



# Using the Financial Ratios ROA and ROE to Predict Farm Loan Deficiency Rates

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IFMA 22 Conference

March 6, 2019

# What do ROA and ROE do

- ROA and ROE look low compared to other investments
  - 10% is good for ROE
  - 5% is good for ROA
  - Land appreciation is not in ratio

# Calculation

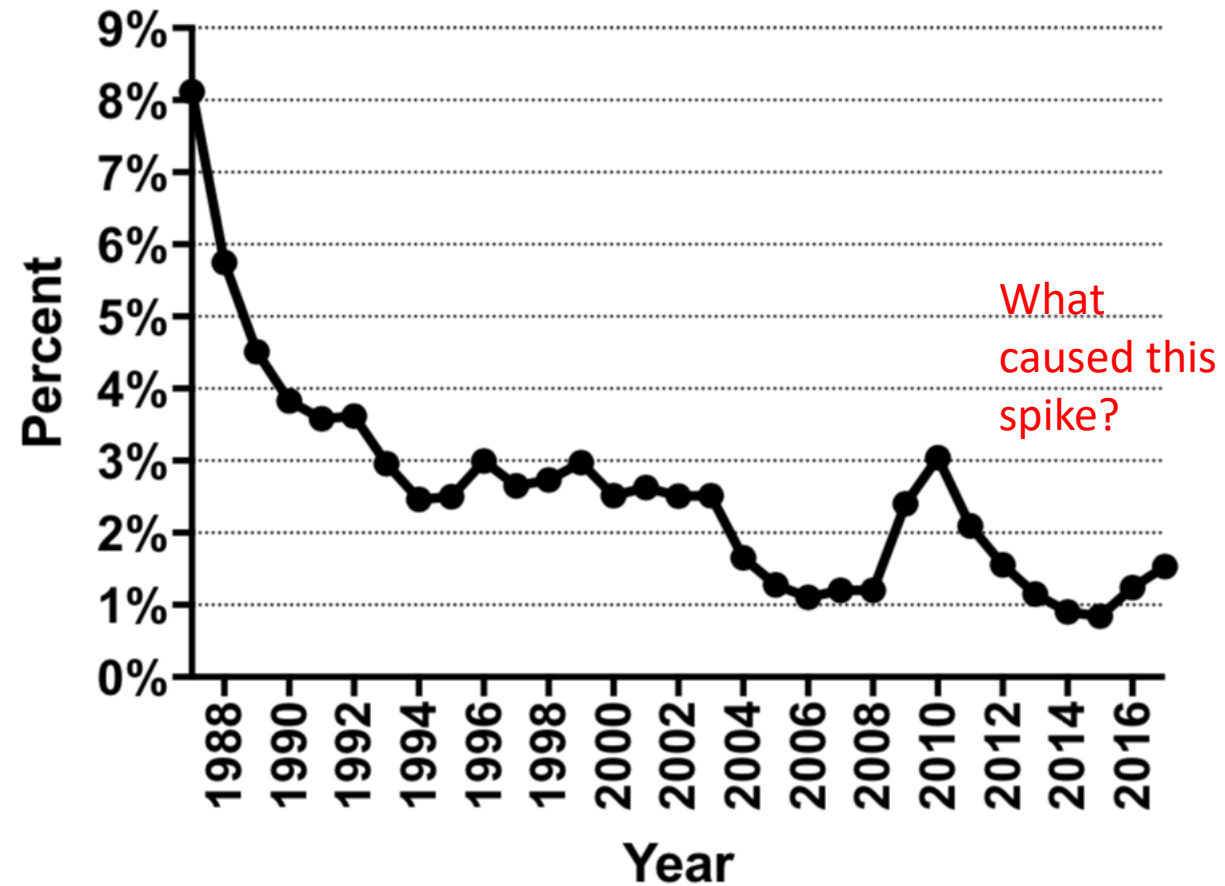
- $ROA = \frac{(\text{NFIFO} + \text{interest expense} - \text{unpaid labor})}{\text{average total assets}}$
- $ROE = \frac{(\text{NFIFO} - \text{unpaid labor})}{\text{average total equity}}$
- Why does ROA include interest?

# Implication

- ROE should be greater than ROA
- Example
  - Assume a farm with \$200 in assets
    - \$100 equity and \$100 debt
  - Assume NFIFO of \$5 and no unpaid labor
  - ROE = 5%
  - Assume interest rate of 5%
    - Interest expense = \$5
  - ROA = 5%  $((5+5)/200)$
  - What would happen if ROE = 4%
    - ROA = 4.5%  $((4+5)/200)$

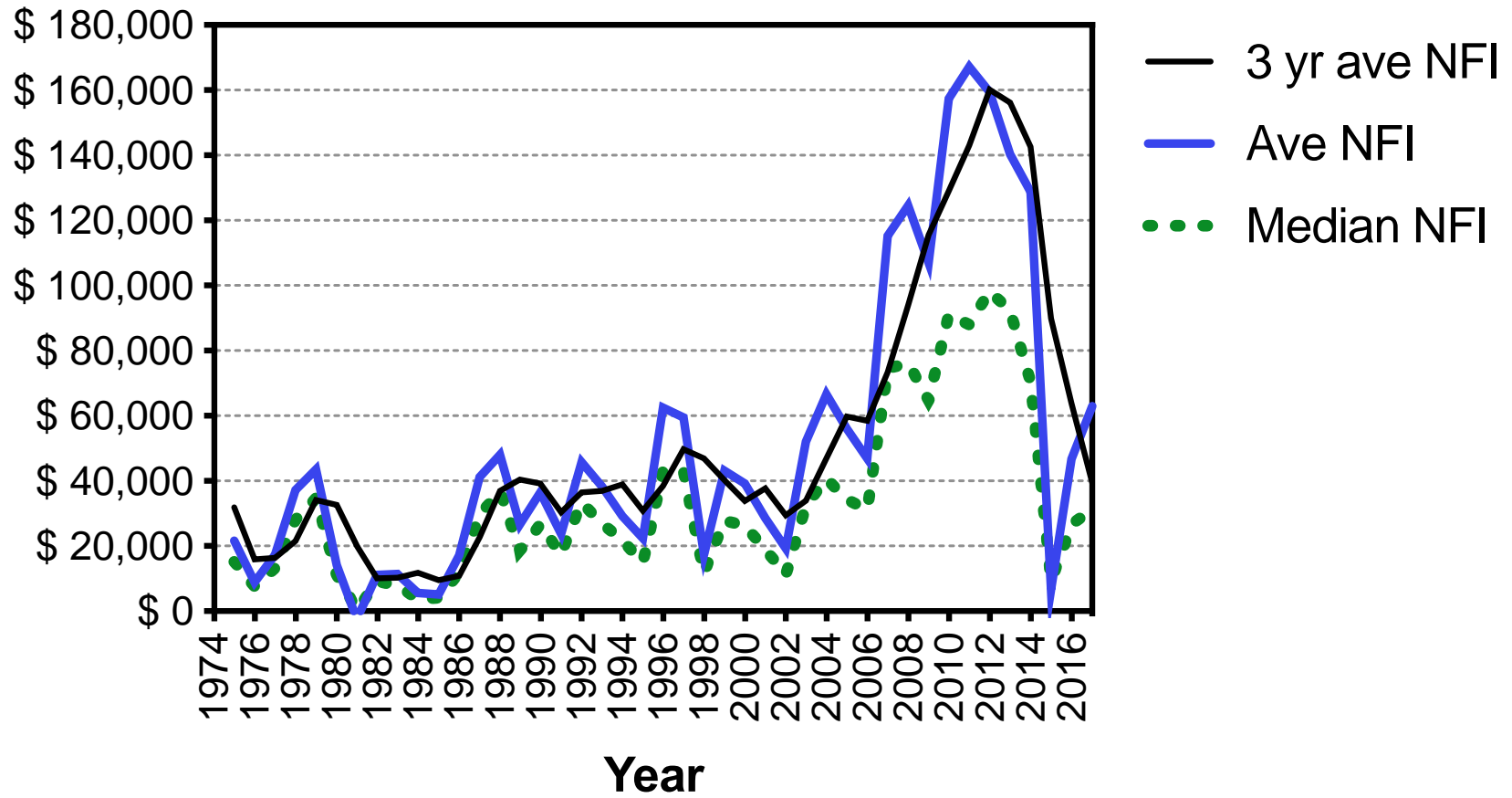


## Ag loan delinquency rate

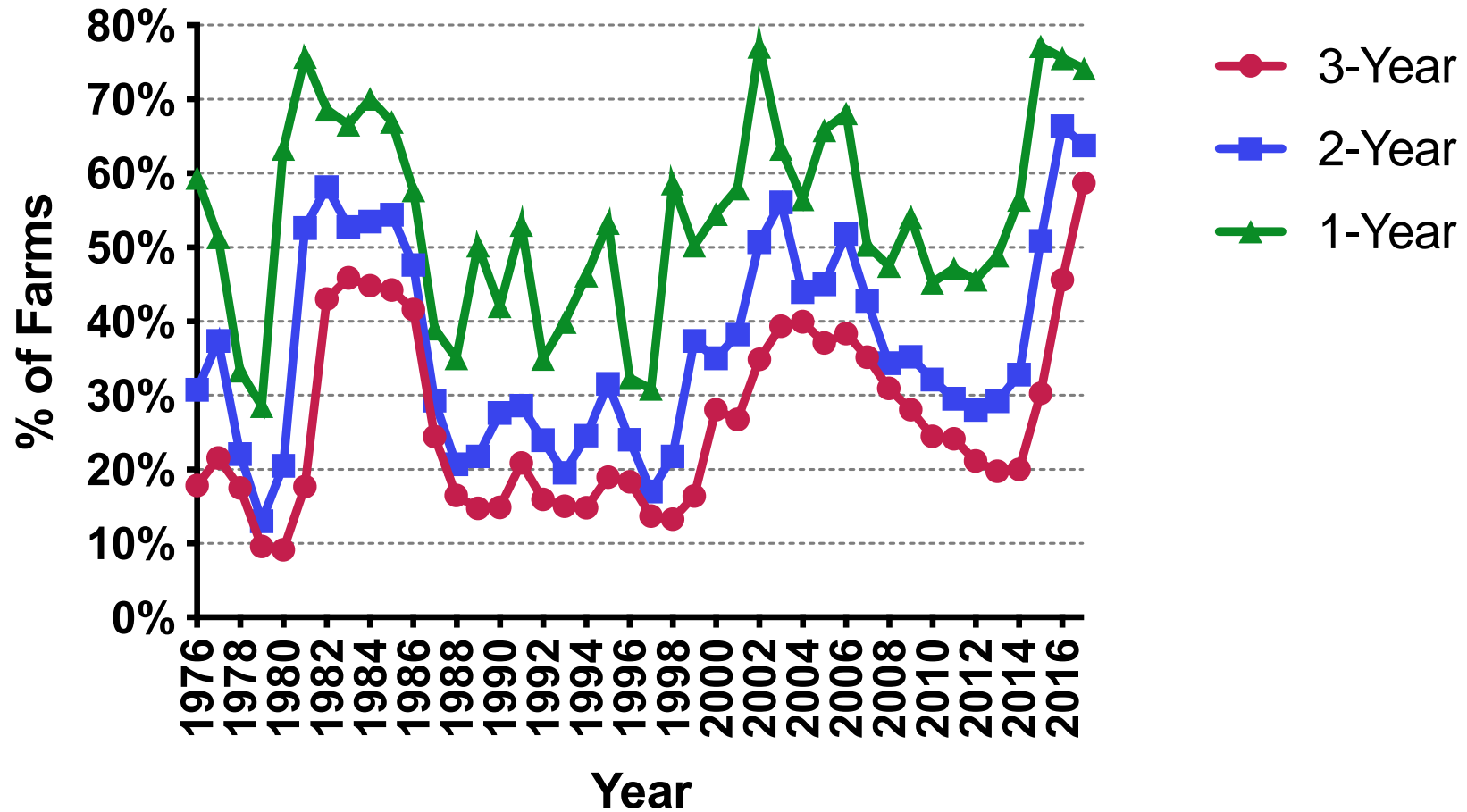


**Figure 1.** Delinquency Rate on Loans To Finance Agricultural Production, All Commercial Banks (St. Louis Federal Reserve Bank)

# Actual Net Farm Income



# Is ROA > ROE





Year	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr
1973	14%									
1974	51%	8%								
1975	47%	25%	4%							
1976	59%	31%	18%	3%						
1977	51%	37%	22%	13%	2%					
1978	33%	22%	17%	11%	6%	1%				
1979	29%	13%	10%	8%	5%	3%	1%			
1980	63%	20%	9%	7%	5%	3%	2%	0%		
1981	76%	53%	18%	7%	5%	4%	3%	1%	0%	
1982	69%	58%	43%	18%	8%	6%	5%	3%	2%	0%
1983	67%	53%	46%	36%	14%	6%	5%	4%	3%	2%
1984	70%	54%	45%	38%	30%	11%	5%	4%	3%	2%
1985	67%	54%	44%	38%	32%	26%	10%	4%	3%	3%
1986	58%	48%	42%	34%	29%	25%	19%	7%	3%	3%
1987	39%	29%	24%	20%	16%	13%	11%	8%	3%	2%
1988	35%	21%	17%	13%	11%	8%	7%	6%	5%	2%
1989	50%	22%	15%	12%	9%	8%	6%	5%	4%	4%
1990	42%	28%	15%	11%	9%	7%	6%	5%	4%	3%
1991	53%	29%	21%	12%	9%	7%	6%	5%	4%	3%
1992	35%	24%	16%	12%	8%	6%	5%	4%	3%	3%
1993	40%	20%	15%	11%	8%	6%	4%	4%	3%	3%
1994	46%	25%	15%	11%	8%	7%	4%	3%	3%	3%
1995	53%	32%	19%	12%	9%	7%	5%	3%	3%	2%
1996	32%	24%	18%	12%	9%	7%	5%	4%	3%	2%
1997	31%	17%	14%	11%	8%	6%	5%	3%	3%	2%
1998	59%	22%	13%	10%	8%	6%	5%	4%	3%	2%
1999	50%	37%	16%	11%	9%	7%	6%	4%	3%	3%
2000	55%	35%	28%	15%	10%	8%	7%	5%	4%	3%
2001	58%	38%	27%	22%	11%	7%	6%	6%	4%	3%
2002	77%	51%	35%	26%	22%	11%	7%	6%	5%	4%
2003	63%	56%	39%	31%	24%	20%	10%	7%	6%	5%
2004	56%	44%	40%	32%	25%	20%	17%	9%	6%	5%
2005	66%	45%	37%	34%	27%	22%	18%	16%	8%	5%
2006	68%	52%	38%	33%	31%	25%	20%	16%	15%	7%
2007	50%	43%	35%	29%	25%	24%	19%	15%	13%	11%
2008	48%	34%	31%	26%	21%	19%	18%	14%	12%	10%
2009	54%	35%	28%	25%	20%	17%	15%	14%	11%	9%
2010	45%	32%	25%	20%	18%	15%	13%	12%	12%	9%
2011	47%	30%	24%	20%	17%	16%	13%	11%	11%	10%
2012	46%	28%	21%	18%	15%	13%	12%	11%	9%	8%
2013	49%	29%	20%	16%	14%	12%	10%	10%	8%	7%
2014	56%	33%	20%	14%	12%	10%	9%	9%	8%	7%
2015	77%	51%	30%	20%	14%	12%	10%	9%	8%	8%
2016	76%	66%	46%	32%	21%	15%	12%	11%	10%	9%
2017	74%	64%	59%	48%	34%	23%	15%	14%	11%	10%

3/14/2019





### Comparison of Delinquency Rate and % Farms ROA>ROE

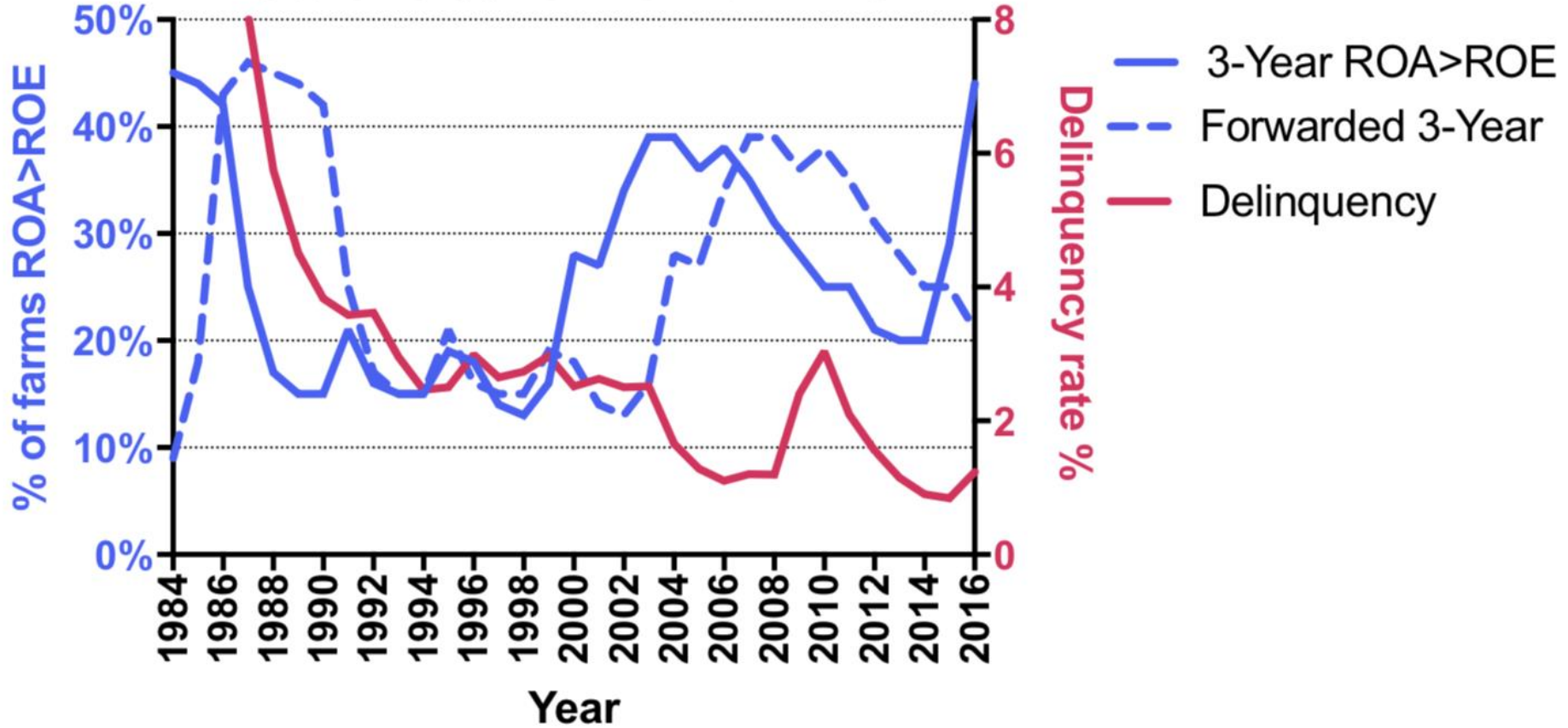
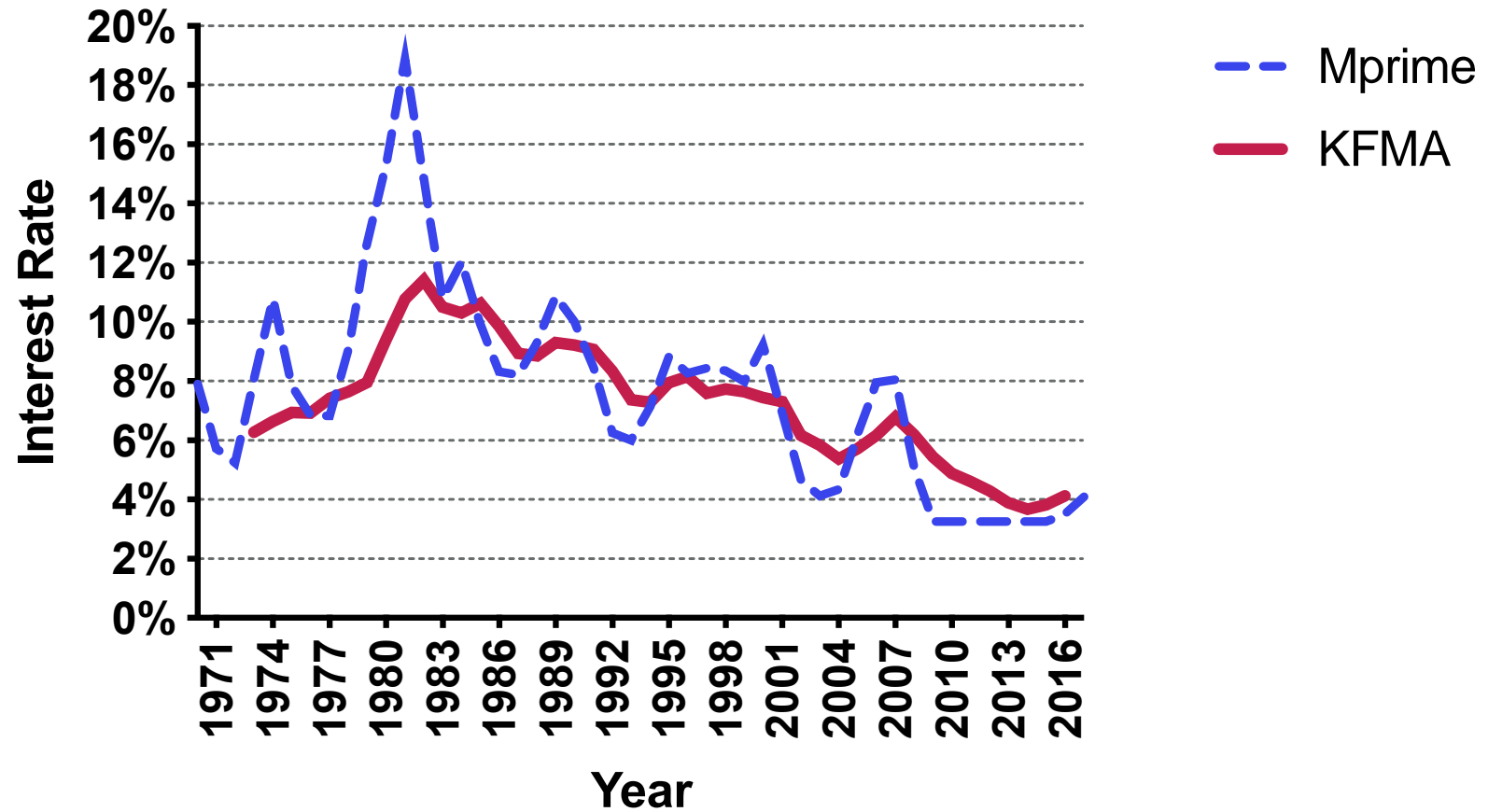


Figure 4. Comparing the farm delinquency rate to the 3-year ROA>ROE percentage



## Interest Rate Comparison



# Questions

- Is there ever a reason for long-term ROA > ROE?
- Do you monitor the relationship between these ratios with your farmers?
- What would the situation look like with a series of interest rate hikes?
- What options are available?