



ASSET BUBBLES AND AGRICULTURAL LAND VALUES

Many individuals including producers, bankers, and professionals in the field of agricultural economics are concerned about the potential for the development of a bubble in land values. Land values have risen rapidly, moving above the trend line in Kansas beginning in 2005 (see figure 1). Farm management data on net farm incomes show relatively good incomes for about 4 years (2003-2006), followed by outstanding net farm incomes in 2007-2010. Land values started their steep increase in the middle of the first set of good years which coincides closely with when crop prices first rose rapidly. Land value increases were not as dramatic during the period 2007-2009. However, there are some indications of rather large increases again in 2010.

Asset bubbles have emerged a number of times in recent years in the stock market, the bond market and the housing market. The latest bubble in the U.S. housing market has had serious consequences for the country, illustrating just how serious bubbles can be. And, many remember the 1980's and the rapid rise and subsequent fall of land prices during those years. Some are concerned currently about the potential for a repeat of that situation. Asset bubbles are situations where asset values trade in high volumes at prices that are considerably higher or lower than the fundamentals of the market would suggest.

Asset bubbles have been associated with low interest rates, and high liquidity—the current situation in production agriculture since crop incomes have been exceptionally high for 3-4 years, interest rates have been exceptionally low, and on average, the financial condition of farms has been good and improving.

There is no widely accepted theory to explain why bubbles occur, but they do occur under a wide range of conditions. Bubbles can occur without uncertainty, speculation, or irrational behavior. Bubbles occur even in highly predictable experimental markets, even with managers and professional traders when there is no uncertainty, and participants find it easy to calculate returns. They can occur even if participants are trying to behave rationally. But, bubbles can most easily be explained if we include emotions that influence markets. In general, both the boom and bust of a bubble are due to some positive feedback mechanism. That is, when prices are high, people bid them even higher. And, when prices are low, people quit buying and sometimes sell so prices go even lower. This is the opposite of what happens in stable markets where high prices encourage people to buy less and low prices encourage people to buy more. However, this is the type of behavior exhibited by “herding behavior” in markets due to pursuing profits after most of the price rise and bailing out of the market when it becomes low.

Asset bubbles are more damaging if they are built on debt than if they are investments aimed at storing wealth. The latest housing bubble

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was bought with debt which exacerbates the problem. This contributes to the severity of the bubble since as housing values fall, more house mortgages are underwater, forcing more houses on the market that again push home values down. This is the type of positive feedback mechanism that feeds bubbles. On the other hand, if assets are purchased with cash, as an investment, if prices drop, the investment may not provide a good return, but it does not flood the market with more assets that further depress prices. In addition, after the bubble pops, you will not have a huge debt problem to fix like we currently have due to the housing bubble which was built with debt. Anecdotal evidence suggests that the current run up in land is certainly partly due to the investment behavior of producers who have other investment opportunities right now that offer relatively low returns or high risk so they invest in land. It is important to point out that the land crash of the 80's was similar to the current housing market crash, and that current land investments are made much more as an investment of incomes that have been generated in agriculture.

To explore the current situation a Kansas Land Price-Earnings ratio was developed. This is a similar ratio to that calculated in the stock market. The S & P P/E ratio provides some indication of whether the stock market is high or low relative to past price earnings relationships. The Kansas Land P/E ratio is shown in Figure 2. This was developed from data over a period of years, looking at historical relationships between land prices and incomes (a moving average of ERS net farm incomes for Kansas was used) in agriculture. Land values in the 1980's show a P/E ratio that is much greater than P/E ratios for much of the historical period for land values, suggesting that there may have been a land price bubble during that period. Note that the Kansas P/E ratio in 2009 (the last year for which data are available) was not greatly out of line with historical relationships.

High asset values may look like bubbles after

the fact, when in reality the price at the time was appropriate. This can happen because the fundamentals supported the high prices at one time, but the fundamentals change so drastically that in hind sight it looks like it was a bubble. The fundamentals that support land prices are expected income from the land, and interest rates. One of the difficulties in the land market is the fact that a long term asset's value is determined by income and interest rates which are highly variable in the short run.

It is often difficult to gain access to the most current land price information as well as current income situations. Table 1 shows land prices from USDA and from sales data for the state of Kansas. Note the relatively large increase of 15% in values from 2009 to 2010 using the sales data. Figure 3 shows the distribution of Kansas sales price data. It is important to note that more sales fell in the price range from \$1,000 to \$1,200 per acre than any other range. While there are several high prices, one should also note that there are several prices that fell in the \$200-\$400 range also. Obviously, the lower priced land was likely lower quality and in the lower priced region of Kansas. There are no controls for types of land, nor location of land in the sales data in this sample, so comparisons between years need to be made with that in mind and the fact that different qualities and locations may be some of the reason for the change in values over time. Reports and presentations that highlight the highest prices they have heard may be inadvertently fueling the type of bidding environment that leads to bubbles. That is why this report purposefully reported the lowest values in the data set.

Of course projecting into the future is fraught with difficulties, but speculation regarding future income, interest rates, and land values may have some value for people involved in the land market. Certainly there is a great deal of concern currently that interest rates will increase, and that incomes will decrease, both of

which would put downward pressure on the prices of land. The bottom line is—this story is not over yet.

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Table 1. Kansas Land Values, USDA and Sales Data Estimates, 2007-2010.

<u>Year</u>	<u>USDA</u>	<u>% Increase</u>	<u>Sales Data</u>	<u>% Increase</u>
2007	980	----	965	----
2008	1,020	4.1%	1,086	12.5%
2009	1,030	1.0%	1,099	1.2%
2010	1,060	2.9%	1,265	15.1%

Figure 1. Net Farm Income and Land Prices

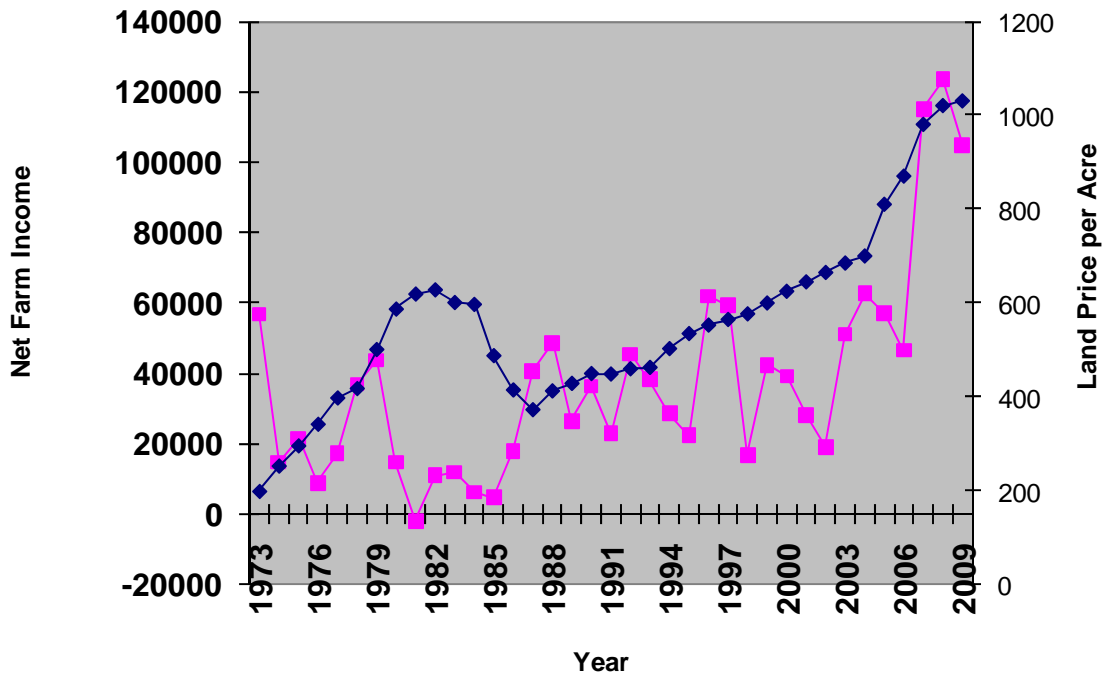


Figure 2. Land Price/Earnings Ratio

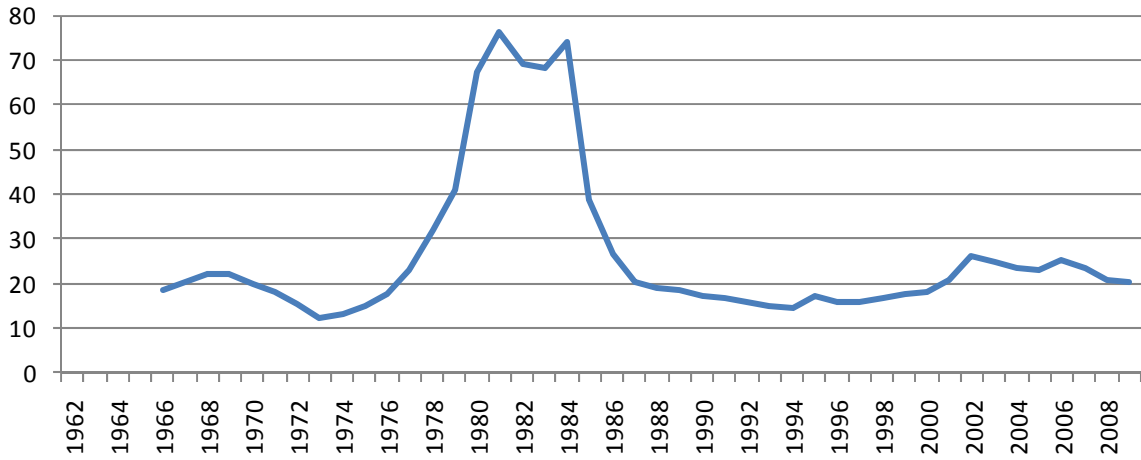
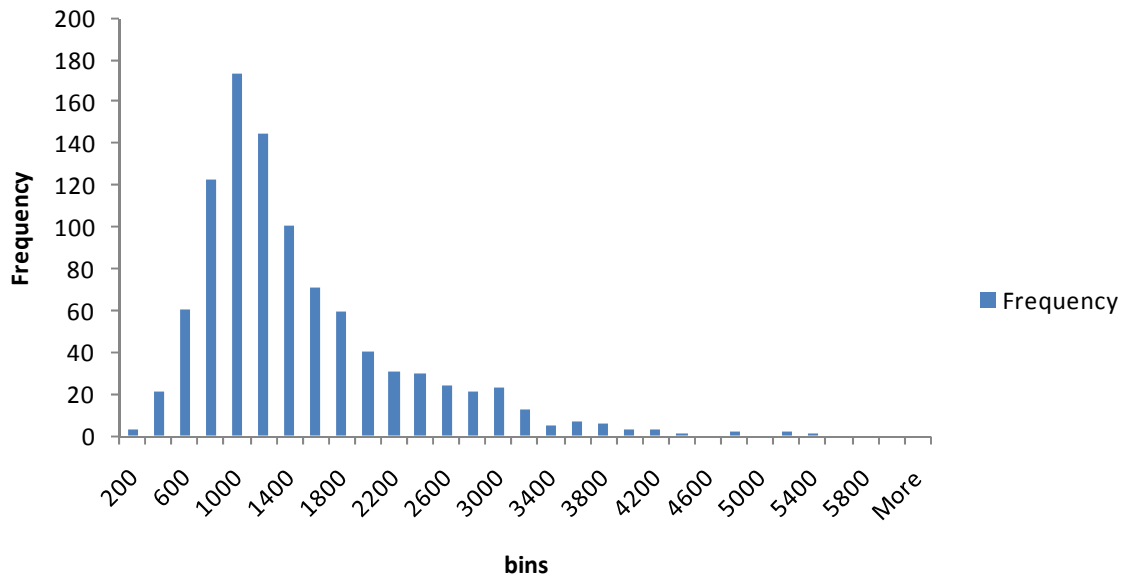


Figure 3. Histogram of Land Values



NET FARM INCOME AND CHANGE IN FARM NET WORTH

Most businesses have a goal of increasing net worth over time. Net worth increases are usually separated into two categories: increases in asset market values and increases in retained earnings. Both of these increases are important

to farmers and ranchers. KFMA members can track these changes using their whole-farm analysis and market value balance sheet. Changes in retained earnings can be tracked using their whole-farm analysis report. Changes

in asset market values can be tracked by members using a market value balance sheet. It is important to note that a market value balance sheet tracks both changes in asset market values and changes in retained earnings. This makes it difficult to disentangle the source of increases in net worth.

This article focuses on increases in retained earnings. Unless farm operators are putting money into the farm business through personal holdings, through profits from an off-farm business, or through inheritance; increases in farm net worth, using a modified cost balance sheet or the balance sheet contained in a KFMA member's whole-farm analysis, are derived from retaining net farm income in the business.

Table 1 presents summary statistics pertaining to net farm income and change in net worth for KFMA farms in 2009. On average, net farm income was \$104,781 and change in farm net worth was \$68,853. Using these figures, on average, approximately two-thirds of net farm income or all but \$35,928 was retained in the farm business. However, the relationship between these two figures varied across farms. Analysis of the relationship between net farm income and change in farm net worth by farm size and type is discussed below. Before making these comparisons, it is important to note that approximately 19 percent of farms had a negative net farm income and approximately 31 percent of the farms had negative change in farm net worth.

Summary statistics by farm size can be found in Table 2. Net farm income increases and the percent of farms with negative net farm income decreases as farm size increases. Similarly, the change in farm net worth increases and the percent of farms with a negative change in farm net worth decreases as farm size increases. For the smallest farm size category, on average, \$10,898 was inserted into the farm business. The difference between net farm income and change in farm net worth varies from \$18,560 for the farms with a value of farm production

between \$100,000 and \$250,000 to \$112,657 for farms with a value of farm production over \$1,000,000. It is important to note that the number of operators increases as farm size increases so we would expect the large farms to take more money out of the farm for operator wages and benefits.

Table 3 presents summary statistics by farm type. There are five farm types presented in the table: non-irrigated, irrigated, crop/beef, crop/dairy, and other. The "other" category includes all of the farms that could not be typed in the other four categories. Notice that the percent of labor devoted to crops is not one for the non-irrigated and irrigated farms suggesting that on average these farms have at least some livestock. It has been more difficult for livestock farms to earn a positive net farm income and to have a positive change in farm net worth. For instance, approximately 33 percent of the crop/beef farms had a negative net farm income and approximately 44 percent had a negative change in farm net worth. In contrast, only 15 percent of the non-irrigated farms had a negative net farm income and only 26 percent had a negative change in farm net worth. The average difference between net farm income and change in farm net worth varies from \$14,468 for crop/beef farms to \$48,276 for irrigated farms. The relatively small difference for crop/beef farms warrants further explanation. The crop/beef farms are smaller and can not afford to take as much money out of the business as the non-irrigated and irrigated farm types.

This article discussed the relationship between net farm income and change in farm net worth for KFMA farms. Producers are encouraged to examine this relationship on their own farms. Having a positive change in farm net worth is critical to future success of any business.

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Table 1. Summary Statistics for 1,477 KFMA Farms in 2009.

Item	Average
Value of Farm Production	\$463,742
Net Farm Income	\$104,781
Percent of Farms with Negative Net Farm Income	19.0%
Change in Farm Net Worth	\$68,853
Percent of Farms with Negative Change in Farm Net Worth	30.7%
Number of Operators	1.01
Percent of Labor Devoted to Crops	78.2%

Source: Kansas Farm Management Association 2009 Databank.

Table 2. Summary Statistics by Farm Size Category.

Item	Value of Farm Production (thousands of dollars)				
	< \$100	\$100 to \$250	\$250 to \$500	\$500 to \$1000	> \$1000
Number of Farms	201	380	445	315	136
Value of Farm Production	\$53,574	\$175,495	\$363,633	\$702,053	\$1,650,933
Net Farm Income	-\$5,387	\$29,483	\$77,849	\$169,035	\$417,299
Percent of Farms with Negative Net Farm Income	49.3%	23.7%	12.8%	8.6%	5.9%
Change in Farm Net Worth	\$5,511	\$10,923	\$55,533	\$96,170	\$304,642
Percent of Farms with Negative Change in Farm Net Worth	52.2%	38.4%	25.8%	22.9%	11.0%
Number of Operators	0.64	0.86	1.02	1.15	1.57
Percent of Labor Devoted to Crops	65.7%	74.0%	80.5%	84.6%	86.5%

Table 3. Summary Statistics by Farm Type.

Item	Non-Irrigated	Irrigated	Crop Beef	Crop Dairy	Other
Number of Farms	1050	54	276	51	46
Value of Farm Production	\$490,109	\$804,749	\$296,549	\$485,497	\$440,609
Net Farm Income	\$122,405	\$172,833	\$38,217	\$57,461	\$74,467
Percent of Farms with Negative Net Farm Income	15.0%	9.3%	33.3%	31.4%	23.9%
Change in Farm Net Worth	\$81,156	\$124,557	\$23,749	\$24,692	\$42,211
Percent of Farms with Negative Change in Farm Net Worth	26.3%	20.4%	43.5%	54.9%	39.1%
Number of Operators	1.00	0.92	0.94	1.43	1.12
Percent of Labor Devoted to Crops	90.4%	98.5%	45.7%	25.9%	30.9%

RECOMMENDATIONS FOR FURTHER READING

The purpose of this section of the newsletter is to briefly discuss articles and web sites that may be of interest to readers. In general, the articles discussed will not report on original research. Rather, the articles will contain citations to web sites and articles that discuss topics of general interest.

Michael Boehlje and Brent Gloy recently wrote an article pertaining to managing risk entitled “Managing the Risk – Capturing the Opportunity in Crop Farming”. Specifically, the authors discuss risk in general and eight strategies that can be used to protect current margins and successfully position a farm against extreme uncertainty. In general, risk is derived from two sources: operations and financing. Operational risks include fluctuating input prices, output prices, and yields. Financial risk involves the level of debt and the interest rate. The author’s eight strategies are as follows: lock in margins, buy crop insurance, fix interest rates on some long-term debt, pay down some debt, hold financial reserves, conservative buying/bidding, slow growth/fund with equity,

and invest in operational excellence and cost control. More information can be found in the article which is posted to my contributor site on Ag Manager under “Recommendations for Further Reading”.

Jean-Jacques Dethier and Alexandra Effenberger have recently written a policy research working paper for the World Bank entitled “Agriculture and Development” that discusses the importance of agriculture to mitigating food insecurity and poverty. Sections of this paper include the following: introduction, the role of agricultural development, the foundations of agricultural growth, the rural non-farm sector and rural development, agricultural policy and food security, and conclusion. Given the importance of increasing food productivity and production in developing countries, this working paper is timely. Those interested in this topic are encouraged to download the paper from my contributor site on Ag Manager.

Alice Rivlin and Pete Domenici have recently

written a short article for the Brookings Institution entitled “Stronger Rules Will Rein in the Debt”. The authors note that the bipartisan bickering over the current budget is a distraction from a much more important budget challenge related to forging a multiyear, bipartisan agreement that reins in future debt increases and keeps the country on a fiscally responsible path. They discuss four rules they have learned from participation in the budget process over the last couple of decades. First, successful budget action must be bipartisan and involve the president. Second, budget process rules must be enforced. Third, enforceable rules can help achieve fiscal responsibility. Fourth, new rules are necessary. In particular, the authors note the importance of passing long-term spending and

revenue targets consistent with stabilizing debt and review them periodically to ensure that the budget stays on track.

Numerous web sites contain information related to policy issues. The Cato Institute (www.cato.org) is a public policy research organization dedicated to the principles of individual liberty, limited government, free markets, and peace. The Institute provides research reports on a wide range of policy issues.

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The Kansas Farm Management Association (KFMA) Newsletter is distributed monthly to provide farm management information to farm decision makers. Further farm management information can be found on the KFMA program website: www.agmanager.info/kfma; and, on the Extension Agricultural Economics website: www.agmanager.info. The Newsletter is edited by Michael Langemeier, Professor, Department of Agricultural Economics, Kansas State University.



Kansas State University Agricultural Experiment Station and Cooperative Extension Service.

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