




Past as Prologue – Lessons from the 1970s and 1980s

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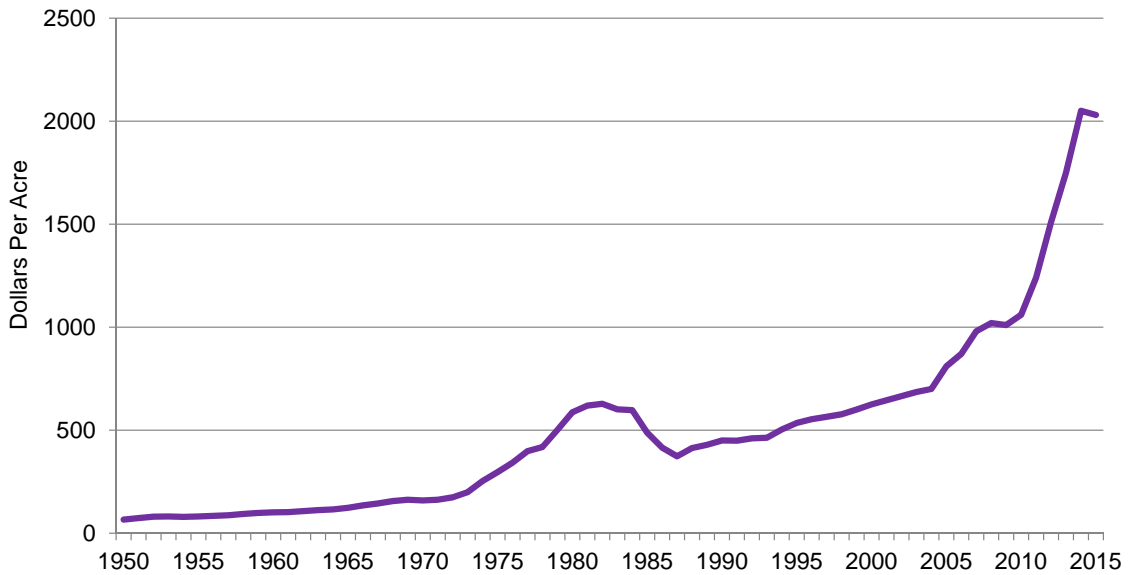


Introduction

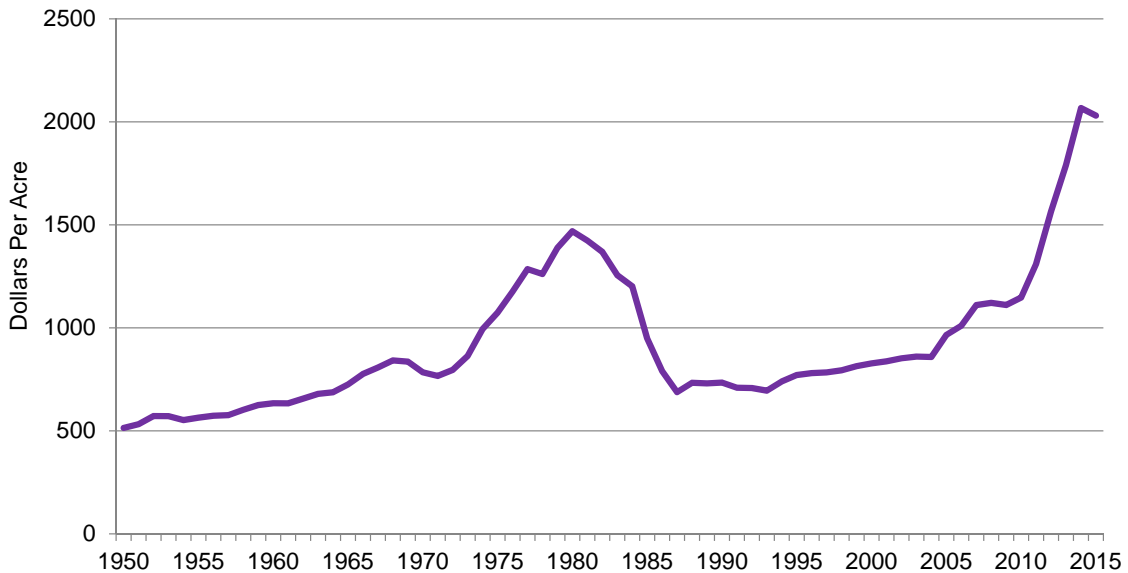


- Farmland was susceptible to two boom-bust cycles in the last century
 - 1920s and 1930s
 - 1973 through 1986
 - Drivers of Boom-Bust Cycles
 - Economic shock justifying higher prices
 - Outside of most investors experience
 - Increased use of leverage
 - A herding effect
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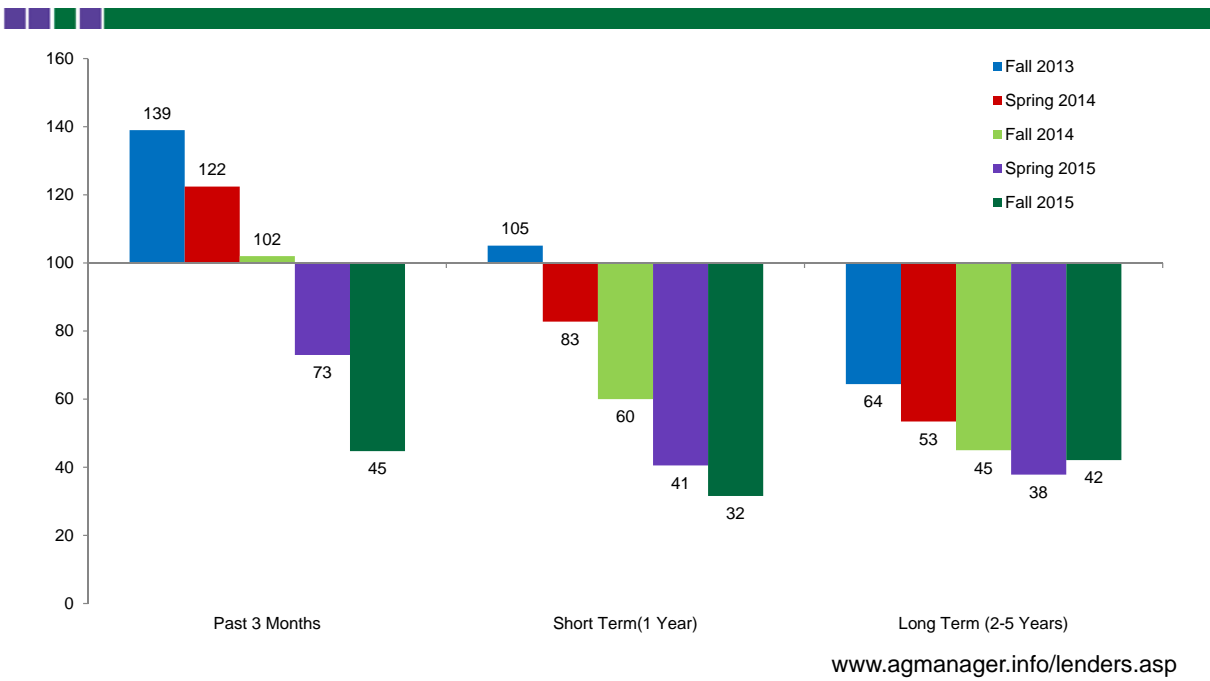
Kansas Land Values



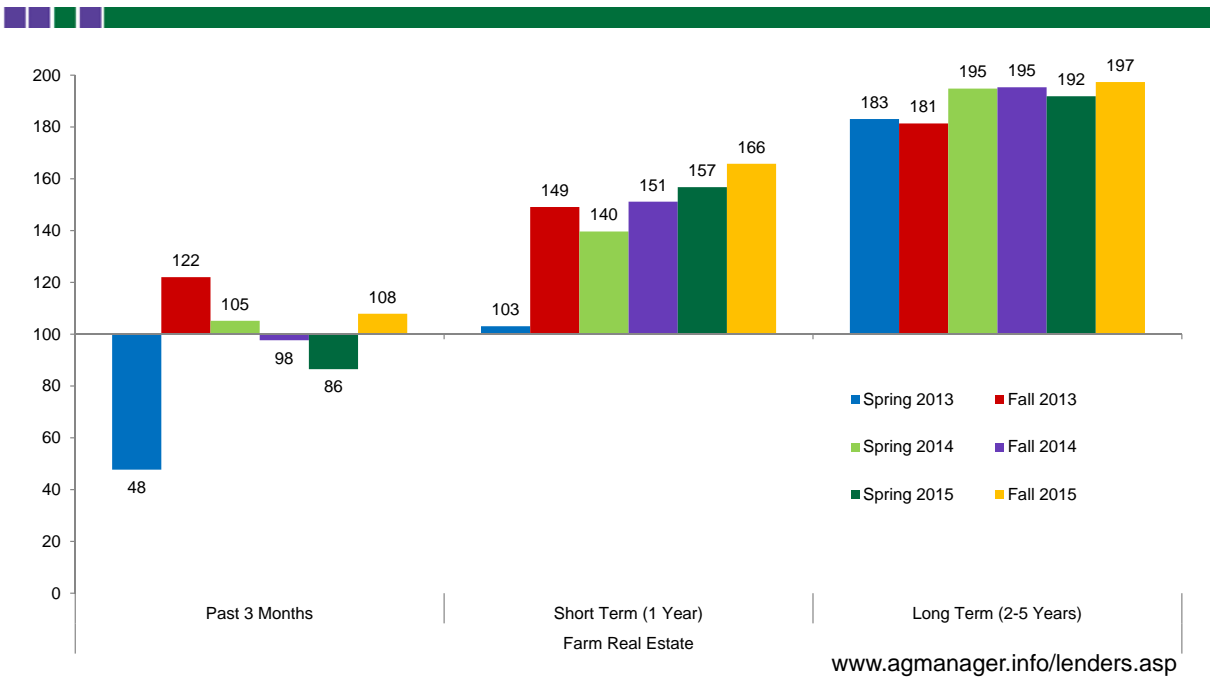
Kansas Inflation-Adjusted Land Values



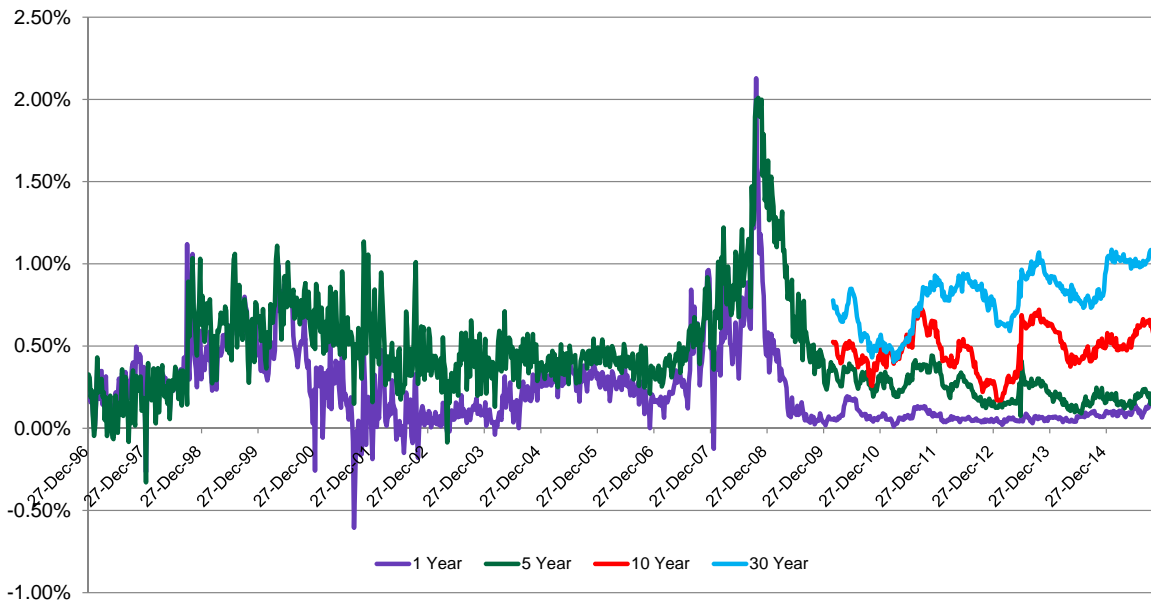
Future Land Values?



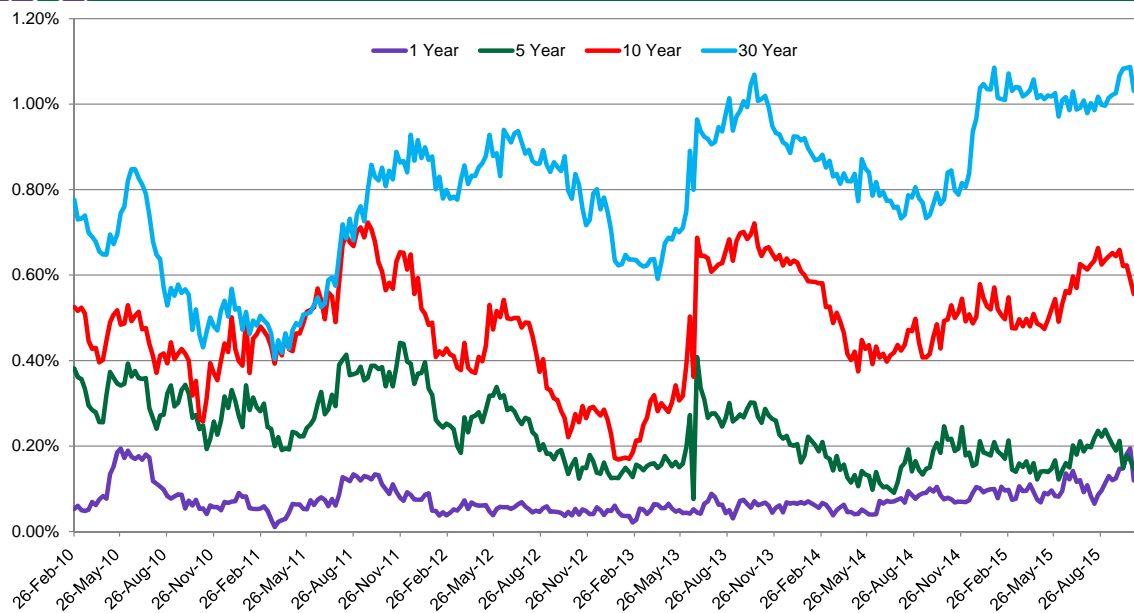
Future Real Estate Interest Rates?



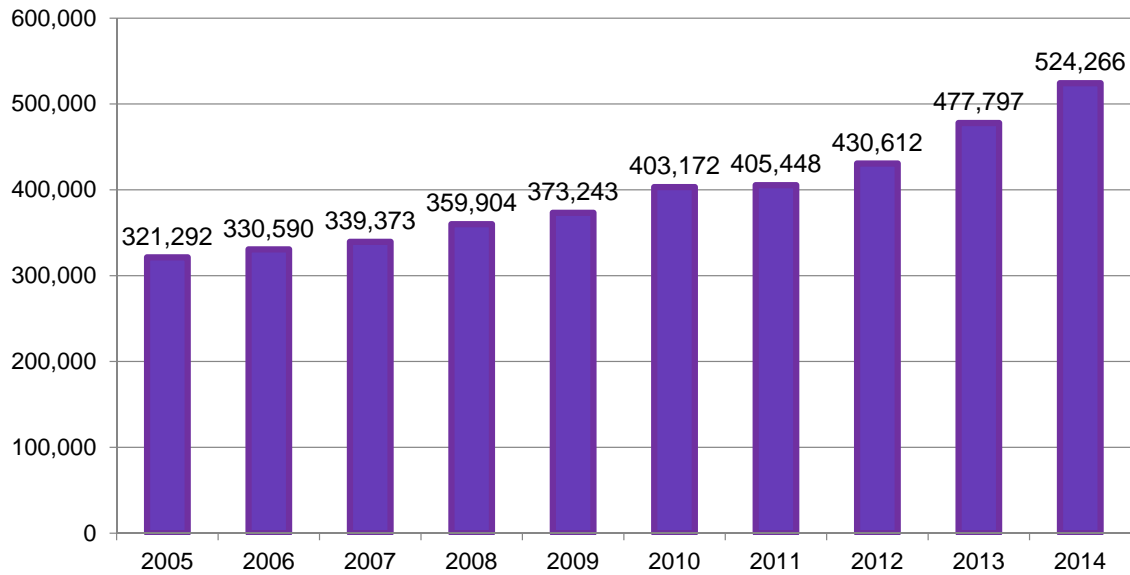
Farm Credit T-Bill Spreads



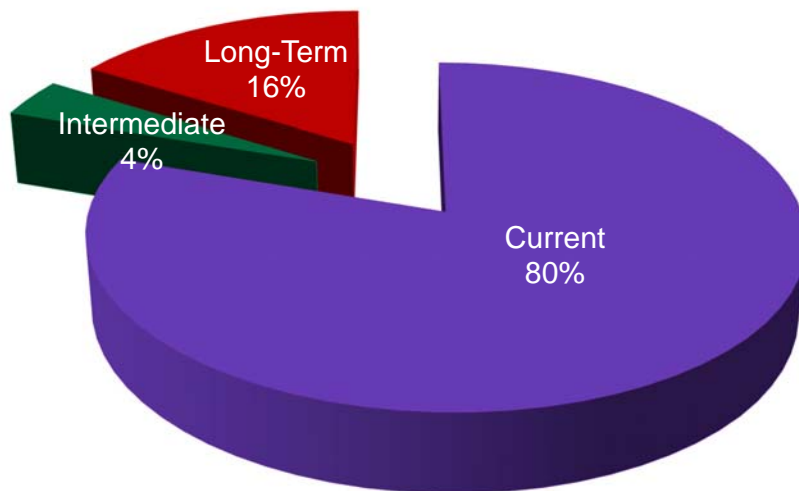
Farm Credit T-Bill Spreads



Kansas Farm Management Association Debt Levels



Change in Kansas Farm Debt 2014



Nine Important Takeaways

- #1 - Loans Perform for Awhile
- #2 - Cost of Borrowing
- #3 - Its in the Tails
- #4 - Default risk is low, but it was in 1979
- #5 - Debt to Asset is Lower in 2013 than 1979
- #6 - Déjà vu All Over Again?
- #7 - What Safety Net?
- #8 - How Fixed are Rates?
- #9 - Land Value Effects

#1 - Loans Perform for Awhile

Table 1. Comparison for Origination and Default Year for 457 Defaulted Equitable Agribusiness Loans

Origination Year	Default Year													Total
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1991	
1967	-	-	-	-	-	-	-	-	1	-	-	-	-	1
1972	-	-	-	-	-	-	1	-	-	-	-	-	-	1
1973	-	-	1	-	-	-	-	-	1	-	-	-	-	2
1974	-	1	-	-	-	-	-	-	2	1	-	-	-	4
1975	-	-	1	-	-	2	1	-	1	1	-	-	-	6
1976	-	-	-	1	1	3	5	6	4	-	-	-	-	20
1977	1	-	3	1	6	7	12	25	14	4	-	2	-	75
1978	-	-	2	2	5	10	11	27	27	5	1	-	-	90
1979	-	-	1	1	4	9	19	23	27	3	2	-	-	89
1980	-	-	1	-	10	9	13	28	22	8	1	-	-	92
1981	-	-	-	1	4	3	3	14	4	1	-	-	-	30
1982	-	-	-	-	-	-	-	2	1	-	-	-	-	3
1983	-	-	-	-	-	-	5	10	7	2	-	-	1	25
1984	-	-	-	-	-	-	1	4	6	2	-	1	-	14
1985	-	-	-	-	-	-	-	1	2	2	-	-	-	5
Total	1	1	9	6	30	43	71	140	119	29	4	3	1	457

Source: Featherstone and Boessen (page 255).

#1 – Loans Perform for Awhile

- Average for the last default was 5.6 years
- Average loan to appraised value ratio for the portfolio of defaulted loans was 60%
 - Two thirds were between 50% and 70%
- Average loan to appraised value for some lenders at 65%
- Historical, not current underwriting standards are key
- Farmers will default on a parcel that is underwater

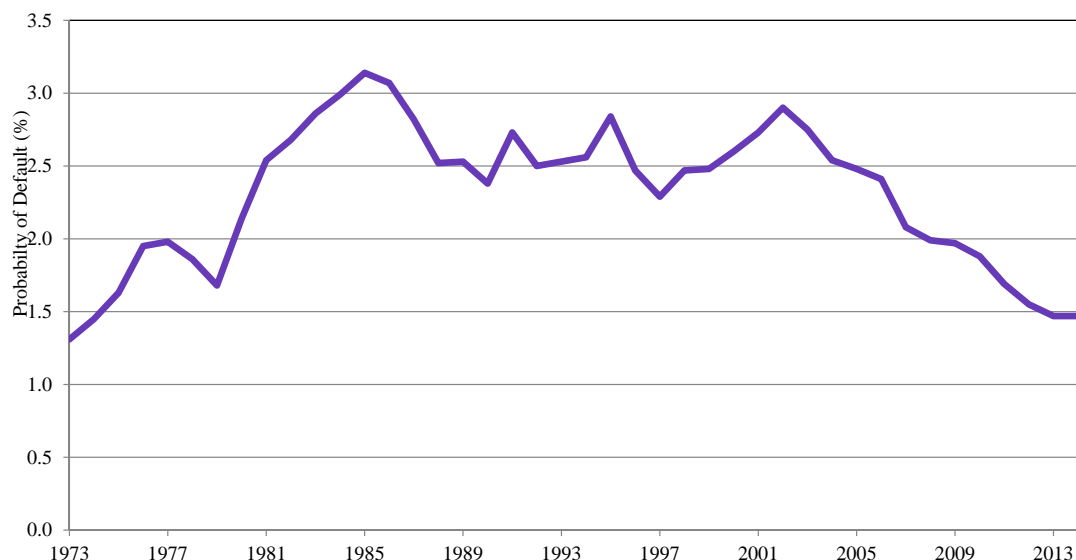
#2 – Cost of Borrowing

- Nominal Cost of Borrowing
 - Last bust average rate on defaulted loans was 11.04%
 - Average 4.88% for 2013 and 2014
- Inflation-adjusted Cost of Borrowing
 - Last bust average rate on defaulted loans was 2.41%
 - Average 4.12% for loans made in 2013 and 2014
- Nominal cost is lower, but the real cost is higher
- Amortized loans at lower interest rates pay more principal early in the loan reducing the possibility of loans going underwater (11.4% more in 6 years for 15 year loan)

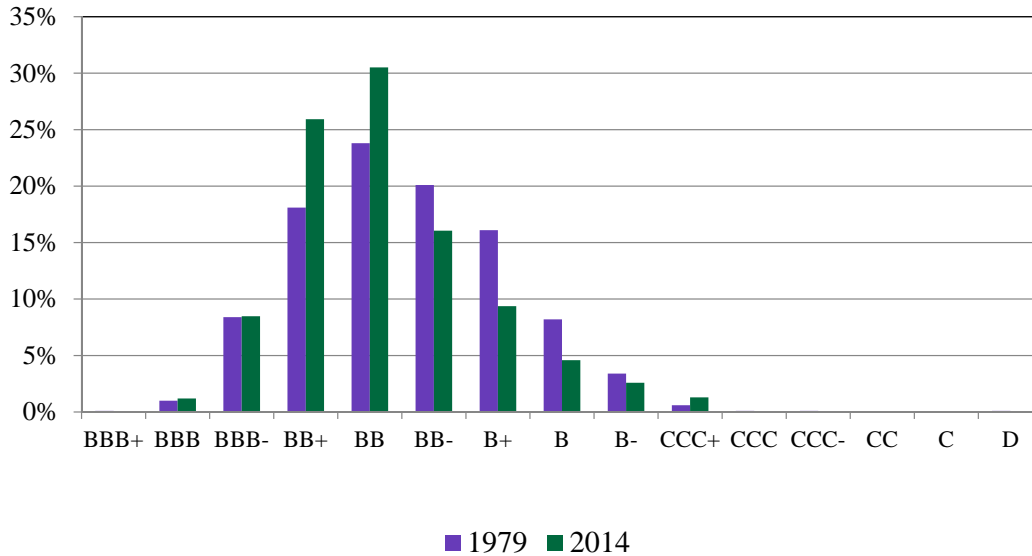
#3 - Its in the Tails

- During the last default, only 10.9% of loans originated during the critical period by a national lender defaulted
- Most buyers of farmland are other farmers
 - Between 72% and 81% of Iowa farmland buyers are other farmers between 2008 and 2014
 - Last two years were 80% and 81%, respectively
- The average will not drive a bust but the tails (margin)
- The tails (margin) will drive the average

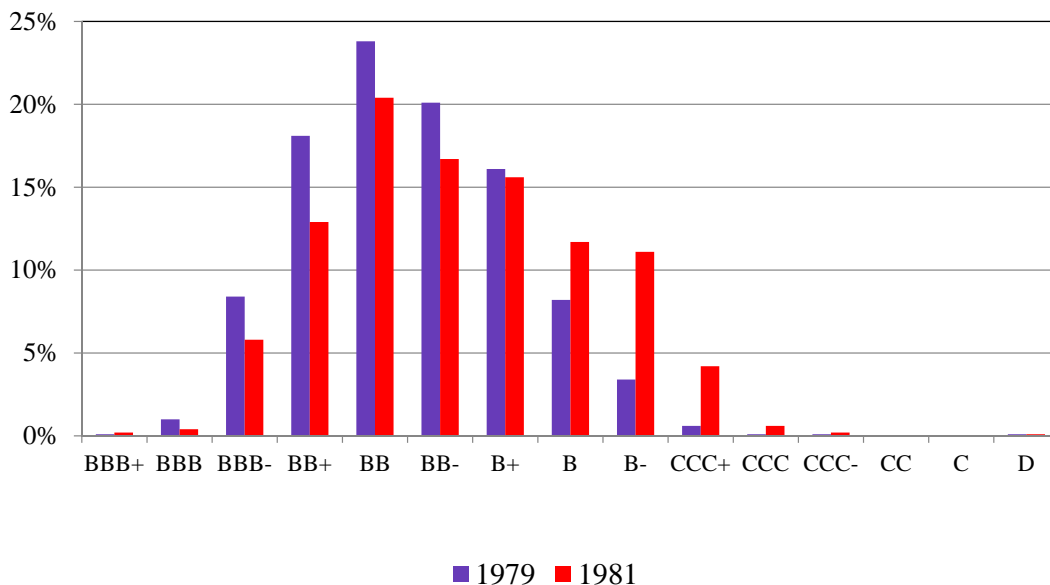
#4 - Default risk is low, but it was in 1979



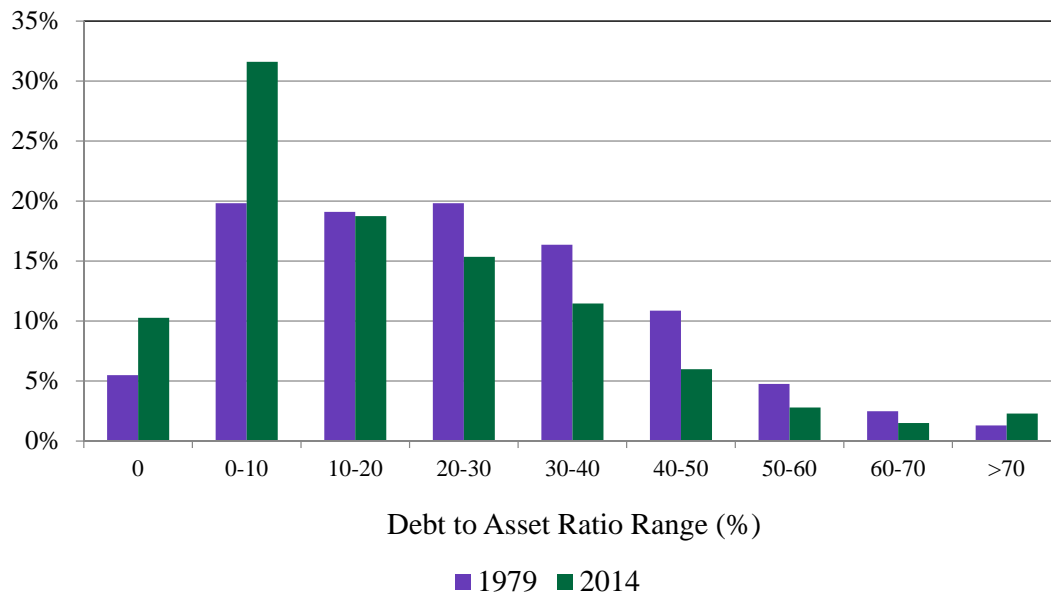
#4 - Default risk is low, but it was in 1979



#4 - Default risk is low, but it was in 1979 and it can change quickly



#5 - Debt to Asset is Lower in 2013 than 1979



#5 - Debt to Asset is Lower in 2014 than 1979

- Average debt to asset ratio for Kansas Farm Management Farms:
 - 1979 – 24.6%
 - 2014 – 19.0%
- Farms Greater than 40% debt to assets
 - 1979 – 19.4%
 - 2014 – 12.6%
- Farms Greater than 70% debt to assets
 - 1979 – 1.3%
 - 2014 – 2.3%

#6 - Déjà Vu All Over Again?

- Repayment capacity was key
 - Fell from 152.8% to 16.3% from 1979 to 1981
- Two key factors
 - Increase in interest payments by 65.3%
 - Decline in value of farm production by 15.7%
- Land Values could no longer be supported
- Could similar decreases result in a crisis again?

#6 - Déjà Vu All Over Again?

	2013	2014	65.3% Interest Increase	15.7% Farm Production Decrease	Both
Value of Farm Production	614,385	608,348	608,348	512,919	512,919
Government Payments	35,126	27,253	27,253	27,253	27,253
Livestock Income	150,752	198,120	198,120	198,120	198,120
Crop Income	428,507	382,976	382,976	287,547	287,547
Expenses w/o Interest	457,778	469,563	469,563	469,563	469,563
Interest	17,966	18,769	31,026	18,769	31,026
Total Expenses	475,743	488,333	500,589	488,333	500,589
Net Farm Income	138,641	120,016	107,759	24,587	12,330
Capital Debt Repayment Capacity	111.25%	90.58%	78.93%	7.22%	-3.34%

#6 - Déjà Vu All Over Again?

Non-Irrigated Corn and Soybean Cost of Production Cost per Acre

Year	Corn		Soybean	
	Variable Cost	Total Cost	Variable Cost	Total Cost
2014	\$322	\$447	\$229	\$339
2013	\$308	\$420	\$224	\$342
2012	\$325	\$435	\$202	\$299
2011	\$281	\$391	\$192	\$286
2010	\$268	\$382	\$176	\$268
2009	\$267	\$371	\$173	\$261
2008	\$265	\$374	\$167	\$250
2007	\$231	\$331	\$145	\$229
2006	\$191	\$269	\$125	\$183
2005	\$188	\$263	\$118	\$177

#7 - What Safety Net?

- Crop revenue would need to fall by 24.9% to decrease the value of farm production by 15.7%
- Using prices from 2014 received on farm:
 - Corn price would need to fall from \$3.60 to \$3.14
 - Wheat price would need to fall from \$6.08 to \$3.24
 - Soybean price would need to fall from \$12.59 to \$7.69

#7 - What Safety Net?

- Crop Revenue Insurance?
 - Prices are set in February for corn based on the December futures contract
 - Prices are set from August 15 to September 14th for wheat in Kansas based on the July futures KCBT contract
 - Prices and thus revenue are only protected within the season, not across seasons

#7 - What Safety Net?

Crop Insurance Minimum Revenue Guarantee Corn Example

	2013	2014	2015	2016
APH (bushel)	150	150	150	150
Coverage Election	80%	80%	80%	80%
Guaranteed Bushel	120	120	120	120
Base Price (per bushel)	\$5.65	\$4.62	\$4.15	\$4.04
Coverage (per acre)	\$678	\$554	\$498	\$485

Decline of 28% since 2013

#7 - What Safety Net?

Crop Insurance Minimum Revenue Guarantee Soybean Example

	2013	2014	2015	2016
APH (bushel)	40	40	40	40
Coverage Election	80%	80%	80%	80%
Guaranteed Bushel	32	32	32	32
Base Price (per bushel)	\$12.87	\$11.36	\$9.73	\$8.80
Coverage (per acre)	\$412	\$364	\$311	\$282

Decline of 31% since 2013

#7 - What Safety Net?

Crop Insurance Minimum Revenue Guarantee Wheat Example (Kansas)

	2013	2014	2015	2016
APH (bushel)	40	40	40	40
Coverage Election	80%	80%	80%	80%
Guaranteed Bushel	32	32	32	32
Base Price (per bushel)	\$8.78	\$7.02	\$6.30	\$5.20
Coverage (per acre)	\$281	\$225	\$202	\$173

Decline of 41% since 2013

#7 - What Safety Net?

- Farm Program Payments
 - PLC Price Support Levels
 - Corn - \$3.70
 - Wheat - \$5.50
 - Soybean - \$8.40
 - ARC absorbs the first 10% of the loss based on revenue

#8 - How Fixed are Rates?

Fixed Rate Farm Credit System Debt Securities Outstanding, 12/31/06 through 12/31/14

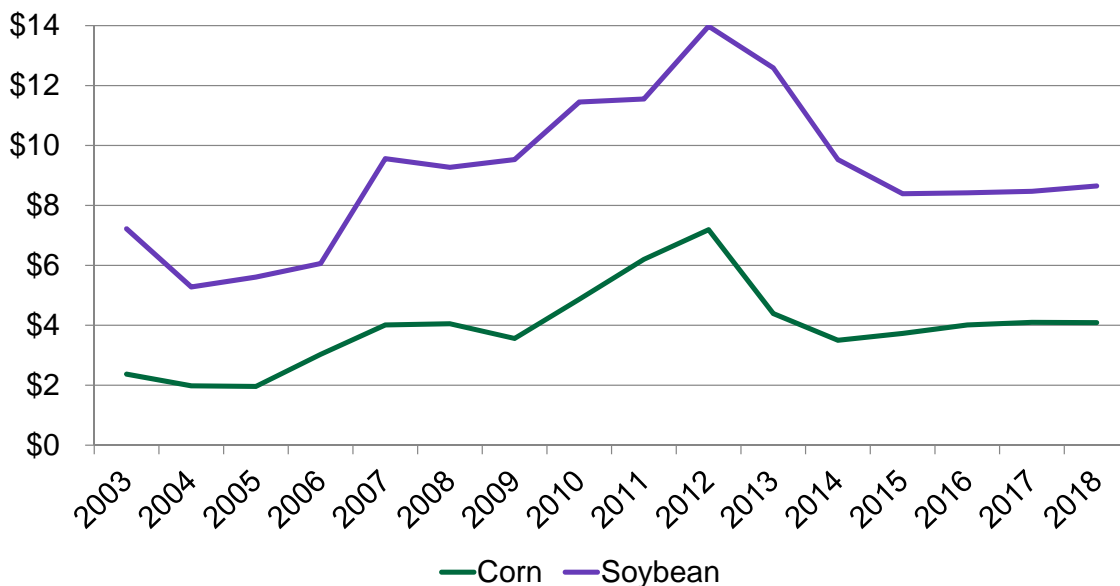
	Fixed Rate Non- Callable Bonds	Fixed Rate Callable Bonds	Total Outstanding	Percent Fixed
	----- \$ billion -----			
12/31/2006	32.4	37.7	134.1	52.3%
12/31/2007	36.6	42.8	154.1	51.5%
12/31/2008	43.0	43.8	176.3	49.2%
12/31/2009	41.7	39.9	176.1	46.3%
12/31/2010	40.9	45.8	187.5	46.2%
12/31/2011	44.0	46.4	184.2	49.1%
12/31/2012	50.1	52.0	196.5	52.0%
12/31/2013	57.2	56.5	206.6	55.0%
12/31/2014	57.5	56.5	224.9	50.7%

Source: Federal Farm Credit Funding Corporation

#8 - How Fixed are Rates?

- Amount of Farm Credit Bonds that are fixed has been slightly above 50% for the last 9 years
 - However, this has fallen at the end of 2014
- The amount of real estate loans at fixed rate have been about 83% for Farm Credit Services of America
- For banks, about 74% of non-real estate loans have floating rates.
- Estimates indicate that 48.6% of Kansas Farm Management Association Debt is at a fixed rate
- Thus, only about 50% of the debt would be affected by an interest rate change

#9 - Land Value Effects - Recent and Projected Crop Prices



#9 - Land Value Effects

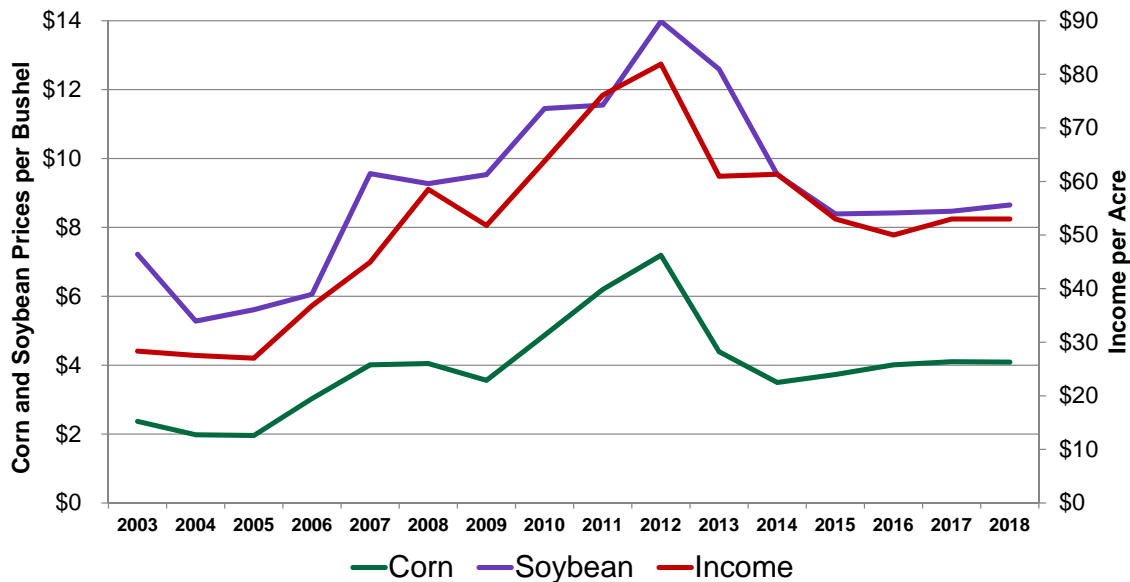
- Using the futures prices at harvest through 2018, prices are more like the 2007 to 2009 period subtracting a \$0.35 basis for soybeans and a \$0.03 for corn (Salina, KS – 5 year average)
- Should futures prices be used for long term price expectations?

#9 - Land Value Effects

CBOT:ZCZ2015, W 375'6 ▼-4'6 (-1.25%) O:381'2 H:383'4 L:375'2 C:375'6



#9 - Projected Income per Crop Acre



#9 - Land Value Effects

- Based on an estimated model for Kansas land values, the one-year multiplier for net farm income for acre was 1.50.
 - One year elasticity is 6.7%
- The long-run multiplier is 21.71 or an implied capitalization rate of 4.61%.
 - Long-run elasticity is 96.9%
- At the projected net farm income per acre of \$53, the projected long-run Kansas land price is \$1151, a decline of 43.3%

Conclusions

- Financial situation of the farm sector is currently in excellent shape partially due to crop insurance
 - However, it is not much different than it was in 1979, two years before the previous bust
- Will leverage drive another bubble?
 - Probably not
- Can leverage exacerbate another bubble?
 - Very likely
- It is generally believed that agricultural land price has and will continue to fall
 - By how much?

Questions?