weask, "Are large and small farms treated equally under the ACRS and ITC rules?", we compare the value of the depreciation tax shields to each operator in Chart I alone. The value of the shields per dollar of investment is $.45 to the larger operator and only $.19 to the small operator. In other words, the present value of the tax shields ($44,602 for the large farm versus $2,707 for the small) is 16 times greater for the large farm than for the small farm, even though the large farm is only seven times as large as the small farm. Clearly, ACRS and ITC reward the large farmer more than the small farmer.

The third point is to ask whether the new tax rules give greater benefits to capital-intensive versus less capital-intensive farms. We can compare the large farm in Chart I with the large farm in Chart III, since the only difference is that of capital expenditures. We find that the value of the depreciation tax shield per dollar of investment by the more capital-intensive farm is $.45, and the value to the less capital-intensive farm is the same at $.45. Therefore, there is no difference when analyzing the question through use of depreciation tax shields.

However, when we look at after-tax operating profit, we

find that it is $176,178 in the more capital-intensive operation and only $135,082 in the less capital-intensive farm. In addition, the present value of the depreciation tax shields contributes 35.5% of the after-tax profit for the former compared to 33.0% of the less capital-intensive operation. Therefore, while the value per dollar of investment is the same, the added volume of capital investment results in greater profit for the operation that is more capital-intensive.

These simplified examples of two farms of different sizes and capitalization illustrate that the present tax rules provide incentives for investors in agriculture to become larger and more capital-intensive.

5.- CONCLUSION

The U.S. has historically supported the concept of the family farm, believing that it formed the bedrock for stable agricultural communities that revolve around a farming system composed of many family-owned farms. Ironically, however, while federal tax policy pays lip service to helping the family farm, it may actually be helping to put it out of business. Tax breaks such as the investment tax credit and accelerated depreciation clearly work to the advantage of large capital-intensive farms over small farms. In addition, tax breaks make the historical problem of oversupply worse.

Other sources also indicate that large farms tend to incorporate, which would decrease the tax rate because the maximum corporate rate is lower than the maximum individual rate (Hassebrook, 1985). Nevertheless, even if they do incorporate, such large farms still receive tax incentives that are greater than those of small farms because the corporate tax rate is higher than that for small farms.

The income tax is progressive, so operations with a higher absolute amount of profit are taxed at a higher rate than small ones, meaning that the small operators are benefited by the tax rate itself. However, a progressive tax structure combined with tax breaks influences who will do further investing. For every dollar of investment, the operator receives a depreciation tax shield in the amount of the depreciation times his tax rate. Large farms get

proportionately larger tax breaks, so their true investment cost is relatively less than for small farms.

Serious implications exist for the future. The small farm category often contains young and beginning farmers, who are less well-established and probably have a larger debt load and lower profitability than larger farms, and therefore lower tax bracket, so they can't use the tax breaks as well as the large farms. Even though large farms show up as the most heavily leveraged (highest debt/asset ratio), they are most likely in a higher tax bracket, so real cost of debt is not as high to them as it is to the small or beginning farmer who is also heavily leveraged.

As more farmers go out of business, the vicious circle continues:

--land ownership is consolidated in the hands of a few

--even if the displaced farmers remain in agriculture as tenant farmers, a shift has still occurred: principally, that ownership has been consolidated.

--production is concentrated in the hands of a few (and it is a top-heavy, capital-intensive, mode of production at that)

--rural communities will undergo further breakdown, as farms consolidate: owners of larger farms bank in larger urban centers instead of many farmers banking at small banks in their own communities. Implement dealers, fertilizer dealers, and other service industries go out of business in the small towns. In addition, it is possible

that larger consolidated farms use machinery more efficiently, demanding fewer but larger pieces of equipment than the many small farms of the past. This would cause a shift in demand for machinery. So, while there still might be production and farming and people, the nature of agriculture in that area will change dramatically.

Family farms are worth maintaining. Contrary to the popular assumption that large farms are more efficient than small farms, some studies suggest that small farms are actually more efficient (Raup, 1984). Many medium-sized farms that support a diverse and stable system of rural communities still makes economic sense for this country, rather than coming to depend on a few huge enterprises that have reached the size they have primarily through attributes of size itself.

More importantly, however, the entire fabric of rural communities depends on small farms. Displaced people and disrupted communities are a real concern--presently the "heartland" of America is undergoing a wrenching change as a result of the failing farm economy that includes bank closings, farm implement dealer and other service industry closings, along with the shift in land ownership and control, toward fewer owners of larger amounts of land and production.

The economic landscape and the farm picture in the U.S. are changing. Rather than simply attributing change to the natural course of events, I believe we are obligated to investigate the extent to which federal policies have dictated

this change. Citizens and policy-makers must make a decision: should they simply accept this change or adjust the policies so that they conform to our perceptions of what the agricultural economy should be. The future of a small-farm agricultural economy rests on this decision.

APPENDIX

CHART I

2 Farms with same capital investment under the condition of investment tax credit and accelerated depreciation

BEFORE-TAX NET OPERATING INCOME

	Operator #1	Operator #2	
Income	560,000	80,000	--Farm 1 is assumed to be 7 times as large as Farm 2
Operating Expense	(404,000)	(57,700)	--Expenses are assumed to be 72% of gross income
Capital Investment	(100,000)	(14,300)	--Capital investment of Farm 1 is 7 times as large as Farm 2
Net Operating Income (NOI)	156,000	22,300	--Income less operating expense
Ratio of NOI to Current Invest	156%	156%	--Net operating income divided by capital investment

FIGURING DEPRECIATION AND ITC	Operator #1					
Investment	100,000					
Section 179 Deduction	5,000	--Operators can expense up to $5,000 of current investment				
Adjusted Investment	95,000	--Investment minus Section 179 deduction				
ITC	9,500	--Investment tax credit = 10% of adjusted investment				
Basis	90,250	--Adjusted investment minus one-half the ITC				
Discount rate	7%	--Low-risk 1984 discount rate				
Year	1	2	3	4	5	
5-year ACRS schedule (%)	15%	22%	21%	21%	21%	--percent ACRS depreciation allowed each year
Depreciation	13,538	19,855	18,953	18,953	18,953	--Basis multiplied by ACRS percent
Depreciation Tax Shield	5,686	8,339	7,960	7,960	7,960	--depreciation multiplied by marginal tax rate = DTS

	Operator #2				
Investment	14,300				
Section 179 Deduction	5,000				
Adjusted Investment	9,300				
ITC	930				
Basis	8,835				
Discount rate	7%				
Year	1	2	3	4	5
5-year ACRS schedule (%)	15%	22%	21%	21%	21%
Depreciation	1,325	1,944	1,855	1,855	1,855
Depreciation Tax Shield	186	272	260	260	260

DEPRECIATION TAX SHIELDS	Operator #1	Operator #2	
PV of Dep. Tax Shield	33,002	1,077	--Present value of 5 years of depreciation tax shields resulting from current year's investment
Section 179 Shield	2,100	700	--Sec. 179 deduc. x marg. tax rate (not discounted)
ITC	9,500	930	--taken in current year so not discounted
TOTAL PV OF TAX SHIELDS	44,602	2,707	--Above 3 lines added together
Present Value of DPS per $1 of Investment	$0.45	$0.19	

AFTER-TAX NET OPERATING INCOME			
Net Operating Income	156,000	22,300	--from above
Less depreciation	95,250	13,835	--tot. depr. allowed in 1 yr., assume same cap. invest. ea. yr.
Taxable income	60,750	8,465	--net operating income minus depreciation
Tax rate	25.5%	7.2%	--rate figured from 1984 IRS Tax Rate Schedules
Tax	15,491	609	--taxable income times tax rate
ITC	9,500	930	--investment tax credit
Tax Owed	5,991	0	--tax less investment tax credit = tax owed
Marginal Tax Rate	42.0%	14.0%	-- = change in tax divided by change in taxable income
After-tax NOI	90,480	19,178	--multiply net operating income by 1 minus the marg. tax rate
Pres. Val. of DTS	44,602	2,707	--present value of the depreciation tax shield, from above
After-tax profit	135,082	21,885	--After-tax NOI plus present value of deprec. tax shield
PV DTS/after-tax profit	33.0%	12.4%	--Pres. val. of deprec. tax shield as a % of after-tax profit
Ratio of after-tax profit to investment	135.1%	153.0%	--After-tax profit divided by investment

CHART II

2 Farms with same capital investment with condition of straight-line depreciation

	Operator #1		Operator #2		
Investment	100,000		14,300		
Useful Life (years)	10		10		
Discount Rate	7%		7%		
Depreciation Year	Deprec.	Tax Shield	Deprec.	Tax Shield	--tax shield = deprec. times marginal tax rate
1	10,000	3,800	1,430	200	--no ITC or Section 179 deduction allowed
2	10,000	3,800	1,430	200	
3	10,000	3,800	1,430	200	
4	10,000	3,800	1,430	200	
5	10,000	3,800	1,430	200	
6	10,000	3,800	1,430	200	
7	10,000	3,800	1,430	200	
8	10,000	3,800	1,430	200	
9	10,000	3,800	1,430	200	
10	10,000	3,800	1,430	200	
Total Depreciation	100,000		14,300		--total deprec. allowed in one yr., assuming same capital investment each year
Depreciation Tax Shields	38,000		2,002		--total depreciation x marg. tax rate
PV of Tax Shield arising from current year's investment	26,690		1,406		--present value of tax shields, using 7% discount rate
PV Depr. Tax Shield per $1 of Investment	$0.27		$0.10		--above line divided by current year's investment
AFTER-TAX NET OPERATING INCOME					
Net Operating Income	156,000		22,300		
Less Depreciation	(100,000)		(14,300)		
Taxable Income	56,000		8,000		
Tax Rate	24.4%		7.2%		
Tax	13,664		576		
Marginal Tax Rate	38.0%		14.0%		
After-tax NOI	96,720		19,178		
PV of Depr. Tax Shields	26,690		1,406		
After-tax Profit	123,410		20,584		
PV DTS/after-tax profit	21.6%		6.8%		
Ratio of after-tax profit to investment	123.4%		143.9%		

CHART III

Large farm more capital-intensive than small; under conditions of investment tax credit and accelerated depreciation

BEFORE-TAX NET OPERATING INCOME

	Operator #1	Operator #2	
Income	560,000	80,000	--Farm 1 is assumed to be 7 times as large as Farm 2
Operating Expense	(364,000)	(57,700)	--Expenses are assumed to be 72% of gross income
Capital Investment	(140,000)	(14,300)	--Capital investment of Farm 1 is 7 times as large as Farm 2
Net Operating Income (NOI)	196,000	22,300	--Income less operating expense
Ratio of NOI to Current Invest	140%	156%	--Net operating income divided by capital investment

FIGURING DEPRECIATION AND ITC	Operator #1	
Investment	140,000	
Section 179 Deduction	5,000	--Operators can expense up to $5,000 of current investment
Adjusted Investment	135,000	--Investment minus Section 179 deduction
ITC	13,500	--Investment tax credit = 10% of adjusted investment
Basis	128,250	--Adjusted investment minus one-half the ITC
Discount rate	7%	--Low-risk 1984 discount rate

Year	1	2	3	4	5	
5-year ACRS schedule (%)	15%	22%	21%	21%	21%	--percent ACRS depreciation allowed each year
Depreciation	19,238	28,215	26,933	26,933	26,933 0	--Basis multiplied by ACRS percent
Depreciation Tax Shield	8,080	11,850	11,312	11,312	11,312	--depreciation multiplied by marginal tax rate = DTS

	Operator #2
Investment	14,300
Section 179 Deduction	5,000
Adjusted Investment	9,300
ITC	930
Basis	8,835
Discount rate	7%

Year	1	2	3	4	5
5-year ACRS schedule (%)	15%	22%	21%	21%	21%
Depreciation	1,325	1,944	1,855	1,855	1,855
Depreciation Tax Shield	186	272	260	260	260

DEPRECIATION TAX SHIELDS	Operator #1	Operator #2	
PV of Dep. Tax Shield	46,898	1,077	--Present value of 5 years of depreciation tax shields resulting from current year's investment
Section 179 Shield	2,100	700	--Sec. 179 deduc. x marg. tax rate (not discounted)
ITC	13,500	930	--taken in current year so not discounted
TOTAL PV OF TAX SHIELDS	62,498	2,707	--Above 3 lines added together
Present Value of DPS per $1 of Investment	$0.45	$0.19	

AFTER-TAX NET OPERATING INCOME			
Net Operating Income	196,000	22,300	--from above
Less depreciation	133,250	13,835	--tot. depr. allowed in 1 yr., assume same cap. invest. ea. yr.
Taxable income	62,750	8,465	--net operating income minus depreciation
Tax rate	26.0%	7.2%	--rate figured from 1984 IRS Tax Rate Schedules
Tax	16,315	609	--taxable income times tax rate
ITC	13,500	930	--Investment tax credit
Tax Owed	2,815	0	--tax less investment tax credit = tax owed
Marginal Tax Rate	42.0%	14.0%	-- = change in tax divided by change in taxable income
After-tax NOI	113,680	19,178	--multiply net operating income by 1 minus the marg. tax rate
Pres. Val. of DTS	62,498	2,707	--present value of the depreciation tax shield, from above
After-tax profit	176,178	21,885	--After-tax NOI plus present value of deprec. tax shield
PV DTS/after-tax profit	35.5%	12.4%	--Pres. val. of deprec. tax shield as a % of after-tax profit
Ratio of after-tax profit to investment	125.8%	153.0%	--After-tax profit divided by investment

CHART IV

Large farm more capital-intensive than small; conditions of straight-line depreciation and no ITC

	Operator #1		Operator #2		
Investment	140,000		14,300		
Useful Life (years)	10		10		
Discount Rate	7%		7%		
Depreciation Year	Deprec.	Tax Shield	Deprec.	Tax Shield	--tax shield = deprec. times marginal tax rate
1	14,000	5,320	1,430	200	--no ITC or Section 179 deduction allowed
2	14,000	5,320	1,430	200	
3	14,000	5,320	1,430	200	
4	14,000	5,320	1,430	200	
5	14,000	5,320	1,430	200	
6	14,000	5,320	1,430	200	
7	14,000	5,320	1,430	200	
8	14,000	5,320	1,430	200	
9	14,000	5,320	1,430	200	
10	14,000	5,320	1,430	200	
Total Depreciation	140,000		14,300		--total deprec. allowed in one yr., assuming same capital investment each year
Depreciation Tax Shields	53,200		2,002		--total depreciation x marg. tax rate
PV of Tax Shield arising from current year's investment	37,365		1,406		--present value of tax shields, using 7% discount rate
PV Depr. Tax Shield per $1 of Investment	$0.27		$0.10		--above line divided by current year's investment
AFTER-TAX NET OPERATING INCOME					
Net Operating Income	196,000		22,300		
Less Depreciation	(140,000)		(14,300)		
Taxable Income	56,000		8,000		
Tax Rate	24.4%		7.2%		
Tax	13,664		576		
Marginal Tax Rate	38.0%		14.0%		
After-tax NOI	121,520		19,178		
PV of Depr. Tax Shields	37,365		1,406		
After-tax Profit	158,885		20,584		
PV DTS/after-tax profit	23.5%		6.8%		
Ratio of after-tax profit to investment	113.5%		143.9%		

BIBLIOGRAPHY

Anderson, James R. "Who Is Subsidizing Whom? American Agriculture and the Federal Government." Testimony presented to the Committee on the Budget, U.S. House of Representatives, February 11, 1985.

Avery, Dennis. "Looking Ahead: Agriculture in the Next 20 Years." U.S. Agriculture in a Global Economy--The 1985 Yearbook of Agriculture. Washington, D.C.: U.S. Government Printing Office, 1985.

Baker, Timothy G. "An Income Capitalization Model of Land Value with Income Tax Considerations." Purdue Agricultural Experiment Station. West Lafayette, Indiana. June 1981.

Brealey, Richard, and Stewart Myers. Principles of Corporate Finance. New York: McGraw-Hill, 1984.

Bryant, William R., Eddy L. LaDue, and Robert S. Smith. Tax Considerations for the Growing Farm. Cornell University, Ithica, New York. May 1973.

_____. Tax Reform and Its Effect on the Dairy Farmer. Cornell University, Ithica, New York. May 1973.

California Institute for Rural Studies. Large Scale Farming in California. Davis, California. 1978.

Carmen, Hoy F. "The Taxing Effects of Tax Reform." Western Fruit Grower. September 1981.

Center For Rural Affairs, Annual Report 1985-1986. Nebraska, 1986.

_____. Center for Rural Affairs Newsletter. Walthill, Nebraska. Monthly issues 1984-1986.

Cochrane, Willard W. and Ryan, Mary. American Farm Policy--1948-1973. Minneapolis, Minnesota: University of Minneapolis Press, 1976.

Davenport, Charles, Michael D. Boehlje, and David B. H. Martin. The Effects of Tax Policy on American Agriculture. U.S. Department of Agriculture, Economic Research Service. Washington, D.C.: U.S. Government Printing Office, February, 1982.

Gilles, T.J. "Tax Shelter Farming--Meanwhile Traditional Farmers Eat Dust." Montana Magazine. January-February 1986.

Gillin, Bill. "Northern Plains Resource Council's Family Farm Task Force." The Plains Truth, newsletter of the Northern Plains Resource Council. Vol. 15, No. 7. September 1985.

Harl, Neil E. "Economics of Tax Shelter Activity in the United States." presented at Seminar on Tax Shelters and Resource Allocation in Agriculture, Iowa State University, Ames, Iowa, 1985.

_____. "The Financial Crisis in U.S. Agriculture." unpublished paper, Iowa State University, Ames, Iowa, 1985.

League of Rural Voters. "U.S. Farm Policy and World Hunger: The Deadly Connection." internal paper, 1985.

Martin, William E. and Jimmie R. Gatz. "Effects of Federal Income Taxes on Cattle-Ranch Prices." American Journal of Agricultural Economics. 50, No. 1, February 1968.

Matusow, Allen J. Farm Policies and Politics in the Truman Years. New York: Atheneum, 1970.

Meisner, Joseph C., and V. James Rhodes, "The Changing Structure of U.S. Cattle Feeding." Columbia, Missouri, November 1974. (Special Report of the Agricultural Economics Department, University of Missouri, No. 167.)

Paarlberg, Donald. American Farm Policy, a Case Study of Centralized Decision-Making. John Wiley and Sons, Inc., 1964.

Paarlberg, Donald. Farm and Food Policy: Issues of the 1980's. Lincoln, Nebraska: University of Nebraska Press, 1980.

Raup, Philip M. "Some Question of Value and Scale in American Agriculture." American Journal of Agricultural Economics. 60, No. 2, (May 1978)

Samuelson, Paul. Economics, an Introductory Analysis. New York: McGraw-Hill, 1964.

Sinclair, Ward. "The World Isn't Dying for American Farm Products Anymore." The Washington Post, 13 January 1986, p. 23-24.

Staiger, William B. "Californian Sees Beef Industry Future." speech reprinted in The Record Stockman, 6 December 1984.

U.S. Bureau of the Census. 1978 Census of Agriculture. Washington, D.C.: U.S. Government Printing Office, 1979.

_____. 1982 Census of Agriculture. Washington, D.C.: U.S. Government Printing Office, 1983.

U.S. Department of Agriculture. 1984 Agricultural Statistics. Washington, D.C.: U.S. Government Printing Office, 1984.

U.S. Department of Agriculture, Economic Research Service. Economic Indicators of the Farm Sector: Costs of Production, 1984. Washington, D.C.: U.S. Government Printing Office, September 1985.

_____. Economic Indicators of the Farm Sector: Farm Sector Review, 1983. Washington, D.C.: U.S. Government Printing Office, August 1984.

_____. Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. Washington, D.C.: U.S. Government Printing Office, September 1984.

_____. Economic Indicators of the Farm Sector: Production and Efficiency Statistics, 1983. Washington, D.C.: U.S. Government Printing Office, August 1984.

_____. Farm Real Estate Market Developments. Washington, D.C.: U.S. Government Printing Office, July 1978 and May 1982.

U.S. Department of the Treasury. Internal Revenue Service. Your Federal Income Tax. Washington, D.C.: U.S. Government Printing Office, Rev. November 1985.

_____. 1984 Federal Income Tax Forms and Instructions. Washington, D.C.: U.S. Government Printing Office, 1984.

Villarejo, Don. New Lands for Agriculture: The California State Water Project. Davis, California: California Institute for Rural Studies, August 1981.