

# Impact of Selected Financial Options on a Representative Cow-Calf Ranch in Western North Dakota

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The July-August 1986 issue of this publication projected a four-year financial future of a typical cash grain farm in central North Dakota (Watt et al. 1986). This article presents a similar report for a western cow-calf operation. Reduced feed costs from lower crop prices result in a brighter future for cow-calf operators than has been evidenced in recent years. This article estimates the costs and advantages of several financial options including: (a) sale of assets with lease-back, (b) 35 percent debt forgiveness and (c) 35 percent interest rate buy down. The research also examines financial performance assuming optimistic and pessimistic economic forecasts.

North Dakota agriculture is in a critical time of readjustment. Results of the second half of the 1980s may greatly impact the structure of the agriculture sector and future economic strength of the state. This analysis estimates yearly cash flow, net income, and balance sheet statistics of a cow-calf ranch over a four-year period (1987-1990) using the Farm Financial Simulation Model (Schnitkey et al. 1986).

## Farm Assumptions

The model ranch is a typical cattle ranch in western North Dakota. Ranch characteristics, production expenses, and liabilities were taken from the annual farm business summaries of the North Dakota Vocational Agriculture Farm Business Management Program (Gullickson and Holkup, 1984). Records from 28 cattle ranches for 1984 were used in developing the model ranch.

The ranch has 2,850 acres of which 800 are tillable. The major crops grown are wheat and barley. Alfalfa is primarily grown for livestock feed. About one-fourth of the tillable land is summer fallowed. Land fallowed the previous year is planted to wheat. The rancher owns 480 acres of tillable land. The remaining 320 acres are rented on a basis of one-third to the landlord and two-thirds to the tenant. The landlord pays no production expenses except real estate taxes and one-third of the crop insurance on rented land. The landlord also pays one-third of storage cost on crops from rented land.

The ranch has 200 stock cows in the breeding herd. An average of 185 calves (92.5 percent) are raised each year. Herd replacements come from retaining superior calves. The model assumes 50 percent of the annual calf crop is fed over winter to gain 616 pounds, while the remaining 50 per-

cent (less replacements) are sold as feeder calves in the fall. Table 1 shows the variable expenses per head for the two classes of livestock (Johnson et al., 1986). Income is based on average animal weights and West Fargo prices.

**Table 1. Variable expenses per head for western North Dakota ranch, 1987.**

Item	Breeding Animal	Backgrounding Calf
<b>Variable expenses</b>		
Vet. medicine	\$ 6.50	\$ 5.00
Breeding fees <sup>a</sup>	8.50	
Trucking	7.00	10.00
Utilities	5.00	3.00
Fuel and oil	3.67	N
Miscellaneous	2.60	5.00
Barley (\$1.67/bu.)	2.42	2.67
Hay (\$50/tn.)	112.50	21.50
Other feed	13.00	1.26

<sup>a</sup>Depreciation and maintenance on bulls.

Crop yields are based on a five-year (1980-1984) average in the southwestern region of North Dakota (North Dakota Crop and Livestock Reporting Service, 1985). Wheat and barley historic yields are increased to reflect a yield trend to the midpoint year of the study (Ali and Johnson, 1981). The yields and 1986 direct crop expenses (Johnson et al. 1986) used are presented in Table 2. Variable cost of storage, excluding interest charge, is 4 cents per bushel of wheat and barley. Repair costs are not included in the individual crop expenses but are deducted with the unallocated costs.

Unallocated cash operating expenses total \$16,468. This includes \$2,304 for hired labor, \$7,568 for machinery repairs, \$788 for building and fence repairs, \$1,907 for utilities, \$1,532 for real estate taxes, and \$2,369 for supplies and miscellaneous expenses. Family living expense is \$14,400 per year.

The rancher participates in government programs so that base acreage is reduced from 27.5 to 30 percent and barley base acreage by 20 percent over the 1987-1990 period. Government payment calculations based on the Food Security Act of 1985 are shown in Table 3. Reductions in

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payments under the Gramm-Rudman Debt Reduction Act are not included.

Machinery investment, on the average, is \$38,450 for the ranch on a current market value basis. Depreciation on machinery and buildings is straight line 7-year and 20-year, respectively. Land is currently valued at \$263 per acre for cropland and \$124 per acre for pastureland (Johnson, 1986).

Half of the crop is marketed in the year produced with the remaining half marketed during the next calendar year. Therefore, one-half of wheat and barley production is included as beginning inventory on the balance sheet.

To examine the importance of debt-to-asset (D/A) ratios, three levels, 20, 40 and 70 percent, are specified. Table 4 shows the beginning balance sheet values for each D/A ratio.

## ECONOMIC SCENARIOS

### Baseline Economic Scenario

Commodity prices assumed over the four years are based on projections prepared by a group of agricultural economists from several midwestern land grant universities (Barry, 1986). The national price projections for 1987 through 1990 were adjusted to reflect the difference between North Dakota price and the national average price. Commodity prices, interest rates, and growth rates are given in Table 5. The economic scenario in Table 5 hereafter will be referred to as the baseline scenario.

A summary of financial measures at the three D/A levels is given in Table 6. End-of-period net worth increased for all D/A levels. The D/A ratios excluding tax liabilities of liquidation for 20, 40, and 70 percent D/A levels ended the four years at .10, .19, and .45 respectively. Average net income for the 20 and 40 percent D/A levels ranged from

**Table 2. Crop yields and 1987 direct crop expenses per acre for western North Dakota ranch.**

Item	Wheat on Fallow Land <sup>a</sup>	Wheat on Nonfallow Land	Barley	Alfalfa	Nonlegume Hay
Yield per acre	24.90 bu.	20.40 bu.	36.20 bu.	1.60 ton	1.20 ton
<b>Direct Expenses<sup>b</sup></b>					
Fuel and lube	\$6.02	\$3.55	\$4.31	\$ 4.34	\$2.89
Fertilizer	3.46	4.99	5.22	7.20	0.00
Herbicide	4.30	4.42	2.19	2.40	1.50
Seed	6.84	6.84	4.50	3.15	0.00
Miscellaneous <sup>c</sup>	2.46	2.53	3.56	10.11	7.50

<sup>a</sup>Includes the costs on an acre of summerfallow in addition to an acre of wheat.

<sup>b</sup>Excludes machinery repair, drying and storage costs.

<sup>c</sup>Includes crop insurance and soil testing expense. Also includes cash rent for alfalfa and nonlegume hayland.

**Table 3. Payment calculation for participating in government programs.**

Item	1987	1988	1989	1990
<b>Wheat</b>				
Base acreage	400	400	400	400
Diversion (%)	27.5	30	30	30
ASCS yield (bu/ac)	23	23	23	23
Target price (\$/bu)	\$4.38	\$4.29	\$4.16	\$4.04
Average price (\$/bu)	\$2.53	\$2.40	\$2.40	\$2.40
Deficiency payment (\$/bu)	\$1.99	\$2.02	\$1.89	\$1.77
Planted acres	290	280	280	280
Payments	\$13,273	\$13,009	\$12,172	\$11,399
<b>Barley</b>				
Base acreage	200	200	200	200
Diversion (%)	20	20	20	20
ASCS yield (bu/ac)	35	35	35	35
Target price (\$/bu)	\$2.60	\$2.52	\$2.45	\$2.39
Average price (\$/bu)	\$1.62	\$1.64	\$1.64	\$1.64
Deficiency payment (\$/bu)	\$0.98	\$0.90	\$0.83	\$0.77
Planted Acres	160	160	160	160
Payments	\$5,488	\$5,040	\$4,658	\$4,312
<b>Total Payments</b>	<b>\$18,761</b>	<b>\$18,049</b>	<b>\$16,820</b>	<b>\$15,711</b>

\$38,000 to \$41,500. The average net income for the 70 percent D/A level was reduced to \$31,000 due to high interest cost. Ending year and average cash flow were positive for the 20 and 40 percent D/A levels. The 70 percent D/A level showed a cash flow shortage of about \$10,000.

#### Pessimistic Economic Scenario

The pessimistic economic scenario represents either lower commodity price or reduced government subsidies for wheat and barley. This scenario was implemented by reducing each year's gross farm income by 10 percent.

Net worth decreased for all D/A levels as compared to that of baseline situation. The net worth reduction over the four years from the baseline was \$26,021, \$27,963, and \$38,316 for the 20, 40, and 70 percent D/A levels, respectively. This reflects an increased susceptibility of heavily indebted ranchers to low prices or productivity. Ending year D/A ratio was much higher for the 70 percent D/A situation than for the baseline scenario. Cash flow remained positive for the 20 and 40 percent D/A levels, but was seriously short for the 70 percent D/A level.

**Table 4. Beginning balance sheets at three leverage positions for western North Dakota ranch, January 1987.**

Item	Debt-to-Asset Ratio		
	20%	40%	70%
<b>Assets</b>			
<b>Current Assets</b>			
Cash		\$ 4,605	
Marketable securities		12,215	
Inventories - grain		28,942	
Total Current Assets		45,762	
<b>Intermediate Assets</b>			
Machinery		38,450	
Breeding Stock		100,000	
Total Intermediate Assets		138,450	
<b>Fixed Assets</b>			
Buildings		10,005	
Land		240,320	
Total Fixed Assets		250,385	
Total Assets		\$434,597	
<b>Liabilities</b>			
<b>Current Liabilities</b>			
Current loans	\$ 8,398	\$ 16,725	\$ 29,286
Accounts payable	756	1,505	2,636
Accrued interest	254	506	886
Current part of inter. and long	10,261	20,522	35,913
Contingencies <sup>a</sup>	8,914	8,914	8,914
Total Current Liabilities	28,583	48,173	77,635
Intermediate loans	20,768	41,535	72,686
Contingencies <sup>a</sup>	18,957	18,957	18,957
Total Intermediate Loan	39,725	60,492	91,644
<b>Long-Term Liabilities</b>			
Long-term loans	43,739	93,477	163,585
Contingencies <sup>a</sup>	21,546	21,546	21,546
Total Long-term Liabilities	68,285	115,023	185,131
Total Liabilities	136,592	223,688	354,416
Net Worth With Contingencies	298,005	210,909	80,187
Net Worth Without Contingencies	\$347,422	\$260,326	\$129,605

<sup>a</sup>Contingencies represent the tax liability that would result from liquidation of the business. This amount must be subtracted from operators' net worth to determine the cash that could be withdrawn upon liquidation of the business.

### Optimistic Economic Scenario

The optimistic scenario represents either higher commodity prices or increased government subsidies. This scenario was incorporated by increasing gross farm income by 20 percent each year.

Net worth over a four-year period increased for all D/A levels (Table 6). Net worth improvement from the baseline scenario was also large for all D/A levels. Average and ending cash flows were positive for all D/A levels. Also, the ending year D/A ratios were improved over the baseline situation.

## POLICY OPTIONS

### Sale With Lease-Back

A rancher may choose to make a conditional sale of land with the right to lease it on conventional terms. This strategy is implemented through asset sales by the rancher either to other investors, to the ranchers' lenders, or to a government entity. The object is to relinquish ownership of some fixed assets to reduce debt but maintain asset control through leasing. Retiring a portion of the ranch indebtedness will reduce cash flow requirements under current rental-interest rate relationships.

This option involves the sale of 35 percent of total assets with a lease-back of the sold assets for the duration of the planning period. A total of 920 acres of pasture and 145 acres of crop land were sold for \$152,109, then leased back. Real estate tax was reduced from \$1,532 to \$367.

A summary of financial measures at the three D/A levels is given in Table 7. Ending net worth was reduced from the baseline scenario by \$29,839, \$21,673, and \$10,693 for the 20, 40, and 70 percent D/A levels, respectively. The ending D/A ratios were also reduced for all D/A levels.

Average and ending cash flows increased substantially for the 40 and 70 percent D/A situations. Ending year return on equity remained similar as the baseline for all D/A levels.

### Reduction In Indebtedness

A reduction in indebtedness can be implemented through loan forgiveness by a lender or a principal write-down or buy-down that results from a specific governmental policy instrument. Debt forgiveness incurs a tax liability which creates cash flow problems in the first year. A 35 percent reduction in the farm's initial level of indebtedness was analyzed. The reduction of the initial debt levels was proportional across all debt categories.

Net worth increased the most for all D/A levels with the debt reduction option. Ending D/A ratios improved to .08, .13, and .26, for 20, 40, and 70 percent D/A levels, respectively. Average and ending year net income for each D/A situation was not much different from that of the baseline. Ending year cash flow for all D/A levels was positive.

### Reduction In Interest Rate

Lower interest rates paid on indebtedness could result from government subsidy, legislation, or a general decline in interest rate due to monetary or financial policy. A reduction of 35 percent was analyzed. Short- and intermediate-term interest rate would be reduced from 12 percent (Table 7) to 8 percent while long-term interest rate would drop from 9 percent to about 6 percent.

The effect of reduced interest rate is similar to public credit programs that allow the substitution of public credit at concessionary interest rates for credit from commercial sources at a reduced rate. The average interest payment reduction was \$2,542, \$4,783, and \$7,306 for 20, 40, and 70 percent D/A levels, respectively.

**Table 5. Summary of economic variables used in western North Dakota ranch.**

Item	1987 <sup>a</sup>	1988	1989	1990
<b>Commodity prices (\$)</b>				
Wheat per bu.	2.53	2.40	2.40	2.40
Barley per bu.	1.62	1.64	1.64	1.64
Alfalfa per ton	48.00	48.00	48.00	48.00
Calves (fall) per head	272.00	265.00	252.00	244.00
Calves (backgrounded) per head	376.00	365.00	346.00	336.00
<b>Interest rates (%)</b>				
Short-term	12.10	12.30	12.30	12.50
Intermediate	12.10	12.30	12.30	12.50
Long-term	9.09	9.24	9.24	9.39
Marketable securities	6.10	7.50	8.40	8.70
<b>Growth rates (%)<sup>b</sup></b>				
Production expenses	xxx	0.80	1.60	3.70
Overhead expenses	xxx	0.80	1.60	3.70
Machinery	-10.57	-9.29	-10.79	-9.49
Buildings and land	0.00	0.00	0.00	0.00

<sup>a</sup>Prices used for selling 1986 crop in 1987 were \$2.61 per bu. for wheat, \$1.67 per bu. for barley, and \$52 per ton for alfalfa.

<sup>b</sup>Rates reflect the change in values from year to year.

**Table 6. Summary of financial measures for three economic scenarios at three leverage positions.**

Item	20 Percent Debt-to-Asset			40 Percent Debt-to-Asset			70 Percent Debt-to-Asset		
	Baseline Economic Scenario	Pessimistic Economic Scenario	Optimistic Economic Scenario	Baseline Economic Scenario	Pessimistic Economic Scenario	Optimistic Economic Scenario	Baseline Economic Scenario	Pessimistic Economic Scenario	Optimistic Economic Scenario
Beginning net worth	\$347,422	\$347,347	\$347,272	\$260,326	\$260,136	\$260,325	\$129,605	\$129,491	\$129,806
Ending net worth	492,803	466,707	538,519	392,361	364,208	444,793	233,338	194,908	292,695
Change in net worth	145,381	119,360	191,247	132,035	104,072	184,468	103,733	65,417	162,889
Tax upon liquidation	61,588	61,588	61,588	61,588	61,588	61,588	61,588	61,588	61,588
Average net income	41,410	34,904	52,876	38,074	31,082	51,182	30,998	21,419	45,837
Ending yr. net income	38,130	31,622	49,977	35,895	29,438	46,988	29,009	17,837	43,833
Average interest cost	7,265	7,279	7,266	13,658	13,780	13,606	25,545	27,782	23,203
Average cash flow	27,031	20,525	38,497	13,433	6,442	26,541	(9,034)	(18,613)	5,805
Ending yr. cash flow	23,323	16,815	35,170	10,827	4,370	21,930	(11,450)	(22,623)	3,373
Ending yr. debt-to-asset ratio	.10	.10	.11	.19	.19	.19	.45	.54	.34
Average return on equity (%)	12.75	11.36	15.09	15.51	13.63	18.82	24.65	20.18	30.74
End of yr. return on equity (%)	10.62	9.62	12.30	12.90	11.82	14.34	19.02	15.71	21.53

Note: Numbers in parentheses are negative.

**Table 7. Summary of financial measures for three policy options at three leverage positions under the baseline economic scenario.**

Item	20 Percent Debt-to-Asset			40 Percent Debt-to-Asset			70 Percent Debt-to-Asset		
	Sale With Lease-Back	Debt Reductions	Interest Reductions	Sale With Lease-Back	Debt Reductions	Interest Reductions	Sale With Lease-Back	Debt Reductions	Interest Reductions
Beginning net worth	\$374,422	\$347,234	\$347,362	\$260,326	\$260,325	\$260,502	\$129,605	\$129,605	\$129,915
Ending net worth	462,964	513,315	498,195	370,688	435,428	403,072	222,645	315,558	257,692
Change in net worth	115,542	166,081	150,833	110,362	175,103	142,570	93,040	185,953	127,777
Change in net worth over baseline scenario	(29,839)	20,700	5,452	(21,673)	43,067	10,535	(10,693)	82,220	24,044
Cost of option	—	27,219	10,171	—	54,437	19,121	—	95,265	35,763
Tax upon liquidation	45,678	61,588	61,588	45,678	61,588	61,588	45,678	61,588	61,588
Average net income	33,945	39,780	42,773	32,651	35,231	40,707	28,321	27,737	37,009
Ending yr. net income	36,517	39,215	39,470	35,936	37,262	37,510	32,431	33,957	34,387
Average interest cost	3,106	5,055	4,723	5,287	9,246	8,875	12,605	17,389	15,897
Average cash flow	48,413	28,745	28,393	27,676	17,441	16,066	(1,571)	(474)	(3,023)
Ending yr. cash flow	25,048	27,379	24,663	17,545	18,496	12,422	2,112	4,993	(6,072)
Ending yr. debt-to-asset ratio	.04	.08	.11	.05	.13	.19	.18	.26	.39
Average return on equity (%)	11.25	11.86	13.03	14.23	13.10	16.19	24.13	16.02	27.16
End of yr. return on equity (%)	10.95	10.42	10.82	13.74	11.90	13.02	22.17	15.60	19.80

Note: Numbers in parentheses are negative.

Net worth increased for all D/A levels with the interest reduction option (Table 7). The changes in net worth over the baseline scenario were modest for the 20 and 40 percent D/A levels (\$5,452 and \$10,535, respectively) but relatively large for the 70 percent D/A level (\$24,044). Average and ending year net incomes for all D/A levels showed improvements over the baseline situation. Cash flow was positive for the 20 and 40 percent D/A levels and was -\$6,000 for the 70 percent D/A level. Average and ending year return on equity improved for all D/A levels from the baseline situation.

## SUMMARY AND CONCLUSIONS

A policy option should be examined in terms of what it will return to the rancher in relation to what it costs, either to the government or lending institution. The policies in the order that would benefit the rancher the most are higher commodity prices (optimistic scenario), sale of assets with a lease-back plan, debt reduction, and interest rate reduction.

Ranchers are projected to have improved return over the cash grain farmers in central North Dakota. Under the most likely scenario, the rancher will have no cash flow problem at the 20 and 40 percent D/A levels. The 70 percent D/A ranch will have cash flow shortage of about \$10,000. As expected, the highly leveraged ranches will have even greater cash flow shortages under the pessimistic scenario.

The ranch with a 20 or 40 percent D/A level does not have any significant financial problems. For the purpose of discussion, the sale with lease-back option will improve the cash flow and D/A; however, the loss of land ownership should be considered due to its serious implications for longer term survivability. Debt reduction improves the financial condition of the rancher more than the interest reduction option. This is because the return per dollar of policy cost will be higher under the debt reduction option. For example, in the case of the 40 percent D/A ranch, the debt reduction option will return 80 cents while the interest rate reduction option will return only 55 cents per dollar of policy cost.

The 70 percent D/A ranch would benefit the most with the debt reduction option. The \$95,265 cost of debt reduction option would improve the D/A ratio to 25 percent and increase the net worth by \$82,220 over the baseline or 86 cents per dollar of cost of the option. The interest reduction option does the least to improve the cash flow situation.

In conclusion, the renegotiation of debt with lenders would be useful strategy before considering a partial liquidation even for the 70 percent D/A ranch with a significant cash problem. Since forced sale and repossession costs are often greater than 20 percent of asset value, it is probably best for lenders to be willing to renegotiate debt if a viable economic unit would result.

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A positive correlation between pregnancy rates and body condition at breeding has been confirmed and it may explain why pregnancy rates were high in all groups, including controls (group D).

## WEANING WEIGHTS

Cows dewormed with IVOMEC® - regardless of treatment schedule - weaned calves a mean of 15.5 pounds heavier than the control group. This statistically significant advantage was consistent for both years of the study indicating that in these herds, under similar conditions, this difference of 15.5 pounds may be anticipated to be approximately the same from year to year. Deworming cows influenced their calves' weaning weight but timing (spring vs. fall) and frequency (once vs. twice) of deworming did not. Under conditions in this study, progeny from dewormed cows were consistently heavier than calves in control groups; however, when or how often cows were dewormed did not significantly affect this difference.

Calves from all groups in all herds were lighter during the second year (1986), with no significant genetic changes occurring within herds. This difference was likely due to environmental changes; 1985 was characterized by drought throughout North Dakota but 1986 had above average rainfall during the entire grazing season. This excessive rainfall resulted in fast-growing, lush forages and may have decreased the nutritional value of the forage.

The advantage in average weaning weights of calves from dewormed cows over calves in control group cannot be attributable only to forage intake by the calves. Previous reports have documented increased milk yields in dairy and beef cows following deworming. In this study, increased weaning weights may be explained in part by an increase of milk production in the dewormed cows.

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