



Producer Investment in a Value-Added New Generation Cooperative: The Case of an Ethanol Plant

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RESEARCH OBJECTIVES

- Substantial NGC Involvement and investment into Agricultural Processing Industry
- Obtaining Additional Information regarding the RISK and RETURNS associated with these investments



Monte Carlo Simulation Model

- Minnesota Corn Processor investing in
 - Corn/Soybean Farm
 - Dry Corn Mill located in SW Minnesota
 - S&P 500 Index
 - T-Bills
- Built in Excel™
- With @Risk to incorporate stochastic variables and evaluate impact of risk
- Examining ROI



PORTFOLIO ALTERNATIVES

- 100 % farm (FARM)
- 75% farm, 25% corn milling (FCM7525)
- 75% farm, 25% S&P 500 (FSP7525)
- 75% farm, 25% T-bills (FTB7525)
- 75% farm, 15% corn mill, 10%S&P(FPSP)
- 75% farm, 15% corn mill, 10%T-Bill (FPTB)



SCENARIOS

- Base Case
 - High, Average and Low Yields
- Excluding State Ethanol Producer Credit
- Excluding Farm Subsidies
- Excluding All Government Subsidies
- Excluding Government Transition Payments



PORTFOLIO EVALUATION

- EV - Expected Value (Mean) - Variance
- FSD - First Degree Stochastic Dominance
- SSD - Second Degree Stochastic Dominance

Results: Base Case

(Efficient Sets)

Yield	E V	FSD	SSD
High	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Average	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Low	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FSP7525 FTB7525 FPSP FPTB

Results: Excluding State

Ethanol Credit (Efficient Sets)

Yield	E V	FSD	SSD
High	FSP7525 FTB7525 FPSP FPTB	FARM FSP7525 FTB7525	FSP7525 FTB7525
Average	FSP7525 FTB7525	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FSP7525 FTB7525
Low	FSP7525 FTB7525 FPSP FPTB	FARM FSP7525 FTB7525	FSP7525 FTB7525

Results: Excluding Farm

Subsidies (Efficient Sets)

Yield	E V	FSD	SSD
High	FCM7525	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Average	FCM7525 FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Low	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FSP7525 FTB7525 FPSP FPTB

Results: Excluding All Gov't

Subsidies (Efficient Sets)

Yield	E V	FSD	SSD
High	FSP7525 FTB7525 FPSP FPTB	FARM FSP7525 FTB7525	FSP7525 FTB7525
Average	FSP7525 FTB7525 FPSP FPTB	FARM FSP7525 FTB7525 FPSP	FSP7525 FTB7525
Low	FSP7525 FTB7525 FPSP FPTB	FARM FSP7525 FTB7525 FPTB	FSP7525 FTB7525

Results: Excl. Gov't Transition

Payments (AMTA) (Efficient Sets)

Yield	E V	FSD	SSD
High	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Average	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FTB7525 FPSP FPTB
Low	FCM7525 FPSP FPTB	FARM FCM7525 FSP7525 FTB7525 FPSP FPTB	FCM7525 FSP7525 FTB7525 FPSP FPTB

Results: Base Case

County Characteristics	Portfolio	Mean	Standard Deviation	Min	Max
High Yield	FARM	3.50	13.50	-42.00	50.68
	FCM7525	5.18	10.17	-32.36	36.72
	FSP7525	4.26	10.65	-32.48	37.68
	FTB7525	4.11	10.20	-30.19	38.83
	FPSP	4.81	10.02	-32.41	36.25
Average Yield	FPTB	4.75	9.99	-30.55	37.56
	FARM	-1.73	11.77	-41.62	31.99
	FCM7525	1.24	9.00	-28.81	25.41
	FSP7525	0.38	9.55	-30.55	29.04
	FTB7525	0.20	8.82	-29.43	25.08
Low Yield	FPSP	0.90	8.81	-27.98	26.72
	FPTB	0.82	8.68	-27.73	25.27
	FARM	-1.11	12.15	-37.68	38.84
	FCM7525	1.42	9.21	-33.83	31.95
	FSP7525	0.91	9.85	-30.21	29.81
	FTB7525	0.71	9.13	-26.87	30.53
	FPSP	1.21	9.10	-29.74	30.26
	FPTB	1.13	8.96	-31.04	30.74

Results: Excluding State Ethanol Producer Credit

County Characteristics	Portfolio	Mean	Standard Deviation	Min	Max
High Yield	FARM	3.39	13.67	-44.68	41.06
	FCM7525	1.48	10.34	-35.68	25.49
	FSP7525	4.15	10.86	-36.14	33.02
	FTB7525	4.06	10.27	-32.63	31.93
	FPSP	2.55	10.21	-35.04	26.17
	FPTB	2.51	10.13	-33.64	27.03
Average Yield	FARM	-1.43	11.24	-40.59	32.50
	FCM7525	-2.01	8.81	-34.73	29.26
	FSP7525	0.63	9.33	-37.44	27.19
	FTB7525	0.46	8.41	-28.83	26.03
	FPSP	-0.95	8.62	-34.33	28.09
	FPTB	-1.02	8.43	-31.86	27.97
Low Yield	FARM	-1.25	12.18	-40.06	38.03
	FCM7525	-1.95	9.25	-36.57	23.32
	FSP7525	0.74	9.88	-31.09	33.48
	FTB7525	0.60	9.18	-28.95	29.63
	FPSP	-0.88	9.10	-33.23	26.57
	FPTB	-0.93	8.99	-33.52	25.03

Results: Excluding Farm Subsidies

County Characteristics	Portfolio	Mean	Standard Deviation	Min	Max
High Yield	FARM	-0.67	14.23	-44.84	38.28
	FCM7525	1.64	10.23	-34.71	30.44
	FSP7525	1.23	11.43	-33.68	36.77
	FTB7525	1.02	10.68	-32.27	30.14
	FPSP	1.48	10.38	-33.52	32.97
	FPTB	1.39	10.23	-33.73	29.67
Average Yield	FARM	-3.99	12.08	-45.19	28.44
	FCM7525	-0.97	8.86	-36.00	23.33
	FSP7525	-1.25	9.90	-39.04	25.14
	FTB7525	-1.46	9.11	-33.68	25.59
	FPSP	-1.08	8.91	-33.78	21.99
	FPTB	-1.17	8.75	-34.67	22.19
Low Yield	FARM	-5.57	11.59	-41.07	28.01
	FCM7525	-1.79	8.91	-34.94	22.67
	FSP7525	-2.55	9.23	-30.41	23.61
	FTB7525	-2.68	8.72	-30.09	21.73
	FPSP	-2.10	8.63	-30.80	21.32
	FPTB	-2.15	8.60	-32.36	20.91

Results: Excluding All Government Subsidies

County Characteristics	Portfolio	Mean	Standard Deviation	Min	Max
High Yield	FARM	-0.42	14.18	-42.59	43.47
	FCM7525	-1.32	10.22	-37.39	27.26
	FSP7525	1.34	11.34	-32.71	33.19
	FTB7525	1.20	10.65	-30.45	33.73
	FPSP	-0.25	10.33	-35.52	27.60
	FPTB	-0.31	10.18	-34.15	28.49
Average Yield	FARM	-5.81	11.93	-41.94	31.61
	FCM7525	-5.36	9.08	-36.03	25.54
	FSP7525	-2.61	9.68	-37.02	30.12
	FTB7525	-2.83	8.99	-29.74	27.02
	FPSP	-4.26	8.93	-34.85	27.37
	FPTB	-4.35	8.81	-32.25	26.13
Low Yield	FARM	-4.85	11.94	-40.63	32.22
	FCM7525	-4.53	8.95	-32.85	24.61
	FSP7525	-1.83	9.83	-34.46	28.91
	FTB7525	-2.12	8.96	-29.48	25.91
	FPSP	-3.45	8.92	-32.71	25.10
	FPTB	-3.57	8.71	-30.81	24.56

Results: excluding Government Transition Payment (AMTA)

County Characteristics	Portfolio	Mean	Standard Deviation	Min	Max
High Yield	FARM	1.02	13.80	-45.47	50.14
	FCM7525	2.91	10.21	-33.55	33.81
	FSP7525	2.44	10.99	-34.94	38.97
	FTB7525	2.27	10.39	-32.90	39.06
	FPSP	2.72	10.19	-33.28	35.88
	FPTB	2.65	10.09	-33.07	35.91
Average Yield	FARM	-4.25	11.68	-43.58	30.00
	FCM7525	-0.85	9.04	-36.45	23.43
	FSP7525	-1.42	9.48	-32.64	28.11
	FTB7525	-1.66	8.80	-30.30	23.68
	FPSP	-1.08	8.79	-32.47	22.40
	FPTB	-1.17	8.71	-33.88	23.21
Low Yield	FARM	-4.24	11.96	-41.77	40.73
	FCM7525	-0.93	9.18	-33.95	27.20
	FSP7525	-1.49	9.79	-30.67	36.44
	FTB7525	-1.68	9.00	-30.42	31.50
	FPSP	-1.15	9.06	-31.36	26.68
	FPTB	-1.23	8.89	-31.13	25.60

Hog Results: Base Case (Efficient Sets)

Yield	E V	FSD	SSD
300 SOW	FP7525	FARM FP7525 FSP7525 FPSP	FP7525
600 SOW	FP7525	FARM FP7525 FSP7525 FPSP FPTB	FP7525 FPSP
1200 SOW	FARM FP7525	FARM FP7525 FSP7525 FPSP	FARM FP7525

Cow/Calf Producers

- Add Value by
 - Retaining ownership
 - Improving genetics
 - Selling on Grid (marketing program)
- Diversity by investing in S&P

Cow/Calf Producers

- Those remaining in Efficient set
 - Involving diversification into S&P
 - Selling on Grid

General Conclusions

- Producers can benefit from diversification
- Need a balanced portfolio
- Need to get out of low-profit areas of business
- Benefit depends on correlation of commodity and final prices

Conclusions for Ethanol

- Diversification is a strategy that corn producers should consider
 - Holds for all scenarios
- Yield Characteristics do not Significantly Impact the Portfolio that a Producer Should Consider
- When farm subsidies are removed Diversification both increases returns and decreases risk

Conclusions for Ethanol

- With no Ethanol subsidies, the portfolios with corn milling in them are removed from efficient set
- Processing one COMMODITY into another COMMODITY may not be the best portfolio alternative from a risk and return prospective
- Excess Capacity