

North Dakota Land Values and Rents Outlook

BRYON J PARMAN

DEPARTMENT OF AG. BUSINESS AND APPLIED ECONOMICS

NDSU EXTENSION

NDSU | EXTENSION

Presentation Outline

Quick Farm Financial Situation and Outlook

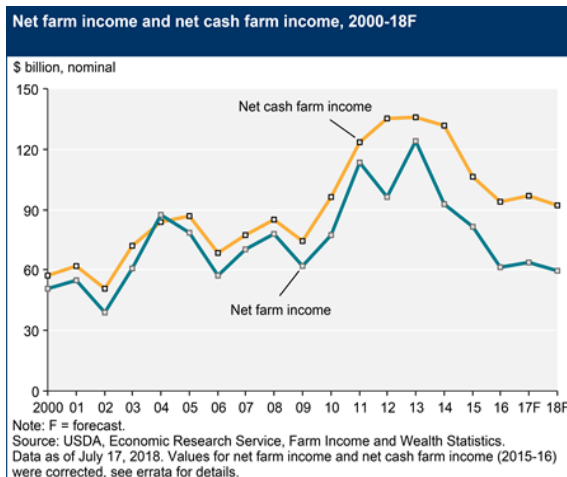
Farm Solvency and Debt

Rents and Values

Margins vs. Sales Prices

Akerson Farmland Evaluation for ND

Net Farm Income at its lowest level in Nearly 10 Years



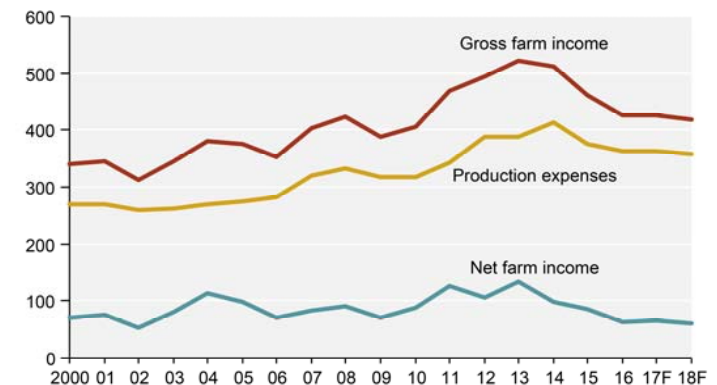
Difference between Net Cash Income and Net Farm Income

Net Cash Income –
-Does not deduct depreciation
-Does not treat family living as operating expenses
-Treats CCC loans as sales
-No Accrual oriented adjustment

Net Farm Income calculated in traditional accrual accounting fashion

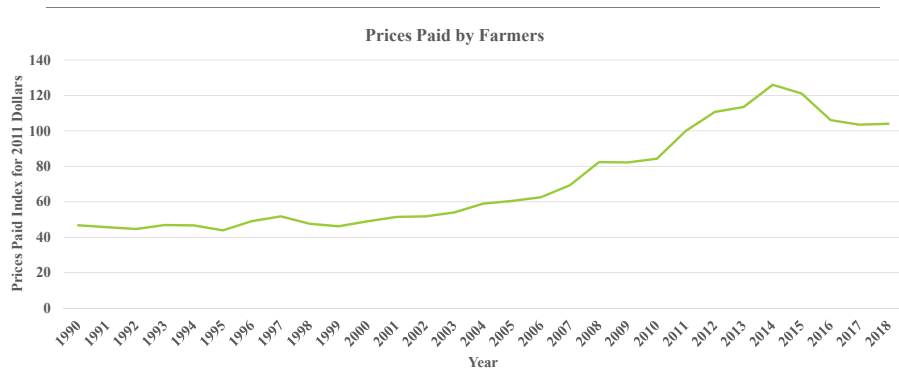
Gross farm income, production expenses, and net farm income, inflation adjusted, 2000-18F

\$ billion (2018)



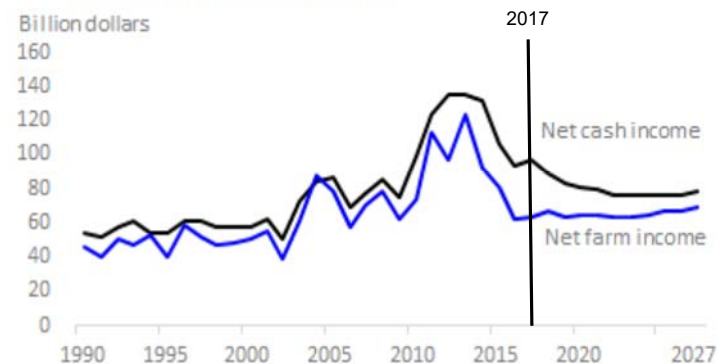
Note: F = forecast. Values are adjusted for inflation using the chain-type GDP deflator, 2018=100.
Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.
Data as of February 7, 2018.

Farm Production Cost Index in 2011 Dollars



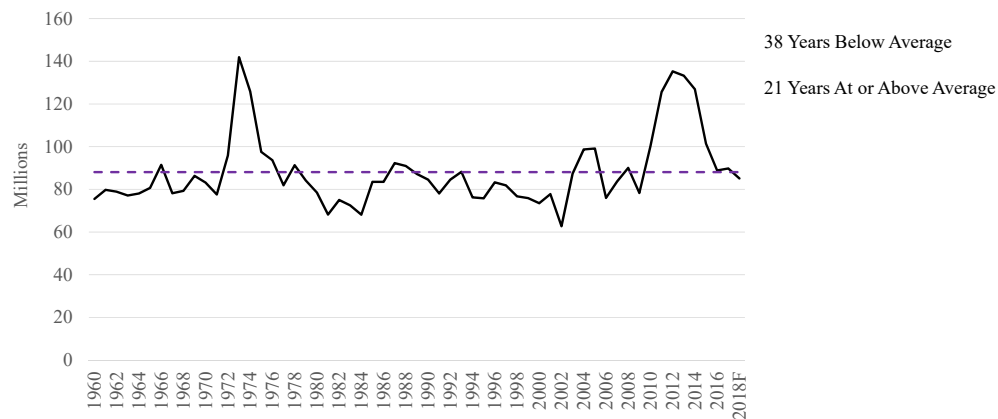
USDA Projected Net Farm Income to 2027

U.S. farm income indicators



Which Periods Are Abnormal?

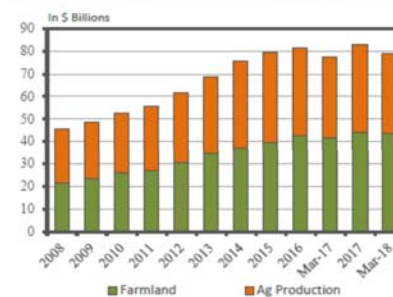
Net Cash Farm Income in 2011 Dollars



Ag loan demand remains elevated, and nonperforming rates have increased.

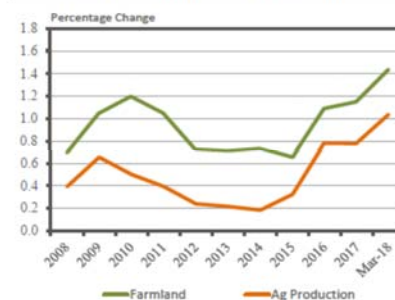
- As a result of lower farm income and diminishing working capital levels, ag borrowers' financing needs have increased and remain elevated.
- Ag borrowers' financial stress continues to increase.

Ag Banks Loan Volume (\$B)



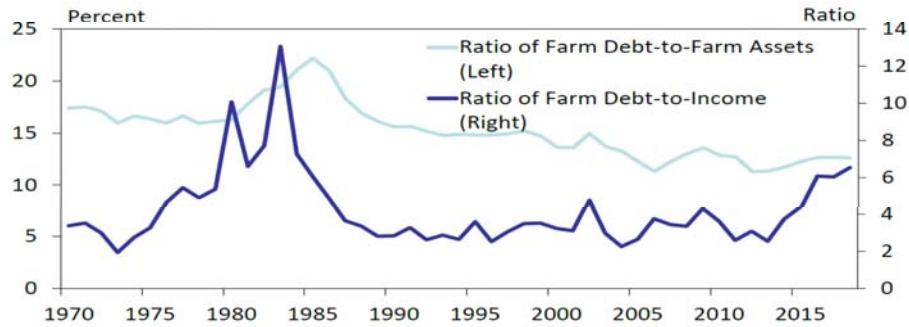
Source: Call Report as of March 31, 2018

Ag Loan Nonperforming Rates (%)



With lower prices in many ag markets, liquidity has deteriorated, but solvency has remained strong.

U.S. Farm Sector Solvency and Liquidity Metrics



Source: USDA

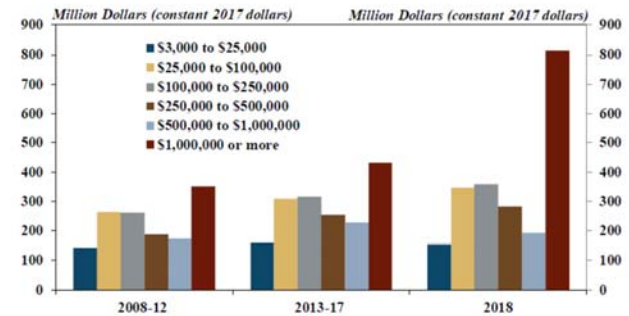
2018 Federal Reserve Bank of St. Louis

ask the Fed

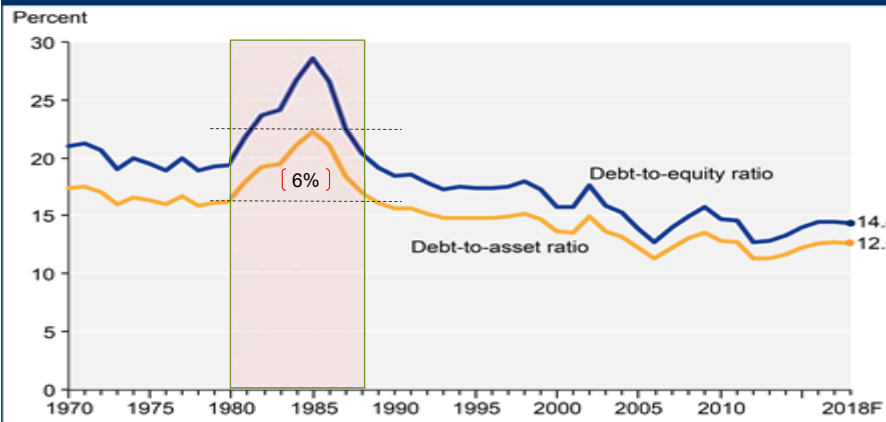
25

From KC FED: Volume of Loans over \$1 Million Nearly Doubles

Chart 3: Volume of Non-Real Estate Farm Loans by Average Size, Third Quarter



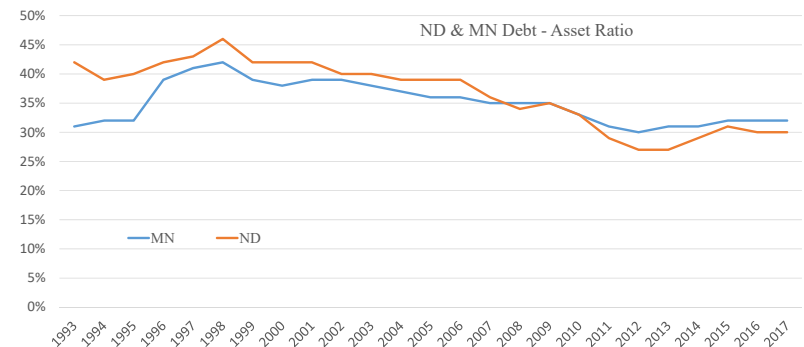
Farm sector solvency ratios, 1970-2018F



Note: F = forecast; data for 2016 and 2017 are forecasts.

Source: USDA, Economic Research Service, Farm Income and Wealth Statistics. Data as of February 7, 2018.

Debt to Asset Ratio at Market Value for North Dakota and Minnesota



Using Debt To EBITDA Ratio

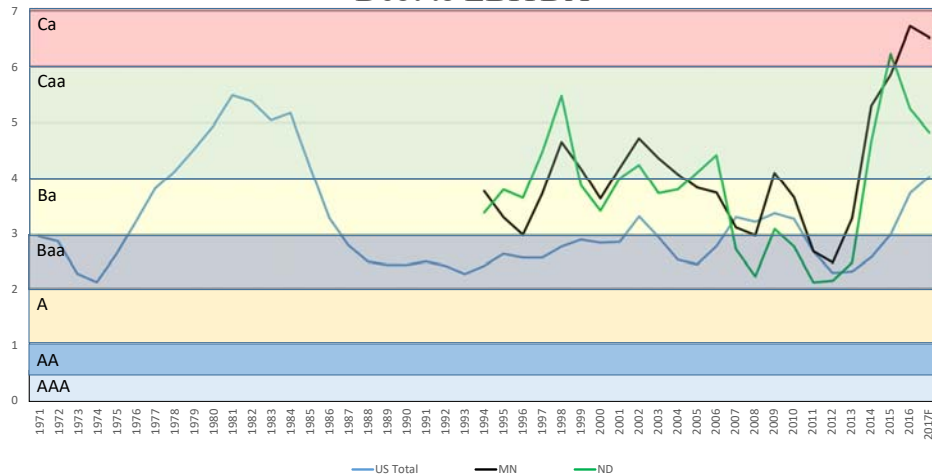
It may be too late by the time poor solvency ratios (D/A or D/E) are the predominant reason for credit denials

The following charts use debt – average EBITDA where earnings are averaged over a two year period.

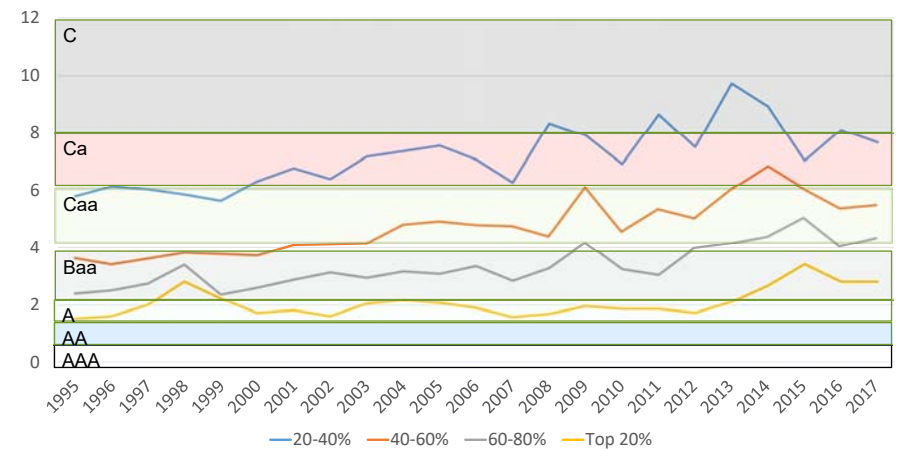
Debt – EBITDA Ratio Credit Rating for Ag.

Moody's Rating		
Investment Grade		
AAA	0 – 0.50	Highest – Lowest Credit Risk
AA	0.51 – 1.00	High - Grade
A	1.01 – 2.00	Upper – Medium Grade
Speculative Grade		
Baa	2.01 – 3.00	Medium Grade
Ba	3.01 – 4.00	Speculative elements
B	4.01 – 6.00	Subject to high credit risk
Ca	6.01 – 8.00	Highly Speculative
C	> 8.00 or < 0	Lowest Rating – In default w/ low recovery prospects

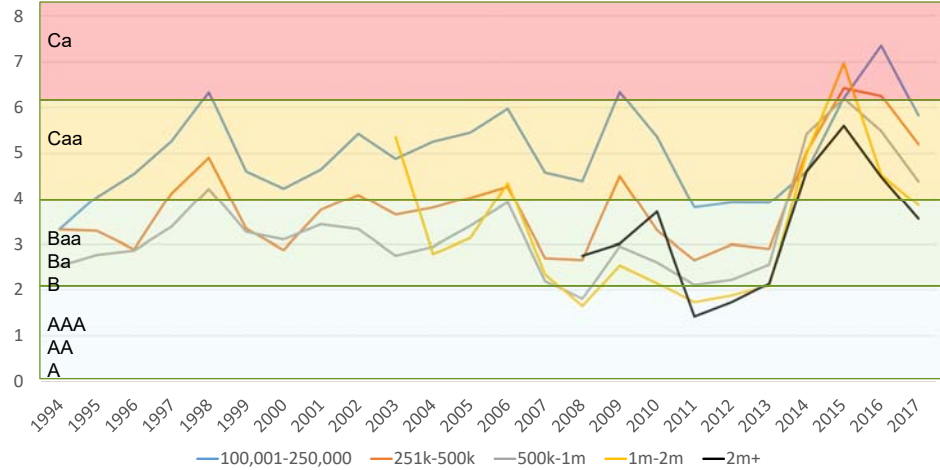
Debt to EBITDA



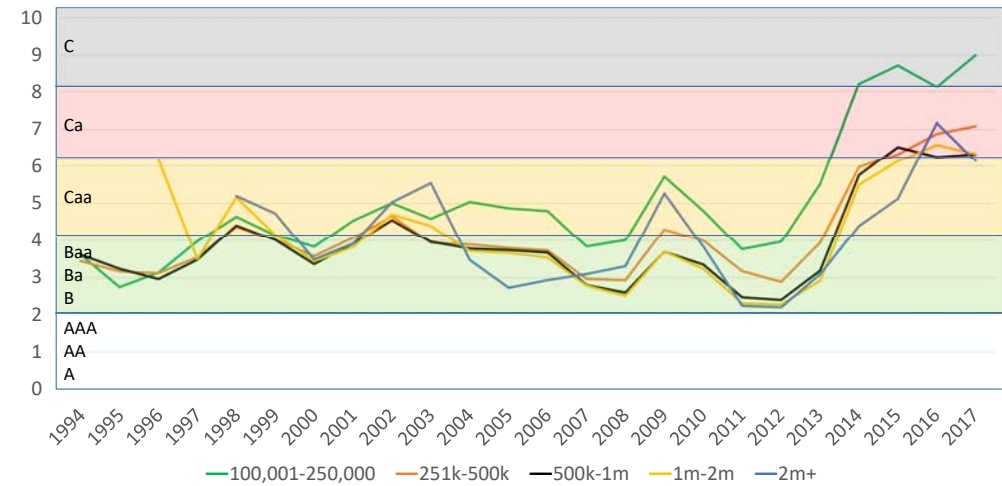
ND Debt To EBITDA by Net Farm Income Pct.



ND Debt To EBITDA by Gross Revenue Class



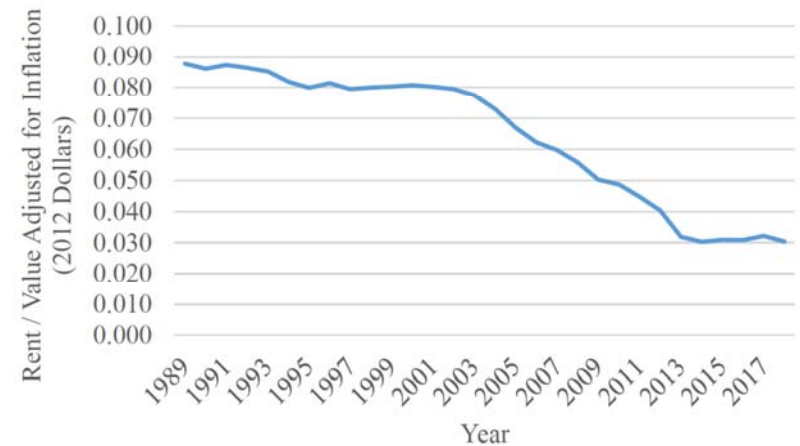
MN Debt to EBITDA by Gross Revenue Class



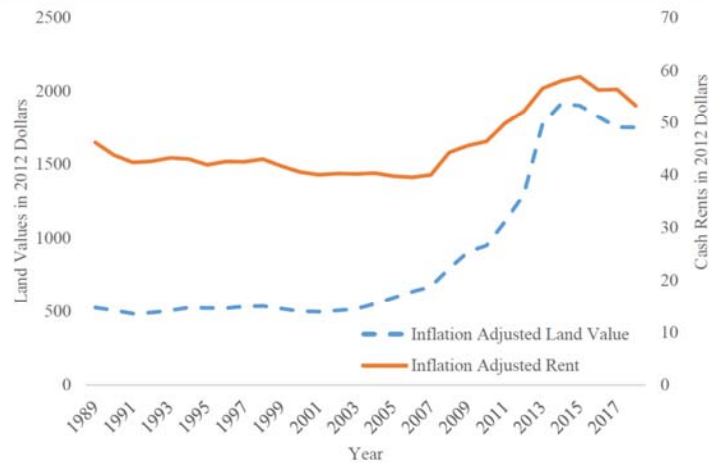
Recap

- Net Farm Income Low
 - Mostly on the crops side
- Solvency still strong using wealth metrics
 - Debt – Asset / Debt – Equity ratios
- High debt relative to income
- Stress showing in extensions, renewals, and restructured loans
- Low interest rates have helped soften the blow, but they are increasing

North Dakota Cropland Rent-to-Value Ratio



North Dakota Cropland Values and Cash Rents 1989-2018



Farm Income Margin

Better at gauging stress/risk than “Net Farm Incomes”

Margin = Net Farm Income Ratio

$$\text{Margin} = \frac{\text{Net Farm Income}}{\text{Value of Production}}$$

The net farm income ratio measures the amount of net farm income generated per dollar of production in the farm sector. Alternatively, it shows the proportion of production remaining after accounting for expenses. A value of 1 would signify all production was realized as net income or equivalently, no expenses were incurred. **Larger values signify increased sector efficiency in converting production to net farm income.**

Source: <https://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/documentation-for-the-farm-sector-financial-ratios/#nfi>

Farm Income Margin

Net Farm Income vs. Farm Income Margin

Example:

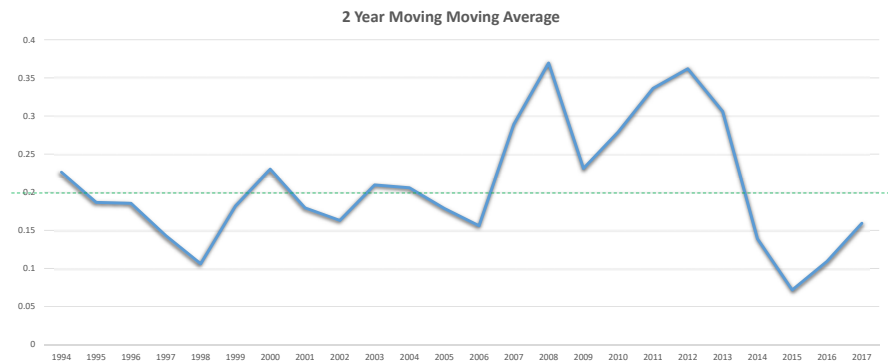
Total costs are 900,000 and Revenues are 1,000,000

- NFI = 100k
- Margin = 10%
- (Costs could to increase 11%)

Total costs are 400,000 and Revenues are 500,000

- NFI = 100k
- Margin = 20%
- (Costs could increase 25%)

North Dakota Revenue Margin

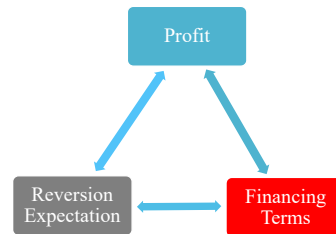


Fundamental Interest is a Fundamental Component of Agricultural Land Valuation

Returns

Expected Returns Includes:

- Annual Expected Profits
- Reversion (Resale Value)
- Financing/Lending Conditions (Interest Rates, Term, Required Initial Equity, and other Market Options)

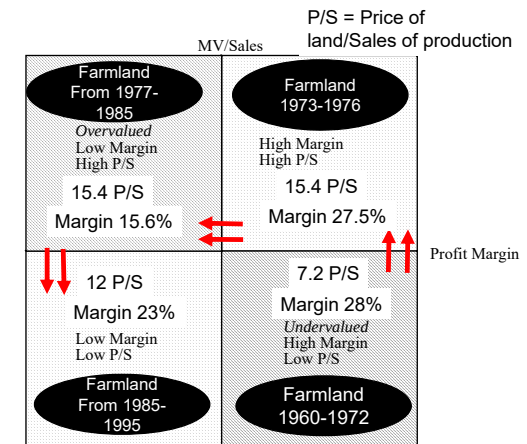


Applying Earnings Multiples to Farmland and Income in The 1980's

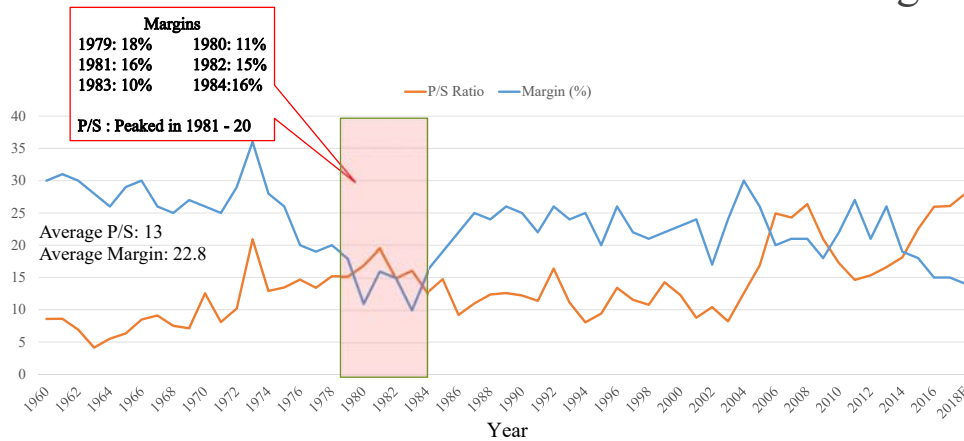
$$\text{Price to Sales Ratio} = \frac{\text{Market Value of Equity}}{\text{Revenues}}$$

$$\text{Margin} = \frac{\text{Net Farm Income}}{\text{Value of Production}}$$

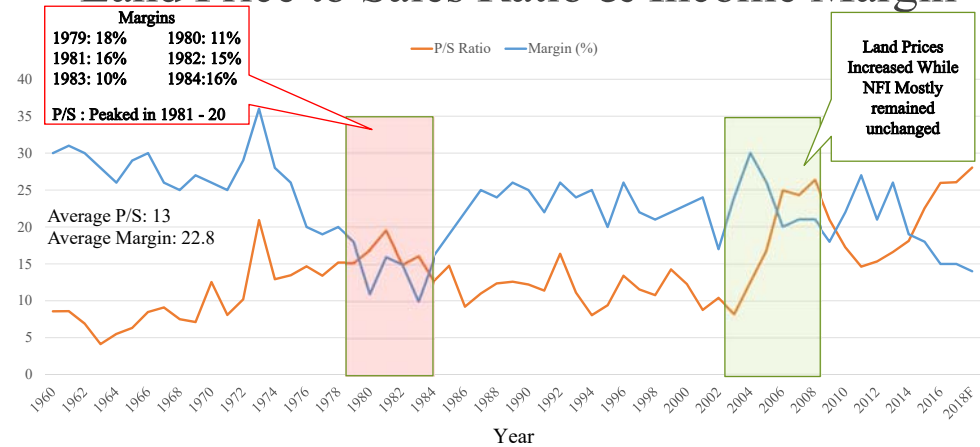
Average Margin: 1960-2018 22%
Average P/S: 1960 – 2018 13



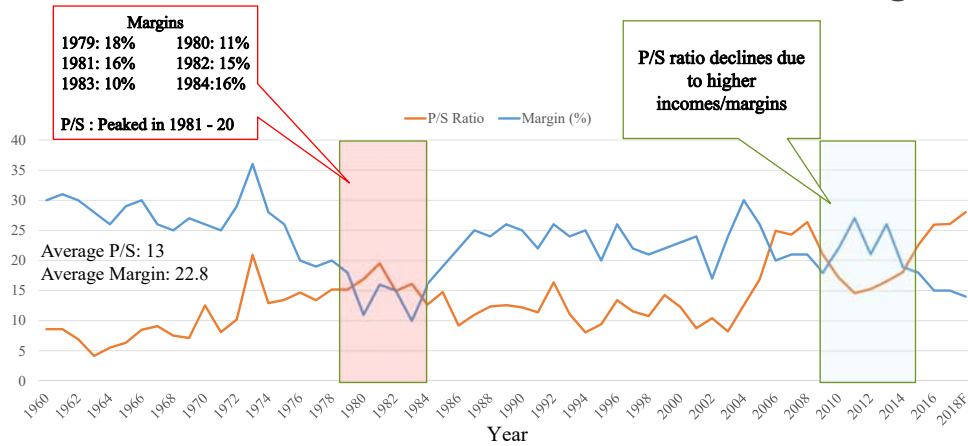
Land Price to Sales Ratio & Income Margin



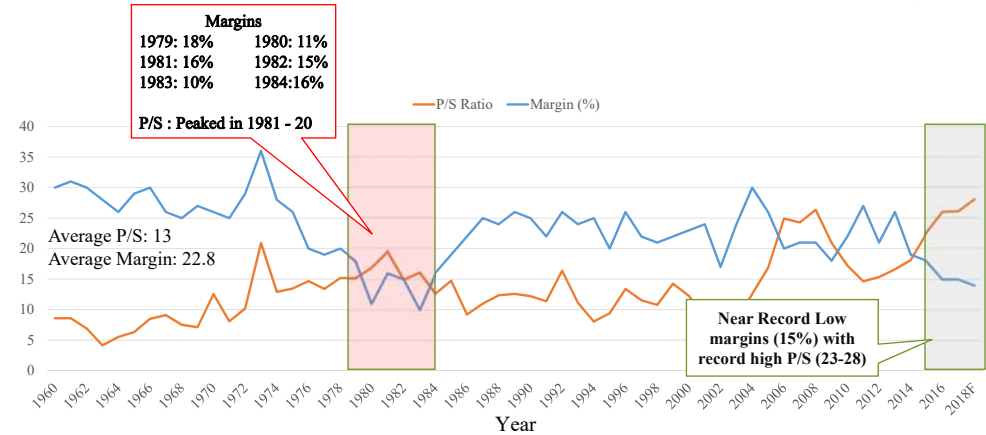
Land Price to Sales Ratio & Income Margin



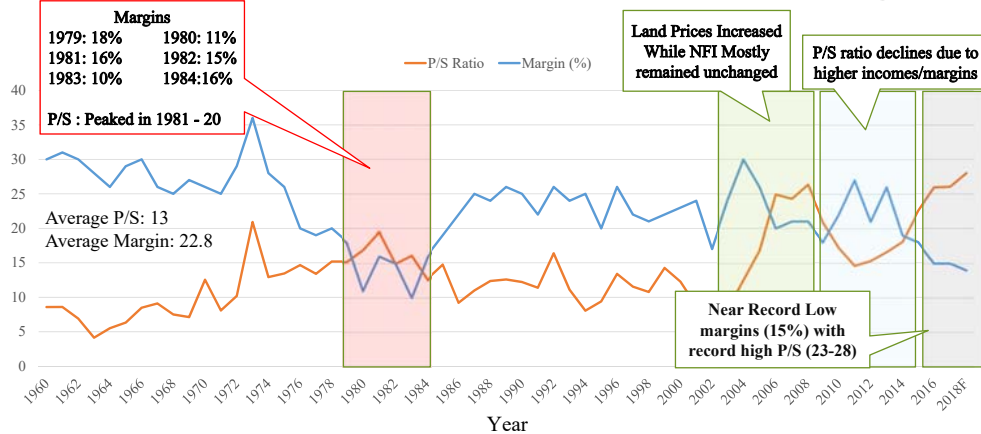
Land Price to Sales Ratio & Income Margin



Land Price to Sales Ratio & Income Margin



Land Price to Sales Ratio & Income Margin



Long and Short Term Averages

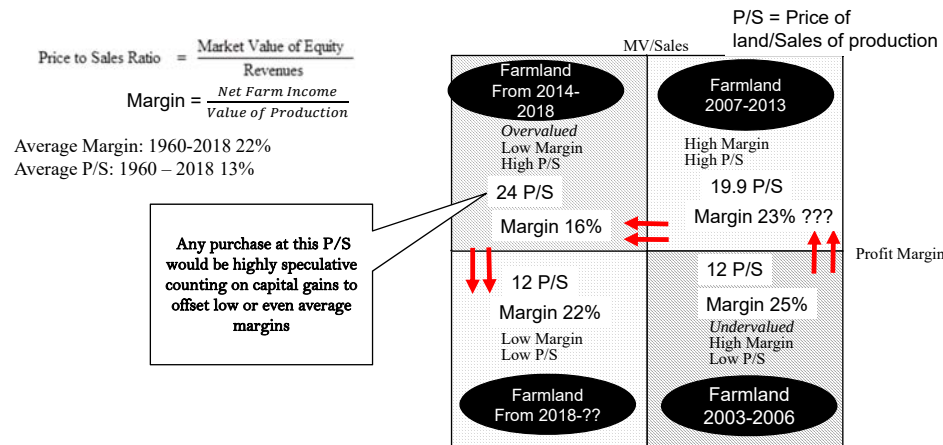
Average P/S 1960 – 2018: 13%

Average Margin: 1960 – 2018: 23%

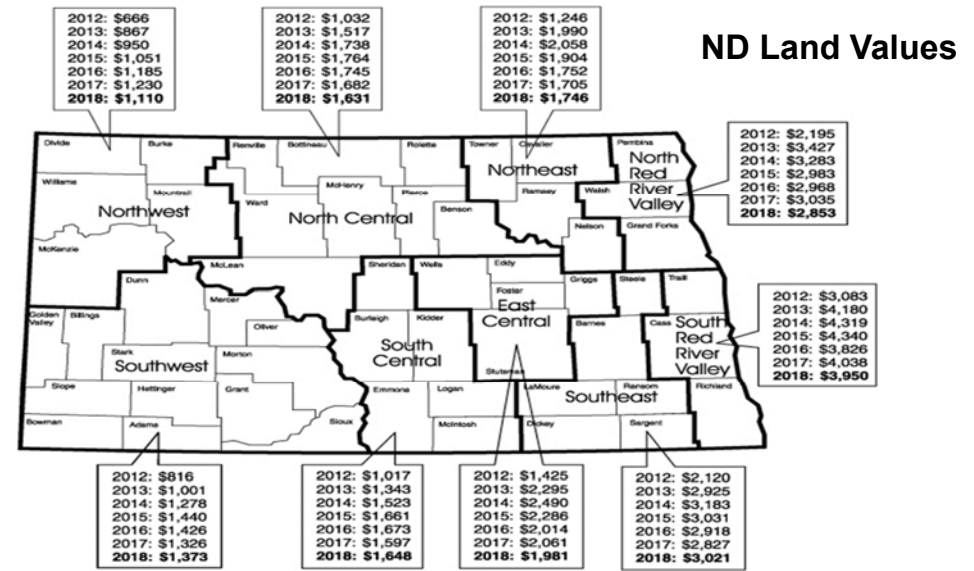
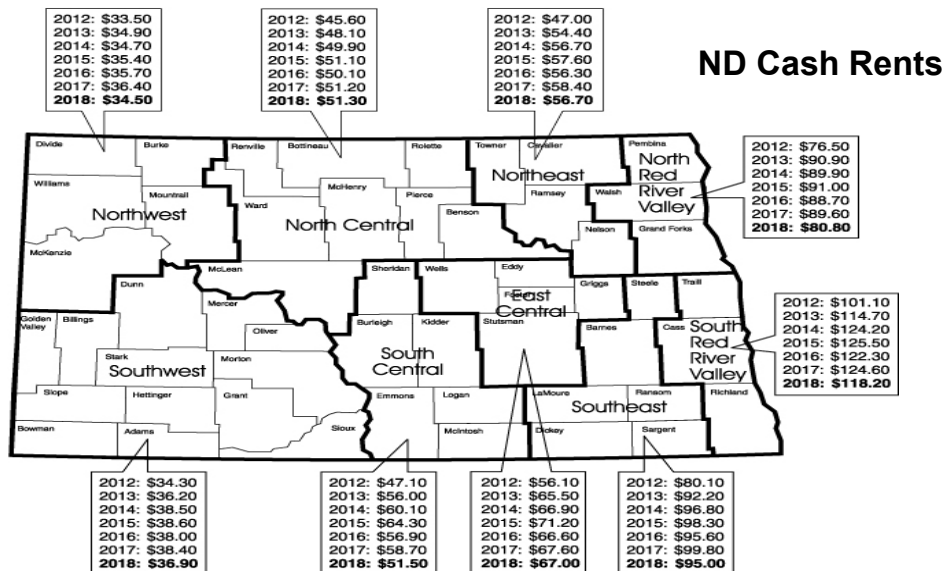
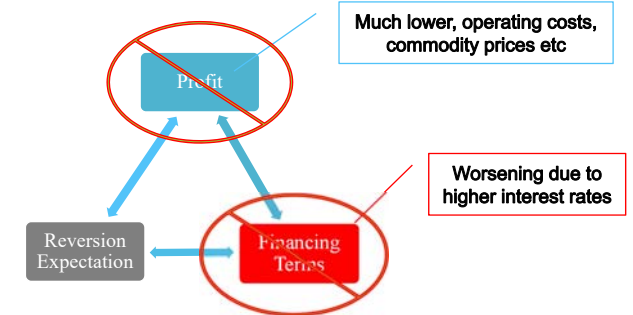
Average P/S 2004 – 2013: 18.9%

Average Margin 2004 – 2013: 23.2%

Applying Earnings Multiples to Farmland



Fundamental Interest is a Fundamental Component of Agricultural Land Valuation



North Valley Example – 3.8% Gain

Int. Rate	5.75%	1		65.00%	x	8.54%		=	0.0555
Amortization	20	2 +		35.00%	x	2.00%		=	0.0070
Holding Period	20	3 -		65.00%	x	100.00%	x	0.018	= 0.0118
LTV	65%	4 =	r						0.0507
Ye	2.00%								
Rm	0.0854235								
E	35%	5		0.018	x	0.01815		=	0.0245
r	0.0507	6 =							0.0263
P	1								
Sn	0.018150274		Cap Rate						2.63%
Ro	2.63%								
Net Income (Rent - T	\$ 80.00		Net Income					\$80.00	
Projected Cap Gain	0.038								
Inflation Rate	0.02		Value					\$/Acre	\$3,044

North Valley Example – No Capital Gain

Int. Rate	5.75%	1		65.00%	x	8.54%		=	0.0555
Amortization	20	2 +		35.00%	x	2.00%		=	0.0070
Holding Period	20	3 -		65.00%	x	100.00%	x	0.018	= 0.0118
LTV	65%	4 =	r						0.0507
Ye	2.00%								
Rm	0.0854235								
E	35%	5		-0.02	x	0.01815		=	0.0112
r	0.0507	6 =							0.0396
P	1								
Sn	0.018150274		Cap Rate						3.96%
Ro	3.96%								
Net Income (Rent - T	\$ 80.00		Net Income					\$80.00	
Projected Cap Gain	0								
Inflation Rate	0.02		Value					\$/Acre	\$2,021

As Interest Rates Rise?

Int. Rate	5.75%	1		65.00%	x	8.54%		=	0.0555
Amortization	20	2 +		35.00%	x	5.50%		=	0.0193
Holding Period	20	3 -		65.00%	x	100.00%	x	0.018	= 0.0118
LTV	65%	4 =	r						0.0630
Ye	5.50%								
Rm	0.0854235								
E	35%	5		0.02	x	0.01815		=	0.0252
r	0.0630	6 =							0.0378
P	1								
Sn	0.018150274		Cap Rate						3.78%
Ro	3.78%								
Net Income (Rent - T	\$ 80.00		Net Income					\$80.00	
Projected Cap Gain	0.04								
Inflation Rate	0.02		Value					\$/Acre	\$2,115

And Since Interest Rates Rise, Profits Low, Capital Gains Fall to Inflationary Levels

Int. Rate	5.75%	1		65.00%	x	8.54%		=	0.0555
Amortization	20	2 +		35.00%	x	5.50%		=	0.0193
Holding Period	20	3 -		65.00%	x	100.00%	x	0.018	= 0.0118
LTV	65%	4 =	r						0.0630
Ye	5.50%								
Rm	0.0854235								
E	35%	5		0	x	0.01815		=	0.0182
r	0.0630	6 =							0.0448
P	1								
Sn	0.018150274		Cap Rate						4.48%
Ro	4.48%								
Net Income (Rent - T	\$ 80.00		Net Income					\$80.00	
Projected Cap Gain	0.02								
Inflation Rate	0.02		Value					\$/Acre	\$1,785

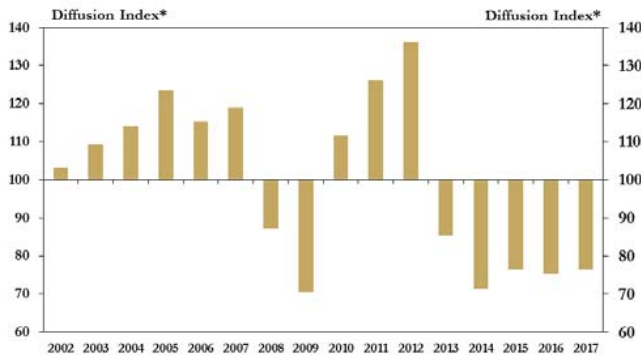
Worst Case Scenario (Deducting Property Taxes)

Int. Rate	6.50%	1	65.00% x 9.08%	=	0.0590
Amortization	20	2+	35.00% x 5.50%	=	0.0193
Holding Period	20	3-	65.00% x 100.00% x 0.016742	=	0.0109
LTV	65%	4=	r		0.0674
Ye	5.50%				
Rm	0.0907564				
E	35%	5	0 x 0.016742	=	0.0167
r	0.0674	6=			0.0506
P	1				
Sn	0.016741657	Cap Rate			5.06%
Ro	5.06%				
Net Income (Rent - Tax)	\$ 60.00	Net Income	\$60.00		
Projected Cap Gain	0.02				
Inflation Rate	0.02	Value	\$/Acre		\$1,185

With Rents at 5% of the Yield Expectation

Int. Rate	6.50%	1	65.00% x 9.08%	=	0.0590
Amortization	20	2+	35.00% x 5.50%	=	0.0193
Holding Period	20	3-	65.00% x 100.00% x 0.016742	=	0.0109
LTV	65%	4=	r		0.0674
Ye	5.50%				
Rm	0.0907564				
E	35%	5	0 x 0.016742	=	0.0167
r	0.0674	6=			0.0506
P	1				
Sn	0.016741657	Cap Rate			5.06%
Ro	5.06%				
Net Income (Rent - Tax)	\$145	Net Income	\$145.00		
Projected Cap Gain	0.02				
Inflation Rate	0.02	Value	\$/Acre		\$2,865

Chart 3: Volume of Farmland Sales



*Bankers responded to each item by indicating whether the volume of land sales increased, decreased, or remain the same. The index numbers are computed by subtracting the percentage of bankers who responded "decreased" from the percentage who responded "increased" and adding 100.

A lower volume of farmland sales has competing implications.

- Significantly lower sales volumes indicate buyers are not willing to pay what current owners expect to receive.

- Lower sales volumes may help prop up values as fair market assessments are at least partially anchored in historical observation.

Conclusions and Comments

- Farm financial situation becoming more worrisome for crop farmers – especially for high cost / highly leveraged individuals
 - Net incomes continue to remain low
 - Interest rates expected to increase
- Stable land values and relatively strong solvency ratios have helped support low incomes
 - Land market has weakened but have mostly held their value since the peak in 2014
 - High land prices have allowed individuals with equity to restructure debt and avoid delinquency
- Forced sales and higher interest rates will put downward pressure on land prices
 - Higher rates means higher interest payments & better outside options for investors
 - Falling land prices will likely put more producers in jeopardy
 - Adjustments may be short lived – but large

Thank You

Bryon J. Parman, Ph.D
Agricultural Financial Specialist
North Dakota State University Extension
701-231-8248
bryon.parmar@ndsu.edu

