

A Flat Rate Tax: Impacts on Representative Hog and Grain Farms

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This paper focuses on identifying shifts in the tax burden within agriculture associated with various flat tax proposals by comparing their effects on farms with different enterprise combinations, resource bases, and financial characteristics. In general, the flat tax imposes higher average tax burdens on small farms and yields a tax cut from ERTA laws for large farms even when the tax base is broadened.

In response to growing concern about the efficacy of Federal tax laws, the Reagan administration has proposed overhauling the present federal tax system. Reagan's tax reform proposal seeks to reduce the number of individual tax rates to three with the top individual income tax rate at 35 percent and to increase overall corporate taxes. A number of Congressional bills in recent years have also urged major tax reform and several bills included plans for a flat rate tax system. Each reform proposal attempts to simplify and streamline the current U.S. tax laws.

The merits of a tax system are generally evaluated using three criteria: simplicity, equity, and efficiency. A simpler tax code makes both administration and compliance easier and reduces record keeping requirements. Equity issues have two dimensions: horizontal equity requires that individuals with equivalent initial resource endowments pay the same taxes ("equal treatment for equals"), while ver-

tical equity determines how taxes vary as resource endowments or income increase (taxes are assessed according to "ability to pay"). The degree of regressivity or progressivity in the rate structure influences the degree of vertical equity. A tax system is economically efficient if the objectives of the system are achieved while minimizing administrative costs and the compliance burden.

Tax reform debates have focused on three questions [Department of the Treasury; Institute for Contemporary Studies; Simon]: Should the base be income or consumption? How can the tax base be broadened? Should the base be taxed progressively? Progressive income taxation has been part of the U.S. tax system since its inception. Hence, most legislation advocating tax reform proposes changes in the number and magnitude of marginal tax rates or base broadening measures as means of improving the system. Base broadening includes more of personal income in tax calculations by changing the level of personal exemptions and the extent of deductions allowed. Bills to modify the tax brackets and marginal rates generally reduce the number of brackets and rates and have included flat tax proposals which impose a single marginal tax rate on income of all individuals.

The implications of potential flat tax reforms have been discussed or analyzed in general terms [Blum; Blum and Kalven; Commission to Revise the Tax Structure;

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Minarik, 1982 a, b; Slemrod and Yitzhaki; Vedder and Frenzel]. Minarik concludes that a flat rate income tax would lower the average and marginal tax rate at high incomes and almost certainly increase the average tax rate for middle income individuals. He points out that positive incentives for work, saving, and investment due to lower tax rates for those with high incomes could be offset by disincentives for those with middle level incomes. Some elements of progressivity are retained in the tax system if exemptions are allowed with the flat tax. High income persons can have larger average shares of their income taxed instead of having higher marginal tax rates. Income reallocation between years and income averaging would become unnecessary, since with a flat tax the tax rate would be the same from year to year [Blum and Kalven; Minarik, 1982a, b].

Minarik also suggests that "good old fashioned tax reform" might be a viable alternative. By incorporating numerous base broadeners, the tax rate schedule could be lowered and flattened. Three or four brackets could be used to approximate the current tax burden on high incomes while simplifying the system. Some of the existing tax problems—bracket creep and other inflationary side effects, and savings and consumption disincentives—might be reduced though not eliminated.

The impact of reforms would vary among different sectors of the economy depending on the concessions currently enjoyed by the sector. Sisson addresses the issue of whether farmers presently have a significant tax advantage over the general population. From his examination of farm-nonfarm tax burdens, he concludes that farmers, particularly large farmers, have substantially lower tax burdens than non-farm taxpayers under the current progressive rates. Tax treatments that especially benefit agriculture and might be lost with reform include 1) a choice of ac-

counting methods between accrual or cash which allows for accounting simplicity and flexibility in adjusting incomes and expenses for the year, 2) options as to the method used to write off capital expenditures, and 3) favorable capital gains treatment given raised capital assets [Davenport *et al.*].

The purpose of this study is to indicate the impacts of adoption of selected flat rate tax alternatives on representative hog and grain farms. This representative farm analysis will provide useful information for evaluating the economic consequences of some tax reform measures.

Method

A comparable study across the economy would be needed to evaluate the comprehensive effects of changes in tax policies on net investment in agriculture and farm income and wealth. Here an attempt is made to highlight some firm level impacts and the possible aggregate implications of a flat tax using the current income tax base and using a broader tax base. Objectives of this analysis include:

1. Identify shifts in the tax burden within agriculture by evaluating the tax implications of two flat tax proposals for farms with various size, enterprise, and financial characteristics.
2. Measure the impact of elimination of special tax treatments for agriculture by determining variations in effective tax rates for different representative farms.

Using Iowa farm data and the Iowa State University computerized business and financial planning model [Lowenberg-DeBoer and Boehlje; Reinders], three alternative tax systems are compared under three income-equity scenarios. Only federal income taxes are considered; state income taxes, social security taxes, excise taxes, and other tax liabilities are not in-

cluded. The farm business simulation model used in the tax research integrates behavioral relationships and accounting identities in describing the growth or decay in terminal value of the farm business.

The model assumes that cash operating income can be estimated from assets in the business [Reinders; Lowenberg-De-Boer and Boehlje]:

$$NOI_t = \alpha_0 + \alpha_1 CA_t + \alpha_2 LA_t + \alpha_3 T \quad (1)$$

where

- NOI_t = net operating income at time t;
- CA_t = current assets at the beginning of year t;
- LA_t = intermediate and long-term assets at the beginning of year t;
- T = an index of time in years; and
- α_i = regression coefficient.

Net operating income is cash income less variable costs except rent and interest. The predicted value of NOI is the expected value and has no stochastic component.

Cash fixed costs and economic depreciation equations are estimated from intermediate and long-term assets:

$$CFC_t = \beta_0 + \beta_1 LA_t + \beta_2 T \quad (2)$$

$$DEPR_t = \gamma_0 + \gamma_1 LA_t + \gamma_2 T \quad (3)$$

where

- CFC_t = cash fixed costs in period t;
- DEPR_t = economic depreciation in period t; and
- β₀, γ₁ = regression coefficients.

Iowa Farm Business Association (IFBA) time series data (1964–82) on farm asset mix, income, depreciation, and fixed costs were used to estimate income, depreciation, and fixed cost equations.¹ Income and cost equation coefficients were calculated with an autoregressive measurement error model with missing observations estimated using an indicator variable technique. These equations were estimated separately for each farm size and type.

Income remaining after cash costs are

paid is reinvested in the farm. Investment is calculated as:

$$INV_t = NOI_t - CFC_t - RENT_t - INT_t - PRIN_t - LP_t - TAX_t - CON_t \quad (4)$$

where

- INV_t = investment in period t;
- RENT_t = real estate rent in period t;
- INT_t = interest payments in period t;
- PRIN_t = principal payments in period t;
- LP_t = lease payments in period t;
- TAX_t = federal income tax payments in period t; and
- CON_t = family living expenses in period t.

The percent of income which is treated as capital gain is estimated from the proportion of breeding stock sales in net cash operating income. The consumption function used in the model is an adaptation of the function estimated by Brake, updated by a price index term. Investment is calculated as a residual, i.e., money remaining after cash costs, and so continuous investment opportunities are implicitly assumed.

Data on the distribution of depreciable farm property in age and useful life categories were drawn from unpublished 1981 IFBA records. These data were used to develop representative depreciation schedules used in calculating allowable depreciation for tax purposes and in allocating new investment to asset categories. Because the Iowa farm records are kept on an accrual basis, estimates of the tax liability are also on an accrual basis. Asset values for the initial year of simulation are based on an average drawn from farm business summaries for a given size and type of farm.

The alternative tax systems which are evaluated include:

1. The progressive tax rates and income tax base currently in use as specified by the Economic Recovery Tax Act of 1981 (ERTA).
2. A flat tax of 20 percent on the present ERTA income tax base.
3. A flat tax of 20 percent on a broader income tax base.

¹ Data for 1972, 1973, and 1981 had to be excluded because of changes in the definition of variables in the series.

TABLE 1. Resource and Financial Characteristics of Illustrative Farms.

	Type of Farm					
	Grain			Hog		
	Small	Medium	Large	Small	Medium	Large
Land Base Acres ^a	149	321	804	133	316	703
Current Assets (\$) ^b	34,412	63,029	147,936	73,372	112,209	208,225
Intermediate Assets (\$) ^c	23,233	32,671	86,690	28,536	44,096	77,293
Fixed Assets (\$) ^d	282,956	396,964	1,451,340	316,568	600,817	1,280,128
Total Assets (\$)	340,601	692,664	1,685,966	418,476	757,122	1,565,646

^a Average value for Iowa Farm Business Association size category (1982).

^b Value of feed and livestock inventories.

^c Value of machinery and equipment.

^d Value of real estate.

The ERTA laws include Accelerated Cost Recovery System (ACRS) rules except that the optional longer and slower write-off alternatives are not allowed. The broader income tax base in our model disallows investment credit, capital gains treatment on eligible income, and "expensing" of investments. Pre-ERTA depreciation rules are used with the broader tax base, reducing the rate of depreciation allowances from current levels.

Not all of the base broadening measures that might accompany a flat tax could be incorporated into the model. Elimination of the cash accounting option is an obvious example. If changes were made to limit interest deductibility, this could affect the results dramatically. Inflation is ignored as is the possibility of asset appreciation. Management is assumed to remain the same regardless of the tax system in effect since there is no empirical basis for modeling behavior changes. Realistically, aggressive managers would be expected to reorganize their operations to benefit from tax law changes. The computations here are an initial attempt to indicate the direction of shifts in tax liabilities with tax reform. An infinite number of scenarios could be created to point out other results of tax law changes.

The 20 percent flat rate was chosen as a reasonable estimate of the rate needed to maintain current tax revenues with the

present tax base [Minarik, 1982b; Institute for Contemporary Studies]. A slightly lower rate could perhaps be justified with the broader tax base but, for comparison purposes, the 20 percent rate was maintained. Under the flat tax, the zero bracket amount was set at \$6,000, and \$1,000 personal exemptions were allowed.

Three sizes and two types of owner-operator farms are used in the comparisons. The size of farm is determined by acreage and represents the divisions used in IFBA data: small farms range in size from 0 to 189 acres, medium size farms are from 260 to 359 acres, and large farms are 500 acres or larger. The three sizes were selected to encompass a range of different farm sizes so that tax advantages or disadvantages due to size could be detected. The type of farm is based on general organization and enterprise characteristics. Grain (corn) farms and hog (farrow-to-finish) farms were chosen for analysis so that tax implications for farms of similar size with varying asset compositions could be compared. Table 1 lists asset characteristics of the farms used in the study. A four person farm family was assumed to own and operate the farm.

Results are reported for estimates of changes in tax liabilities associated with tax law changes for three income-equity scenarios. Other scenarios were evaluated but three scenarios seemed to bracket ad-

TABLE 2. Financial Impacts of Alternative Tax Systems for Illustrative Grain Farms with 70 Percent Equity.

	Type of Farm											
	Grain, Small				Grain, Medium				Grain, Large			
	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base
Income from Earnings, ^a 1982 (\$)	4,628	4,628	4,628	13,391	13,391	13,391	56,401	56,401	56,401	56,401	56,401	56,401
Income from Earnings, 1991 (\$)	16,246	16,111	16,328	38,616	38,474	38,211	141,501	141,501	141,202	141,202	136,495	136,495
Tax Paid, 1982 (\$)	1,128	1,370	1,033	1,969	2,362	1,836	7,320	7,320	7,360	7,360	8,783	8,783
Tax Paid, 1991 (\$)	5,036	5,022	4,825	9,268	9,290	12,253	28,931	28,931	28,935	28,935	55,389	55,389
Average Tax Paid over 10 Year Period (\$)	3,333	3,580	3,161	6,036	6,464	7,518	18,805	18,805	19,590	19,590	34,570	34,570
Tax Burden, ^b 1982	.046	.056	.042	.059	.071	.055	.096	.096	.096	.096	.115	.115
Tax Burden, 1991	.139	.139	.133	.158	.159	.210	.179	.179	.179	.179	.354	.354
Average Tax Burden	.110	.118	.104	.130	.140	.163	.158	.158	.165	.165	.294	.294
Personal Taxable Income, 1982 (\$)	15,643	16,852	16,852	19,847	21,812	21,812	46,603	46,603	46,803	46,803	46,803	46,803
Personal Taxable Income, 1991 (\$)	35,183	35,114	35,309	56,340	56,452	56,329	154,658	154,658	154,677	154,677	151,685	151,685
Ending Percent Equity	82.09	82.0	82.13	81.39	81.31	81.18	83.02	83.02	82.96	82.96	82.02	82.02

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

TABLE 3. Financial Impacts of Alternative Tax Systems for Illustrative Hog Farms with 70 Percent Equity.

	Type of Farm											
	Hog, Small				Hog, Medium				Hog, Large			
	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base
Income from Earnings, ^a 1982 (\$)	23,568	23,568	23,568	44,457	44,457	44,457	77,924	77,924	77,924	77,924	77,924	77,924
Income from Earnings, 1991 (\$)	56,438	57,538	56,398	102,976	104,061	98,085	175,580	176,552	176,552	176,552	166,133	166,133
Tax Paid, 1982 (\$)	3,665	2,740	2,196	6,523	5,459	5,385	9,958	8,531	8,531	9,958	10,858	10,858
Tax Paid, 1991 (\$)	12,302	10,505	14,430	21,268	18,932	30,981	34,754	31,495	31,495	34,754	59,939	59,939
Average Tax Paid over 10 Year Period (\$)	8,040	7,023	8,391	13,811	12,674	18,949	22,969	21,358	21,358	22,969	38,182	38,182
Tax Burden, ^b 1982	.084	.063	.050	.101	.085	.084	.102	.087	.087	.102	.111	.111
Tax Burden, 1991	.161	.135	.189	.173	.153	.262	.178	.160	.160	.178	.322	.322
Average Tax Burden	.139	.120	.144	.152	.139	.213	.159	.147	.147	.159	.270	.270
Personal Taxable Income, 1982 (\$)	28,326	23,702	23,702	42,617	37,298	37,298	59,794	52,658	52,658	59,794	52,658	52,658
Personal Taxable Income, 1991 (\$)	71,510	62,525	62,060	116,341	104,660	100,847	183,774	167,617	167,617	183,774	160,970	160,970
Ending Percent Equity	86.16	86.35	86.15	85.83	85.95	85.25	84.83	84.93	84.93	84.83	83.87	83.87

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

TABLE 4. Financial Impacts of Alternative Tax Systems for Illustrative Grain Farms with 60 Percent Equity.

	Type of Farm											
	Grain, Small				Grain, Medium				Grain, Large			
	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progres- sive Tax ERTA Base
Income from Earnings, ^a 1982 (\$)	504	504	504	4,891	4,891	4,891	35,697	35,697	35,697	35,697	35,697	35,697
Tax Paid, 1982 (\$)	6,399	6,252	6,271	27,559	27,227	27,453	118,640	118,640	118,096	118,640	115,716	115,716
Tax Paid, 1991 (\$)	0	0	0	0	0	0	1,179	1,179	1,219	1,179	963	963
Average Tax Paid over 10 Year Period (\$)	1,208	1,231	963	5,269	5,356	5,385	22,796	22,796	22,719	22,796	41,039	41,039
Tax Burden, ^b 1982	402	489	415	2,216	2,308	2,291	12,552	12,552	13,468	12,552	21,782	21,782
Tax Burden, ^b 1991	0	0	0	0	0	0	.026	.026	.027	.026	.021	.021
Average Tax Burden	.074	.076	.059	.140	.144	.144	.177	.177	.177	.177	.326	.326
Personal Taxable Income, 1982 (\$)	.031	.038	.032	.087	.102	.091	.145	.145	.156	.145	.254	.254
Personal Taxable Income, 1991 (\$)	1,519	2,728	2,728	1,347	3,312	3,312	15,899	15,899	16,099	15,899	16,099	16,099
Ending Percent Equity	16,043	16,159	16,178	36,346	36,782	37,008	123,983	123,983	123,598	123,983	122,399	122,399
	64.82	64.44	64.49	70.03	69.61	69.90	74.21	74.21	74.09	74.21	73.30	73.30

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

TABLE 5. Financial Impacts of Alternative Tax Systems for Illustrative Hog Farms with 60 Percent Equity.

	Type of Farm											
	Hog, Small			Hog, Medium			Hog, Large			Progressive Tax		
	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base
Income from Earnings, ^a 1982 (\$)	18,340	18,340	18,340	35,057	35,057	35,057	58,564	58,564	58,564	58,064	58,564	58,564
Income from Earnings, 1991 (\$)	37,679	38,200	38,547	77,584	78,224	76,370	144,643	144,643	145,302	145,302	139,714	139,714
Tax Paid, 1982 (\$)	619	0	0	2,643	1,579	1,185	4,086	4,086	2,659	2,659	2,107	2,107
Tax Paid, 1991 (\$)	6,967	5,704	5,805	14,636	12,872	18,895	27,183	27,183	24,250	24,250	43,822	43,822
Average Tax Paid over 10 Year Period (\$)	4,066	3,463	3,171	8,813	8,049	10,435	16,434	16,434	15,231	15,231	25,157	25,157
Tax Burden, ^b 1982	.022	0	0	.059	.035	.026	.060	.060	.039	.039	.031	.031
Tax Burden, 1991	.146	.118	.12	.167	.146	.219	.176	.176	.156	.156	.293	.293
Average Tax Burden	.109	.093	.085	.137	.124	.162	.149	.149	.138	.138	.231	.231
Personal Taxable Income, 1982 (\$)	13,098	8,474	8,474	23,218	17,898	17,898	30,434	30,434	23,298	23,298	23,298	23,298
Personal Taxable Income, 1991 (\$)	44,837	38,523	38,777	83,184	74,362	72,874	145,917	145,917	131,254	131,254	128,078	128,078
Ending Percent Equity	76.64	76.83	76.96	77.34	77.47	77.07	76.77	76.77	76.88	76.88	75.91	75.91

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

TABLE 6. Financial Impacts of Alternative Tax Systems for Illustrative Grain Farms with 50 Percent Equity.

	Type of Farm											
	Grain, Small				Grain, Medium				Grain, Large			
	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Progressive Tax Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Progressive Tax Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Progressive Tax Base
Income from Earnings, ^a 1982 (\$)	-3,695	-3,695	-3,695	-3,616	-3,616	-3,616	-3,616	-3,616	14,997	14,997	14,997	14,997
Income from Earnings, 1991 (\$)	-53,507	-53,507	-53,507	-16,795	-16,795	-16,795	-16,795	-16,795	83,275	83,275	83,275	83,275
Tax Paid, 1982 (\$)	0	0	0	0	0	0	0	0	0	0	0	0
Tax Paid, 1991 (\$)	0	0	0	0	0	0	0	0	14,055	14,287	22,084	22,084
Average Tax Paid over 10 Year Period (\$)	0	0	0	0	0	0	0	0	5,360	6,156	8,246	8,246
Tax Burden, ^b 1982	0	0	0	0	0	0	0	0	0	0	0	0
Tax Burden, 1991	0	0	0	0	0	0	0	0	.169	.174	.272	.272
Average Tax Burden	0	0	0	0	0	0	0	0	.112	.136	.183	.183
Personal Taxable Income, 1982 (\$)	0	0	0	0	0	0	0	0	0	0	0	0
Personal Taxable Income, 1991 (\$)	0	0	0	0	0	0	0	0	80,278	81,435	80,466	80,466
Ending Percent Equity	-42.12	-42.12	-42.12	13.82	13.82	13.82	13.82	13.82	56.76	56.25	55.76	55.76

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

equately the tax consequences associated with tax law changes for farms with different cash flows and debt positions. In the first scenario, the farm family receives \$20,000 in nonfarm income and begins with 70 percent equity in the firm. The farm unit in the second scenario has \$10,000 off-farm income and begins with 60 percent equity in the firm. The "worst case" scenario assumes farm families have no off-farm income and 50 percent initial equity. Current loans in all cases were charged 14 percent interest and were due in one year; intermediate asset loans were assessed 14 percent and given a three year life; fixed asset loans were assumed to have a 30 year life. These three scenarios were chosen to highlight variations in tax burdens for farms of differing economic health.

Output from the simulation model includes comparative statements of business financial position, cash flow statements, and tax information for a ten-year period beginning with 1982. The time value of money is accounted for through reinvestment of business earnings over time which results in faster equity growth. Estimates of income and tax liabilities for grain and hog farms having a beginning equity of 70 percent and \$20,000 off-farm income are in Tables 2 and 3. Tables 4 and 5 list statistics for farms with \$10,000 off-farm income and initial equity of 60 percent. Results for farms with no off-farm income and 50 percent beginning equities are in Tables 6 and 7.

Empirical Results

Most farms experienced an increasing tax burden over the ten-year period, where tax burden is defined as tax paid divided by total income (the sum of income from farm earnings and off-farm income). The burden under the flat tax approaches the flat rate of 20 percent as the amount of taxable income increases, whether by definition of tax base or through higher

earned income over time. For instance, on large high equity hog farms under the flat tax with an ERTA income base, the tax burden grows from 0.087 to 0.160 because of rising earnings over the ten-year period (Table 3). The additional burden on the same farm as a result of a broader income base (assuming a 20 percent flat tax) is evidenced by a final period flat tax burden of 0.178.

The largest increases over time in taxes paid and in the tax burden occur with ERTA tax laws since progressive marginal rates lead to an increasing share of income payable as taxes. The average tax burden in 1991 for the large high equity grain farm is projected to be 0.294 under ERTA laws as compared to 0.158 and 0.165 under broad based and ERTA based flat taxes, respectively (Table 2). The smallest increases in tax liabilities are generally incurred when a flat tax with a narrow base is assumed. Tax burdens are highest in the tenth period of the projection in all cases, except for the two grain farms experiencing financial losses where tax liabilities remain at zero.

The effect of broadening the tax base can be seen by comparing the taxes paid and tax burden under the two flat tax schemes. For instance, on large high equity hog farms, even though 1991 earnings are highest (\$176,552) under the flat tax with ERTA base, personal taxable income, taxes paid, and the tax burden are highest under the broad based flat tax (Table 3). Once income exceeds the exemption level under the broad based flat tax, more income is eligible for taxation.

Differences in incomes and tax liabilities due to differences in marginal tax rates are evidenced through comparisons of the two ERTA based taxes. On low equity hog farms, for instance, more taxes are paid in 1991 on the small farm under a flat tax, while on mid-size and large farms tax burdens are less under a flat tax than with progressive rates, given an ERTA base for both (Table 7).

TABLE 7. Financial Impacts of Alternative Tax Systems for Illustrative Hog Farms with 50 Percent Equity.

	Type of Farm											
	Hog, Small			Hog, Medium			Hog, Large			Progressive Tax Base		
	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base	Flat Tax Broad Base	Flat Tax ERTA Base	Progressive Tax ERTA Base
Income from Earnings, ^a 1982 (\$)	13,116	13,116	13,116	25,657	25,657	25,657	39,204	39,204	39,204	39,204	39,204	39,204
Income from Earnings, 1991 (\$)	20,278	20,467	20,441	53,849	53,988	54,079	113,775	113,965	113,965	113,965	111,935	111,935
Tax Paid, 1982 (\$)	0	0	0	0	0	0	0	0	0	0	0	0
Tax Paid, 1991 (\$)	1,715	1,010	823	8,345	7,165	8,442	19,674	16,586	16,586	16,586	28,453	28,453
Average Tax Paid over 10 Year Period (\$)	585	295	268	3,958	3,672	3,713	9,651	9,026	9,026	9,026	13,313	13,313
Tax Burden, ^b 1982	0	0	0	0	0	0	0	0	0	0	0	0
Tax Burden, 1991	.085	.049	.040	.155	.133	.156	.173	.145	.145	.145	.254	.254
Average Tax Burden	.036	.018	.016	.102	.094	.095	.129	.121	.121	.121	.180	.180
Personal Taxable Income, 1982 (\$)	0	0	0	0	0	0	1,074	0	0	0	0	0
Personal Taxable Income, 1991 (\$)	18,576	15,053	15,026	51,727	45,829	45,769	108,373	92,901	92,901	92,901	95,228	95,228
Ending Percent Equity	54.77	55.20	55.14	65.51	65.56	65.60	66.01	66.07	66.07	66.07	65.49	65.49

^a Income from earnings is net operating income less cash fixed expenses and interest payments.

^b The tax burden is estimated by dividing tax paid by total income (income from earnings plus off farm income).

Comparisons Across Farm Types

The results indicate that, in general, income from earnings rises over time regardless of tax system. Accumulated earnings add to the equity base and lead to higher incomes. Expansions through increases in debt are not allowed. Farm earnings generally rise most under the flat tax with an ERTA tax base for hog farms, and increase most under a broad based flat tax for grain farms. Only small and mid-size grain farms with initial equities of 50 percent show decreases in farm earnings over the ten-year period. In all other cases, rising farm income leads to higher taxable income and higher tax liabilities. Personal taxable income increases most during the ten-year period under the broad based flat tax for all farm types and sizes.

Rising incomes contribute to firm growth and improved equity positions. All farms with beginning equities of 70 percent have positive growth in equity as indicated by higher equity positions at the end of the ten-year period (Tables 2 and 3). Farms beginning with 60 percent equity (Tables 4 and 5) also exhibit moderate to high increases in equity over the ten-year period, with increases ranging from 4.4 to 14.21 percent on grain farms and 15.91 to 17.47 percent on hog farms depending on the size farm and tax system. Farms with initial equities of 50 percent (Tables 6 and 7) in general experience limited equity growth during the ten-year projection period. In fact, small and mid-size grain farms with 50 percent equity have actual reductions in equity percentages. The debt burden for these farms apparently causes an extreme financial hardship on the farms.

Income from earnings increases most for grain farms under a flat tax with a broad base, while earnings income on hog farms increases most under a flat tax on the current ERTA income tax base. Personal taxable income, on the other hand, is gener-

ally highest under the broad based flat tax for hog farms and greatest under the narrow based flat tax for grain farms. This indicates that broadening the tax base has a greater impact on livestock farms (compared to grain farms) where capital gains provisions are most important. The importance of depreciation and investment credit provisions depends on the size of the asset base and the extent of annual new investment.

Growth in equity is highest for grain farms with a broad base flat tax, and for hog farms is highest under a flat tax with an ERTA income base. Thus hog farms fare better in growth terms under a flat tax allowing capital gains exclusions, investment credit, expensing of capital purchases, and accelerated depreciation, while grain farms do as well or better under a broad based flat tax. Hog farms experience greater equity growth than grain farms under all income-equity scenarios. For example, large grain farms with beginning equities of 60 percent have ending equities of 73.30 percent of total assets under current ERTA laws, while large hog farms with 60 percent initial equities have ending equities of 75.91 percent.

Comparisons Across Farm Size

Taxes paid in the first year are lowest under ERTA laws for small and mid-sized grain and hog farms. Large hog farms have the lowest tax liability initially under an ERTA based flat tax while grain farms have the smallest liability under a broad based flat tax. Initial tax liabilities are highest under ERTA laws for the large hog and grain farms, highest under a broad based flat tax for mid and small size hog farms, and highest under a narrow based flat tax for mid- and small size grain farms. These results support the hypothesis that initially the broad based flat tax represents an increased burden for small and mid-size farmers.

In the final period taxes paid by mid-

and large size grain and livestock farms are highest under ERTA; incomes have grown to levels which are taxed at marginal rates greater than the flat rate of 20 percent. Small grain farms and small low-equity hog farms continue to have the largest tax liabilities under the broad based flat tax throughout the projection period.

Small low equity hog farmers pay more than twice the taxes (\$1,715) in 1991 under a broad based flat tax than they would under ERTA (\$823) (Table 7). The higher rate and more inclusive income definition of the broad based flat tax especially impacts hog farmers since proportionally more of their earnings become taxable (i.e., no income is eligible for capital gains treatment). Farms which would be taxed at a marginal rate less than 20 percent under current rules (those with taxable incomes less than \$30,000) will pay higher taxes with a flat rate.

Tax burdens increase the most and average the highest under ERTA laws for all but the smallest farms. Tax burdens rise less in absolute terms for hog farms than for grain farms. Average tax burdens for large hog farms were actually less under ERTA tax laws than for large grain farms even though incomes were higher on the hog farms, indicating the benefits of capital gains exclusions, investment credit, and expensing of investments under current ERTA rules for such farms.

Comparisons Across Income-Equity Scenarios

Farms with 70 percent equity and \$20,000 off-farm income represent farms with strong financial positions and prospects, while farms with 60 percent initial equity have higher debt burdens and are assumed to have less off-farm and total income. Low equity farms (50 percent initially) have no off-farm income and depict farms with low income levels. Income from earnings is much lower initially in all cases under low equity scenarios. In-

come from earnings in 1982 for mid-size hog farms is \$25,567 with 50 percent equity, \$35,057 with 60 percent equity, and \$44,457 with 70 percent equity.

Low equity farms (50 percent), both hog and grain, pay no taxes in 1982 regardless of tax system. Small and mid-sized grain farms with 60 percent equity also pay no tax. Small hog farms with 60 percent initial equity pay 1982 taxes only under the broad based flat tax system. For a given type and size of farm and a given tax system, income from earnings, average taxes paid, personal taxable income, and changes in these variables over the prediction interval are greatest for the high equity farms. Tax burdens are higher for the high equity farms, but the lower equity farms generally had greater increases in tax burdens over the ten-year period.

The differences in results due to initial equity assumptions are most dramatic for the grain farms. Small and mid-size low equity grain farms are unable to make principal payments on existing loans and are forced to increase short-term borrowings over the entire period, resulting in negative growth in equity. Other low equity grain and hog farms as well as farms with 60 percent initial equity also experience financial difficulties in the first year of operation but have positive growth in equity over the projection period.

Equity growth rates are much lower for low equity farms than they are for high equity farms. On small hog farms the equity position improved from 50 to 55.14 percent under current ERTA law compared to an increase from 70 to 86.15 percent on high equity farms. The pattern of positive equity growth within a farm size and type is generally the same—growth is highest under the flat tax with an ERTA income tax base for hog farms and under the flat broad based tax for grain farms.

Conclusions

In general, the results are as expected given the magnitudes of income estimat-

ed. More income is taxable under the the broad base flat tax unless income is near the exemption level. When incomes are below \$30,000, as is more common on small farms, the broad base flat tax causes the greatest tax liability and tax burden. The flat tax yields a tax cut from ERTA laws for large farms with larger incomes even when the base is broadened to eliminate investment credit, capital gains treatment on income, and slow depreciation deductions. Low equity small and mid-size grain and hog farms have lower average tax liabilities under ERTA laws.

Income from earnings increases most under the ERTA based flat tax for hog farms and increases most for grain farms under the broad based flat tax. The average tax burden is generally higher for small and medium size hog farms as compared to grain farms of similar size for a given tax-equity scenario. On large hog farms the average tax burden is usually lower than on large grain farms.

The absolute change in tax burdens over the ten-year projection varies with both size and leverage positions. The change in tax burden is generally higher for grain farms than hog farms except on small sizes. High equity farms (70 percent) generally experience less absolute increases in tax burden than do the 60 percent equity farms, and 60 percent equity farms generally have smaller increases in tax burdens than do 50 percent equity farms. Average tax burdens are highest for high equity farms when farms of the same type and size are compared. The increase in income from earnings over time is also highest for high equity farms.

The flat tax (with or without base broadening) could contribute to pressure for growth in farm size and to increased disparities in the distribution of farm incomes. A flat tax magnifies the disparity between large and small farms, as compared to a progressive tax, by creating greater tax burdens at low income levels while reducing tax burdens at high in-

come levels. Broadening the tax base would increase taxable income and slow equity growth most in farm operations with significant amounts of income eligible for capital gains treatment. Farms in financial trouble could be made worse off by the broad based flat tax when incomes are low and current liabilities are high. Low equity firms had trouble making principal payments in beginning years of the projection period and showed lower growth potential under the broad based flat tax. Smaller farms especially would have higher tax burdens compared to current ERTA law as their incomes begin to grow from low levels.

Proposals incorporating flat rate taxes or measures to broaden the tax base, once having fully replaced the current system, could simplify tax administration and compliance. Since determining the taxable income and allowable tax credits is the most difficult part of completing tax returns, broadening the tax base would contribute most to simplification of filing returns. The incentive for creative tax management should decrease under a broad based flat tax, given fewer motives for investing simply for tax purposes. Effective tax rates and tax burdens would no longer be disguised by assorted deductions, exemptions, and credits.

Major tax reforms such as a flat tax have the potential to change the characteristics of agriculture. More limited reforms could be used to eliminate tax features which obviously benefit individuals with high incomes. Subsidies and special tax treatments can encourage investment and stimulate production which will perhaps result in low farm product prices [Carmen]. Conversely, elimination of special treatments as would occur in base broadening reforms could lead to reduced supplies and higher prices in some sectors. Tax provisions, by affecting the present value of future income streams, can influence the demand and price of land and other inputs [Adams]. Flat tax reforms

could change the income and wealth of people in agriculture, the size and number of farms, and affect the mobility of labor and capital into and out of agriculture by influencing income distributions and shifting tax burdens. The elimination of tax provisions which have traditionally favored farmers could have repercussions on the agribusiness sector. Further research would be needed to specify and analyze other short-run and long-run effects of tax reform.

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