1987

CASH FLOW COMPARISONS OF TWO METHODS OF ALLOCATING COOPERATIVE PATRONAGE REFUNDS

Jeffrey S. Royer
USDA
Wash DC

Paper presented at the annual meeting of the American Agricultural Economics Association, Michigan State University, East Lansing, August 3, 1987.

Taxation

CASH FLOW COMPARISONS OF TWO METHODS OF ALLOCATING COOPERATIVE PATRONAGE REFUNDS

Abstract

Nonqualified allocations offer an alternative method of allocating patronage refunds. This paper compares patron after-tax cash flows from qualified and nonqualified allocations. Results suggest neither method is clearly superior. Because of tax timing differences, present values of cash flows from nonqualified allocations often are comparatively greater than nominal values.

CASH FLOW COMPARISONS OF TWO METHODS OF ALLOCATING COOPERATIVE PATRONAGE REFUNDS

Federal income tax treatment of farmer cooperatives generally provides for patronage refunds to be taxed once, at either the cooperative or patron level. Subchapter T of the Internal Revenue Code defines the tax treatment of most cooperatives and the conditions under which a cooperative deducts certain patronage refund allocations in determining its federal taxable income. The patron to whom an allocation is made must agree to include it in current ordinary income if it is to qualify for deduction from the cooperative's income. In addition, at least 20% of the allocation must be paid in cash. Allocations that meet the conditions for deduction are called qualified allocations, and they are the method of allocating patron equity normally used by most cooperatives.

Subchapter T also specifies a second type of allocation called nonqualified allocations. Patrons do not agree to accept nonqualified allocations as current ordinary income. Therefore, these allocations do not qualify for exclusion from the cooperative's taxable income. However, a cooperative does deduct cash it pays to redeem nonqualified allocations. A patron who receives cash in redemption of a nonqualified allocation includes it in taxable income.

Nonqualified allocations offer farmer cooperatives an alternative method for allocating patron equity which may have advantages in some situations (Royer and Wissman). Because patrons do not recognize nonqualified allocations for tax purposes until they are redeemed in cash, they can be used to avoid negative cash flows due to tax on qualified allocations. Some patrons may wish to delay receiving income and, therefore, would prefer nonqualified allocations. Nonqualified allocations also offer cooperatives an additional tool for tax planning, tax management, and handling losses. However, only a small percentage of U.S. farmer cooperatives use nonqualified allocations (Davidson and Royer).

This paper describes cash flow comparisons of qualified and nonqualified patronage refund allocations using a simulation model. First, a base simulation is described outlining general characteristics of qualified and nonqualified allocations and the cash flow relationships between the cooperative and patrons. Second, these data are reconstructed to describe relationships between an individual patron and the cooperative. Third, parameter values are varied one at a time to isolate their effects.

Analyses were conducted using federal tax rules in effect at the beginning of 1986. These rules allow an examination of graduated personal and corporate rate structures and investment tax credit. They also were in effect when recent choices between qualified and nonqualified allocations were made. Changes due to the Tax Reform Act of 1986 are summarized in a later section.

Methodology

The simulation model used generates annual cash flow and tax data for a cooperative and its patrons given selected parameter values. The model is based on the first-in/first-out revolving fund plan used by most farmer cooperatives (Brown and Volkin, p. 8). Each year equity allocated during the year is added to the revolving fund to be redeemed in turn. Equity redeemed during the current year is the residual of net margins less cash patronage refunds, income tax, and planned equity growth. The initial revolving fund consists of equity allocations made in previous years and determined by relationships from Cobia et al. (p. 210). The revolving period may vary from year to year and is affected by the cooperative's ability to redeem equity given current net margins and cash flows.

The model generates data for two practices: (1) distributing cooperative net margins to patrons in the form of cash and noncash qualified patronage refund allocations; and (2) distributing net margins in the form of noncash nonqualified allocations. In analyzing the nonqualified practice, it is assumed the

cooperative previously has distributed qualified allocations and is switching to nonqualified allocations. This is done because most cooperatives currently allocate patronage refunds in qualified form.

Parameter values for the base simulation are presented in table 1. Because cooperatives are financially diverse, no attempt was made to select parameter values representative of a specific type of cooperative. Instead reasonable values clearly demonstrating important concepts and relationships were chosen.

Impacts on Cooperative and Patrons

Table 1 presents results of the base simulation for a 50-year period. The cooperative earned a total of $7.2 million in net margins in both submodels. Twenty percent of net margins in the qualified model were distributed to patrons as cash patronage refunds. Remaining net margins were allocated as noncash qualified patronage refunds and placed into the revolving fund. In the nonqualified model, all net margins were allocated as noncash refunds.

One half of net margins went into equity growth in both models. Net margins remaining after paying income tax and cash refunds were used to retire patron equity. The cooperative retired approximately $2.2 million of equity in both models. The cooperative in the nonqualified model redeemed $100 thousand of qualified allocations issued prior to the simulation and generated a tax liability of $1.6 million. Investment tax credit earned by the cooperative was applied against this tax. Tax paid was $1.4 million--about the same as the cash drain due to cash patronage refunds in the qualified model.

Patron tax liability was greatest in the qualified model. Patrons received $7.2 million in taxable income--$5.2 million more than in the nonqualified model. The difference in tax liability is a result of the timing difference in tax treatment. Because qualified cash and noncash refunds are taxed at the patron level when allocated, patron tax liability for the qualified model reflects all

allocations made during the simulation. A substantial portion of the nonqualified allocations was not recognized as taxable income by patrons. None of the $241.3 thousand investment credit earned by the cooperative was passed through to patrons in the nonqualified model. The entire amount was passed through in the qualified model. This reduced tax paid by patrons to $1.6 million, an amount still $1.0 million more than paid by patrons in the nonqualified model.

Nevertheless, the $2.1 million patron after-tax cash flow was $389.8 thousand more in the qualified model. Although patrons in the nonqualified model paid less tax, patrons in the qualified model received enough cash patronage refunds to more than offset the difference in tax paid. The nonqualified model yielded the greatest present value of patron after-tax cash flow. This is due primarily to timing differences in equity retirement. Because the cooperative in the nonqualified model redeemed more equity early in the simulation, the present value of equity retired is greater than in the other model.

An important determinant of patron cash flow in the nonqualified model is the cooperative marginal tax rate. As cooperative taxable income grows, the cooperative tax rate increases according to the progressive corporate tax structure. This increases the cash drain on the cooperative and reduces funds available for retiring patron equity. Cooperative taxable income generally would increase as net margins grow, but this effect is mitigated by redemption of nonqualified allocations deductible from taxable income.

The revolving period in the qualified model is 14 years throughout the simulation as it is initially in the nonqualified model. When the cooperative in the nonqualified model switches to allocating nonqualified refunds, the cash drain from tax is at first less than that which would have occurred from paying 20% cash patronage refunds. This allows the cooperative to reduce the revolving period to 12 years from year 8 until year 35 when the increased cash drain due to increasingly higher tax rates results in longer revolving periods.

Impact on Individual Patrons

The effect of qualified and nonqualified patronage refunds on an individual patron's cash flow is shown in table 2. It is assumed the patron farms for 35 years and is responsible for 1% of the cooperative's total patronage. To analyze individual data, three periods are defined. The investment period starts when the patron begins doing business with the cooperative and ends when the cooperative begins redeeming the patron's equity. During this period, the patron invests equity in the cooperative but does not receive cash from the cooperative (in the nonqualified case) or may be subject to a cash drain from tax (qualified case). The growth period starts when the cooperative begins redeeming the patron's equity and ends when the patron quits doing business with the cooperative. During this period, the patron's investment in the cooperative generally increases as business grows. This period usually results in higher cash flows because equity retirement offsets the negative tax impacts. The disinvestment period begins when the patron quits doing business with the cooperative and ends when the cooperative retires the last of the patron's equity. This period results in positive cash flows because tax liabilities do not exceed the cash flow from redeemed equity.

Overall patron cash flow is greatest in the qualified model. The nonqualified model yields the highest cash flow during the patron's active farming career. The qualified model provides the highest cash flow during the disinvestment period. Total cash flow is $771.26 more in the qualified model. Present value of total patron cash flow is $71.32 more in the nonqualified model because it yields higher present values early in the patron's career. If the 25% patron marginal tax rate is replaced by 15% during the disinvestment period to reflect lower taxable income common to many retirees, total patron cash flow in the nonqualified model increases to $18,823.53--$698.96 more than in the qualified model. The present value of total patron cash flow is $817.42.

Effect of Parameter Changes

Effects of selected parameter changes are presented in table 3. At low patron tax rates, qualified allocations may provide patrons higher present values of after-tax cash flow than nonqualified allocations. However, increases in the average patron marginal tax rate generally affect the qualified model more. Because qualified refunds are taxed at the patron level when allocated, the cash drain occurs early and weighs heavily in present value computations.

At low discount rates, the qualified model provides patrons a higher present value. As discount rates are increased, the nonqualified model yields the highest present values due to the timing of cash flows. The nonqualified model provides patrons higher nominal cash flows in early years because of earlier equity retirement and avoidance of negative cash flows from tax. The qualified model results in higher cash flows in later years because of a slowdown in equity retirement in the nonqualified model due to higher cooperative tax rates. As the discount rate is increased, later cash flows weigh increasingly less in the present value calculation.

The percentage cash patronage refunds does not affect the present value of total patron after-tax cash flow in the qualified model. Thus it does not affect the relative attractiveness of the two methods to patrons as a group. This is because increasing cash refunds decreases funds available for equity retirement by the same amount. Neither affects the cash drain due to patron income tax. However, the percentage cash refunds does affect individual patrons. Patrons in the investment periods of their careers will prefer high cash refunds while those in the disinvestment period will prefer faster equity revolvement.

Increasing investment tax credit earned by the cooperative increases patron after-tax cash flows in both models but has a greater effect in the nonqualified model. This is because increases in cooperative cash flow due to investment

credit are used to redeem additional nonqualified allocations and thereby achieve additional tax benefits passed on to patrons in equity retirement. Not only is investment credit more valuable applied at the cooperative level, it is more valuable the higher the cooperative tax rate.

Cooperative size, as measured by net worth, has a significant effect on which allocations patrons prefer. Nonqualified allocations provide the greatest patron after-tax present value for small cooperatives. At greater amounts of initial equity, qualified allocations provide the largest present values. The improved relative performance of qualified allocations as size increases is due to the higher cooperative tax rates in the nonqualified model.

Increasing the rate of return to equity appears to be relatively neutral in its effect on patron preferences. As the rate of return increases, the present value of patron after-tax cash flow increases about the same in both models. This differs from results for cooperative size and rate of growth. Increases in these parameters, like the rate of return, increase net margins. However, they also increase cooperative taxable income in the nonqualified model. An increase in the rate of return increases net margins but also allows the cooperative to accelerate redemption of nonqualified allocations, lowering taxable income and delaying the increase in tax rates. Cooperatives with higher rates of return are able to deduct redemptions of nonqualified allocations earlier and shelter a larger proportion of net margins, resulting in effective average tax rates generally less than or equal to those at lower rates of return.

The effect of the rate of equity growth on patron preferences is complex. Increases in the rate of growth first increase and then decrease the present value of patron after-tax cash flows for both allocations. The relative attractiveness of nonqualified allocations also increases and decreases as the rate of growth increases. This is because increases in the rate of growth have two effects on

patron cash flows. First, current patron cash flow is decreased because cooperative cash flow is diverted from equity retirement. Second, an increased growth rate increases future net margins and patron cash flows. The situation is complicated by the progressive corporate tax structure which can cause a relative decline in after-tax cash flows for later years in the nonqualified model.

Tax Reform Act of 1986

The Tax Reform Act of 1986 includes three changes relevant to the preceding analysis: (1) reduction in number of individual tax brackets and maximum rate; (2) reduction in number of corporate brackets and maximum rate; and (3) elimination of investment credit. The effect of changing the individual marginal tax rate has been discussed, and the maximum 28% rate effective after 1987 is within the values presented in table 3. The result of zero investment tax credit also is shown in table 3. Therefore, two additional analyses are presented to demonstrate the effect of the tax law changes: (1) new corporate rates only; and (2) new corporate rates and elimination of investment credit.

The new corporate tax schedule affects only the nonqualified model. The lower rates increase cash flow available for equity retirement, and, therefore, both nominal and present values of patron after-tax cash flow. Loss of investment credit lowers patron after-tax cash flow in both models but has a greater impact in the nonqualified model. The net effect of the act on individual cooperatives will depend on the relative importance of the decrease in marginal tax rate and loss of investment tax credit. Generally, lower corporate rates probably will make nonqualified allocations more attractive, but this effect will be partially offset by the loss of investment credit.

Conclusions

Results of the preceding analyses suggest neither method of allocating patronage refunds is clearly superior. Patron cash flows and other variables are sensitive to changes in several parameters. Increases in patron marginal tax rate, discount rate, and investment credit may make nonqualified allocations more attractive. Increases in cooperative size, or cooperative marginal tax rate, may favor qualified allocations. Increases in the rate of return to equity are relatively neutral, and increases in the rate of growth in equity are ambiguous. The most critical factor affecting cash flow from nonqualified allocations is the corporate tax rate. If the average cooperative tax rate is less than 20%, the cash drain from issuing nonqualified allocations is less than from paying qualified cash patronage refunds. However, increases in taxable income result in higher effective tax rates which decrease equity retirement and patron cash flow. New lower corporate tax rates may diminish this effect unless they are outweighed by the elimination of investment credit.

Nonqualified allocations can be used to avoid negative cash flows that may result from qualified allocations early in a patron's farming career. Nonqualified allocations also may provide higher present values because their cash flows occur earlier. If patrons expect to be in lower marginal tax brackets after retirement, nonqualified allocations may be more attractive because much of the tax burden is shifted to post-retirement years. Because of timing differences in the tax treatment of patronage refunds, nonqualified allocations may provide higher present values of patron after-tax cash flow in many situations where qualified allocations result in higher nominal values. One reason cooperatives have used nonqualified allocations so little may be that cooperatives have not considered present values in making allocation decisions.

References

Brown, Phillip F., and David Volkin. Equity Redemption Practices of Agricultural Cooperatives. Washington, D.C.: USDA FCS Res. Rep. 41, Apr. 1977.

Cobia, David W., et al. Equity Redemption: Issues and Alternatives for Farmer Cooperatives. Washington, D.C.: USDA ACS Res. Rep. 23, Oct. 1982.

Davidson, Donald R., and Jeffrey S. Royer. "Top 100 Cooperatives Cut Refunds 20 Percent in 1985." Farmer Cooperatives, November 1986, pp. 10-15.

Royer, Jeffrey S., and Roger A. Wissman. "Nonqualified Allocations Offer Alternative Method of Retaining Funds." American Cooperation 1985, pp. 246-52. Washington, D.C.: American Institute of Cooperation, 1985.

Table 1. Comparison of Qualified and Nonqualified Models, 50-Year Simulations[a]

Item	Nominal Values		Present Values	
	Qualified Model	Nonqualified Model	Qualified Model	Nonqualified Model
	Dollars			
Cash patronage refunds	1,447,589.86	0.00	81,983.63	0.00
Patronage refund allocations	5,790,359.41	7,237,949.27	327,934.52	409,918.15
Net margins	7,237,949.27	7,237,949.27	409,918.15	409,918.15
Equity growth	3,618,974.70	3,618,974.70	204,959.08	204,959.08
Patron equity retired:				
Qualified allocations	2,171,384.71	100,000.00	122,975.45	53,540.79
Nonqualified allocations	0.00	2,081,290.02	0.00	103,451.42
Total	2,171,384.71	2,181,290.02	122,975.45	156,992.21
Cooperative:				
Taxable income	0.00	5,156,659.25	0.00	306,466.73
Tax liability	0.00	1,678,949.52	0.00	61,630.81
Investment credit applied	0.00	241,264.97	0.00	13,663.94
Tax paid	0.00	1,437,684.55	0.00	47,966.87
Patrons:				
Taxable income	7,237,949.27	2,081,290.02	409,918.15	103,451.42
Tax liability	1,809,487.32	520,322.51	93,163.21	23,511.69
Investment credit applied	241,264.97	0.00	12,421.76	0.00
Tax paid	1,568,222.35	520,322.51	80,741.45	23,511.69
Patron after-tax cash flow	2,050,752.22	1,660,967.52	124,217.63	133,480.53

[a]Percentage qualified cash patronage refunds=.20, patron marginal tax rate=.25, rate of return=.15, rate of growth=.075, discount rate=.10, initial net worth=$100,000, initial qualified property=$5,000. Annual investment and replacement of capital assets qualifying for investment tax credit assumed to grow at same rate as net worth.

Table 2. Comparison of Qualified and Nonqualified Models from Individual Patron Perspective

Model and Period	Length of Period	Cash Patronage Refunds	Patronage Refund Allocations	Patron Equity Retired	Patron Taxable Income	Patron After-Tax Cash Flow	Present Value of After-Tax Cash Flow	Average Revolving Period
	Years	Dollars						Years
Qualified model:								
Investment period	14	700.98	2,803.91	0.00	3,504.89	(58.41)	5.00	14.0
Growth period	21	3,926.57	15,706.28	5,889.85	19,632.85	5,562.64	504.64	14.0
Disinvestment period	14	0.00	0.00	12,620.34	0.00	12,620.34	215.97	14.0
Total	49	4,627.55	18,510.19	18,510.19	23,137.74	18,124.57	725.61	14.0
Nonqualified model:								
Investment period	12	0.00	2,763.56	0.00	0.00	0.00	0.00	12.8
Growth period	23	0.00	20,374.18	8,435.55	8,435.55	6,326.66	622.78	12.0
Disinvestment period	18	0.00	0.00	14,702.19	14,702.19	11,026.65	174.15	15.2
Total	53	0.00	23,137.74	23,137.74	23,137.74	17,353.31	796.93	13.3

Table 3. Effects of Parameter Perturbations on Patron After-Tax Cash Flows, 50-Year Simulations

Item	Nominal Values		Present Values	
	Qualified Model	Nonqualified Model	Qualified Model	Nonqualified Model
	Thousand dollars			
Base simulation[a]	2,050.75	1,660.97	124.22	133.48
Patron marginal tax rate:				
0	3,860.24	2,181.29	217.38	156.99
.10	3,136.44	1,973.16	180.12	147.59
.20	2,412.65	1,765.03	142.85	138.18
.30	1,688.85	1,556.90	105.58	128.78
.40	965.06	1,348.77	68.32	119.37
Discount rate:				
.05	2,050.75	1,660.97	395.21	372.31
.15	2,050.75	1,660.97	60.18	68.94
.25	2,050.75	1,660.97	27.99	32.34
Investment tax credit:[b]				
0	1,809.49	1,349.16	111.80	118.61
.5x	1,930.12	1,505.36	118.01	126.05
2x	2,292.02	1,970.70	136.64	148.18
Cooperative size:[c]				
.5x	1,025.38	1,040.99	62.11	71.30
2x	4,101.50	2,622.80	248.44	236.64
10x	20,507.52	7,867.43	1,242.18	554.53
Rate of return:				
.10	[d]	[d]	[d]	[d]
.20	3,860.24	3,470.41	229.80	240.03
.30	7,479.21	7,088.67	440.97	451.52
.40	11,098.19	10,707.26	652.14	662.73
Rate of growth:				
.02	824.65	853.10	122.69	130.84
.04	1,183.17	1,257.63	125.97	137.29
.06	1,669.43	1,752.74	127.42	142.50
.08	2,151.64	1,452.72	121.46	124.93
.10	[d]	[d]	[d]	[d]
Tax Reform Act of 1986:				
New corporate rates only	2,050.75	1,945.21	124.22	139.13
New corporate rates and elimination of investment credit	1,809.49	1,669.32	111.80	125.16

[a] Parameter values presented in table 1.

[b] Expressed as proportion of initial annual investment and replacement of capital assets qualifying for investment tax credit in base simulation.

[c] Expressed as proportion of initial net worth in base simulation. Investment tax credit varied by same proportion.

[d] Nonqualified method infeasible at this level given other parameter values.