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# **Financial Stress in Iowa Farms: 2014-2016**

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NC-1177 Annual Meeting  
Federal Reserve Bank of Minneapolis  
October 2, 2017

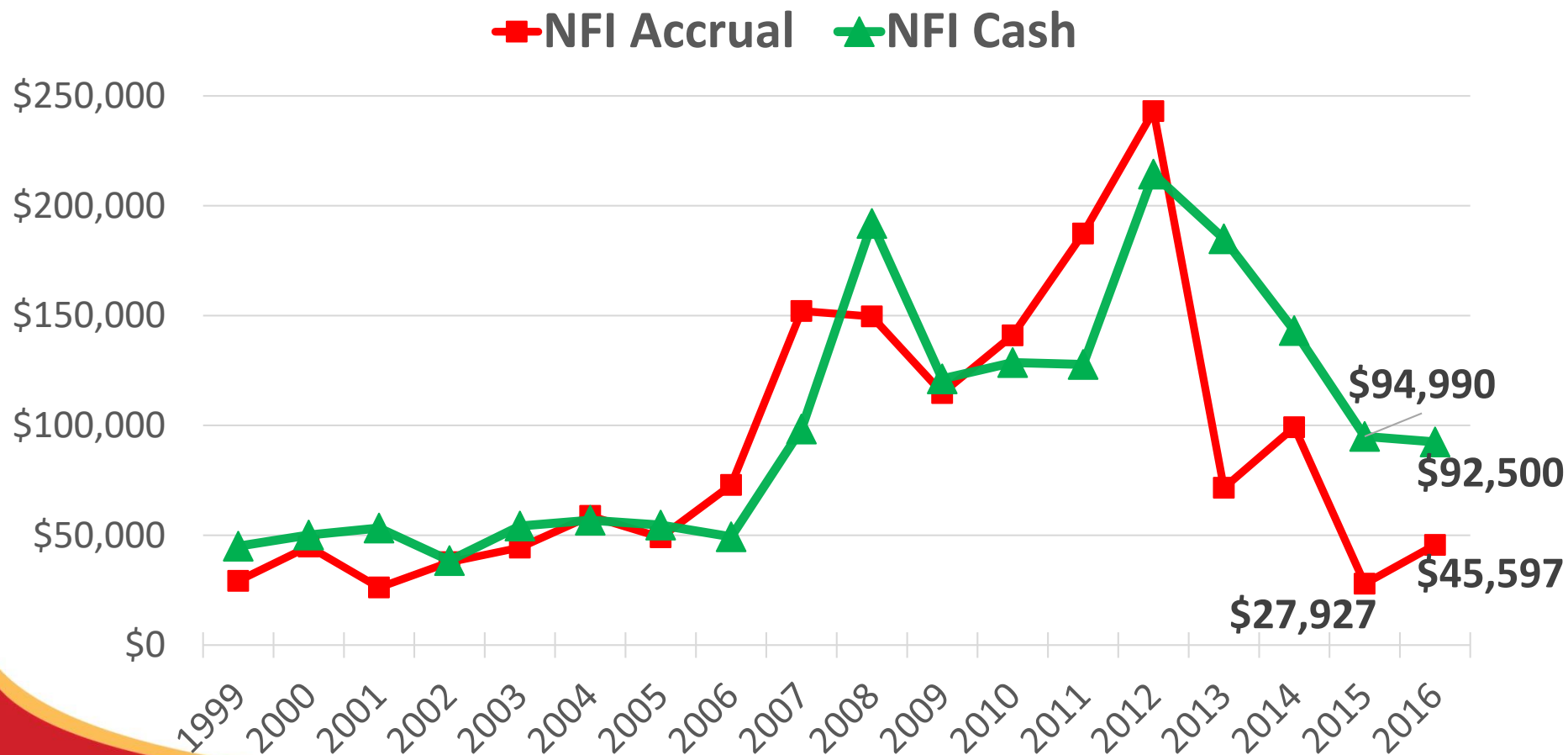
# Data

- Source: Iowa Farm Business Association

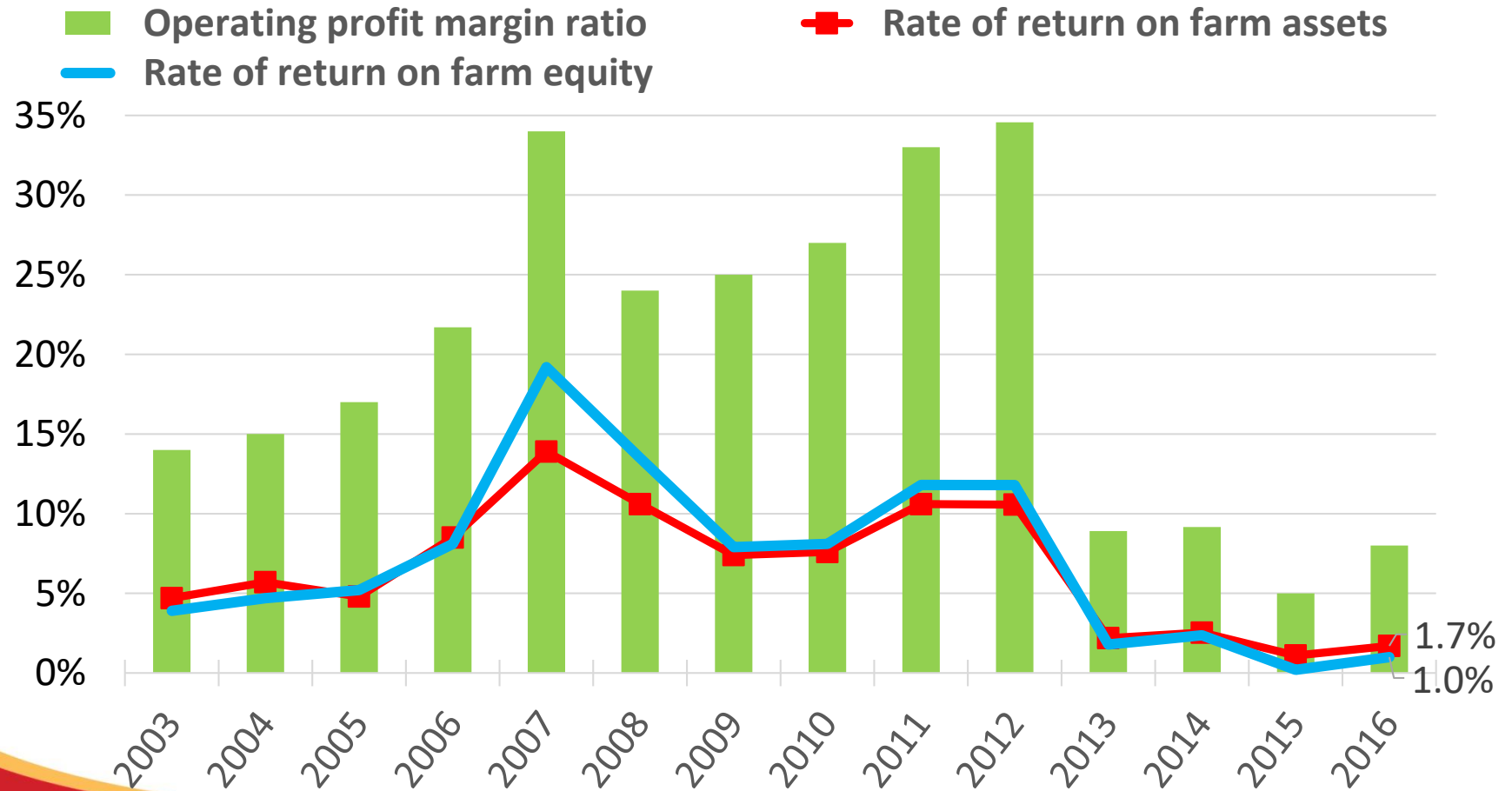


- Actively Managed Mid-size Commercial Farms
- Focus on Farm Management Decisions
- Machinery and Land recorded at COST value

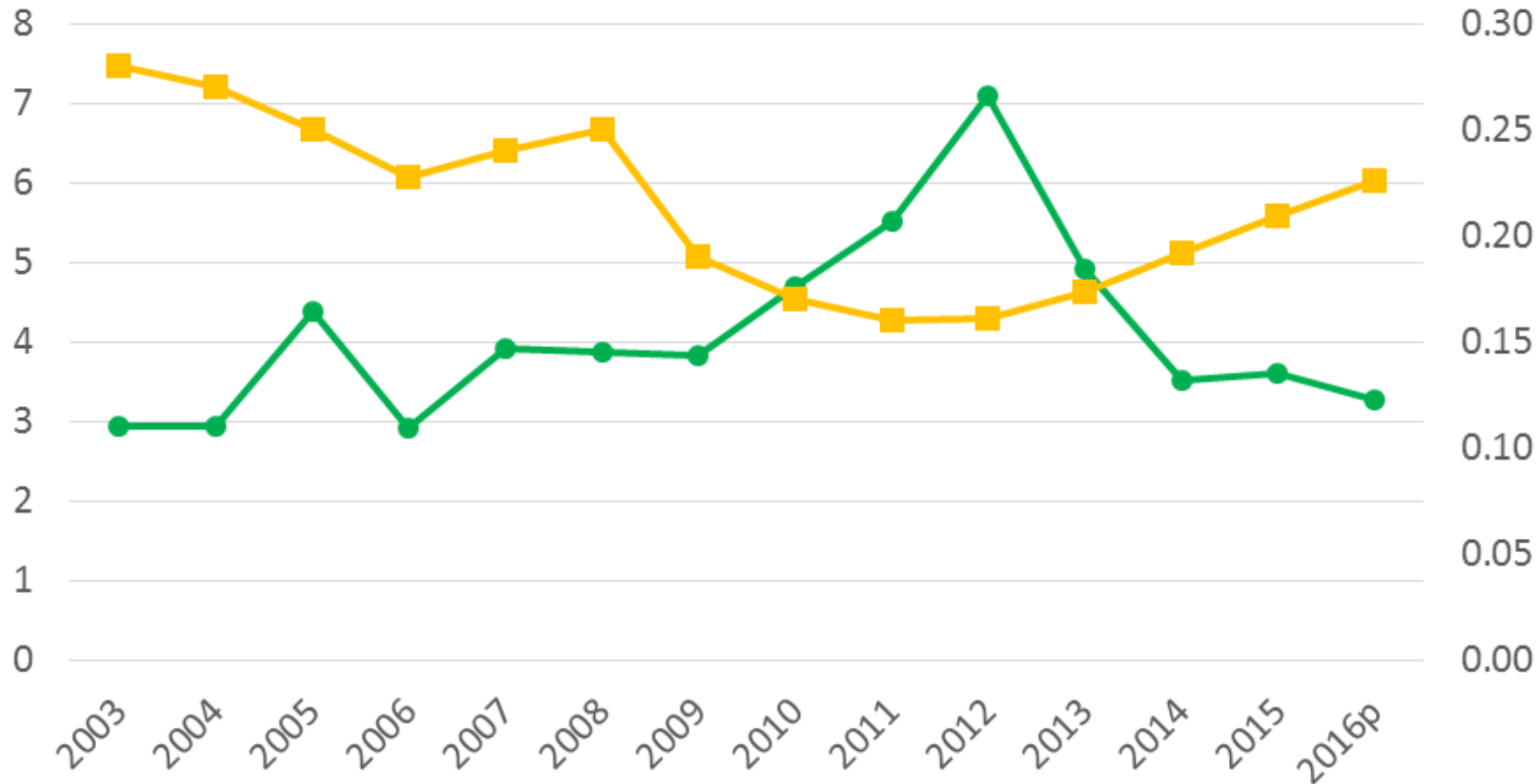
# Average Net Farm Income in Iowa: CASH versus ACCRUAL (all nominal)



# Average Farm Profitability in Iowa: ROA, ROE, Operating profit margin ratio



# Average Farm Liquidity & Solvency



● Current ratio (left axis)  
Higher: stronger liquidity

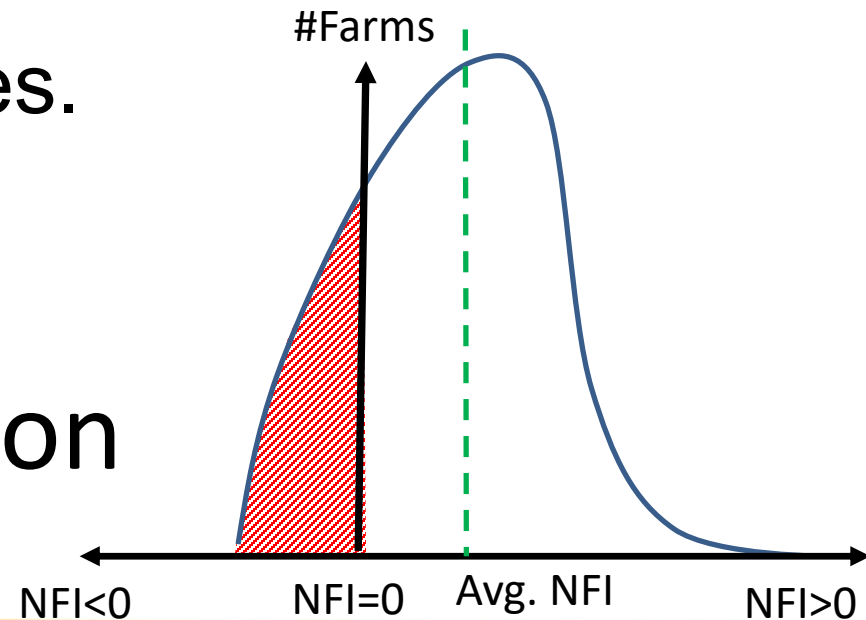
■ Total debt to asset ratio (right axis)  
Lower: Stronger solvency

# Conclusions from Averages

- Thin profit margins
- Deterioration in liquidity and solvency...
- ... from record high levels...
- ... to historical averages.

## Problem:

Tails of the distribution



# Track evolution of same set of farms through time

- December 31, 2014
- December 31, 2015
- December 31, 2016
  
- N=273



# Classification Matrix

		Solvency: Total Debt-to-Asset Ratio		
		Strong: Under 30%	Normal: Between 30% and 60%	Vulnerable: Above 60%
Liquidity: Current Ratio	Strong: Over 2.0			
	Normal: Between 1.3 and 2.0			
	Vulnerable: Below 1.3			

# Dec 31, 2014 (273 farms)

Percent of Farms in Each Category

		Solvency: Total Debt-to-Asset Ratio		
		Strong: Under 30%	Normal: Between 30% and 60%	Vulnerable: Above 60%
Liquidity: Current Ratio	Strong: Over 2.0	33.0%	12.1%	2.2%
	Normal: Between 1.3 and 2.0	7.0%	10.6%	3.7%
	Vulnerable: Below 1.3	2.6%	14.3%	14.7%



# Dec 31, 2014 (273 farms)

Percent of Farms in Each Category

		Solvency: Total Debt-to-Asset Ratio		
		Strong: Under 30%	Normal: Between 30% and 60%	Vulnerable: Above 60%
Liquidity: Current Ratio	Strong: Over 2.0	<b>Total Vulnerable: 37.4%</b>		
	Normal: Between 1.3 and 2.0			
	Vulnerable: Below 1.3			



# Dec 31, 2015 (273 farms)

Percent of Farms in Each Category  
(Change from last year)

		Solvency: Total Debt-to-Asset Ratio		
		Strong: Under 30%	Normal: Between 30% and 60%	Vulnerable: Above 60%
Liquidity: Current Ratio	Strong: Over 2.0	29.3% (-3.7%)	10.6% (-1.5%)	1.5% (-0.7%)
	Normal: Between 1.3 and 2.0	6.2% (-0.7%)	9.2% (-1.5%)	2.6% (-1.1%)
	Vulnerable: Below 1.3	2.9% <b>(+0.4%)</b>	17.2% <b>(+2.9%)</b>	20.5% <b>(+5.9%)</b>



# Dec 31, 2015 (273 farms)

Percent of Farms in Each Category

## Solvency: Total Debt-to-Asset Ratio

<b>Strong: Under 30%</b>	<b>Normal: Between 30% and 60%</b>	<b>Vulnerable: Above 60%</b>
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**Liquidity:  
Current  
Ratio**

<b>Strong: Over 2.0</b>
<b>Normal: Between 1.3 and 2.0</b>
<b>Vulnerable: Below 1.3</b>

<b>Total</b>	
<b>Vulnerable: 44.7%</b>	
<b>(+7%)</b>	



# Dec 31, 2016 (273 farms)

Percent of Farms in Each Category  
(Change from last year)

		Solvency: Total Debt-to-Asset Ratio		
		Strong: Under 30%	Normal: Between 30% and 60%	Vulnerable: Above 60%
Liquidity: Current Ratio	Strong: Over 2.0	30.8% (+1.5%)	10.3% (-0.4%)	0.7% (-0.7%)
	Normal: Between 1.3 and 2.0	6.2% (0%)	6.2% (-2.9%)	2.9% (+0.4%)
	Vulnerable: Below 1.3	2.9% (0%)	18.3% (+1.1%)	21.6% (+1.1%)



# Dec 31, 2016 (273 farms)

Percent of Farms in Each Category

## Solvency: Total Debt-to-Asset Ratio

<b>Strong: Under 30%</b>	<b>Normal: Between 30% and 60%</b>	<b>Vulnerable: Above 60%</b>
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**Liquidity:  
Current  
Ratio**

<b>Strong: Over 2.0</b>
<b>Normal: Between 1.3 and 2.0</b>
<b>Vulnerable: Below 1.3</b>

<b>Total Vulnerable: 46.4%  (+1.7%)</b>
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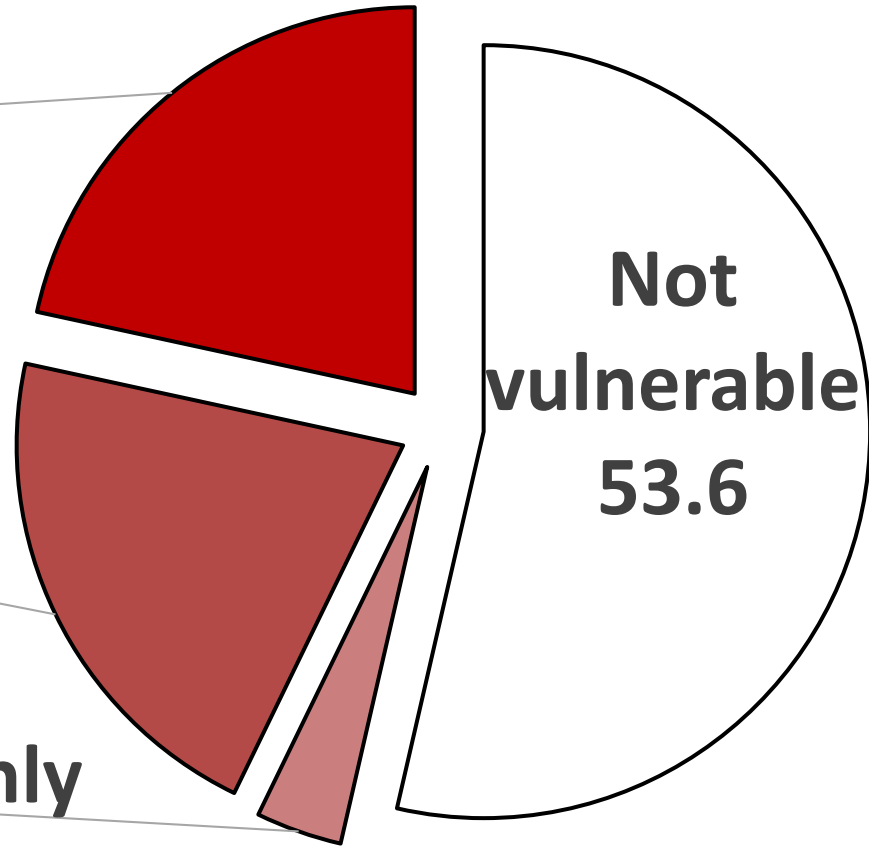
# Percent of Vulnerable Farms Dec'16

**Liquidity and  
Solvency**  
**21.6**

**Liquidity only**  
**21.2**

**Solvency only**  
**3.6**

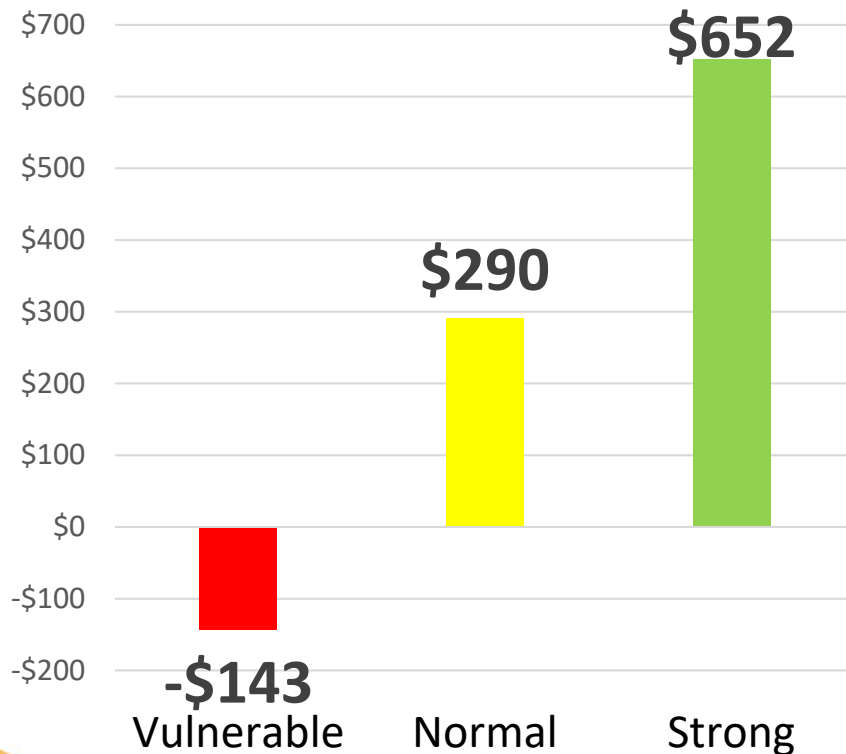
**Not  
vulnerable**  
**53.6**



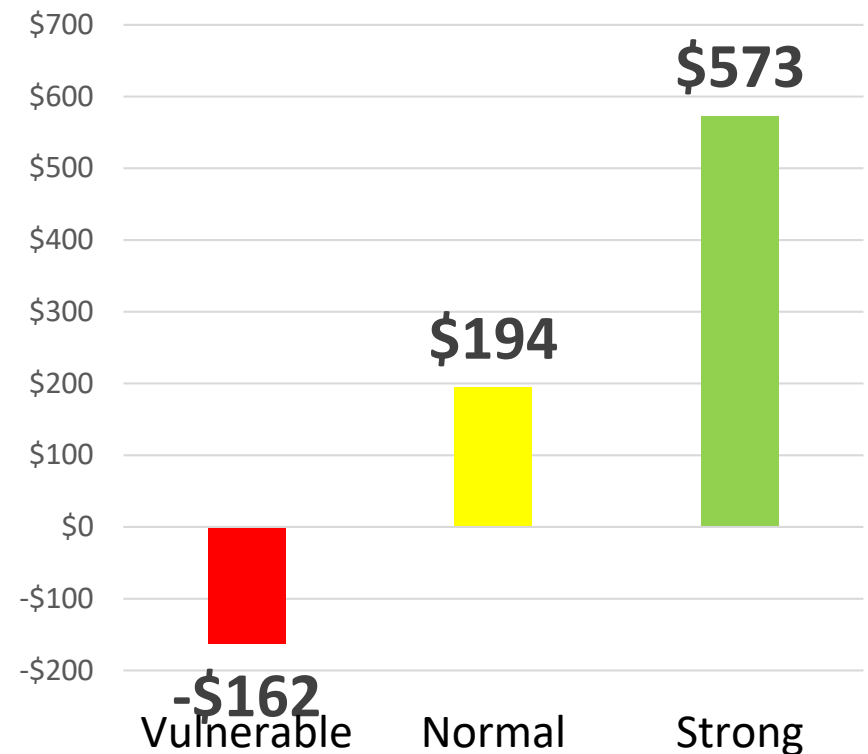


# Average Working Capital per Acre in Dec 2016

## By Liquidity Rating

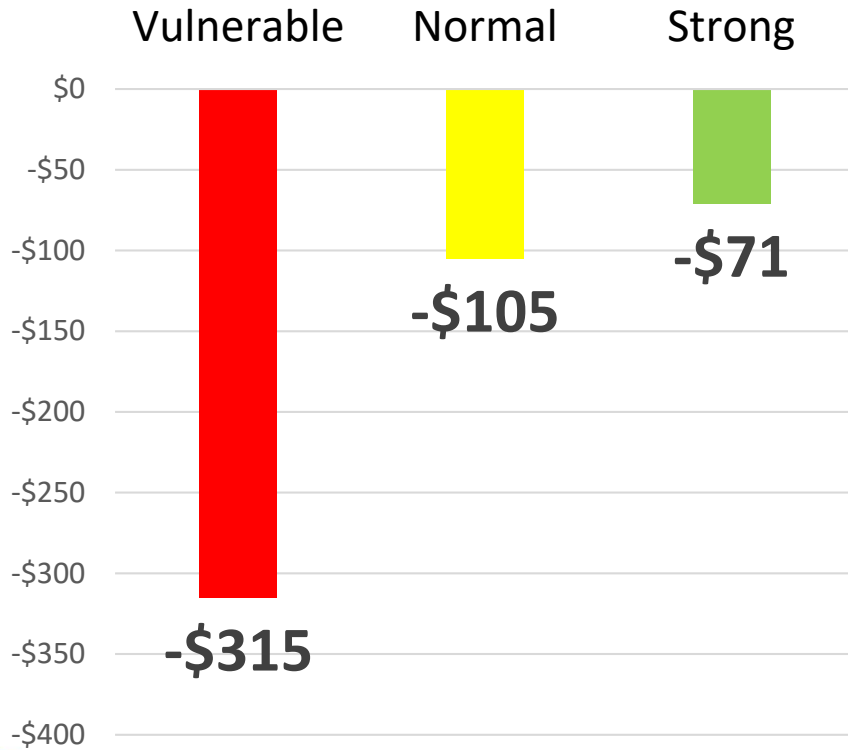


## By Solvency Rating

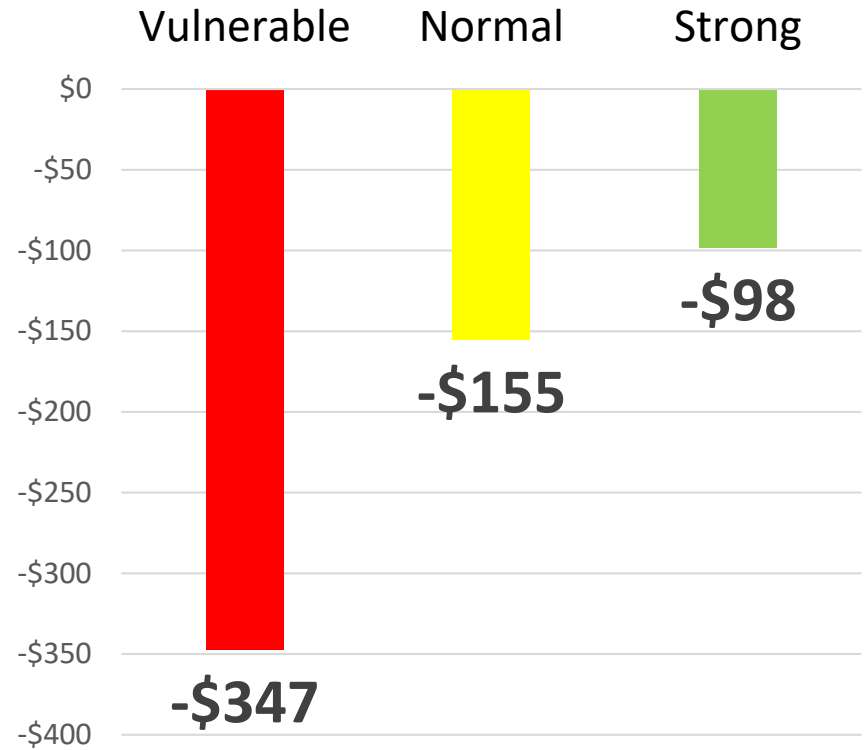


# Average Cumulative (14-16) Loss in Working Capital/Acre

## By Liquidity Rating Dec'16



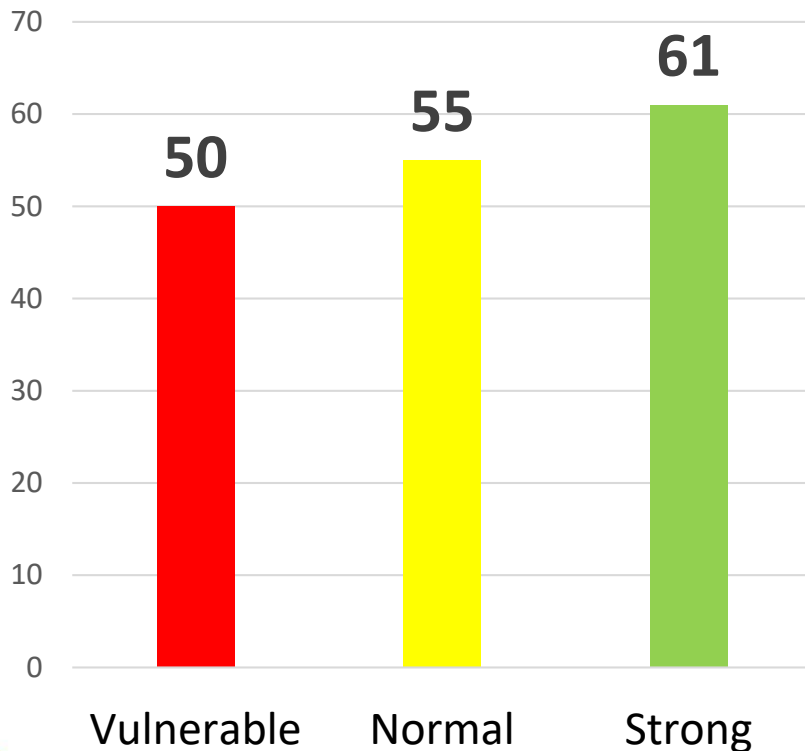
## By Solvency Rating Dec'16



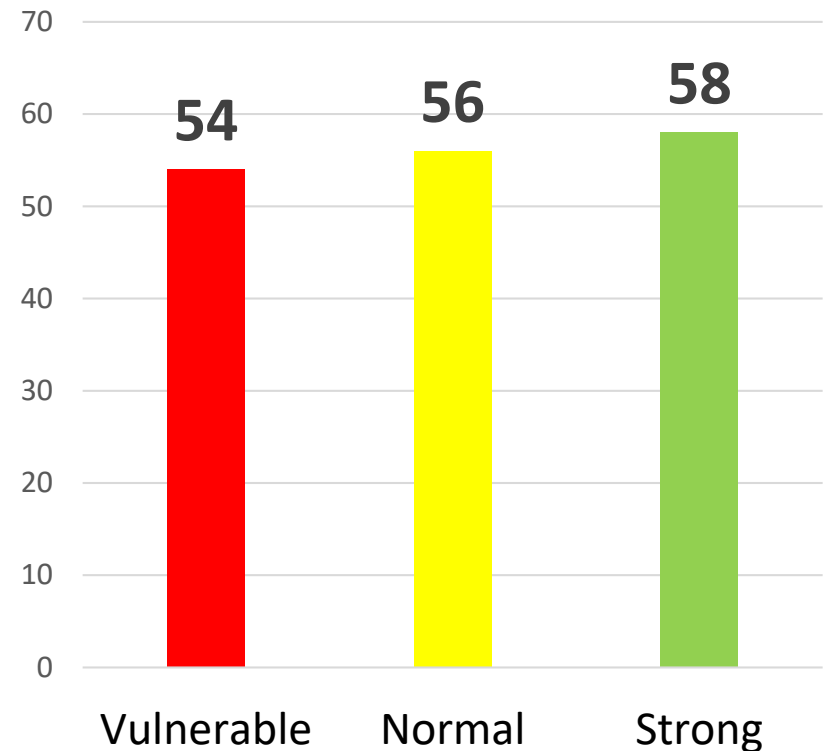
**Average -\$180**

# Average Age of Principal Operator (2016)

## By Liquidity Rating



## By Solvency Rating

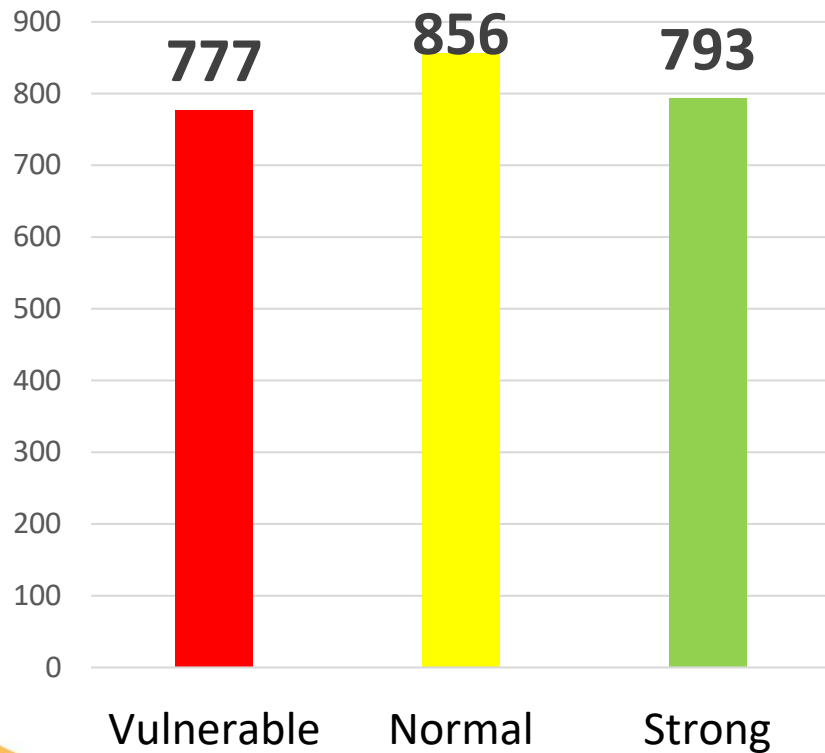


**LIQ.: All significantly different at 1% confidence level**

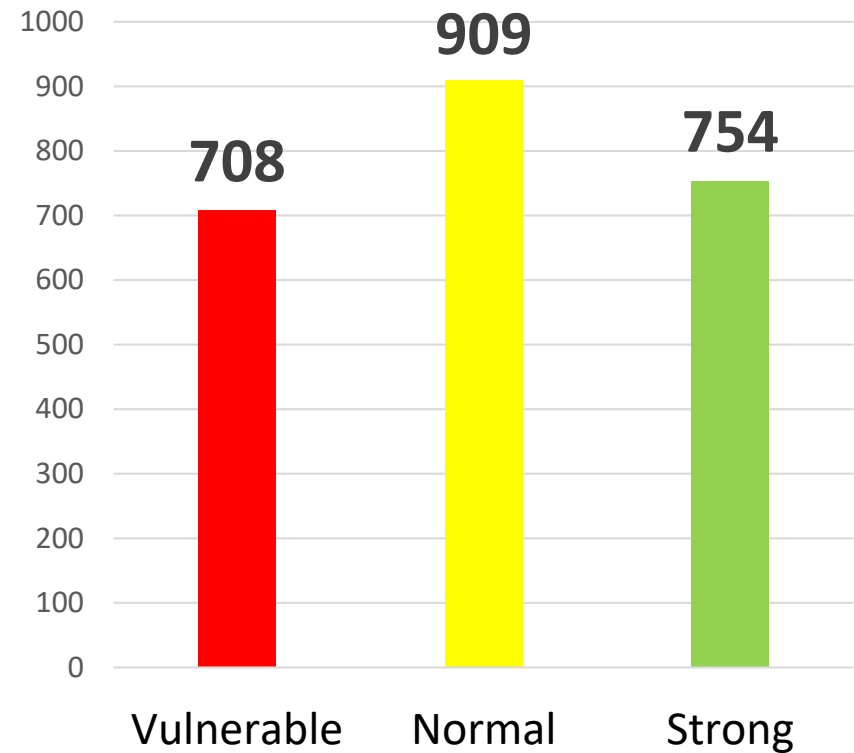
**SOLV.: Age of Vulnerable sig. smaller than Age of Strong**

# Average Farm Size in Acres (2016)

## By Liquidity Rating



## By Solvency Rating

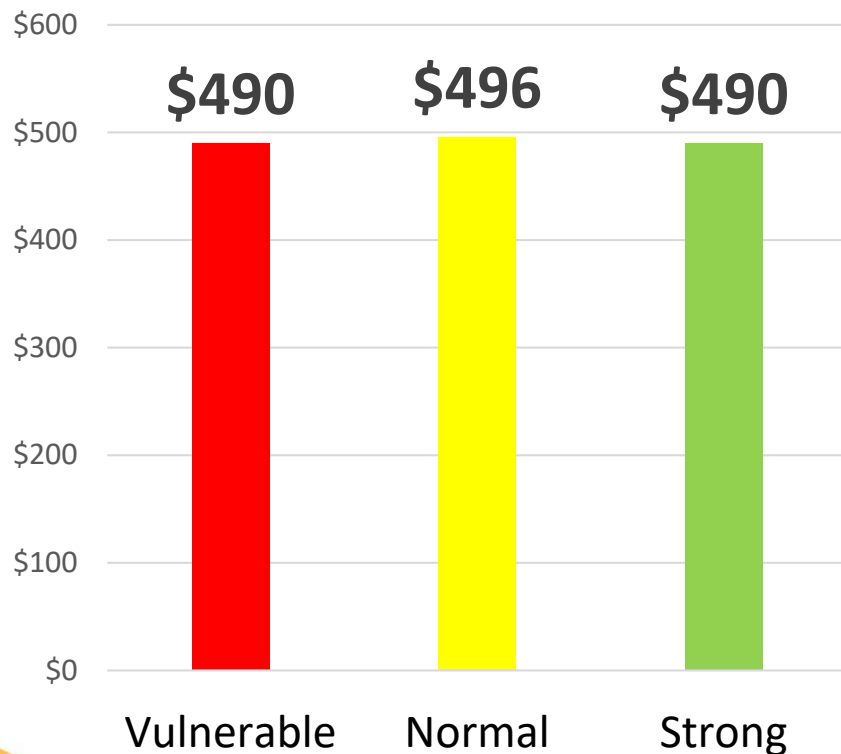


**LIQ.:** Differences in farm size are not statistically significant

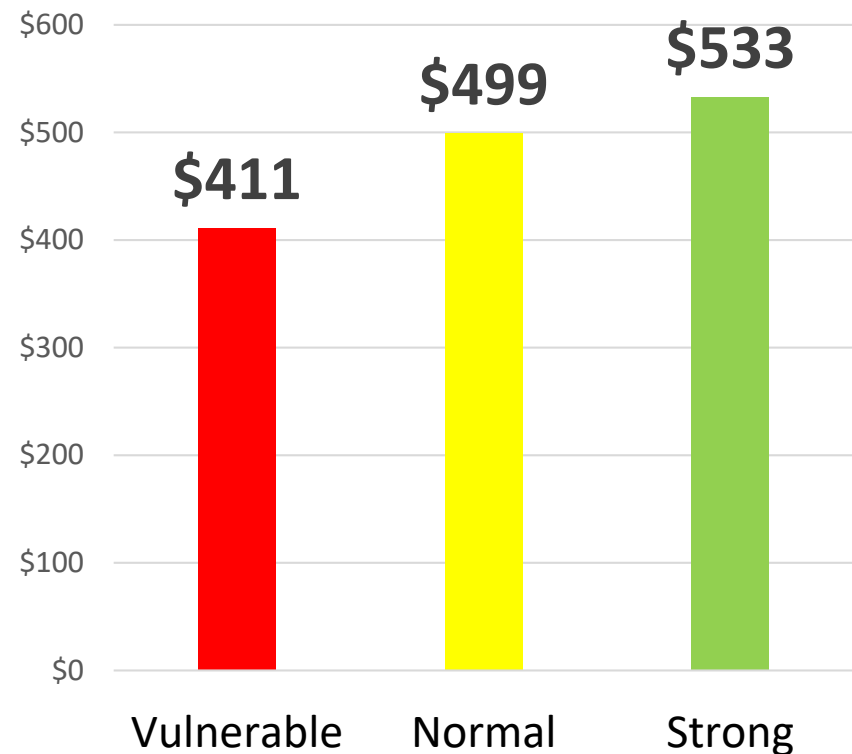
**SOLV.:** Normal larger than others. But no difference b/ Vulnerable and Strong.

# Average Machinery Investment per Acre (2016)

## By Liquidity Rating



## By Solvency Rating



**LIQ.: Differences in machinery investment/acre not significant**

**SOLV.: machinery inv./acre in farms with vulnerable solvency lower than for other farms.**

# Concluding remarks

- Increasing number of financially stressed farms
- Liquidity problems more widespread than solvency problems
- Liquidity stronger among farms with stronger solvency.

# Concluding remarks (cont.)

- Financially stressed farms tend to be managed by younger farmers
- No evidence that :
  - Smaller farms are more likely to be financially stressed than larger farms
  - Stressed farms overinvested in machinery

# Lower incomes might affect...

 Family living expenses /  
Repayment of loans

 Local jobs

 Local communities

 Family relations / stress

 Litigation



# More Information

1. Financial stress in Iowa farms: 2014-2016.  
<https://store.extension.iastate.edu/Product/15261>
2. 2016 Iowa Farm Costs and Returns:  
<https://www.extension.iastate.edu/agdm/wholefarm/pdf/c1-10.pdf>
3. Financial Performance Measures for Iowa Farms:  
<https://www.extension.iastate.edu/agdm/wholefarm/html/c3-55.html>
4. ARC/PLC Payments by County in Iowa:  
<http://card.iastate.edu/tools/farm-bill/arc-plc/>

# Thank you for your attention!

## Questions?

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