Case Study #1: Mixed Farm Operation - The Kattel Farm

Alternate Scenarios

This fictional Case Study featuring cattle operation owned by Michael and Martha Kattel was prepared as part of a series to illustrate the process involved, and benefits of completing a financial review to analyze options that might be available for a farm operation. Every Situation has several possible solutions. The original Case Study Mixed Farm Operation illustrates an action plan based on one scenario. The following are action plans for alternative scenarios for this farm family to consider:

Scenario 2 – rent half section

Scenario 3 – custom graze cows

Scenario 4 – cow / calf buying feed

Scenario 5 – selling and working off farm

Note: This Case Study and the alternate scenarios are not a recommendation for a particular course of action. Individual results for farm operators considering all their own option will vary, with their own financial information and family and business goals.

Scenario 2: The Action Plan –

In this scenario, the Action Plan is to rent an additional 2 quarters of land to grow crops for sale:

- Refinance the new land loan over longer terms. 20 years was again chosen a being an appropriate repayment period.
- Continue to sell the calves when weaned in late September each year.
- Rent an additional half section of land to grow cash crops for sale. The land available has 300 acres under cultivation, and the rental cost would be $80/acre, 50% due in the spring and 50% due in the fall. In the projections, industry revenues and expense amounts for the area are used.
- Purchase a larger used combine costing $30,000 net of their trade in, and finance the purchase over 5 years. As the combine will be purchased in the summer, and payments will be annual, no payments will be due in the first year. The Kattels currently own a small older combine as little grain is harvested each year. They will still purchase the new baler as per the original plan.
- All other aspects of their operation will remain the same in this scenario.

Operations were projected for 2 years based on these changes. The results follow:

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)						Expenses (Jan 1 - Dec 31, 2016)	
Income						**Expense**	
Livestock sales						Livestock expense	71,750
calves	180	x	1,500	270,000		Cropping expense	179,040
cull cows	33	x	1,400	46,200		Overhead expense	13,655
repl. hfrs	15	x	2,000	30,000		Operating interest	4,430
bulls	4		2,500	10,000		Term interest	35,613
Total				356,200		**Total Cash Expense**	304,488
Crop sales						**Non Cash Expense**	
oats	4000	x	2.80	11,200		Depreciation	37,684
barley	2000	x	4.00	8,000		Exp. side acc. adj.	1,194
canola	3000	x	10.00	30,000		**Total Non Cash Expense**	38,878
Total				49,200		**Total Accrued Expense**	343,366
Other income							
Gov't programs				2,000		**Net Accrued Farm Income**	145,034
Custom work				3,000		Net wages	10,000
Other				6,800		Living costs	60,000
Total				11,800		Income tax	15,000
Total Cash Income				417,200		**Debt Service Capacity**	153,331
Inc. side accrual adjustments				71,200		(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)	
Total Accrued Income				488,400			

Profitability Ratios:	
Debt Service Ratio:	1.35
Return on Assets:	3.95%
Return on Equity:	3.83%
Max. operating loan required:	187,022

Payments	
Principal	77,785
Interest	35,613
Total	113,398

Closing Financial Ratios:	
Current Ratio	2.62
Debt to Equity Ratio	0.42
Equity Ratio	0.71

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)

Income				
Livestock sales				
calves	180	x	1,500	270,000
cull cows	33	x	1,400	46,200
repl. hfrs	15	x	2,000	30,000
bulls	4		2,500	10,000
Total				356,200
Crop sales				
oats	5500	x	2.80	15,400
barley	11250	x	4.00	45,000
canola	6000	x	10.00	60,000
Total				120,400
Other income				
Gov't programs				2,000
Custom work				3,000
Other				6,800
Total				11,800
Total Cash Income				488,400
Inc. side accrual adjustments				0
Total Accrued Income				488,400

Expenses (Jan 1 - Dec 31, 2017)

Expense	
Livestock expense	71,750
Cropping expense	179,040
Overhead expense	13,655
Operating interest	3,047
Term interest	34,680
Total Cash Expense	302,172
Non Cash Expense	
Depreciation	40,244
Exp. side acc. adj.	537
Total Non Cash Expense	40,782
Total Accrued Expense	342,954
Net Accrued Farm Income	145,446
Net wages	10,000
Living costs	60,000
Income tax	15,000
Debt Service Capacity	155,371

(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)

Profitability Ratios:	
Debt Service Ratio:	1.35
Return on Assets:	3.91%
Return on Equity:	3.71%
Max. operating loan required:	146,506

Payments	
Principal	80,004
Interest	34,680
Total	114,684

Closing Financial Ratios:	
Current Ratio	3.16
Debt to Equity Ratio	0.37
Equity Ratio	0.73

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:***
    - ***Return on Assets = 5.71%***
    - ***Return on Equity = 6.16%***

Some comments about these results are as follows:

1. The additional productivity and income projected results in an improvement in projected Net Accrued Income from $131,134 in the projection before the change to $145,446 in the second year of the plan. Estimated income tax, remains the same for each of these projected years even though net income is expected to increase because of the cash expense with the addition of cows and other income deferments that will happen with these changes.
2. With the refinancing proposed, payments should drop from the $133,837 projected before the change to $113,398 in Year 1, and $114,684 in Year 2 of the Plan. This includes the payments on the additional debt planned in this Scenario for the purchase of a combine. The Debt Service Ratio is projected to remain adequate in both projected years at 1.35.
3. The Operating loan requirements in this Scenario will increase significantly during the operating season due to the additional crop inputs required, to $187,022 in Year 1 and then reduce to $146,506 in Year 2 of the Plan.

| Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |

Scenario 3: The Action Plan

In this scenario, the Action Plan is to change from a cow/calf enterprise where all feed is produced and calves are sold in the fall, to a grazing operation where cow/calf units are grazed on a custom basis. The Action Plan, then is to:

- Continue to run the farm as a cow/calf operation, and produce feed as in the past until the fall, when all the livestock will be liquidated.
- Disperse feed and grain produced as able, retaining enough to provide feed for the livestock when it is sold. It is anticipated that some of the feed will be sold in Year 1 – any left unsold over year end would then be sold in the next year, Year 2 of our Plan.
- Sell equipment not needed for the new enterprise, as there is opportunity. It is expected that equipment used for spring operations will be sold in the summer, and harvesting and other equipment will be sold in the fall. An option would be to hold the equipment over for a spring sale, if it seemed the extra price gain would make it worthwhile. It is projected that $282,000 of equipment would be sold, $95,300 retained for the new enterprise.
- Sell the grazing lease in the fall of Year 1. Projected sale price is $250,000.
- Terminate the existing private lease on 320 acres. Projections done suggest that profitability from operations would make net returns on this land marginal.
- Underseed the remaining crop land to grass for pasture at a cost of about $4,000.
- Spend $20,000 to improve fences to allow for more intensive rotational grazing in the new custom grazing enterprise.
- For future operations, custom graze all the cultivated land for approximately 4 months.

- Proceeds from the sale of assets will be used to pay off debt. Surplus funds projected to be $250,000 will be put into an investment expecting to return 5%/year. Thereafter, surplus cash will be invested as it becomes available.
- With the reduced workload expected in this change of enterprises, Michael and Martha expect to be able to increase their level of non farm work. Income from this source would stay at the present $10,000 for Year 1, but in Year 2, when the change of enterprises is complete, they expect it to increase to $30,000.

Operations were projected for 2 years based on these changes. The results follow:

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					Expenses (Jan 1 - Dec 31, 2016)	
Income					**Expense**	
Livestock sales					Livestock expense	54,180
calves	254	x	1,550	393,700	Cropping expense	95,535
cull cows	248	x	1,900	471,200	Overhead expense	13,655
repl. hfrs	50	x	2,000	100,000	Operating interest	471
bulls	10		3,500	35,000	Term interest	29,524
Total				999,900	**Total Cash Expense**	193,365
Crop sales					**Non Cash Expense**	
oats	4000	x	2.80	11,200	Depreciation	37,684
hay bales	1000	x	50.00	50,000	Exp. side acc. adj.	92,007
Total				61,200	**Total Non Cash Expense**	129,691
Other income					**Total Accrued Expense**	323,056
Gov't programs				2,000	**Net Accrued Farm Income**	132,724
Custom work				3,000	Net wages	10,000
Other				6,800	Living costs	60,000
Total				11,800	Income tax	150,000
Total Cash Income				1,072,900	**Debt Service Capacity**	(68)
Inc. side accrual adjustments				(617,120)	(Net acc. farm inc. + depreciation + term interest + non farm income	
Total Accrued Income				455,780	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	0.00
Return on Assets:	4.87%
Return on Equity:	3.51%
Max. operating loan required:	71,140

Payments	
Principal	0
Interest	29,524
Total	29,524

Closing Financial Ratios:	
Current Ratio	no debt
Debt to Equity Ratio	0.00
Equity Ratio	1.00

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)					Expenses (Jan 1 - Dec 31, 2017)	
Income					**Expense**	
Custom grazing					Livestock expense	0
pasture	550	x	75	41,250	Cropping expense	14,700
					Overhead expense	4,980
Total				41,250	Operating interest	0
					Term interest	0
Crop sales					**Total Cash Expense**	19,680
oats	7350	x	2.8	20,580	**Non Cash Expense**	
hay	950	x	50	47,500	Depreciation	11,782
Total				68,080	Exp. side acc. adj.	0
					Total Non Cash Expense	11,782
Other income					**Total Accrued Expense**	31,462
Gov't programs				500	**Net Accrued Farm Income**	21,088
Custom work				3,000	Net wages	30,000
Other				7,800	Interest income	12,500
Total				11,300	Living costs	60,000
					Income tax	5,000
Total Cash Income				120,630	**Debt Service Capacity**	10,370
Inc. side accrual adjustments				(68,080)	(Net acc. farm inc. + depreciation + term interest + non farm income	
Total Accrued Income				52,550	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	no debt
Return on Assets:	-1.88%
Return on Equity:	-1.88%
Max. operating loan required:	0

Payments	
Principal	0
Interest	0
Total	0

Closing Financial Ratios:	
Current Ratio	no debt
Debt to Equity Ratio	0.00
Equity Ratio	1.00

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are before interest income and after living costs are paid. Before living costs, the returns on assets and equity (farm and investment) are:***
  - ***Return on Assets = .99%***
  - ***Return on Equity = .99%***

Some comments about these results are as follows:

4. The sell off of assets in this plan allows for all debt to be repaid, and leaves $250,000 to invest. Projected return of 5% results in additional net income of $12,500 per year from that source. In the plan, payments are essentially 0 after the changes are complete.
5. Transition from the present operation to the proposed operation is expected to bear some cost in terms of lost productivity in the change year, some set up costs, and tax liability. Profitability from farm operations decreases from $131,134 in the projection before the change to $21,088 in the second year of the plan.
6. The reduction in farm operations means that both Michael and Martha will be able to have non farm jobs. They anticipate that net non farm income after tax for them together will increase from $10,000/year to about $30,000.
7. It is expected that the change, in particular the sale of livestock, could result in a large tax liability. For purposes of this Case Study, the amount is estimated to be $150,000 which would be funded out of asset sales, mainly in Year 1.
8. Cash flow in this plan should be strong. The farm is projected to be profitable, and there will be non farm income and interest income, which in total, will exceed living costs and income tax requirement. The result is surplus cash that could be invested, or spent on items of personal interest.

| Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |

Scenario 4: The Action Plan

In this scenario, the Action Plan is to continue on with the cow/calf enterprise where calves are sold in the fall, but change from growing the feed required to purchasing it. The Plan then, is to:

- In the spring of Year 1, sell equipment no longer needed for this operation ($218,000 of the present $337,300 equipment line).
- Use the proceeds from the sale of equipment to reduce debt.
- Refinance the reduced private loan over 20 years to decrease payments.
- Terminate the lease on the privately rented land.
- Starting in the first year, purchase all feed required.
- Rent out the surplus land. Rents in the area are currently $80/acre.
- Not having to seed and harvest their own crops, Michael believes he will be able to get work during the summer with other farms in his area. The estimate for net wages is increased from $10,000 to $30,000 per year.

Operations were projected for 2 years based on these changes. The results follow:

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					Expenses (Jan 1 - Dec 31, 2016)	
Income					**Expense**	
Livestock sales					Livestock expense	185,050
calves	180	x	1,500	270,000	Cropping expense	3,190
cull cows	33	x	1,400	46,200	Overhead expense	45,980
repl. hfrs	15	x	2,000	30,000	Operating interest	258
bulls	4		2,500	10,000	Term interest	28,979
Total				356,200	**Total Cash Expense**	263,457
Crop sales					**Non Cash Expense**	
oats	2000	x	2.80	5,600	Depreciation	37,684
Total				5,600	Exp. side acc. adj.	-457
					Total Non Cash Expense	37,227
Other Income					**Total Accrued Expense**	300,684
Land rental				38,400		
Gov't programs				2,000	**Net Accrued Farm Income**	105,716
Custom work				3,000	Net wages	30,000
Other				6,800	Living costs	60,000
Total				50,200	Income tax	20,000
Total Cash Income				412,000	**Debt Service Capacity**	122,379
Inc. side accrual adjustments				-5,600	(Net acc. farm inc. + depreciation	
					+ term interest + non farm income	
Total Accrued Income				406,400	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.68
Return on Assets:	2.59%
Return on Equity:	2.08%
Max. operating loan required:	34,224

Payments	
Principal	43,925
Interest	28,979
Total	72,904

Closing Financial Ratios:	
Current Ratio	5.07
Debt to Equity Ratio	0.31
Equity Ratio	0.76

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)					Expenses (Jan 1 - Dec 31, 2017)	
Income					**Expense**	
Livestock sales					Livestock expense	185,050
calves	180	x	1,500	270,000	Cropping expense	3,190
cull cows	33	x	1,400	46,200	Overhead expense	45,980
repl. hfrs	15	x	2,000	30,000	Operating interest	0
bulls	4		2,500	10,000	Term interest	24,323
Total				356,200	**Total Cash Expense**	258,543
Crop sales					**Non Cash Expense**	
none				0	Depreciation	17,604
					Exp. side acc. adj.	(121)
Total				0	**Total Non Cash Expense**	17,483
Other income					**Total Accrued Expense**	276,026
Land rental				38,400		
Gov't programs				2,000	**Net Accrued Farm Income**	130,374
Custom work				3,000	Net wages	30,000
Other				6,800	Living costs	60,000
Total				50,200	Income tax	15,000
Total Cash Income				406,400	**Debt Service Capacity**	127,301
Inc. side accrual adjustments				0	(Net acc. farm inc. + depreciation + term interest + non farm income	
Total Accrued Income				406,400	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	1.84
Return on Assets:	3.24%
Return on Equity:	3.09%
Max. operating loan required:	0

Payments	
Principal	44,770
Interest	24,323
Total	69,093

Closing Financial Ratios:	
Current Ratio	6.22
Debt to Equity Ratio	0.28
Equity Ratio	0.78

Notes on Return on Assets and Equity:

- ***the percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:***
  - ***Return on Assets = 5.20%***
  - ***Return on Equity = 5.57%***

Some comments about these results are as follows:

9. The Kattels have always wondered if they would be better off purchasing their feed rather than producing it. In this option, they do that, and sell the equipment not now needed, giving up the rented land, and renting out surplus land.
10. Debt is significantly reduced with this change, and leverage and equity ratios also improve.
11. Profitability from farm operations slightly drops from $131,134 in the projection before the change to $130,374 in the second year of the plan.
12. The change means that both Michael and Martha will be able to have non farm jobs. They anticipate that Michael will now earn about $10,000 after tax from non farm income in addition to Martha's projected $20,000 in the second year of the plan.
13. Cash flow in this plan should be strong. No operating funding should be required in the second year of the plan, and surplus cash from farm and non farm sources should be available for investment into non farm investments or further reduction of debt.

| Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |

Scenario 5: The Action Plan –

In this scenario, the Action Plan is to terminate farm operations, sell livestock and equipment and rent the land out. Michael and Martha would both then obtain full time non farm employments. The Action Plan then, is to:

- Calve out, and continue to feed the owned cows until about May 1, then sell as cow/calf pairs.
- After the cows are sold, sell remaining feed.
- In the spring, sell all equipment other than a front end loader tractor, the quad, tools and the farm pickup trucks. Total proceeds from the sale are projected to be $299,300.
- Sell the grazing lease for $250,000 prior to the grazing season.
- Use the proceeds from the sale of equipment, livestock and grazing lease to retire all debt. Surplus funds after the sale of $250,000 will be put into an investment expected to return 5%. It it is expected there should be further funds to invest in Year 2 and the years following.
- Terminate the lease on the privately held land.
- Rent all the land out.
- Both Michael and Martha obtain full time employment. As the equipment will be sold in the spring, and the cattle in May, they won't be increase their scale of employment until after the sales. Net non farm income is expected to be about $40,000 in Year 1 and $70,000 in Year 2.

Operations were projected for 2 years based on these changes. The results follow:

After Change Projection (Year 1)

Income (Jan 1 - Dec 31, 2016)					Expenses (Jan 1 - Dec 31, 2016)	
Income					**Expense**	
Livestock sales					Livestock expense	31,800
calves	24	x	1,800	43,200	Cropping expense	0
cull cows	249	x	2,500	622,500	Overhead expense	5,680
repl. hfrs	50	x	2,000	100,000	Operating interest	0
bulls	10		3,000	30,000	Term interest	14,588
Total				795,700	**Total Cash Expense**	52,068
Crop sales					**Non Cash Expense**	
oats	2000	x	2.80	5,600	Depreciation	18,819
hay bales	400	x	50	20,000	Exp. side acc. adj.	72,007
Total				25,600	**Total Non Cash Expense**	90,826
Other income					**Total Accrued Expense**	142,894
Land rental				44,000	**Net Accrued Farm Income**	23,006
Gov't programs				0	Interest	9,375
Custom work				1,000	Net wages	40,000
Other				4,800	Living costs	65,000
Total				49,800	Income tax	175,000
Total Cash Income				871,100	**Debt Service Capacity**	-134,212
Inc. side accrual adjustments				-705,200	(Net acc. farm inc. + depreciation + term interest + non farm income	
Total Accrued Income				165,900	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	-9.20
Return on Assets:	-1.48%
Return on Equity:	-2.13%
Max. operating loan required:	none

Payments	
Principal	0
Interest	14,588
Total	14,588

Closing Financial Ratios:	
Current Ratio	n/a
Debt to Equity Ratio	0.00
Equity Ratio	1.00

After Change Projection (Year 2)

Income (Jan 1 - Dec 31, 2017)		Expenses (Jan 1 - Dec 31, 2017)	
Income		**Expense**	
Livestock sales		Livestock expense	0
none	0	Cropping expense	0
		Overhead expense	5,680
		Operating interest	0
		Term interest	0
Total	0	**Total Cash Expense**	5,680
Crop sales		**Non Cash Expense**	
none	0	Depreciation	12,609
		Exp. side acc. adj.	0
Total	0	**Total Non Cash Expense**	12,609
Other income		**Total Accrued Expense**	18,289
Land rental	44,000	**Net Accrued Farm Income**	31,511
Gov't programs	0	Interest	12,500
Custom work	1,000	Net wages	70,000
Other	4,800	Living costs	70,000
Total	49,800	Income tax	8,000
Total Cash Income	49,800	**Debt Service Capacity**	48,620
Inc. side accrual adjustments	0	(Net acc. farm inc. + depreciation + term interest + non farm income	
Total Accrued Income	49,800	- living costs - income tax)	

Profitability Ratios:	
Debt Service Ratio:	no debt
Return on Assets:	-1.92%
Return on Equity:	-1.92%
Max. operating loan required:	none

Payments	
Principal	0
Interest	0
Total	0

Closing Financial Ratios:	
Current Ratio	n/a
Debt to Equity Ratio	0.00
Equity Ratio	1.00

__Notes on Return on Assets and Equity:__

- ***the percentage returns shown above are before interest income after living costs are paid. Before living costs, the returns on assets and equity (farm and investment) are:***
  - ***Return on Assets = 1.52%***
  - ***Return on Equity = 1.52%***

Some comments about these results are as follows:

14. The selloff of assets in this plan allows for all debt to be repaid, and leaves $250,000 to invest. Projected return of 5% results in additional net income of $9,375 in Year 1 and $12,500 in Year 2. In the plan, payments after the changes are complete are essentially 0.
15. Transition from the present operation to the proposed operation is expected to bear some cost in terms of lost productivity in the change year, some set up costs, and tax liability.
16. Profitability from farm operations decreases from $131,134 in the projection before the change to $31,511 in the second year of the plan. After change, however, there will be interest income as well, as noted above.
17. The termination of farm operations means that both Michael and Martha will be able to have full time non farm jobs. They anticipate that net non farm income after tax for them together will increase from $10,000/year to about $70,000 in the second year of the Plan. Income tax payable on net farm and investment income is expected to decrease from $15,000 per year at present to about $8,000 per year with this change. With the higher levels of non farm employment, they expect living costs to increase slightly.
18. Cash flow in this plan should be strong. Surplus cash should accumulate over time, to invest, or be spent on items of personal interest.

Summary

Four alternative Scenarios have been developed for this Case Study. Each Scenario has it's own individual results, positive features and negative features. Please refer to the Summary document which displays the Financial Ratios and Indicators for each Scenario, and what are considered to be the Positives and Negatives of each relative to the Case Study presented and Business and Personal Goals of the Case Study Farmers.

| **Scenario 2** | **Scenario 3** | **Scenario 4** | **Scenario 5** |