

The Farm Financial Situation: Using Historic Insights to Evaluate Current Conditions

A Report for the Farm Credit System Coordinating Committee

By

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Introduction

After several years of record-high farm income, the USDA's August 2015 estimate of net farm income grabbed numerous headlines. For the second consecutive year net farm income is forecast to fall, and the declines have been dramatic. Net farm income in 2015 was estimated to be 54% lower than record highs of 2013.

Not surprisingly, the current agricultural economic conditions have stirred memories of the substantial drop in net farm income that preceded the agricultural financial crisis of the 1980s. Concerns are even amplified given the recent surges in farmland values and cash rents. Many have noticed the similarities between the boom of the 1970s and current conditions. The current question on their minds is will a bust and subsequent financial crisis follow?

Fortunately, after the last farm financial crisis forward-thinking leaders provided a valuable analysis of the situation in a book titled *Anatomy of an American Credit Crisis*¹. In the forward of this book Kenneth Peoples, President and Chairman of the Farm Credit Assistance Board, describes the motivation for the development of the book.

"The Farm Credit System Assistance Board decided that it could further assist the U.S. government and this nation's farmers and ranchers on the eve of its termination by publishing an account of what actually took place during this trying time for agriculture and why the conventional wisdom of the day fell short. By doing so, agribusiness leaders and their lenders may learn how to avoid business failures during the next economic downturn."

-Kenneth L. Peoples, pp. xi-xii, Foreword to *Anatomy of an American Agricultural Credit Crisis*.

Leveraging the work of this book, the objective of this paper is to evaluate the current agricultural economic and financial conditions by reviewing the conditions leading up to the farm financial crisis of the 1980s, compare and contrast those conditions to the current environment, and highlight additional data or caveats that are important considerations for evaluating the current farm economic environment.

I. A Look at the Farm Financial Crisis of the 1980s

The farm financial crisis of the 1980s was a traumatic event for farmers and lenders alike. At its peak, nearly 17% of U.S. farms were financially stressed and by 1985 over 46,000 commercial farms were insolvent². This degree of financial stress was relatively unprecedented in modern times and placed a tremendous strain on the institutions that financed agriculture as well as rural communities throughout the United States.

¹ Peoples, Kenneth L., et al., *Anatomy of an American Agricultural Credit Crisis. Farm Debt in the 1980s*. Lanham, Maryland: Rowman & Littlefield Publishers, Inc. 1992. Print.

² Hanson, Gregory, G.H. Parandvash, and J.Ryan. "Loan Repayment Problems of Farmers in the Mid-1980's." *United State Department of Agriculture: Agricultural Economic Report Number 649*. 1991.

At the most basic level, an agricultural boom in the 1970s led to a series of conditions that fueled a farm financial crisis in the 1980s. For many, declining farm income and rapid growth in farm debt are the most memorable factors associated with the crisis. However, there are several other factors that are worth examining.

In reviewing *Anatomy of An American Agricultural Credit Crisis*, eight key metrics can be used to help explain the crisis. As the authors point out, the crisis had its roots within the economic conditions of the agricultural economy, but factors in the broader global economy greatly impacted the agricultural economy. As such, the metrics evaluate conditions both within the agricultural sector as well as factors that occurred in the broader global economy and spilled over into the agricultural economy. Specific to agriculture the authors identified five primary conditions; net farm income, agricultural commodity prices, farm debt, farmland values, and agricultural exports. Outside of the agricultural economy they highlighted three macroeconomic conditions that are also important to consider; exchange rates, inflation, and interest rates.

5 Key Measures of Agricultural Conditions

A variety of agricultural economic conditions combined to make for a tremendously difficult economic environment in agriculture. These factors are by no means mutually exclusive, but all played prominent roles in both the farm boom and bust.

1. *Net Farm Income*: Dramatic changes in net farm income were likely the most prominent story of the 1970s and 1980s (Figure 1). In the early 1970s, real net farm income was commonly around \$60 billion annually (2009 dollars)³. These levels were slightly below the current long run average of \$71 billion dollars, but in-line with typical conditions throughout history. By 1973, net farm income surged to a record high of \$130 billion. This did not last long, however, as real net farm income quickly retreated back to levels around \$60 billion by 1976. After four years of stability (1976-1979), net farm income plunged even lower beginning in 1980 and reached a low of \$27 billion in 1983. At the low point in 1983, real net farm income was only 21% of record levels reached just 10 years prior.
2. *Agricultural Commodity Prices*: The major push of higher net farm income came from higher commodity prices received by farmers (Figure 2). An inflation adjusted index of commodity prices shows that prices for crops and livestock jumped higher from 1973 to 1975. After 1975 real commodity prices headed lower.

Overall inflation was a significant driver of commodity prices. Corn prices peaked in 1974 at \$3.02 per bushel (nominal). Adjusting for inflation, that price level would have been equal to \$13.14 per bushel in 2009 dollars. Corn prices would once again peak in 1980 to \$3.11 per bushel, but this time the equivalent was only \$8.09 in 2009 dollars. It's important to keep in

³ Throughout this report inflation-adjusted values, or real values, are reported. It is important to consider and evaluate real values as data in this project often span more than 45 years. General inflation in the economy, even at a low rate, over such a long period of time becomes significant, especially for land values or total sector debt levels. By using real terms, the impact of inflation is removed from historic price data. In general, real values were collected directly from the USDA's various reporting agencies. When real values were not directly available, adjustments were made using the Consumer Price Index (CPI).

mind that constant prices during periods of high inflation result in declining real, or inflation adjusted, prices. This was a significant issue during the period. Real indexed prices for both crops and livestock would decline further into the 1980s and beyond.

3. *Farm Debt*: From 1967 to 1970, total real farm debt hovered around \$210 billion (2009 dollars) (Figure 3). During the 1970s, total farm debt grew at an incredible pace and topped out at nearly \$365 billion in 1980. This was a 74% increase in less than ten years. Initially farm debt was slow to fall, but would eventually decline 49% from the highs in 1980 when it hit \$185 billion in 1993. The dramatic growth in farm debt was a key contributor to the financial crisis. As incomes turned lower, debt service proved to be unsustainable.
4. *Farmland Values*: Across the entire county, real farmland values increased substantially during the 1970s (Figure 4). Some of this was due to high levels of inflation in the broader economy, but the gains in real farmland values were also very large. In 1980 real, inflation-adjusted farmland values peaked at levels nearly twice those in 1970. What's more, farmland values continued higher even as real net farm income declined after 1973. This disconnect between declining farm income and increasing farmland values also proved to be unsustainable.

That trend, however, reversed in 1981 when real farmland values declined 8%. This began an 11 year decline in real farmland values. Through 1986 the declines were sharp. From 1980 to 1986 47% real farmland values evaporated. The decline would stabilize and drift slightly lower through 1992 at which point, in total, real farmland value had lost 49% of its 1980 value.

5. *Agricultural Exports*: U.S. agricultural exports were a key driver of the boom and bust during the 1970s and 1980s. In real dollars (2009), U.S. agricultural exports of bulk commodities were \$25 billion in 1970 and 1971 (Figure 5). By 1974 U.S. bulk agricultural exports reached \$67.5 billion and eventually peaked at \$72 billion in 1980, a 170% and 188% increase respectively. During the 1980s, U.S. agricultural exports sharply contracted. By 1986 they had fallen \$27 billion by 1986 leaving them virtually unchanged from their pre-boom levels. A key contributor to this export boom and bust was the 1972 Soviet purchase of U.S. grain during a severe drought.

It is unlikely that any one of these factors by itself would have had a substantial impact. However, when all five moved in tandem, the result was a tremendous boom and collapse of the sector. The fact that all five factors moved in a negative direction at the same time, however, is not entirely surprising. Several of these factors are closely related and provided an element of instability in the sector. For instance net farm income is clearly impacted by commodity prices. This is in part due to slow cost adjustment that prolongs periods of high and low incomes as both fixed and variable costs adjust.

In the 1970s and 1980s, fixed costs driven primarily by land values were slow to respond to economic signals of lower farm income. What appears particularly critical to the situation in the 1970s and 1980s was the extent to which all five factors moved together and the magnitude of the changes. In particular, the feedback from commodity prices and incomes moved very quickly into decisions about adding debt. However, when incomes and prices fell, farms could not deleverage fast enough to avert a collapse of the economy. This disconnect between financial decisions and economic conditions magnified the boom and collapse.

General Economic Conditions

While conditions in the general agricultural economy played key roles in the situation, the 1970s and 1980s were also historically interesting times for general economy as well. The period of the 1970s was probably most infamous for high inflation rates. The 1980s were then made infamous for the staggeringly high interest rates that were required to control the inflation of the 1970s. It's worth noting that outside of agriculture, conditions during this time included oil price shocks of 1973 and 1979. These shocks added additional turmoil to the economy. The authors highlight three key economic conditions in the general economy that played leading roles in the agricultural boom and bust.

1. *Exchange Rates*: Exchange rates are an important factor when considering commodity exports. All else equal, a stronger dollar makes U.S. goods more expensive for international buyer, while a weaker dollar makes U.S. goods cheaper. Data on the agricultural trade weighted exchange rate, which takes into account the various purchasers of U.S. agricultural exports, are shown in Figure 6. In general, the exchange rate weakened during the 1970s until it reached an index value of 67 in 1979. In the 1980s the indexed exchange rate would strengthen considerably, making U.S. agricultural products much more expensive. For example, by 1987 the index value had reached a value of 109, a 63% increase.

The magnitude of this increase likely played a key role in the decline of U.S. agricultural exports mentioned above. While exchange rates clearly impact U.S. agriculture, they are not directly impacted by agricultural economic conditions; a departure from the interaction of the five agricultural conditions described above. This is critical because deterioration of agricultural economic conditions did not provide a strong impetus for the exchange rate to moderate, causing extended economic stress in the agricultural sector.

2. *Inflation*: A second general economic event that overshadowed the agricultural boom and bust was the prevalence of extremely high inflation rates. Annual inflation rates peaked above 12% three times during the 1970s and 1980s (1974, 1979, & 1980). Inflation rates were at their highest in 1979 and 1980 when double-digit inflation rates were observed for two consecutive years (13.3% in 1979 and 12.4% in 1980) (Figure 7). These high rates of inflation encouraged people to search for investments that provided protection from inflation. Farmland was viewed as one such investment. As a result, buyers were willing to invest at farmland with the expectation of inflation driven valuation increases. These expectations were then dashed when inflation was brought under control.
3. *Interest Rates*: Interest rates and inflation often go hand-in-hand as the Federal Reserve may target lower rates of inflation by reducing the money supply to encourage higher interest rates. The U.S. prime interest rate is a key measure of interest rates in the U.S. This rate trended higher in the 1970s and peaked in 1981 with an annual average nominal rate of 18.5% (Figure 8).

These extremely high interest rates had a crippling impact in the debt heavy agricultural sector which experienced skyrocketing interest expenses. In 1983, for example, interest expense accounted for 60% of before interest farm earnings, leaving little income to service principal obligations, capital investment, and family living expenses. Furthermore, higher interest rates

typically place downward pressure on asset prices, such as farmland. Farmland, correspondingly, began to decline in 1981 as interest rates peaked.

Another important consideration during this period are real interest rates (Figure 9). When considering the prime interest rate and subtracting the annual inflation rate, the effective cost of borrowing money is the real interest rate. During three years in this period (1973, 1974, and 1979), real interest rates were negative. While the real interest rate for a specific farm loan might not have been negative, the implication of this condition is that real farm interest rates were very low which incentivized borrowing and placed strong, upward pressure on asset values. Real farmland values across the county, for example, were up 16% in 1973 alone. After a decade of low, real U.S. prime interest rates in the 1970s, real interest rates surged in the early 1980s.

It is quite clear that conditions in the general economy played a key role in the farm financial crisis. The combination of these first highly favorable and then highly unfavorable external economic conditions made it very difficult for the sector to adjust to the situation. The adjustment is particularly difficult because these conditions are largely exogenous, or outside the farm sector. In other words, they impact the agricultural sector, but agricultural conditions do not impact them. As a result, the agricultural sector is left to adjust to these conditions. When all of them are undergoing rapid change, along with rapid change within the sector itself, the adjustment process will likely be difficult, as was the case here.

Summary of the Farm Financial Crisis of the 1980s.

Overall, the authors of the book summarized the event fairly well in two passages:

“While the boom and bust of U.S. agriculture in the 1970s and 1980s was triggered by farm-related events (primarily an export-led boom and bust), outside forces, such as inflation, interest rates, and foreign exchange rates also played a significant role.”

The authors went on to say:

“Most analysts believe that the farm credit crisis of the 1980s has no single cause but reflects the compound effects of a number of events and decisions, some of which took place within the farm sector, and other outside it. All of these changes reversed the conditions of the 1970s that had been so favorable to agriculture. If any factor stands out from the rest, however, it is the rapid changes in the level of real interest rates.”
- pp. 33-35, *Anatomy of an American Agricultural Credit Crisis*.

II. Evaluation of Current Conditions

In recent years agriculture has gone through another boom period with rising commodity prices, a long period of generally high net farm incomes, and strong farmland prices. Since 2014, however, the economic and financial condition facing farmers has rapidly deteriorated. Commodity prices have fallen while input costs, both variable and fixed, have been stubborn to adjust lower. In 2015 farmers in the Midwest planted their crop anticipating significant economic losses.

Many question if the current margin squeeze crop producers are facing will escalate into conditions similar to the farm financial crisis in the 1980s. To examine this issue, the current conditions for the eight key metrics highlighted in the earlier section were considered.

1. *Net Farm Income:* Since 2004, net farm income has been above the long-run average nine out of twelve years, or 75% of the time (Figure 1). While the most recent peak in net farm income (\$116 billion in 2013) was less than the all-time high of \$130 billion set in 1972, the duration of strong net farm income since 2004 has been noteworthy. From 1960 to 1990, net farm income was only above the long-term average seven years, or 23% of the time.

Currently, net farm income in 2015 is forecasted at \$53 billion; considerably lower than the long-run average (nearly \$72 billion). The rate at which net farm income has declined has been substantial, lower 28% in 2014 and 37% in 2015. The decline in 2015 alone is historically significant as the third-largest single-year decline observed; behind 46% lower in 1980 and 42% lower in 1983.

Another critical factor to consider with respect to net farm income is the role of the federal government in stabilizing farm income. In the 1980's the federal government provided significant financial support to the farm sector. For instance, in 1987 real direct government support to agriculture totaled \$27 billion (2009 dollars) an amount that accounted for 44% of the total net farm income in the sector. This support helped to improve a situation that would have been very dire in its absence.

Today, direct government support for much of agriculture will largely be governed by the ARC-CO program. This program will make some substantial payments in 2015 and 2016, but it is almost certain that in real terms the payments received from this program will not be of the magnitude of those made in the 1970's. This will put more onus on the farm sector to adjust to the changing economic conditions.

Overall the declines in net farm income are in the ballpark of those experienced in the 1980s. Looking ahead, it will be critical to carefully monitor net farm income in 2016. A third year of large declines would likely make financial conditions very serious and would result in declines rivaling those of the 1970s.

2. *Prices Received:* From 2001 to 2006, the index of prices received, adjusted for inflation, for crops hovered around 85 (Figure 2). In 2007, prices began to increase and reached a high of 116 in 2012 at the height of the Midwestern drought. From 2006 to 2008 crop prices increased 32%. Although their upward price cycle started later than crops, livestock prices also increased sharply during the boom, with the price index increasing from 100 in 2009 to 158 by 2015

While commodity prices peaked in recent years, it's worth noting that in real terms, today's index prices were much lower than in the 1970s. As mentioned earlier, the real corn price in 1974 was \$13.14 per bushel in 1974 compared to a peak of \$6.44 in 2012 (2009 dollars). So while commodity prices are considerably higher than before the boom, their peak was not as exaggerated as in the 1970s boom.

3. *Farm Debt*: While real farm sector debt has trended higher since the post farm financial crisis low in 1993, levels have yet to exceed the record high levels reached in 1981 (Figure 3).

In recent years farm debt has headed higher and since 2012 increased at an average annualized rate of 5.9%. As net farm income declined 54% from 2013 to 2015, total farm debt increased nearly 14%. While aggregate debt has not reached critical levels, the trend of higher debt levels with lower net farm income is dangerous over the long-run. How long this trend continues, especially for net farm income, will be an important factor to evaluate moving forward.

4. *Farmland*: Real farmland values trended higher after the farm financial crisis (Figure 4). Currently, real farmland values are 20% higher than the peak-levels reached in 1980. This is important to note as the total real value of all U.S. farmland, which accounts for a large share of total farm assets, have exceeded levels reached in the 1980s, while total farm debt has remained below early 1980s levels.

Another very important and critical observation regarding farmland values is that real values in 2015 were 3% lower than in 2014. This should be viewed as a healthy sign because it indicates that farmland values are beginning to adjust to lower farm incomes. In the years leading up to the farm financial crisis, real net farm income trended lower from 1973 to 1983 while farmland values trended higher until 1980; the creation of a land asset valuation bubble.

5. *Agricultural Exports*: In 2006, a strong boost in agricultural exports began. In just two years, the real value of bulk agricultural exports increased by 85%. The value of agricultural exports has remained strong since 2007 (Figure 5).

Although agricultural exports have played a prominent role in today's boom, they were even more important in the 1970s. This can be seen by comparing the value of agricultural exports to the total value of agricultural production, shown in Figure 10. During the 1970s exports went from accounting for less than 30% of the total value of agricultural production to 50% in 1980. This left U.S. agricultural economy extremely vulnerable to export markets and the impacts of the foreign exchange rates.

In recent years exports have accounted for a smaller share of the total value of production. Exports accounted for between 20% and 30% of the value of agricultural production since 2000. The latest data, 2014, reveals that agricultural exports account for nearly 26% of the total value of production. This likely leaves U.S. agriculture less vulnerable to the impacts a stronger dollar and less favorable foreign exchange rates than in the previous bust.

6. *Exchange Rates*: An important, and often overlooked, feature of strong agricultural exports in the 1970s was the weak dollar. This is best shown by the U.S. bulk commodity trade weighted exchange rate, shown in Figure 6. Similar to the situation in the 1970s, exchange rates trended downward from 2002 to 2012. Exports during this time were also generally higher than in the period leading up to it.

Since 2013, the U.S. dollar and associated agriculture weighted exchange rate has appreciated. The current exchange rate has appreciated nearly 8% through 2015; this is compared to the 66% appreciation observed from 1978 to 1987. At this point the increase is minor relative to what occurred in the late 1970s and 1980s, but will be an important trend to monitor, especially if the U.S. economy enters a period of robust growth.

7. *Inflation*: During the 1970s and early 1980s, inflation was an important influence in global markets. As commodity prices headed higher in 1972, so did the annual rates of inflation. Currently inflation rates have been a very low; well below the long-run average of 3.5% (Figure 7). Furthermore, since 2000 the inflation rate has averaged 2.1% with a peak of 4.1% in 2007. More recently, inflation has been below 2% since 2011.

The contrast between the 1970s and today is probably greatest when it comes to inflation. Today's inflation rates are simply much, much lower than that experienced in the 1970s. There are certainly prognosticators that have been concerned about inflation heating up. To this point inflation remains stubbornly low, so much so that monetary policy makers have been worried about too little inflation as opposed to too much inflation. It is always possible that things could change rapidly, but at present inflation remains very low.

8. *Interest Rates*: Interest rates are very low by historical standards. It's also important to consider current real interest rates, Figure 9. While current nominal rates have been at, or near, historic lows, real (inflation adjusted) interest rates have not been as low as experienced in the 1970s. During the 1970's real interest rates dipped into negative territory, which made borrowing relatively attractive. Unlike the 1970s real interest rates did not dip into negative territory during the current boom (Figure 8). Although they came close in 2011, low inflation rates have more than offset the declines in interest rates and kept real rates positive. Since 2011 interest rates have trended upward. The fact that real interest rates have remained positive has likely tempered borrowing more than would be the case if real rates were negative.

Summary of the Current Situation

The metrics used to evaluate the current conditions in U.S. agriculture point to some warning signs. Perhaps the biggest red flag is in the area of net farm income. It is clear that net farm income is declining rapidly. The declines in net farm income are large by historical standards and on par with those of the 1980s. In the 1980s large direct government payments helped cushion some of the blow of lower commodity prices and incomes. Today, direct government support will likely start to increase, but it is unlikely that it will reach levels anywhere close to that of the 1980s. This means that additional adjustment will be necessary in the farm sector.

III. Summary of Current Conditions in Relation to the 1970's and 1980's

The authors of *Anatomy of an Agricultural Credit Crisis* sought to document the crisis in the hopes that future generations might avoid some of the mistakes associated with that time period. In doing so several critical contributions were made. The authors developed several key metrics helpful in monitoring the financial health of the agricultural sector. They also documented how economic factors outside of agriculture, such as interest rates, exchange rates, and inflation rates, impacted the sector. Furthermore the authors identified how an income crisis became a financial crisis as low incomes combined with increasing debt loads to create a systematic panic in the farm sector. As financial problems arose many of the short term reactions (foreclosures and forced asset sales) overwhelmed already beaten down markets.

In reviewing their work, the parallel between the agricultural boom in the early 1970s and in recent years has numerous similarities. Strong growth in net farm incomes occurred as commodity prices ratcheted higher. In both cases, farmland values were pushed higher and total farm debt increased. In both boom eras strong growth in agricultural exports occurred while the general economy faced low interest rates, and a weak dollar.

Although there are clearly similarities, there are also many major differences. One major difference between the former and current boom is inflation rates. During the current farm boom inflation rates have remained low while they were very high during the 1970s. The impact of a high inflation rate is difficult to overstate. High inflation rates had the dual impact of making it attractive to buy assets that were viewed as a hedge against inflation (farmland) as well as cutting the cost of borrowing money to purchase the assets. This helped fuel a tremendous increase in farm borrowings and farmland values in a short period of time. Likewise, when inflation collapsed, real rates increased dramatically making borrowing very unattractive and ending speculative demand for farmland.

Farmland values have also behaved differently in the current boom than in the 1970s and 1980s. Today, as net farm incomes have declined real farmland values have begun to moderate and decline. In the 1970s, real farmland values kept increasing as real incomes fell until finally collapsing in the 1980s. While current farmland values may continue to decline, it appears they are appropriately reacting to reduced incomes.

Another important feature of the previous bust was the collapse of agricultural exports. Today, as net farm incomes have declined and exchange rates have begun to increase, bulk agricultural exports have remained relatively strong. Further, bulk agricultural exports played a much more prominent role in the previous boom and bust. While very important today, exports account for a much smaller share of the total value of agricultural production than in the previous period. Although it is still important to monitor agricultural exports, the vulnerability today seems lower than in the 1970s and 1980s when they accounted for 50% of the total value of agricultural production. Additionally, the increase in commodity prices associated with this boom were certainly substantial, but in real terms they were not as large as those seen in the 1970s.

On the other hand there are some concerns today that were not present in the previous period. One of the major drivers of this farm boom has been the widespread adoption and use of biofuels, particularly ethanol. This development was spurred by government policy. While it is unlikely that this policy will be

changed in a way that substantially reduces the use of ethanol, it is clear that the farm sector is more dependent upon that policy than perhaps any policy of the 1970s.

Like inflation rates, interest rates have been very low during the current boom. These low interest rates have provided an incentive to purchase farmland assets and prices have been bid up accordingly. Unlike the 1980's interest rates have not changed rapidly. If they were to change dramatically, it would likely cause significant issues in the sector.

Another important consideration is the concentration of farm debt. While many will cite favorable sector financial metrics, such as a low debt to equity ratio across all farms (Figure 11), evaluating measures like these at the aggregate levels obscures some important details. This specific ratio averages together farms with no debt and highly leveraged farms. Perhaps more important is the concentration and distribution of debt in the farm sector. In other words, one would much rather monitor the financial conditions on the farms that are actually using most of the debt.

According to the Economic Research Service Agricultural Resources and Management Survey, farm businesses with sales over \$1 million represent about 10% of farm businesses and account for 50% of farm debt. It is clearly important to monitor the financial conditions on these farms. Unfortunately, there are limited data on these farms and their financial condition. Going forward it would be very useful to have better data with which to monitor the economic conditions on these farms.

Throughout this paper the overall agriculture economy was considered at the national-level. However conditions in the 1980s varied quite significantly by state. When considering commercial producers, the share of producers that were technically insolvent from between 1984 and 1986 varied from 12% in Missouri to 4% in Illinois and North Dakota.⁴ Minnesota (10%), Iowa (8%), and Kansas (8%) were also states with a large share of commercial farms technically insolvent.⁵ Just as conditions varied in the 1980s, financial conditions will vary greatly in the current environment.

Final Thoughts

While the current situation and the previous boom and bust have some similarities there are also many important differences. Today, it does not appear likely that the current situation will evolve into anything as destabilizing as the farm crisis of the 1980s. However, it is important to remember that economic adjustments can follow a long process. For instance, net farm income started higher in 1972 and crashed in 1983. This was an 11 year process. Net farm income did not recover to the long run average until 1989 or another 6 years. In other words, the process played out over 17 years!

Today's agricultural sector has experienced a decade of generally strong to very strong incomes. The sector appears to be in much better shape than it was leading up to the previous bust. However, it is important to provide some caution on the situation. The farm sector is in relatively strong financial shape, although the farm level indicators identified in this paper are all showing warning signs. If the previous boom and bust are any indication, the most difficult factors for the sector to adjust to would be a rapid change in interest rates, inflation rates, and/or exchange rates. These factors are largely outside the control and influence of the sector, but large shifts in these variables would likely cause significant

⁴ Commercial producers were those with sales of more than \$40,000, in nominal terms.

⁵ Hanson, Gregory, G.H. Parandvash, and J.Ryan. "Loan Repayment Problems of Farmers in the Mid-1980's." *United State Department of Agriculture: Agricultural Economic Report Number 649*. 1991.

problems. These threats linger in today's environment and could still deal a dangerous blow to the agricultural economy moving forward.

In reflecting on historic and current conditions, a single line from Kenneth Peoples's forward for the *Anatomy of an American Agricultural Credit Crisis* bears repeating. The purpose of commissioning the book was to publish "... *an account of what actually took place during this trying time for agriculture and why the conventional wisdom of the day fell short.*" It is important to recognize that conventional wisdom may again fall short.

Another way of considering this is outlined in framework popularized by Donald Rumsfeld:

"As we know, there are known knowns; these are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns- the ones we don't know we don't know."

- Donald Rumsfeld

In reviewing the economic and financial situation in agriculture today, the "known knowns" are how current conditions compare to historic events. The "known unknowns" are, for example, the magnitude and impacts of concentrated farm debt and how general economic conditions – such as inflation, interest rates, and exchange rates – will unfold over the next several years. The "unknown unknowns," however, are the blind spots of today's conventional wisdom. The "unknown unknowns," which could result in positive and negative impacts on the agricultural economy, are the most challenging issues for agricultural producers and lenders to prepare for. As the agricultural economy moves forward it appears that it is in a vulnerable, but considerably better position than that immediately preceding the farm financial crisis of the 1980s.

Figures

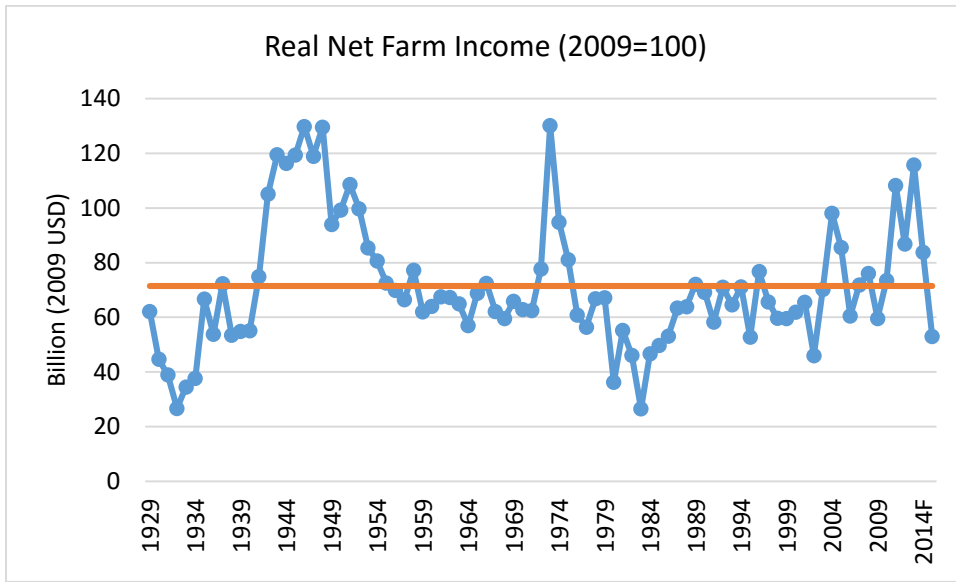


Figure 1. Real U.S. Net Farm Income, 1920- 2015F. Data Source: USDA ERS.

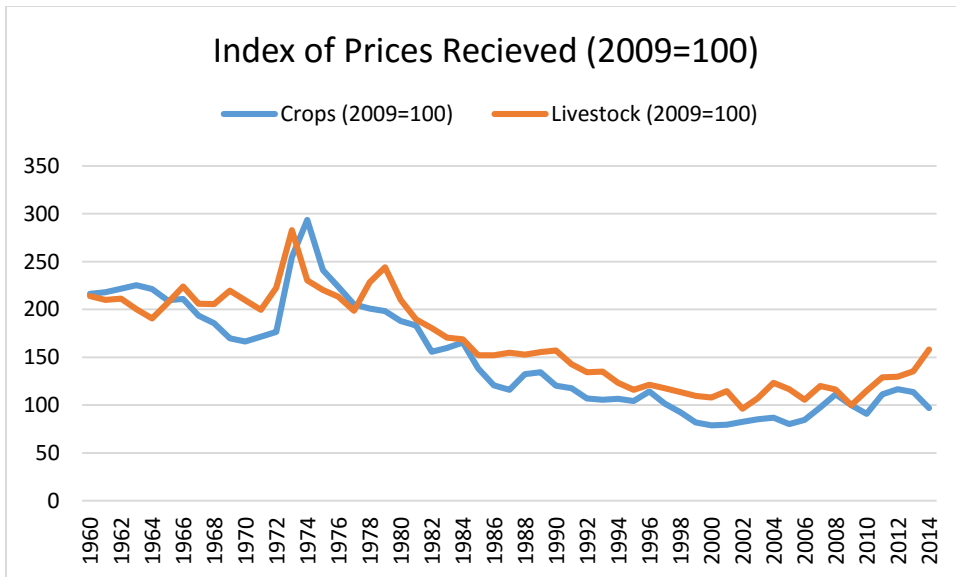


Figure 2. Farm Index of Real Prices Received. 2009 = 100. Data Source: USDA ERS and US Bureau of Labor Statistics.

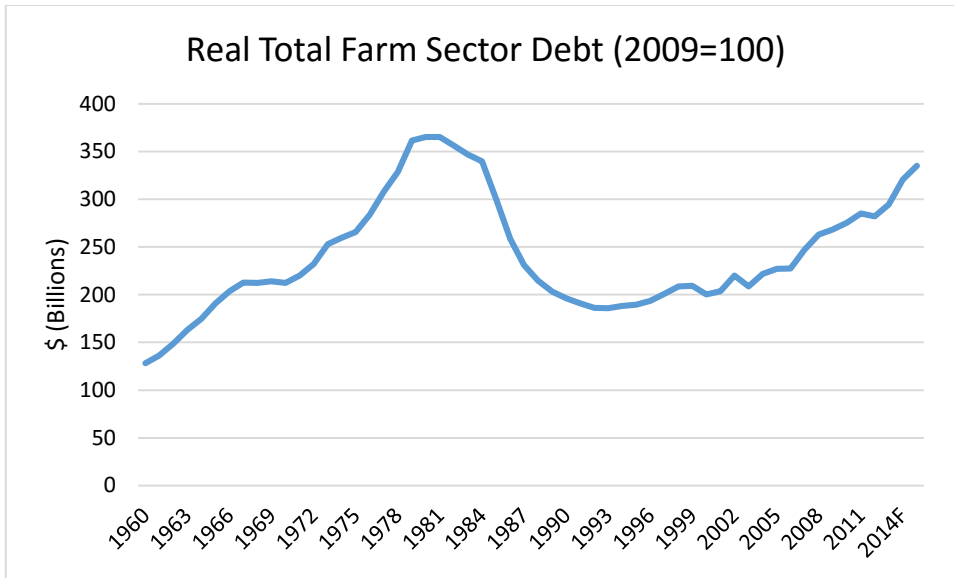


Figure 3. Real Total Farm Sector Debt (2009 = 100). Data Source: USDA ERS

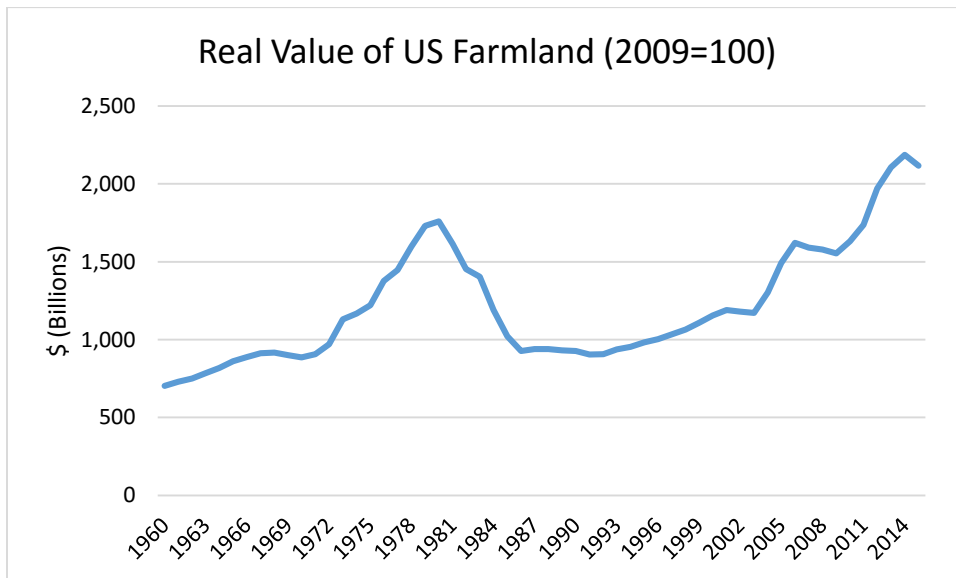


Figure 4. Real Value of U.S. Farmland (2009 = 100). Data Source: USDA ERS

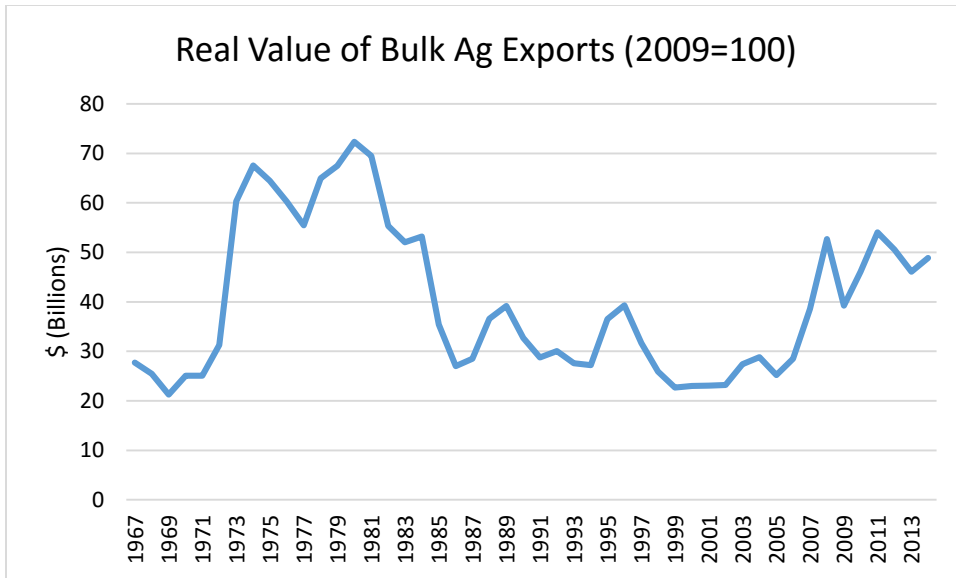


Figure 5. Real Value of Bulk Agricultural Exports, 2009 = 100. Data Source: USDA FAS, Global Ag Trade Database.

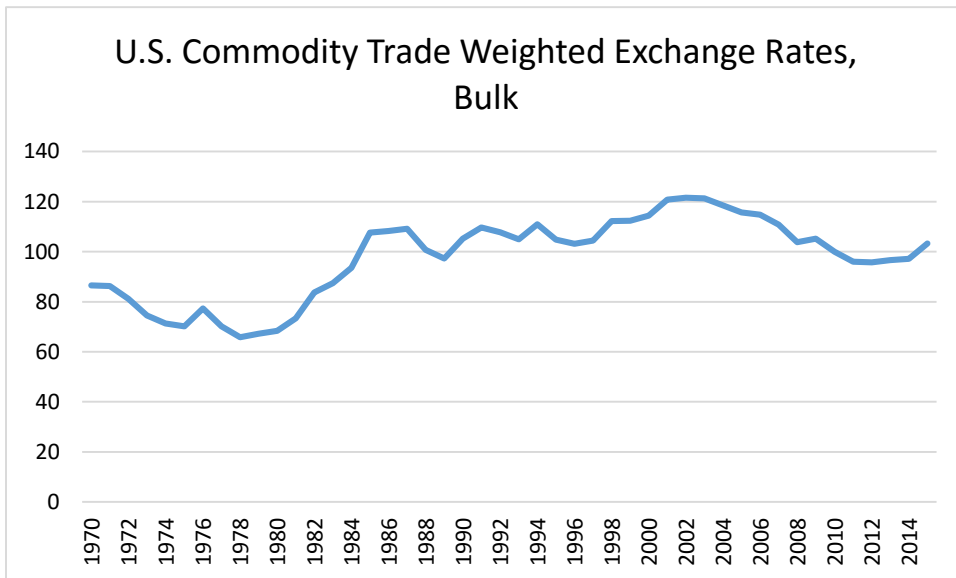


Figure 6. U.S. Bulk Commodity Trade Weighted Exchange Rates. Data Source: USDA ERS.

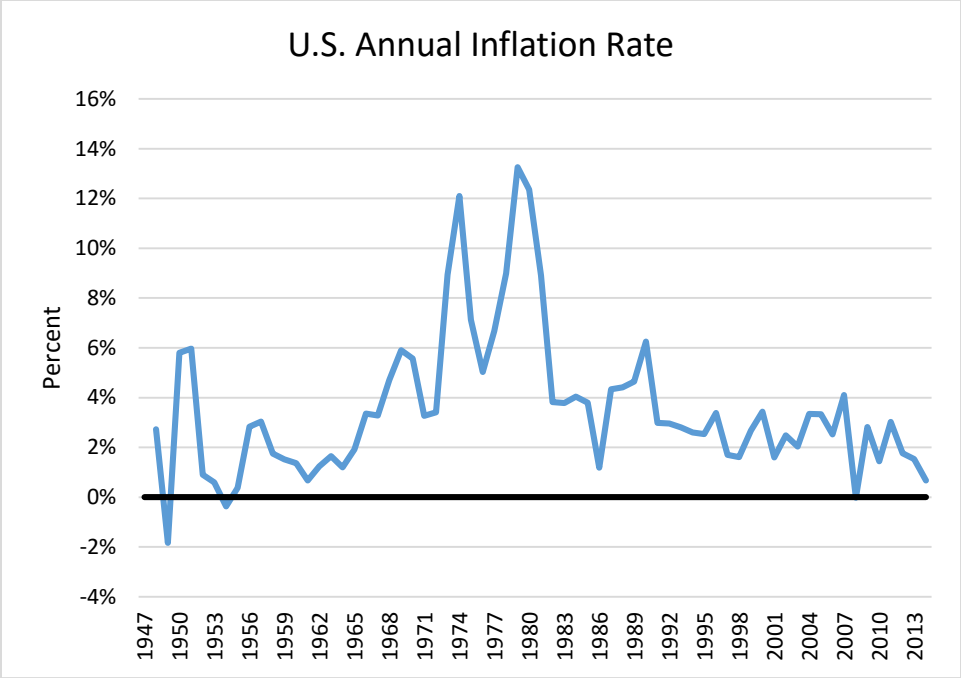


Figure 7. U.S. Annual Inflation Rates, based on the Consumer Price Index (CPI). Data Source: US Bureau of Labor Statistics (retrieved from FRED, Federal Reserve Bank of St. Louis).

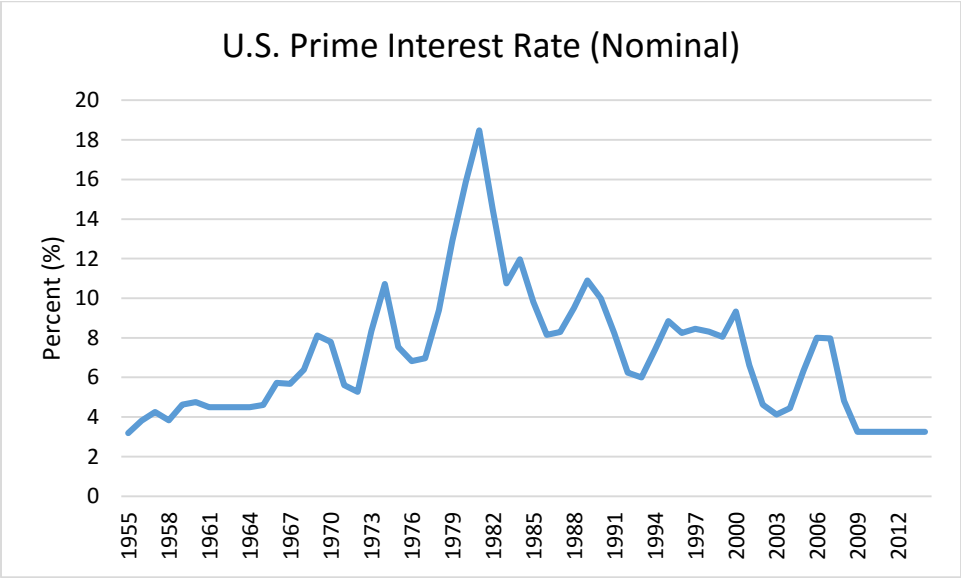


Figure 8. Annual U.S. Prime Interest Rate (Nominal). Data Source: Organization for Economic Co-operation and Development (retrieved from FRED, Federal Reserve Bank of St. Louis).

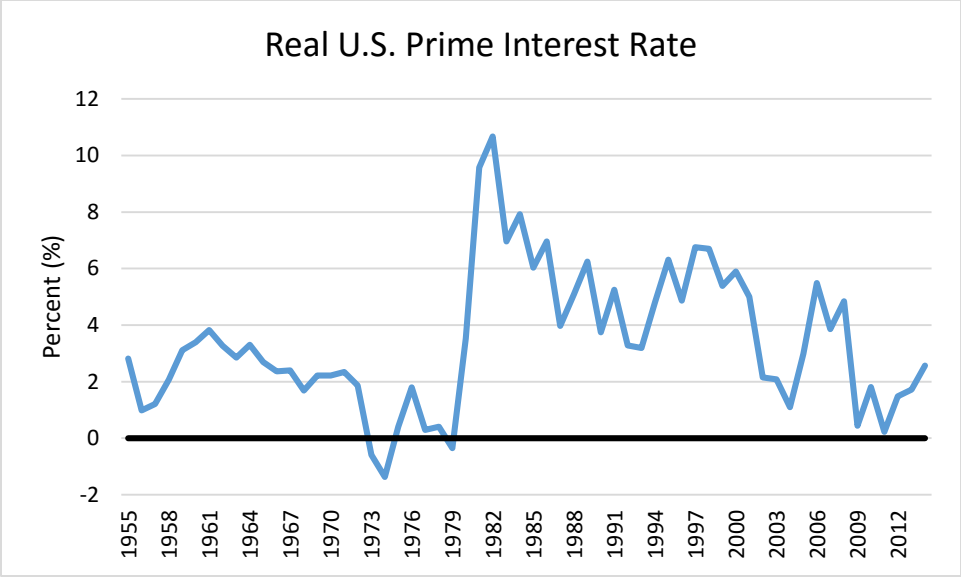


Figure 9. Real Annual U.S. Prime Interest Rate (adjusted by annual CPI inflation). Data Source: Organization for Economic Co-operation and Development and CPI (retrieved from FRED, Federal Reserve Bank of St. Louis).

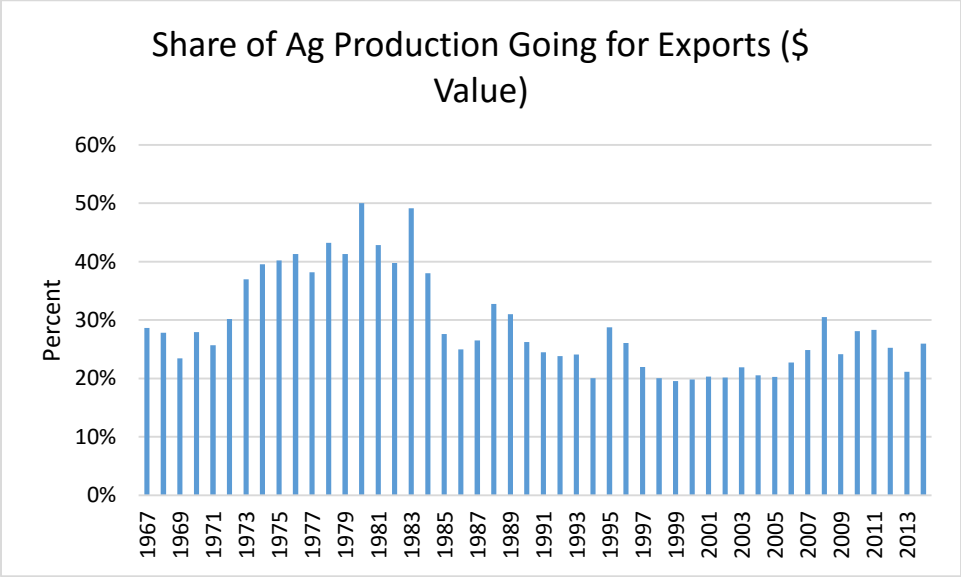


Figure 10. Share of the Total Value of Agricultural Production that Exports Account For. Data Source: USDA ERS & USDA FAS Global Ag Trade Database.

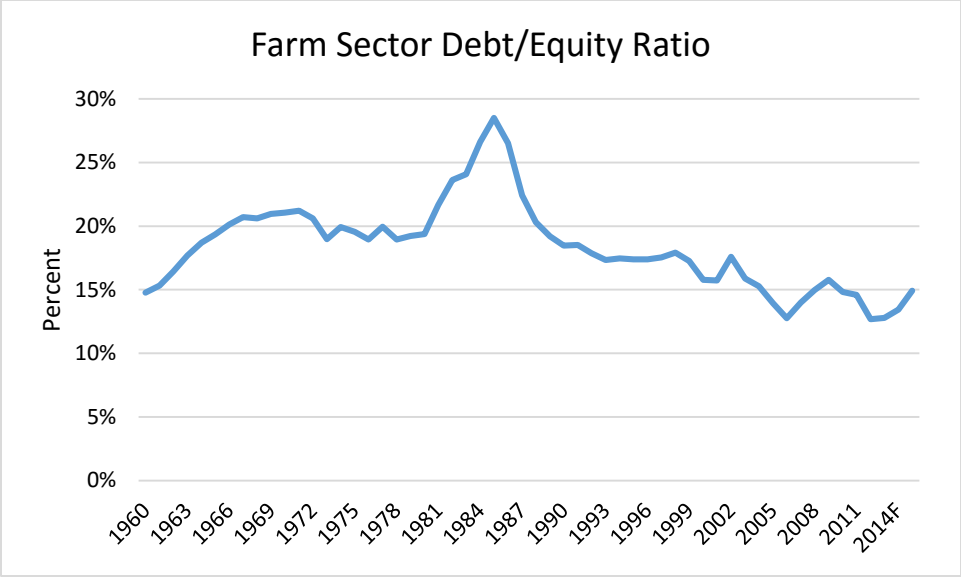


Figure 11. Farm Sector Debt/Equity Ratio. Data Source: USDA ERS