Chapter 4. Agricultural Finance

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General Outlook

The financial condition of New York's agricultural economy in 2014 is holding steady if not improving over 2013. Although there is some uncertainty regarding the future of grain and oilseed prices, at least in the short run the livestock sector including dairy appears to be sound. Sector-wide New York's diversified agricultural economy is stable as declines in cash crops are offset by higher livestock prices and lower feed crops. Credit conditions are strong. Farm equity is very high, and the debt carrying and debt repayment capacity of the agricultural economy is substantial. If New York is following national trends, loan charge-offs and non-performing/non-accruing loans are at historical lows. Farm Credit East in its Quarterly Report (as at September 30th 2014) shows an improvement over 2013. Impaired loans to total loans are 1.07%, nonaccrual loans to total loans are 0.99% and delinquencies as a % of total performing loans are at 0.35%. The performance of Farm Credit East and the Farm Credit System does not appear to be any more or less impaired than the commercial banking sector, and both are performing better than the commercial and personal lending sector. The residual effects of working capital shortages arising from the financial crisis appear to be over. There have been no failures of agricultural banks since 2012. Credit demand is moderately inelastic: a 1% increase in interest rates will decrease loan demand by about 0.588%. All indications suggest that farmers are being prudent with their lending behavior. For example, while an increase in the demand for farm credit is observed as interest rates fall, an increase in the number of loans does not change. Farmers are not borrowing just because interest rates are low; borrowing is done with a purpose.

Farmland values in 2014 are holding steady with a slight increase over 2013. The short run trend appears to be one of moderation, with no signals of a high growth in land values for 2015. Part of this may be a consequence of lower grain prices and increased volatility.

Agricultural Prices

Figures 4-1 a-f show the closing CME nearby futures prices from 2014 to the present (accessed November 17-19,2014, http://www.cmegroup.com/trading/agricultural/) . Corn, soybeans, and wheat are in the left column, and Class III milk, live cattle and lean hogs are presented in the right column. Grain and oilseed prices continue to drop, from the highs several years ago. Grain corn started 2014 at about $4.50/bushel, but ended the year at about $3.64/bushel a decrease of 21.2%. Soybeans and wheat, currently at prices around $10.23/bu and 5.59/bu. Saw price decreases over the year of approximately 9.95% and 13.42% respectively. Milk prices have held steady throughout the year and are about 21.9% higher than late 2013. Strength is also observed in the live cattle and hog markets with prices rising 26.3% from $1.31/lbs to 1.704/lbs and hogs rising 16.26% from $0.79/lbs to $0.93/lbs. Milk price increases are largely driven by consumer and industrial demand. Live cattle prices are likely due to increased demand as well as destocking of feeder cattle as feed prices climbed in 2012 and into 2013. Hog demand, particularly from Asia, combined with an outbreak of new porcine epidemic diarrhea virus (PEDv) and porcine reproductive and respiratory syndrome (PRRS) put pressures on supply.

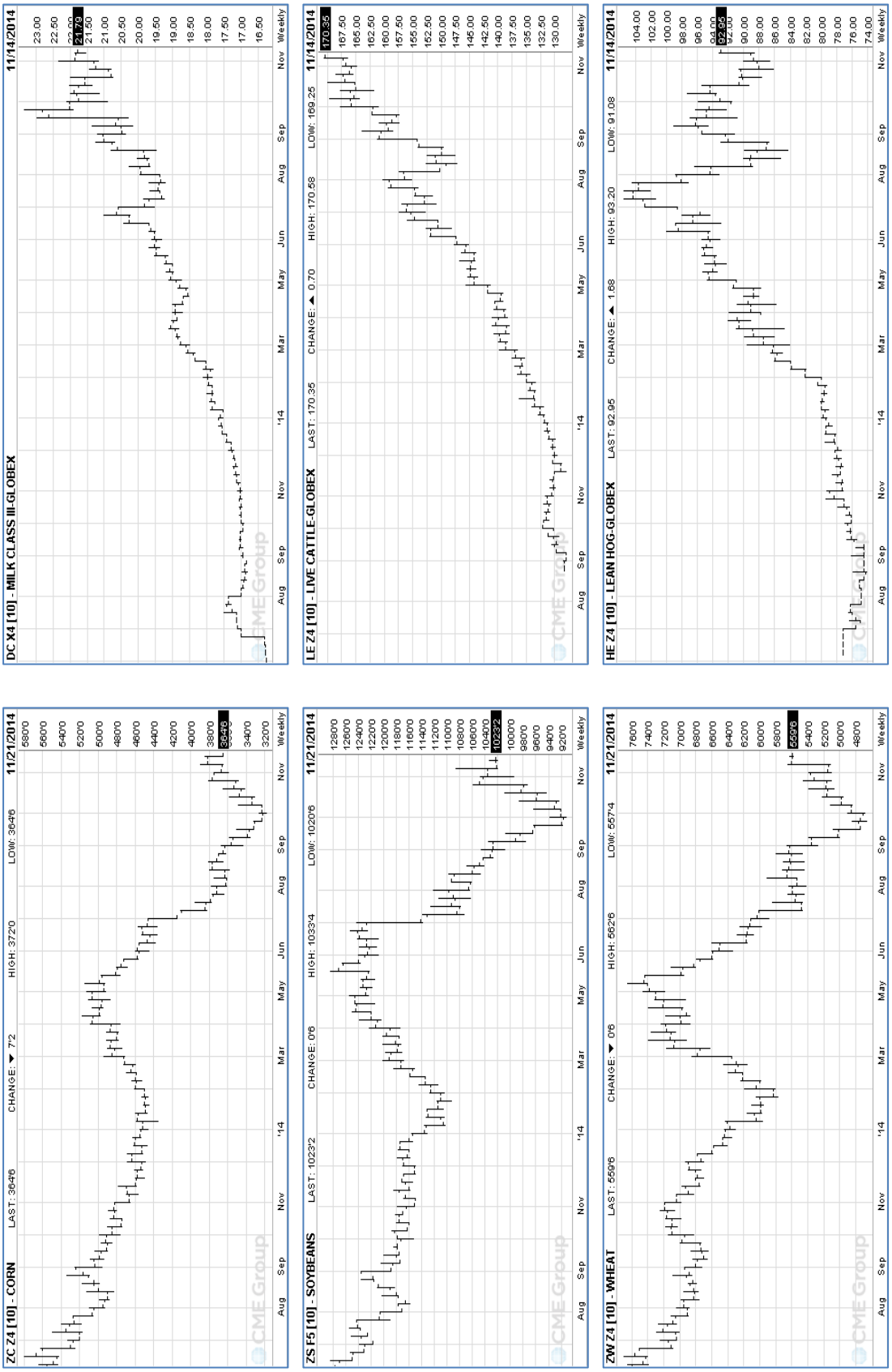


Figure 4-1: Nearby Futures Prices for Major Grains and Livestock Production, 2013-2014

Cash Receipts, Value Added and Farm Income

New York cash receipts from agricultural activities were $5.287 Billion in 2012. Real Cash Receipts for NY state farmers are as high as they have ever been on a per farm basis (Figure 4-2, right axis), although aggregate cash receipts in real terms (2009=100) have still not matched the period following the outbreak of war in 1939. New York farms continue to consolidate and expand with only 20% of farms in 2014 as there were in 1940.

Figure 4-3 shows net cash farm income per farm in constant 2009 dollars. Again, since 2003 NY farmers have seen a significant uptick in farm incomes. The volatility in commodity prices, combined with increased energy costs have contributed significantly to farm income volatility, but in terms of trend the outlook for NY farmers looks favorable in the next few years. This of course is contingent on the degrees of correlation between major crops and livestock. Sector wide, decreases in grain prices are being offset by rises in livestock prices, including milk. Farm profitability in 2014/2015 will be relatively stable as increased profitability in livestock, bolstered by lower feed costs, offset declines in the cash crop sector.

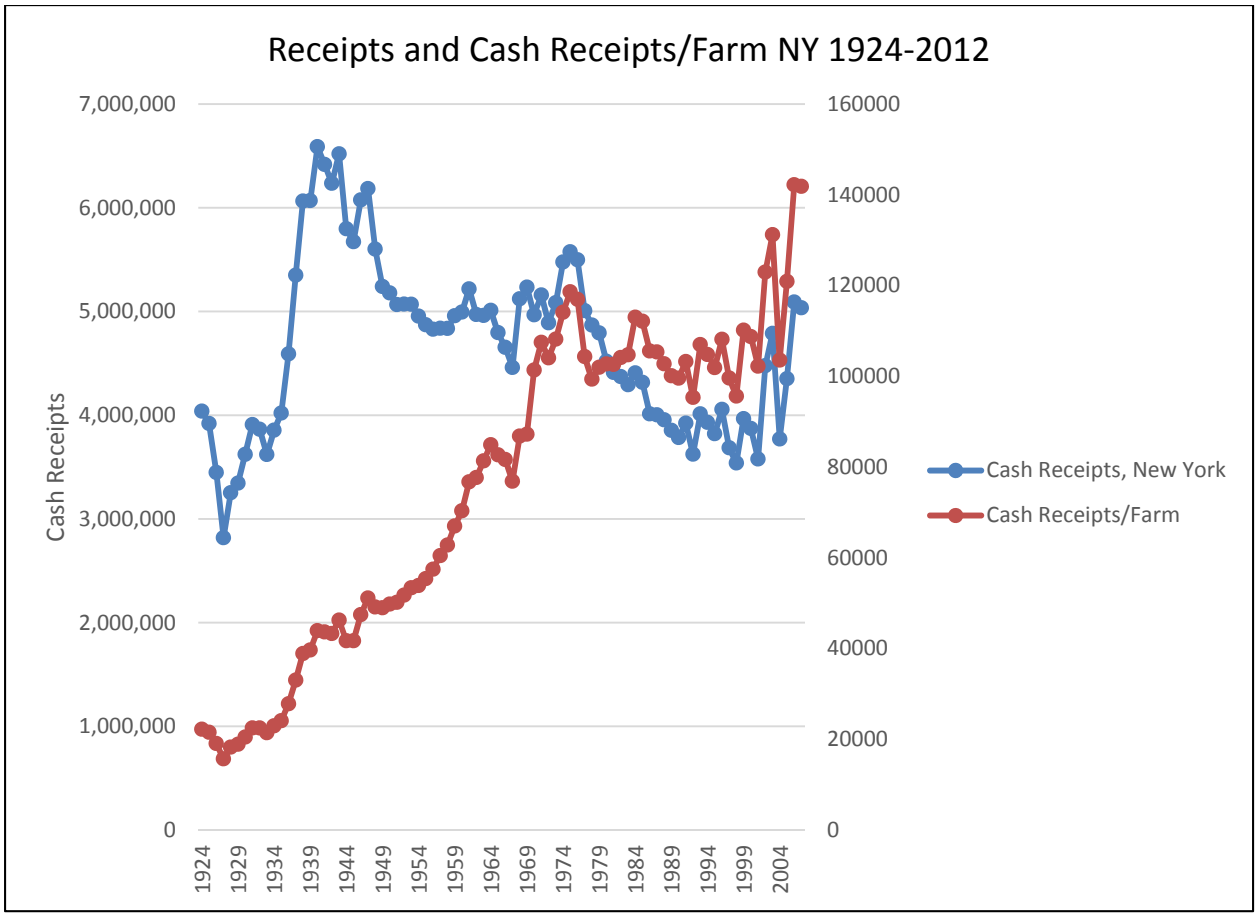


Figure 4-2: Real Cash Receipts (2009=100) NY Total and Per Farm (Source USDA ERS)

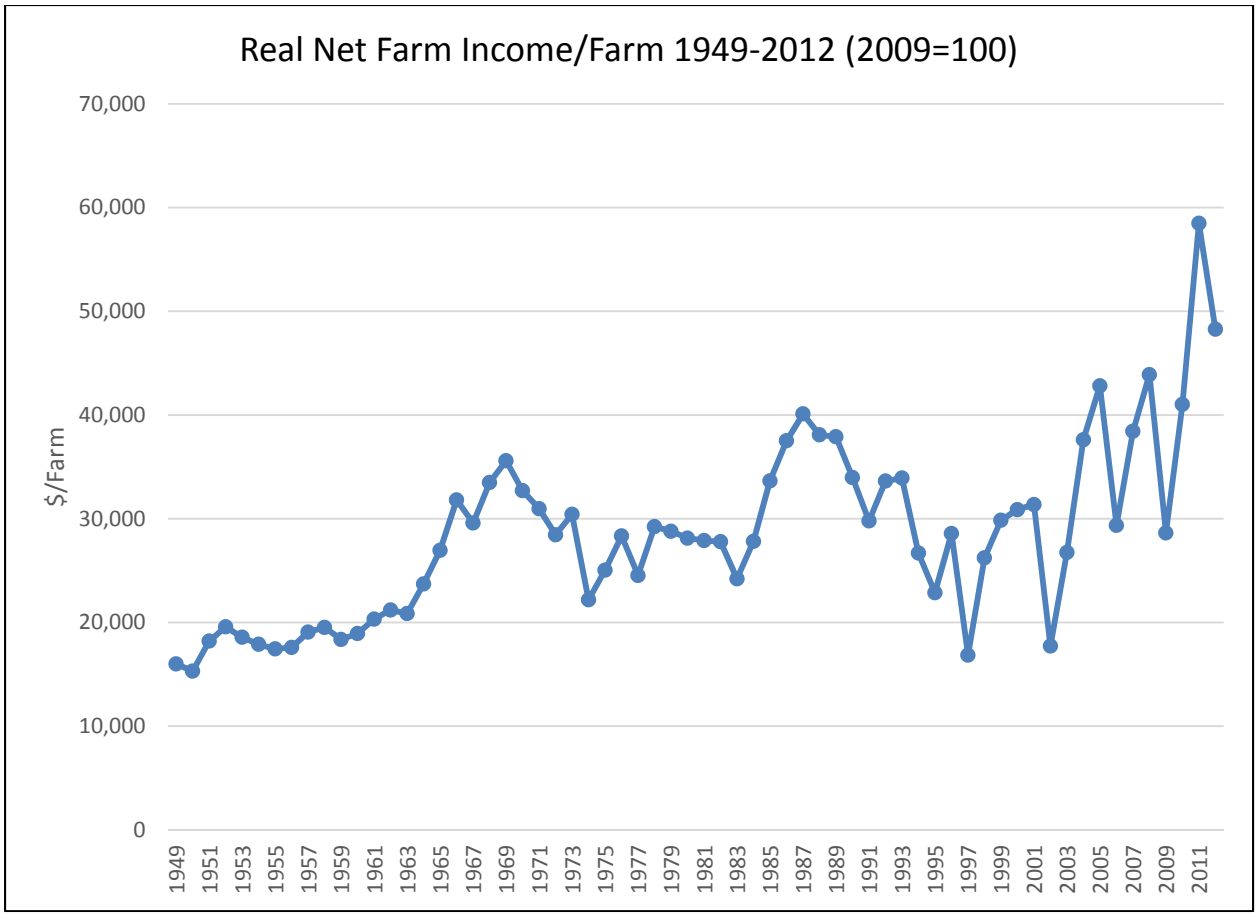


Figure 4-3: Real Net Farm Income per Farm (2009=100, Source USDA ERS)

As Table 4-1 shows, dairy accounts for approximately 48.3% of cash receipts in NY so that much of the financial and economic health of the State's agricultural economy depends on the dairy sector. For NY dairy farms using data from 1997-2010 it was found that a 1 unit decrease in the milk/corn price ratio would decrease average $/cow income by $248/year, for the low income/efficiency farms it was $429.42/cow. Between 2000 and 2007 the average price ratio was 5.39, but from 2008 to 2012 the average ratio fell to 3.03 capturing ethanol and other market effects.

Table 4-1: Share of Receipts for NY Commodities in Top 20 USA Rankings, 2012 (Source: USDA ERS)

Crop	Rank	State receipts for Total	Share of U.S. receipts for Total	Share of State receipts for all commodities ($5.2878 Billion)	Share of U.S. receipts for all commodities ($395.068 Billion)
		$1,000	Percent	Percent	Percent
Total	26	5,287,766	1.3	100.0	1.338
Apples	2	234,543	7.8	4.4	0.059
Dairy	3	2,553,816	6.9	48.3	0.646
Fruits/nuts	6	318,425	1.2	6.0	0.081
Greenhouse	8	383,350	2.5	7.2	0.097
Grapes	4	52,252	1.1	1.0	0.013
Potatoes	13	60,776	1.6	1.1	0.015
Strawberries	5	6,880	0.3	0.1	0.002
Tomatoes	5	47,174	2.5	0.9	0.012
Vegetables/ melons	7	625,277	3.0	11.8	0.158
Top 10		4,282,493	80.99	81.0	1.084
All Others		1,005,273	19.01	19.01	0.254

More generally, NY agriculture still suffers from significant inter-year volatility. Figure 4-4 shows the percentage change in Gross Value Added, Net Value Added and Net Farm Income from 2001-2012 (2012 is the last year data was updated). It shows that the residual effects of market uncertainties reside with the farmer. Since 2008 the economy has seen year over year changes of a decline by 60% to a rise of 60% in farm incomes. Gross value added is growing at an average rate of 4.4% annually with standard deviation of 11.37% while net value added is growing at an average rate of 5.06% with a standard deviation of 20.2%. But net farm incomes, while growing at an average rate of 7% , has a volatility of about 50%. This means that given current conditions, there is a 67% chance that net farm income, state-wide, will rise or fall by 50%.

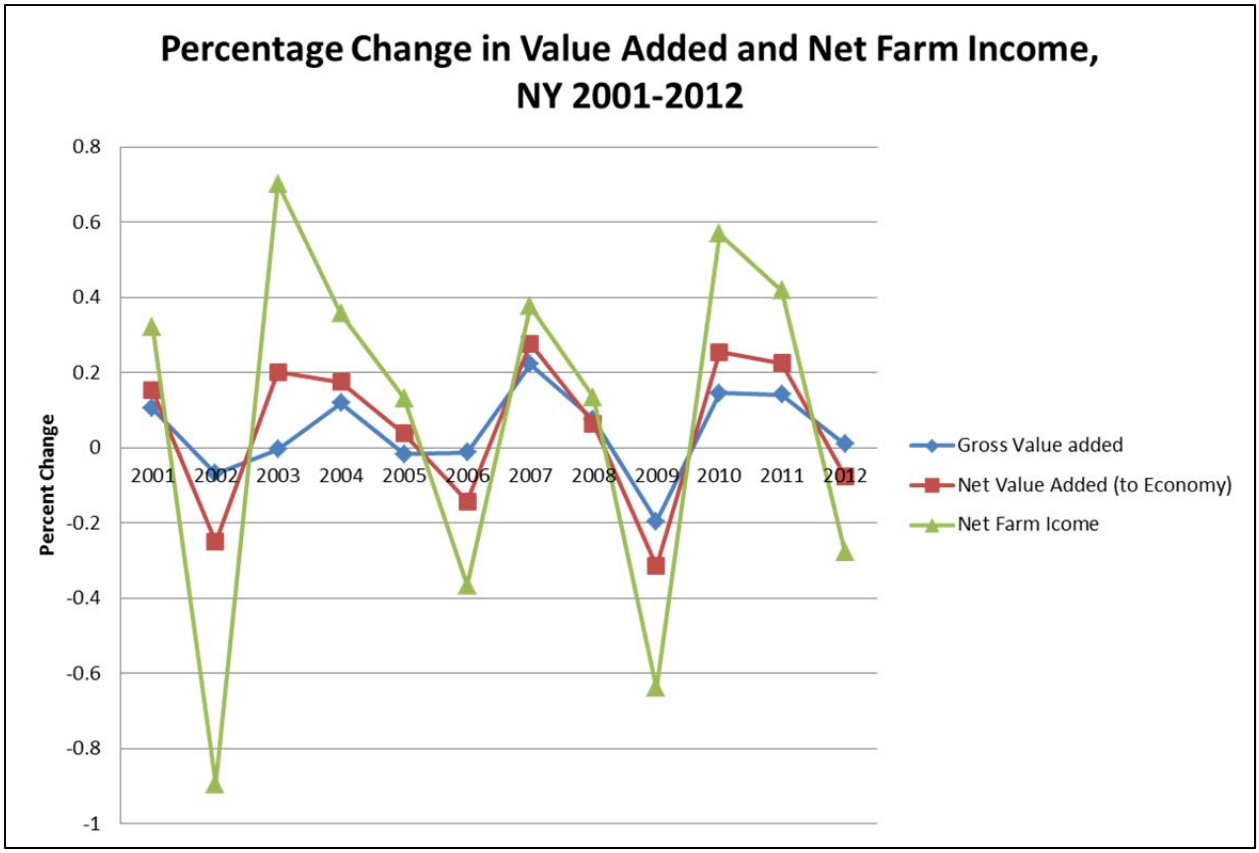


Figure 4-4: Percentage Change in Value Added and Net Farm Income, NY 2001-2012. Source USDA ERS

The Milk/Corn Price Ratio

Most important for NY State is of course the relation between milk prices and corn prices with the latter capturing a major input cost and the former capturing the leading source of revenue and value added. Table 2 shows the closing futures prices for corn and milk for contract months December 2014 through December 2015. Currently the milk to corn price ratio is at 5.07 which is actually higher than that calculated for December 2014 (Table 4-2 Column 4). The market futures price suggest that the Milk/Corn price ratio will remain above 4.0 (minimum 4.11) throughout 2015. This is still healthier than what has been observed in the past few years and while it might signal prudence in financial practices, it does not appear, historically at any rate, to signal any deterioration in financial conditions beyond conventional risk coping strategies.

Table 4-2: Projected Milk/Corn Price Ratio for 2014

Contract Month	Class III Milk	Corn	2015 Milk/Corn Price ratio	2014 Milk/Corn Price ratio
Dec-14	**19.05**	**3.75**	**5.07**	**4.45**
Mar-15	**16.81**	**3.88**	**4.33**	**4.00**
May-15	**16.70**	**3.96**	**4.22**	**3.90**
July-15	**16.87**	**4.03**	**4.18**	**3.90**
Sep-15	**17.30**	**4.10**	**4.22**	**3.87**
Dec-15	**17.18**	**4.18**	**4.11**	**3.75**

Agricultural Finance

The supply of credit to agriculture is strong and demand remains high. Figures 4-5 and 4-6 show the market shares of key providers of agricultural credit [1]. The Farm Credit System dominates the market for long term credit with about 27% compared to 20% for commercial lenders. In comparison, commercial lenders hold about 20% of non-real estate debt compared to about 14% of the Farm Credit System. The Farm Service Agency originates less than 1% of the debt but it is an important component of agricultural finance nonetheless because of its willingness to guarantee higher risk loans. Up until 1995 the data show that commercial lenders and the Farm Credit System were actually substitutes for credit: As Farm Credit loans increased, commercial loans decreased and vice versa. But since 1995 the two key lending sectors have been complementary as the FCS shed its 'lender of last resort' image. Under this competitive environment FCS mortgage loans have dominated. For operating and other intermediate loans commercial lenders and the FCS have always seemed to compete, although since 1995 it appears that non-mortgage loans originated by the FCS are increasing relative to those of commercial banks. In terms of the financial crisis it does not appear that there was any long term reduction in the provision of either real estate or non-real estate loans to agriculture.

[1] USDA NASS/ERS data on the allocation of farm debt was not updated to reflect 2013 or 2014 at the time of writing (November 2014)

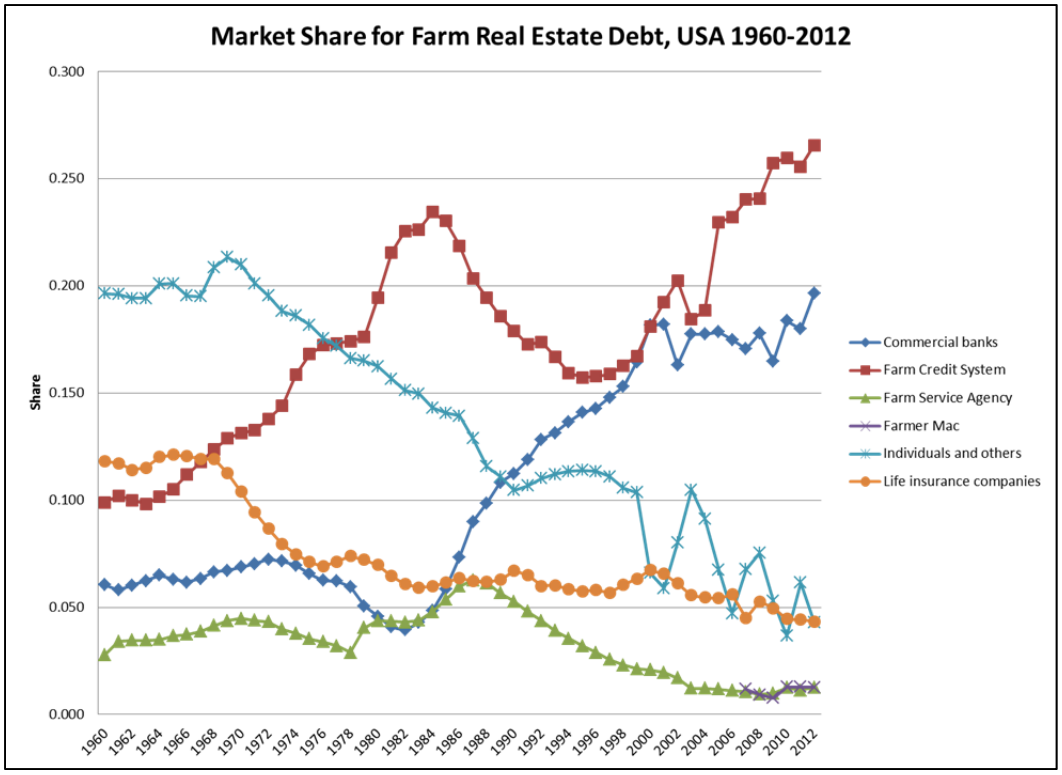


Figure 4-5: Market Share for Farm Real Estate Debt, 1960-2012

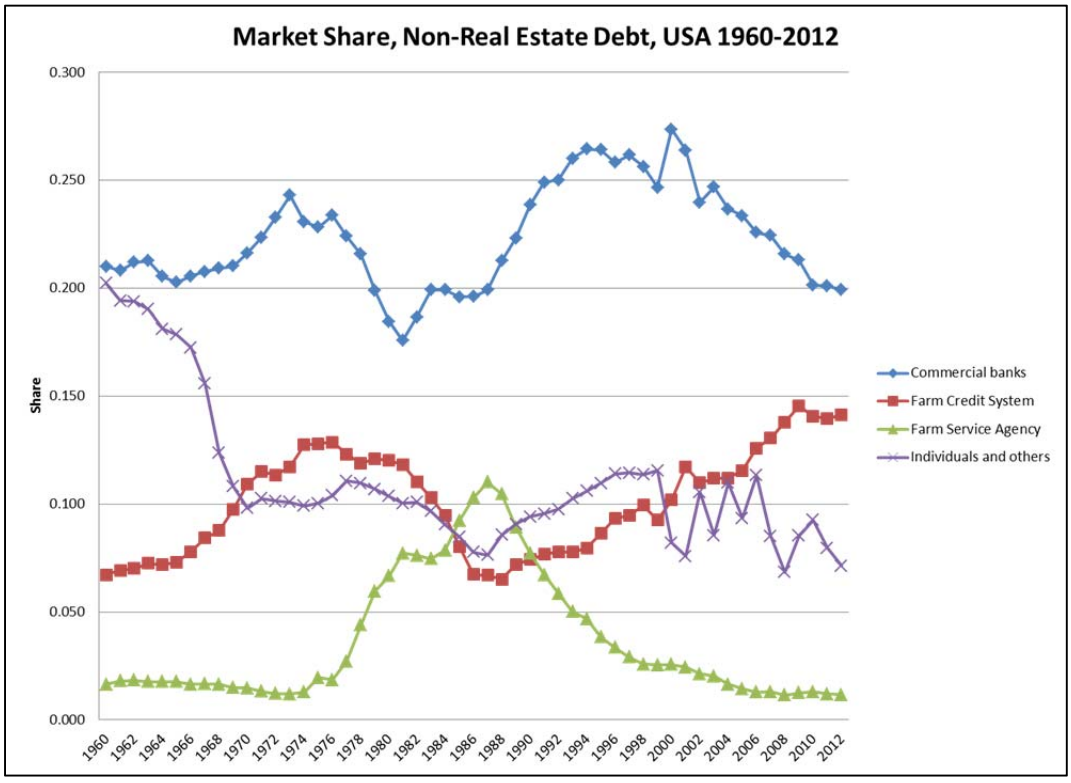


Figure 4-6: Market Share, Non-Real Estate Debt, USA 1960-2012

Table 4-3 provides a side-by-side comparison of a typical USA farm versus an average USA dairy farm (not necessarily NY) in terms of debt capacity. The average farm in the USA has net income of $40,882 in 2012 compared to $173,455 for dairy. The average farm has $74,250 in debt in comparison to the average dairy farm debt of $393,829. Adjusting for depreciation and debt servicing we can determine the debt servicing capacity of the two farm types. Assuming and interest rate of 7.5% and loan amortization over 20 years the maximum debt carrying capacity of an average USA farm is $445,081 while that of the dairy farm is significantly higher at $393,829. These numbers are absolute maximums in times of certainty. In reality the maximum capacity for the typical farm would be at most 75% at $333,811 and for the dairy farm $673,242. Even at these levels the actual debt used on average are only 22.2% and 58.5% of the reserved debt capacity.

Table 4-3: Debt Repayment Capacity of USA Farms and Dairy Farms

Farm Business Debt Repayment Capacity			
		ALL	Dairy
All Farms: TOTAL		2012	
All Farms: TOTAL	Units	Estimate	Estimate
Farms	Number	2,161,844	45,993
Number of farms with debt	Number	534,036	30,636
Gross cash farm income	$ per farm	158,529	894,449
Net farm income	$ per farm	40,882	173,455
Income for debt coverage	$ per farm	55,778	237,277
Principal/interest payments	$ per farm	9,870	54,754
Debt coverage margin	$ per farm	47,416	195,720
Maximum loan payment	$ per farm	43,659	88,053
Total reported debt	$ per farm	74,250	393,829
Max feasible debt (7.5%)	$ per farm	445,081	897,656
Max debt (7.5%) with 25% reserve	$ per farm	333,811	673,242
Repayment capacity use (7.5%)	Percent	0.166823	0.438731
Repayment capacity use (7.5%)	Percent	0.222431	0.584974

A similar story arises in the commercial banking sector. Figures 4-7 through 4-9 were generated from data made available through the Kansas City Federal Reserve's Farm Data Handbook and places current conditions in a historical context. System wide, nonperforming loans were below 1% (0.6%) by the 2nd quarter of 2014 (Figure 4-7) which are not materially different from than that of the Farm Credit System, but also expected since commercial banks can more easily move in and out of agricultural finance as market conditions change. But in terms of long term mortgages, nonperforming loans are about 1.12% of total (Figure 4-7), down from 1.36% at the end of 2013.

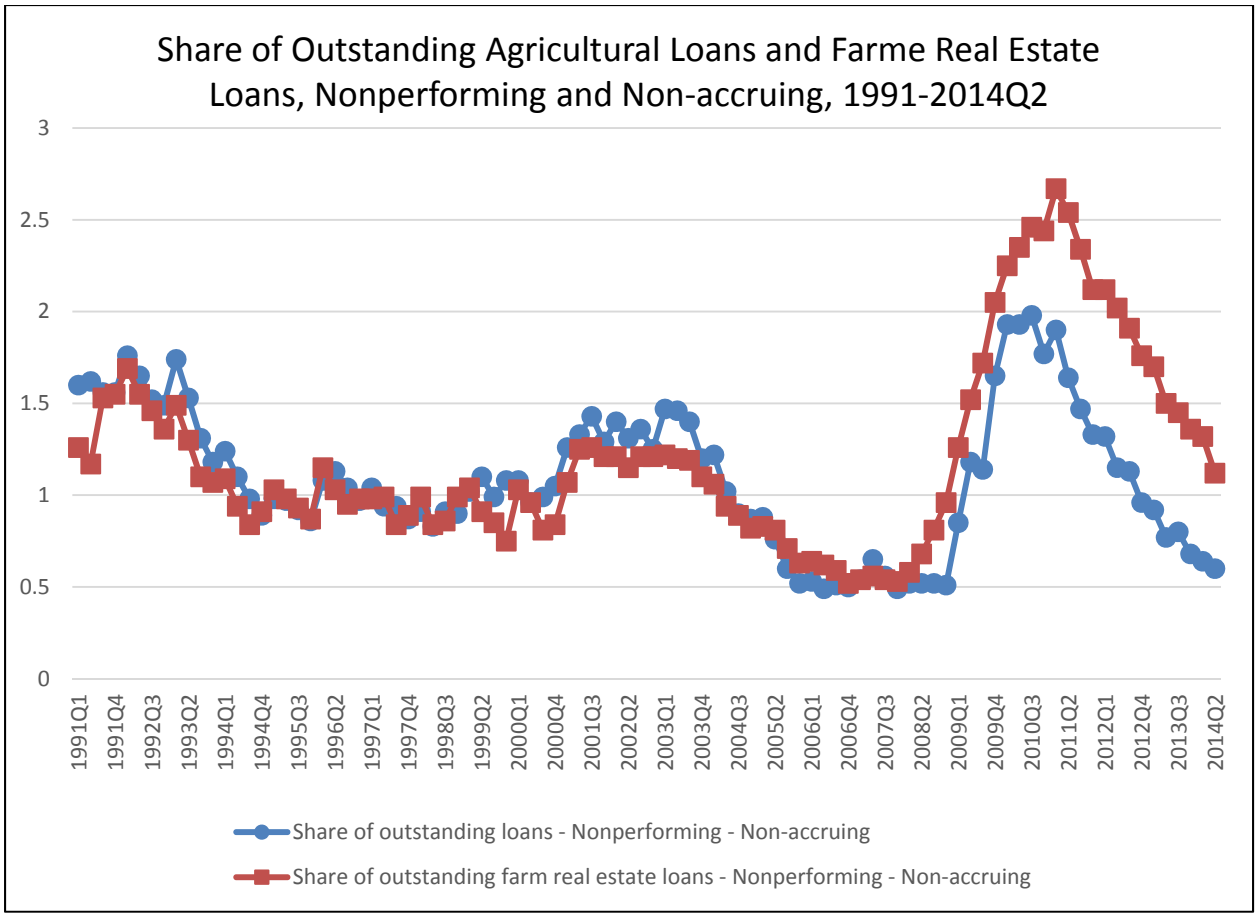


Figure 4-7: Share of Outstanding Farm Real Estate Loans-Nonperforming-Non-accruing

Figure 4-8 compares net charge-offs for commercial and agricultural banks from 1977-2013 which interestingly details the two significant financial crises of the agricultural sector. As of the most recent data in 2014 actual charge-offs of loans are quite small, and at historical lows for both the farm and non-farm sectors. Charge-offs applied to only 6 in 1000 agricultural loans versus 10 in 1,000 commercial loans. The first, peaking in the financial crisis of the mid 1980's, shows charge-offs by agricultural banks of about 2.25% in 1986 compared to 1.1% of commercial banks. But in the financial crisis following 2007/2008 the larger charge-off rate was with the nonagricultural banks at rates of 1.2% versus 0.8% in 2010. While some deterioration followed this later financial crisis because of the tightening of credit facilities (including working capital), what is important is that agricultural loans proved safer than nonagricultural loans, and banks with a larger proportion of agricultural loans were better able to stabilize credit risks. There is a very good case to make that because agricultural returns are largely independent or at least weakly correlated with the general industrial/consumer economy the commercial banking system may well show an increased interest in agricultural loans as a general hedging strategy that not only reduces credit risks but also adds to profits. More generally these results strongly suggest that the USA credit system for small loans is in very good shape with historical lows in nonperforming and non-accrual loans and charge-offs to those loans.

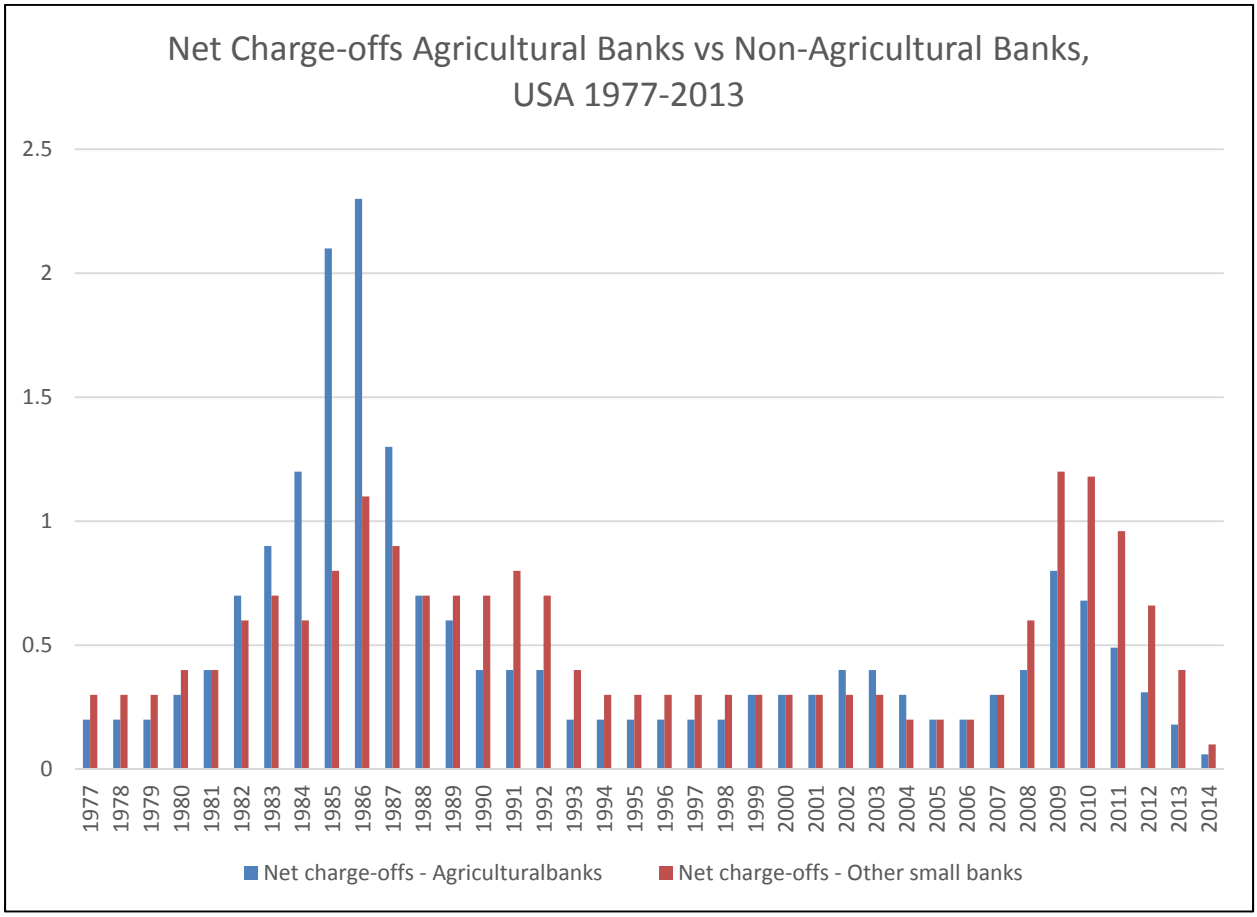


Figure 4-8: Net Charge-Offs. Agricultural versus Non-Agricultural Banks

Despite this, Figure 4-9 shows a slight fallout from the 2007/2008 financial crisis with a failure amongst some commercial banks averaging about 9 per year from 2009-2010, but an agricultural bank has not failed since 2012 indicating that the macroeconomic effects of the financial crisis has largely passed. It should however be noted that the increase in bank failures in 2009 and 2010 were largely due to conditions outside of agriculture. Since sub-prime loans were not typically applied to agricultural loans these banks likely failed for residual reasons such as a large number of sub-prime or otherwise overvalued residential and commercial real estate holdings or holding too much sub-prime paper on their books as part of an investment strategy.

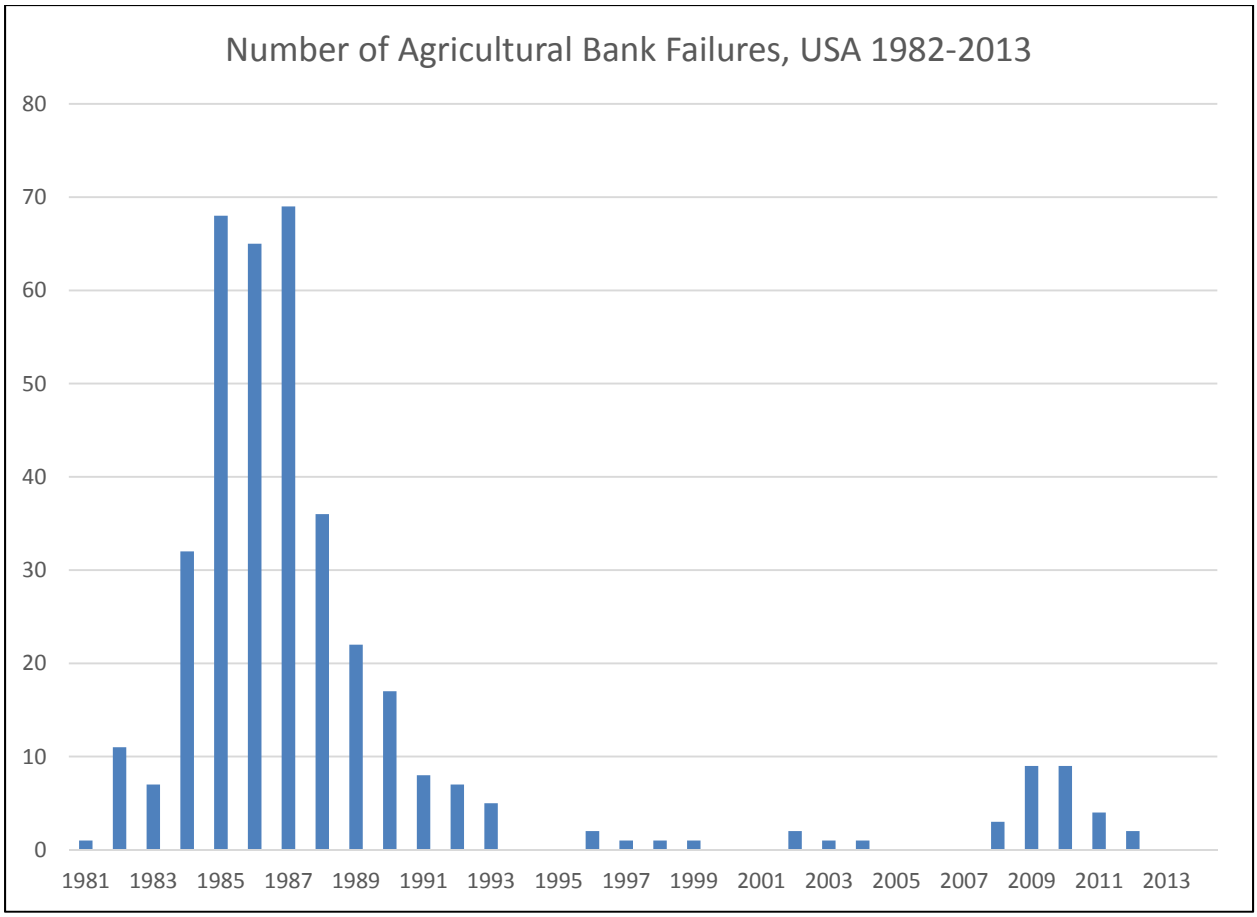
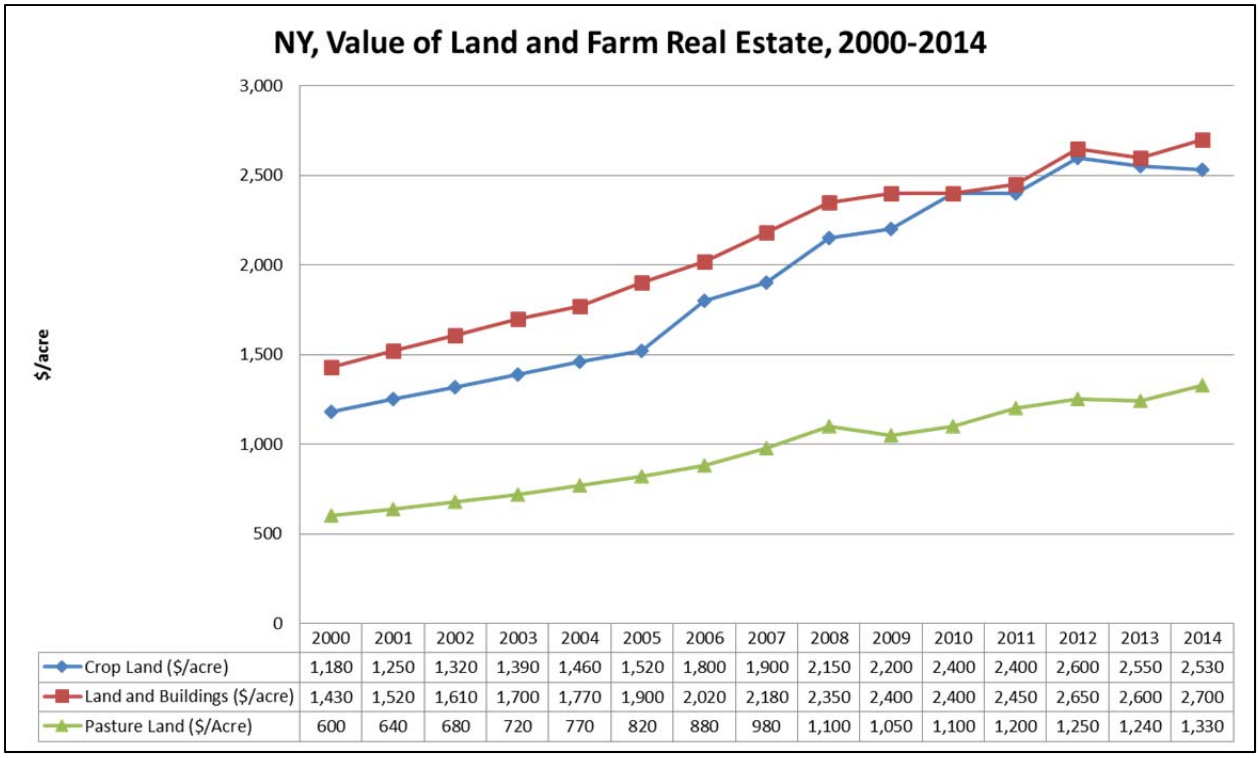


Figure 4-9: Number of Agricultural Bank Failures, USA 1982-2012

Farmland Values

Agricultural land is, for most farmers, the largest asset item with unrealized capital gains being the largest contributor to equity. Some extraordinary rises in farmland prices in recent year has led to questions of whether a bubble exists and if so whether a bust is imminent. In 2013/2014 it looks perhaps that land prices are now leveling off and in fact for the first time in many years USDA data shows that crop and pasture land, and land with buildings have decreased. The decrease is small with average prices falling only $50/acre over 2013 (Figure 4-10). But this comes after a significant reduction in the rate at which land prices were increasing since 2000 and peaking between 2005 and 2008. There are many possible reasons for this decline. The most obvious is that NY farmers looked rationally at the price of land, the cash flow it generates, the risks in generating those cash flows, and long run viability of agricultural production if they became overly speculative in land investment. Market uncertainties in grains and oilseeds as previously discussed could also cause some farmers to take a wait-and-see approach until the recent tumult in commodity markets and policy is resolved. Even so it is difficult to gage the future. The trend for 2015 is that land prices will either rise slightly or remain unchanged.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Crop Land ($/acre)	1,180	1,250	1,320	1,390	1,460	1,520	1,800	1,900	2,150	2,200	2,400	2,400	2,600	2,550	2,530
Land and Buildings ($/acre)	1,430	1,520	1,610	1,700	1,770	1,900	2,020	2,180	2,350	2,400	2,400	2,450	2,650	2,600	2,700
Pasture Land ($/Acre)	600	640	680	720	770	820	880	980	1,100	1,050	1,100	1,200	1,250	1,240	1,330

Figure 4-10: New York Land Values, 2000-2014, $/acre (Source: USDA ARMS)

Financial Conditions of U.S. and NY Farms

As indicated earlier New York is no longer surveyed as part of the USDA's periodic Agricultural Resource Management Survey but from past experience financial conditions in New York were fairly consistent with the financial conditions of farmers elsewhere in the USA. Figure 4-11 illustrates the debt to asset and debt to equity ratios sector wide across the USA. Overall, farm debt in agriculture is low with plenty of equity for investment and expansion. The debt to asset ratio sector-wide is only 10% and the debt to equity ratio is about 10.2%. These have not changed in any economically meaningful way since 2012. However it must be kept in mind that these ratios are sector wide and include farms with no debt as well as debt and also includes the capital gain (market) value of farmland. In general as long as the value of assets increases faster than the accumulation of debt one will see a decrease in either leverage ratio. In this outlook report for 2012 it was reported only 29.4% of American farmers have debt with an average debt to asset ratio of 28.9% and a debt to equity ratio of 40.6%. Even at 28.9%, this is not a degree of over-leverage that will bring widespread harm to the agricultural economy should a down-turn occur. Younger farmers hold more debt relative to assets or equities (36.9% and 58.4%) than older farmers (22.1% and 28.3%).

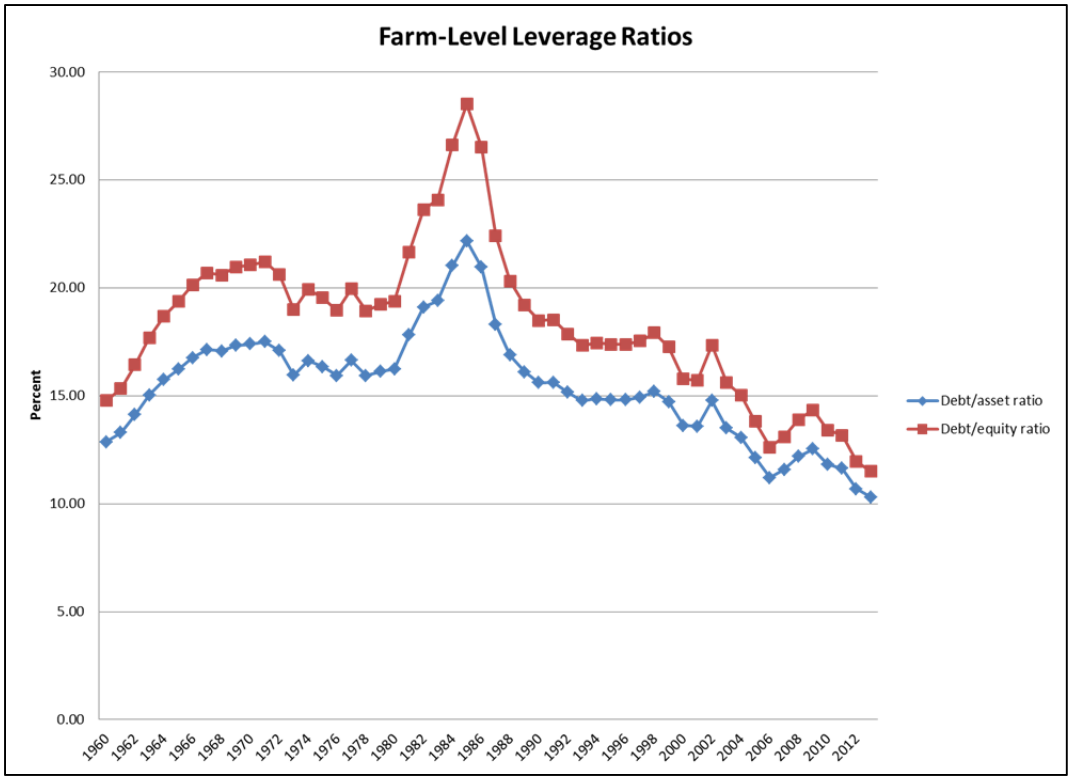


Figure 4-11: Debt to Asset and Debt to Equity Ratios, United States 1960-2012

Loan Demand and Interest Rates

This section describes some aspects of credit demand and interest using data available from the Agricultural Finance Databook, Kansas Federal Reserve. Figure 4-12 shows the percentage allocation of non-real estate loans by loan type. What is interesting in this graph is the percentage of loans, 68.94% that are applied to the 'other' category. This category is largely represented by lines of credit to farmers, from which funds are drawn to purchase livestock, inputs, machinery and so on.

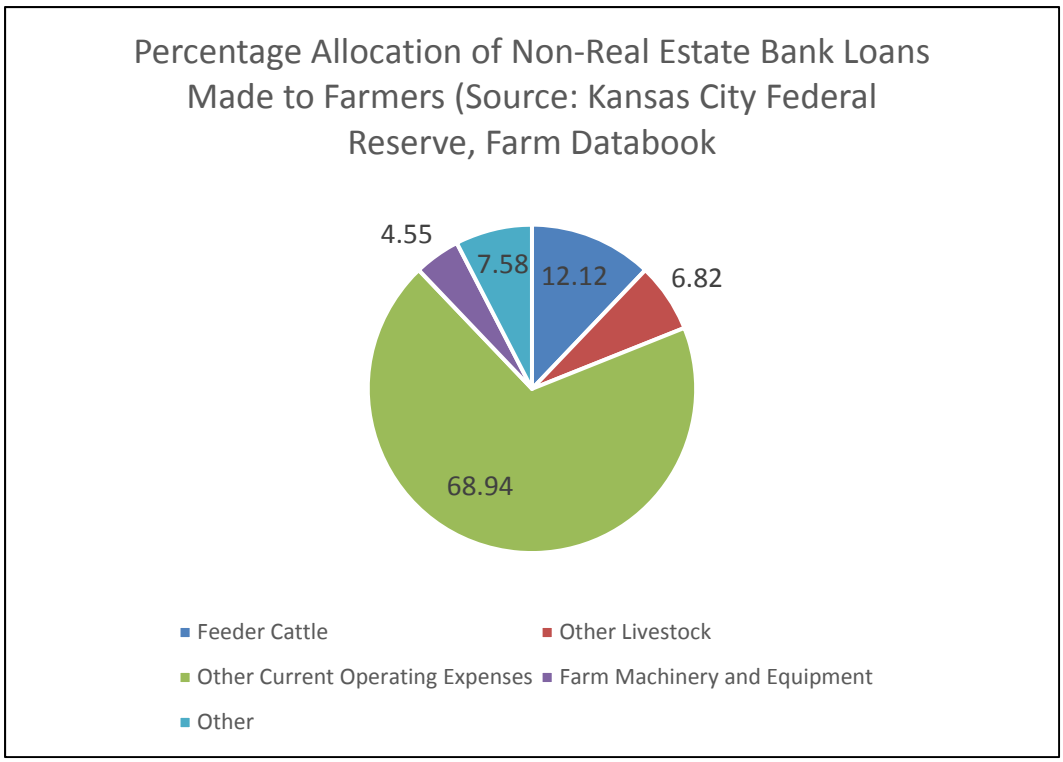


Figure 4-12: Percent Allocation of Non-real estate loans

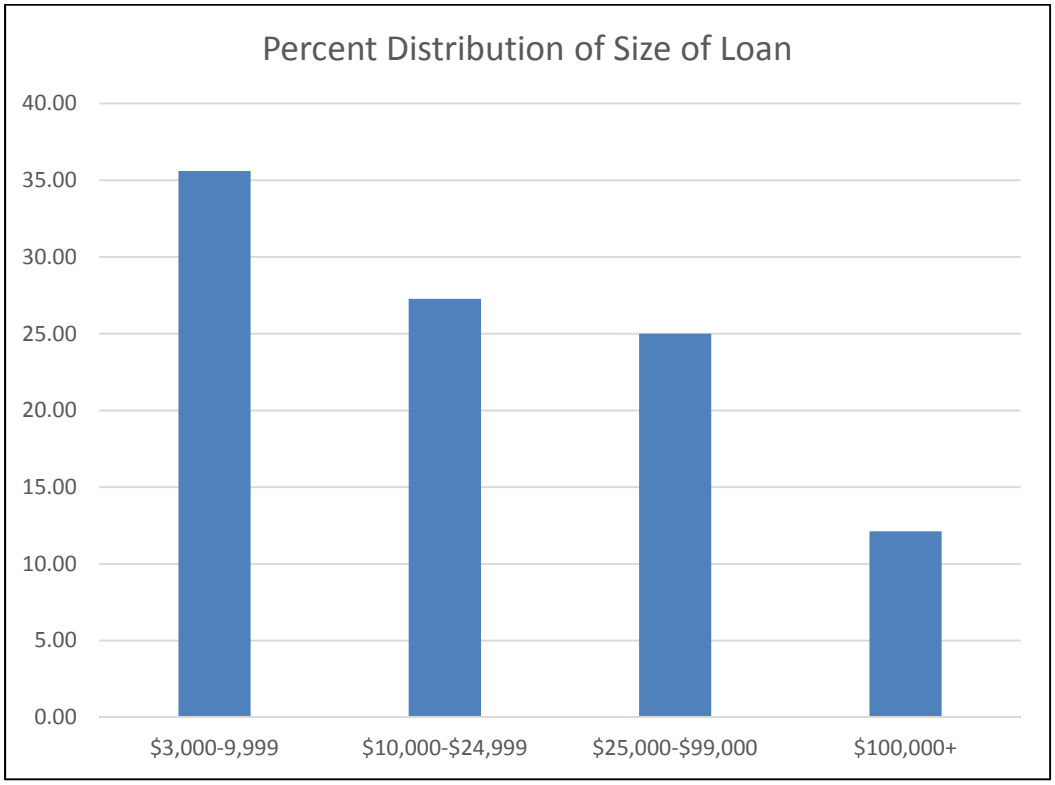


Figure 4-13: % Distribution of Non-Real Estate Loans by Type

However, the actual size of loans is relatively small (Figure 4-13 and Figure 4-14). 35% of loans are less than $10,000, while only slightly more than 10% of non-real estate loans are greater than $100,000. Figure 4-14 shows how these loans are distributed across uses. The average line of credit was about $227,000 with substantially lower machinery loans of $48,950 to livestock loans of $68,140.

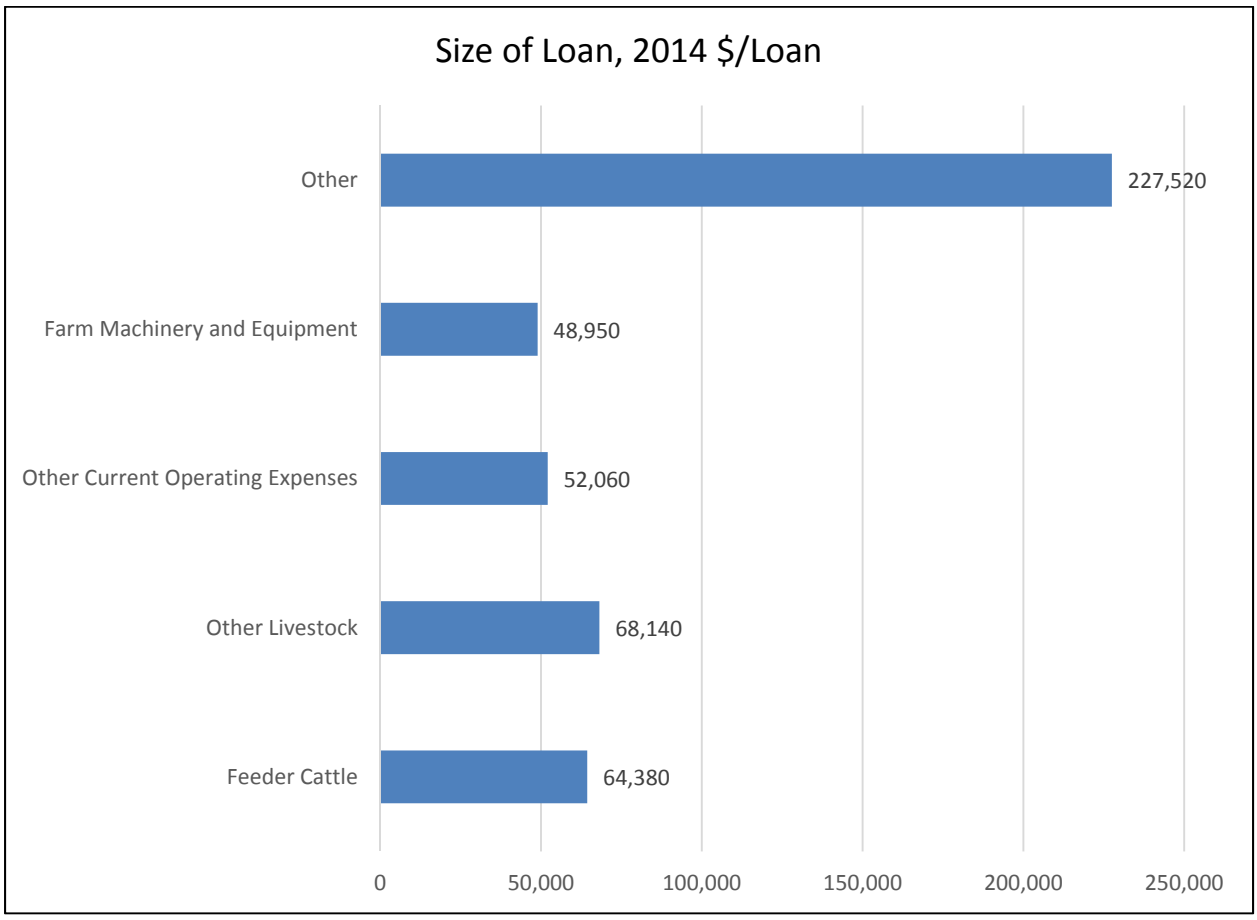


Figure 4-14: Average Loan Size by Loan Type

Interest rates remain low. Figure 4-15 shows the distribution of loan rates by type. Loans for cattle, livestock, operating expenses and farm machinery ranged from 4.1% to 4.9% in 2014Q2. However, the loan rates on the 'other' category are substantially lower at 2.5%. This is probably due to securities assigned to lines of credit in comparison to market-valued or illiquid collateral on production and machinery loans. Figure 4-6 shows that there is an interest rate bias in favor of larger loans. For example the average effective rate of interest on loans greater than $100,000 is 3.7%, almost a full percentage point lower than rates on loans of $25,000-99,000.

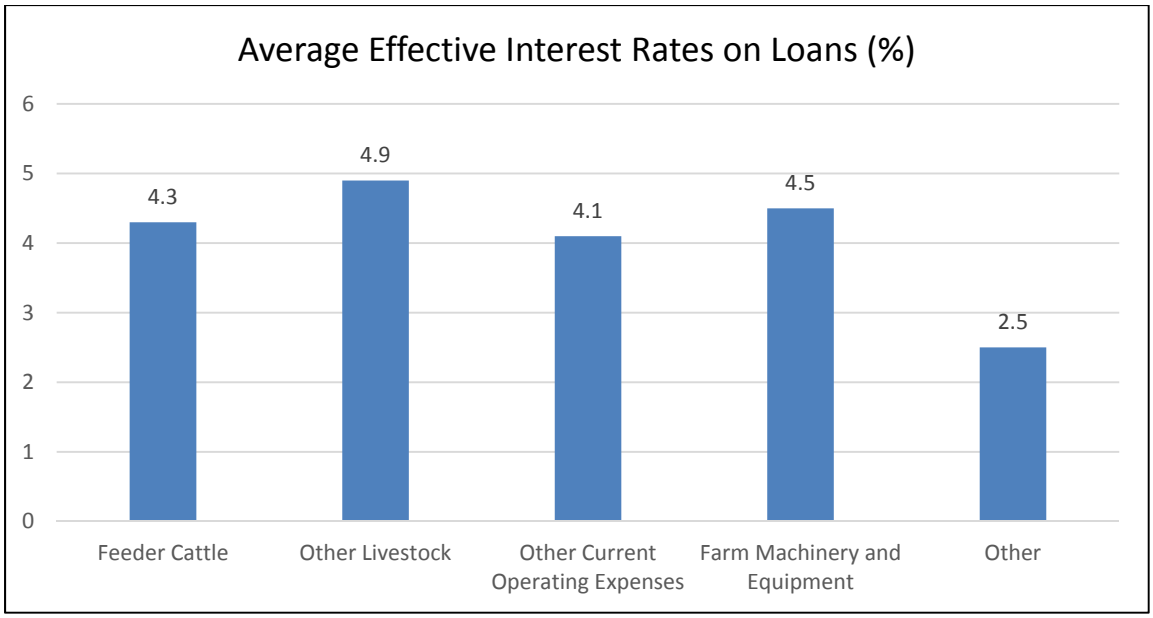


Figure 4-15: Average Effective Interest Rates on Loans, by Type

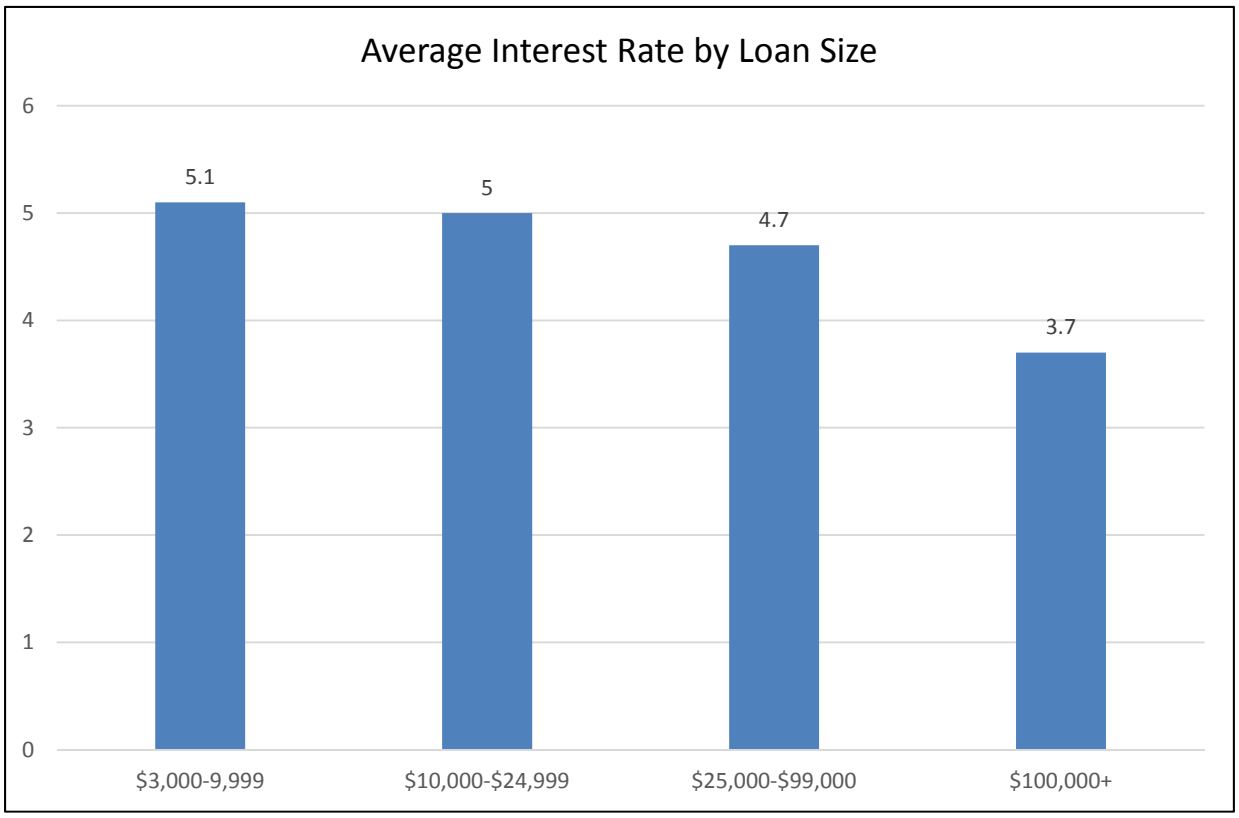


Figure 4-16: Average Interest Rates by Loan Size

Finally, Figure 4-17 shows the historical relationship between average loan demand between 1991 and 2014 and effective interest rates charged on those loans. A simple regression through the loan-interest pairs gives a rough estimate of the credit demand elasticity. This elasticity of -0.588 indicates that on average a 1% increase in interest rates will reduce credit demand by 0.588%. This 'inelastic' demand suggests that farmers typically borrow with a purpose, but moderate their borrowing as interest rates rise.

For example if interest rates rise from 4% to 5%, (an increase of 25%) the elasticity measure suggests that the demand for credit will fall by 14.7%: A loan of 100,000 at 4% will fall to $85,300 if interest rates rise to 5%.

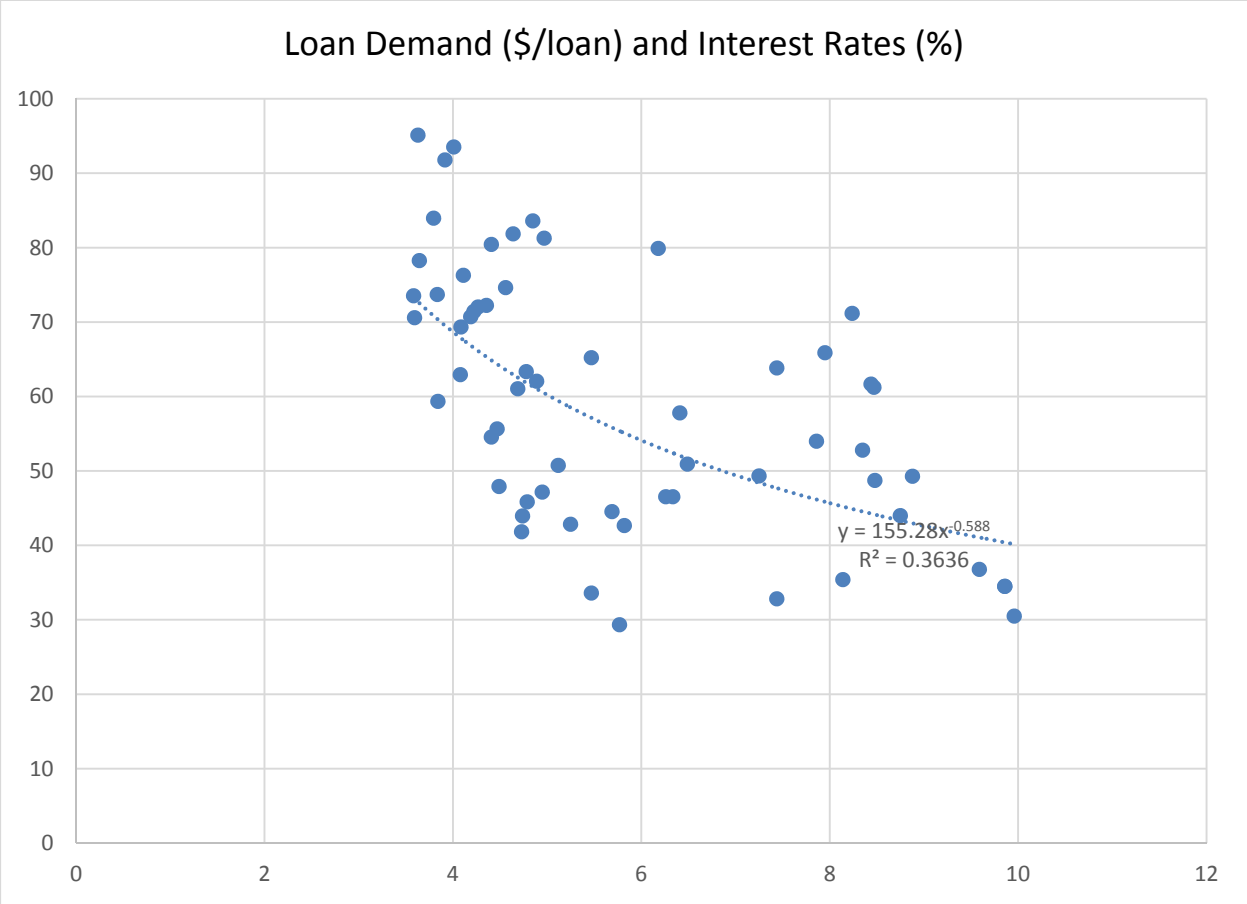


Figure 4-17: Loam Demand ($/loan) and Interest Rates (%)

Summary and Conclusions

2014 has been a mixed year for New York farmers. Grain and oilseed farmers are seeing lower cash prices and higher volatility and risk, while livestock farmers, including dairy are doing reasonably well with significantly higher prices with reduced feed costs. For dairy farmers, New York's principal farm type, the milk/corn price ratio measured by CME futures prices is over 4, which indicates that milk prices are more than breakeven.

Agricultural credit from both the Farm Credit System and commercial lenders seem to be in ample supply and with interest rates hovering between 2.5% and 5% the cost of debt will unlikely be a significant barrier to credit demand. However, a quick estimate of credit demand found that the demand for credit is modestly inelastic with a 1% increase in interest rates reducing credit demand by only 0.588%. In general debt is treated as a necessity by farmers, but they are also prudent and reduce the amount of credit as interest rates rise. Equity looms large in the agricultural sector and there is a tremendous amount of low risk credit capacity to ensure ample supply. The tumult of the financial crisis appears to have largely dissipated and in NY, the Northeast, and nationally loan performance is solid and faring much better than the non-agricultural market.