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## ABSTRACT

Agriculture has seen several periods of both high and low farmer profitability. This has resulted in at least some farmers leaving agriculture because of financial difficulty. Other farmers, however, have managed to survive the bust periods of agriculture and are still farming today. This paper uses a 40-year dataset of farm financial data from the Kansas Farm Management Association (KFMA) to compare those farms that have been in the program the entire 40-year timeframe to the remaining farms in the dataset to determine if those long-term farms have any different financial characteristics that have helped them survive long-term.

Results indicate that the long-term farms have put more of their profits back into the farm resulting in higher levels of equity and lower levels of debt.

## Characteristics That Help a Farm Achieve Long-Term Viability

By Gregg Ibendahl & Michael R. Langemeier

### Introduction

Grain farms have been very profitable since 2007. All-time high commodity prices have led to record net farm income for many farmers. Although many farmers are currently enjoying a time of prosperity, farming has not always been such a booming industry. There have been many periods of austerity due to low prices, poor yields, or declining asset values. It is during these “bust” cycles that farmers might consider another occupation.

According to Goetz and Debertin (2001), farmers are more likely to exit farming when the transaction costs of moving to off-farm employment are low. They also found that when farmers have higher valued assets, irrigate less ground, or they live in a higher population density county, they are more likely to exit farming. Conversely, operating their own farm meant farmers were less likely to leave farming.



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While many farmers have been in business for a long-time, certainly not all have. The increasing size of farm operations means that as some farmers exit through retirement or a change in occupation, other farms are expanding. Those farms that have been around very long term might have different characteristics than other farms. This paper investigates farms that have been in operation for 40 years to see if they have different financial characteristics than other farms in order to determine if there has been anything that has contributed to the longevity of the farm.

A 40-year time frame is long enough to see several cycles of farm prosperity and farm austerity. The early 1970's saw farm profits spike as exports doubled. The late 1970's and early 1980's were also a period of high interest rates and inflation where land prices quickly rose. By the early 1980's, net farm income had fallen due in part to lower exports. The combination of high interest rates, high farm debt, and lower net farm income contributed to the farm crisis of the mid-1980's. During this period, farm land values dropped by 40 percent. The 1990's saw a period of low commodity prices and a high reliance on government payments. The current environment is one of low interest rates and higher than average commodity prices. Figure 1 shows the inflation rate as determined by the CPI index as well as the annual prime interest rate. (Boehlje, Gloy, and Henderson; 2012).

### Data

Data comes from the Kansas Farm Management Association (KFMA) where farm information has been collected since 1973 (40 years). Of the

original set of farms in the program, 55 farms are still in the program today. In 2012, there were 1,290 farms with useable farm records. The 1,235 farms not in the program back in 1973 have been added at various points since then. In 1973, there were 2,400 farms in the program and there are likely more than 55 of these farms still in operation today. Farmers have to pay to be in the KFMA program and thus may have exited the KFMA because of financial considerations. Still, some of the original farmers have likely exited agriculture completely.

There are several reasons why some farms have been with the KFMA program the entire time and others have not. These farmers may have been more profitable than the others resulting in these other farms exiting agriculture during one of the bust times of agriculture. Another reason might be the area KFMA economist working with the farmers. Some economists are more skilled than others possibly resulting in better advice and thus more farmer satisfaction with the KFMA program. These farmers are more likely to stay with KFMA than those farmers less satisfied. Economist stability is another factor as farmer/economist relationships become important.

### Analysis

In the analysis to follow, the 55 farms that have been with the KFMA program since inception are called long-term farms, the remainder of the KFMA farms are called other farms. These other farms may have either exited farming, still be farming but no longer in KFMA, farming 40 years ago but added as a KFMA member less than 40 years ago, or have started farming less than 40 years ago. It is likely

some of those original KFMA farms that dropped out of the program did so because they were doing less well than those farms staying in the program and were looking to cut expenses.

The first step in the comparison of the long-term KFMA farms against the other KFMA farms is to examine historical accrual-adjusted net farm income. As can be seen in Figure 2, net farm income of the long-term farms has been consistently greater than the other farms until about four years ago. Net farm income of the long-term farms has also been less variable. Figure 3 shows the regression of real net farm income across time. In this figure, net farm income has been adjusted to a real value based on the CPI index. For the CPI index, the base year is 1982. As seen here, net farm income of the long-term farms has grown at about the same rate as the other farms. The difference is that the long-term farms started at a higher level of real net farm income.

Figure 4 illustrates how Return On Equity varies by year for long-term farms and for the other farms. This year ratio was calculated by combining returns and equity before calculating the ratio. For the debt-to-asset ratio discussed next, the ratio for each farm was calculated and then averaged together. The ROE for the long-term farms has been less variable than the ROE for the other farms. In the 1970's and 80's, the long-term farms had a greater ROE. Starting in the 1990's, the other farms had a greater ROE. This is a strong indication that the long-term farms had less debt than the other farms. Figures 4 and 5 were calculated using nominal values.

Figure 5 confirms that the long-term farms did have a lower level of debt. This occurred despite the two groups nearly starting at the same level of debt in 1973. The long-term farms and the other farms really diverged starting in 1980 right before farmland values collapsed. Since about 1985, the gap in the debt-to-asset ratio has been constant.

Figures 6 and 7 show that long-term farms have grown both total assets and equity faster than the other KFMA farms have. Equity growth has been even faster than asset growth. These two figures are both based on converting nominal values of equity and assets into 1982 real values by using the CPI index. One reason for the improved growth of assets and equity by long-term farms is the improved profit margins of long-term farms (shown in Figure 8).

Henderson (2008) argues that farmland values seem reasonable based on net farm income. Using a net present value model, farmland is priced based on future expectations of income. However, these models also include a discount rate as part of the equation. The discount rate might also affect net farm income as shown in Figure 9. Here, the Kansas Farm Management net farm income is plotted against the interest rate spread between the prime rate and the inflation rate. As this gap grows, net farm income tends to decrease.

## Discussion

As Figures 4 and 5 show, long-term farms and other farms started in similar spots back in 1973. Both sets of farms were earning a ROE of 16 percent and both sets of farms had debt-to-asset ratios of 28

percent. The two groups start to diverge from there however. Obviously, as shown in Figure 5, the other farms were using more debt to run their business. Despite this, long-term farms still grew their total assets and total equity quicker. This leads to the conclusion that long-term farms have been keeping more of their equity in place on the farm and putting it back into the farm business. The other farms by contrast have used more of their equity and have been more dependent upon debt capital. Since both farm types have increased their net farm income at the same rate, it doesn't appear that the capital structure affects net farm income very much.

One reason that long-term farms have been able to grow total assets and equity quicker than the other farms is that long-term farms have higher profit margins than the other farms. As shown in Figure 8, long-term farms have a higher profit margin nearly every year along with much less variability. There were two periods during the late 1970's and early 2000's where this difference is especially evident. It is very likely that during these periods, the other farms may have been forced to take pull more money out of the farm business in order to meet family needs.

Comparing Figure 3 with Figures 6 and 7 also suggests long-term farms have kept more of their net farm income in place within the farm. Figure 3 indicates that both long-term farms and other farms have grown net farm income at nearly the same rate. Long-term farms are earning more net income though. Despite increasing their net farm income at the same rate, the two farm types have grown their assets and equity at different rates. In real dollar

terms other farms have not increased their equity or assets at all. Long-term farms have increased the real value of both total assets and equity. The only way for this to occur is for long-term farms to leave more of their net farm income within the business.

A key point is the long-term farms have always generated more net farm income. This makes it much easier for those farms to plow more money back into the farm business. Smaller net income farms may very well need to pull that income out of the farm to meet family living expenses. This could be especially true during high interest rate times when net farm income could very well be less than normal. We don't have long-term data on family withdrawals but it seems clear the long-term farms have not been taking as much money out of the farm business.

The result of keeping more equity in the farm business has been a set of farms more likely to stay in the KFMA program. Although there are several reasons a farm might exit the KFMA program, certainly maintaining profitability is likely to increase the odds that a farm will not drop out. It certainly helps longevity if a farm starts from a higher level of net farm income.

What are the management strategies that farmers can apply today? Certainly, leaving as much net farm income in the farm business as possible will allow a farm to grow assets and equity quicker. To accomplish this, it helps to have a larger than normal net farm income. Both farm groups in this study were about the same physical size but the long-term farms were able to generate a higher profit

margin. This higher margin could be a function of management and/or better growing conditions (i.e., more rain or better soils). Given the greater variability in profit margins of the other farms, this

group might have to make more sacrifices during the down times of agriculture in order to avoid pulling equity out of the farm business.

## References

Boehlje, M.D., Gloy, B.A. & Henderson, J.R., 2013. U.S. Farm Prosperity: The New Normal or Reversion to the Mean. *American Journal of Agricultural Economics*, 95(2), pp.310–317.

Goetz, S.J. & Debertin, D.L., 2001. Why Farmers Quit: A County-Level Analysis. *American Journal of Agricultural Economics*, 83(4), pp.1010–1023.

Henderson, J, 2008. Will Farmland Values Keep Booming? Economic Review – Second Quarter 2008. Kansas City Federal Reserve (available at <http://www.kc.frb.org/PUBLICAT/ECONREV/PDF/2q08henderson.pdf>)

Figure 1. The Inflation Rate and the Prime Rate from 1973 to 2012

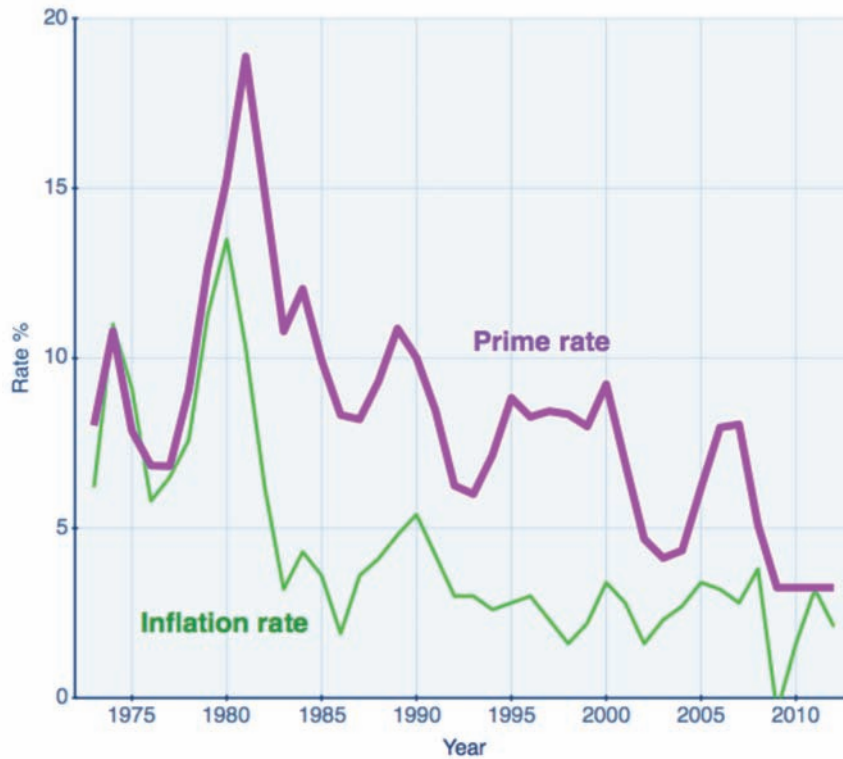


Figure 2. Net farm Income by Year for each Farm Group

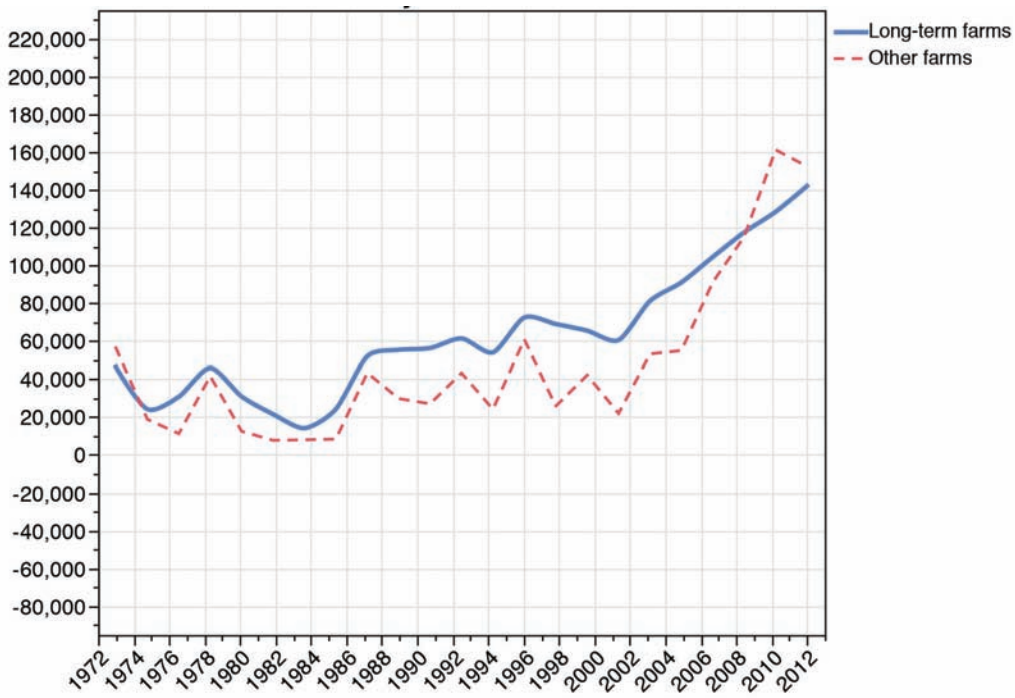




Figure 3. Regression of Net Farm Income for Each Farm Group

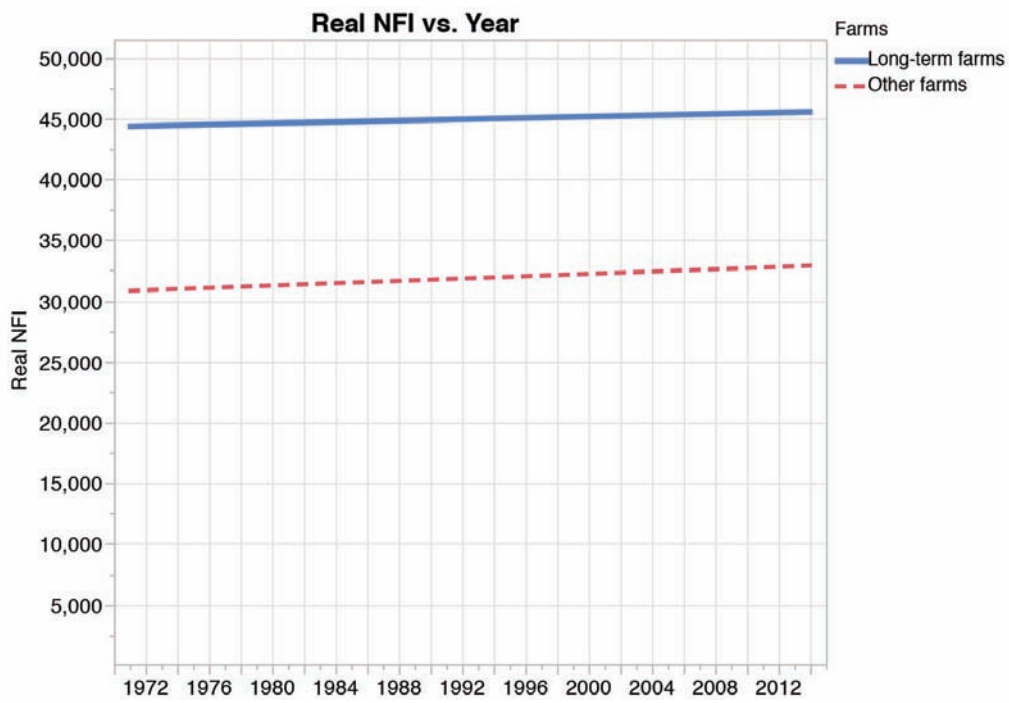


Figure 4. Smoothed ROE by Year for Each Farm Group

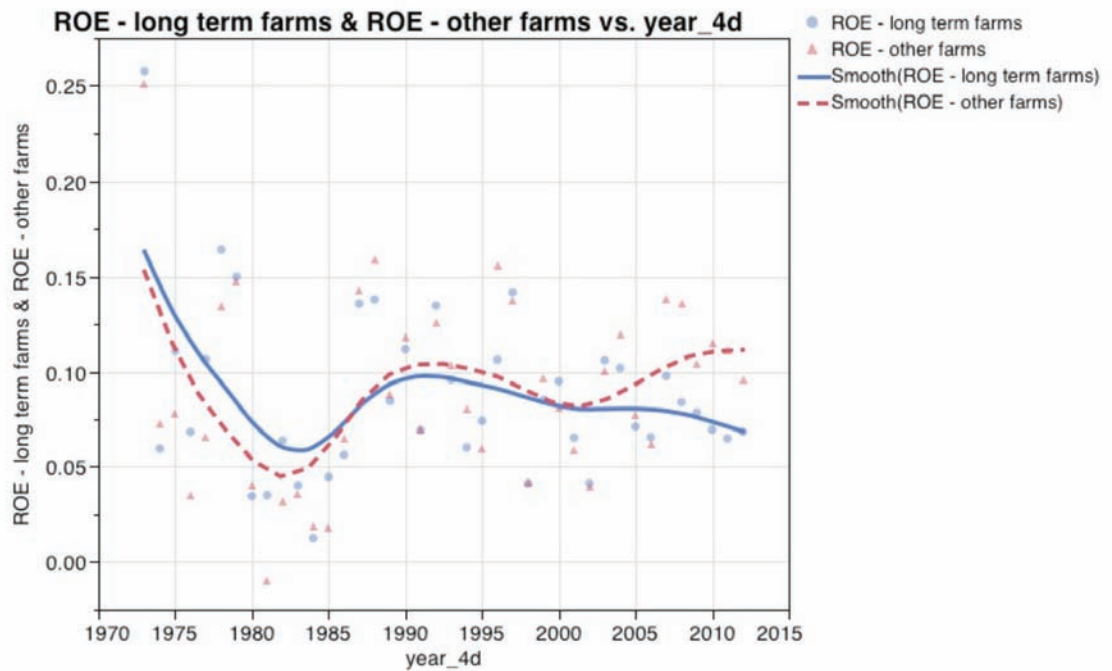


Figure 5. Debt-to-Asset Ratio by Year for Each Farm Group

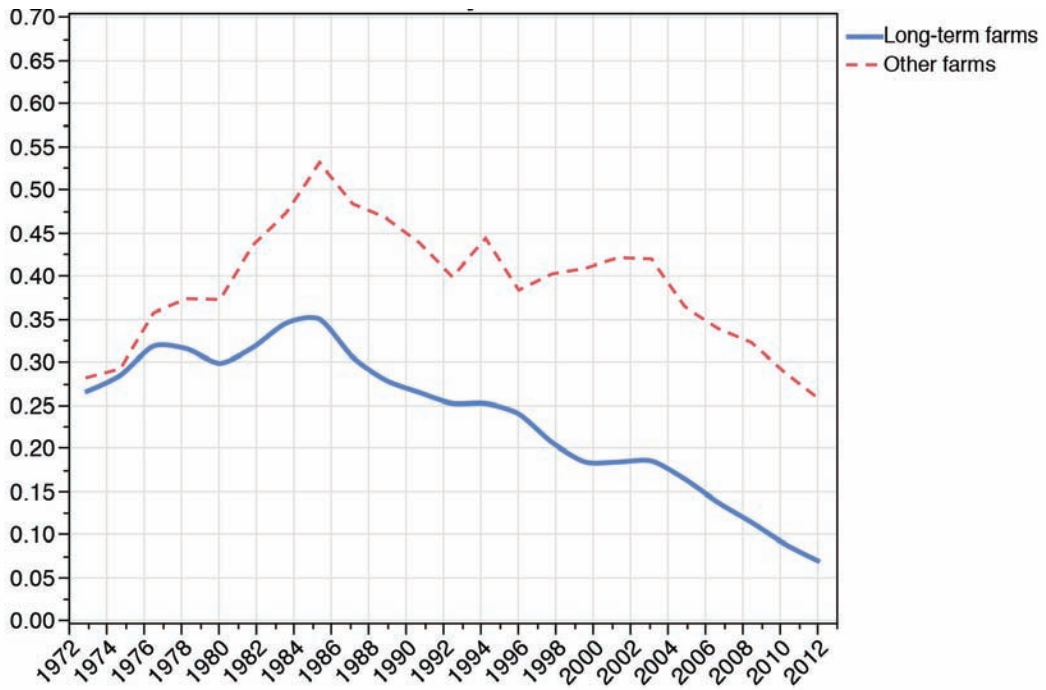


Figure 6. Asset Growth Over Time

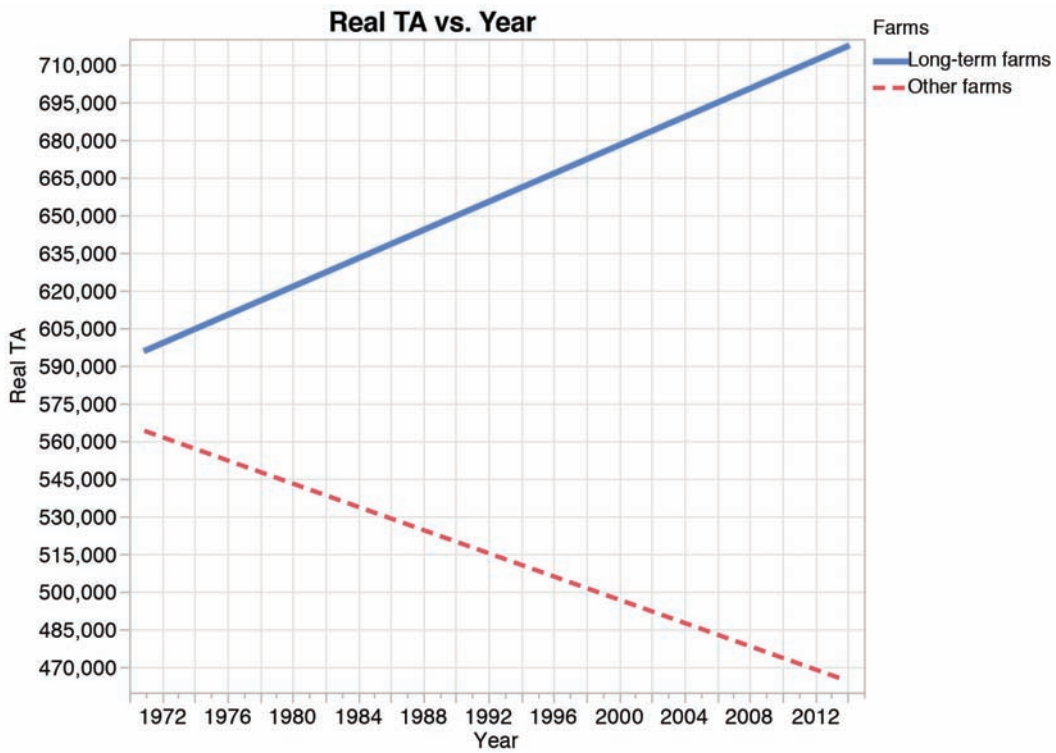


Figure 7. Equity Growth Over Time

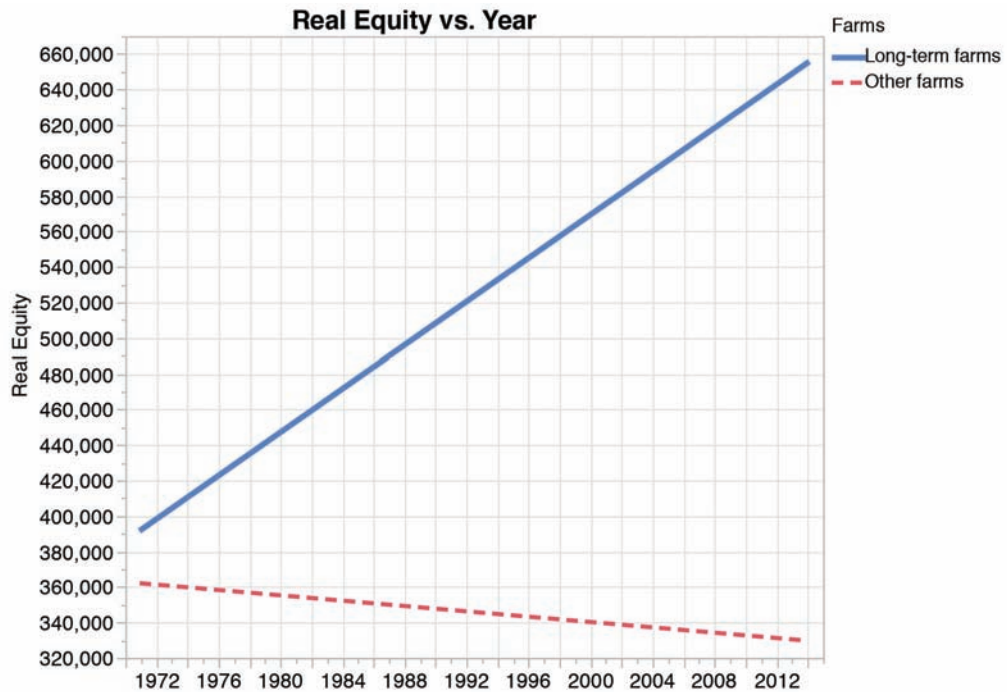


Figure 8. Operating Profit Margins Over Time

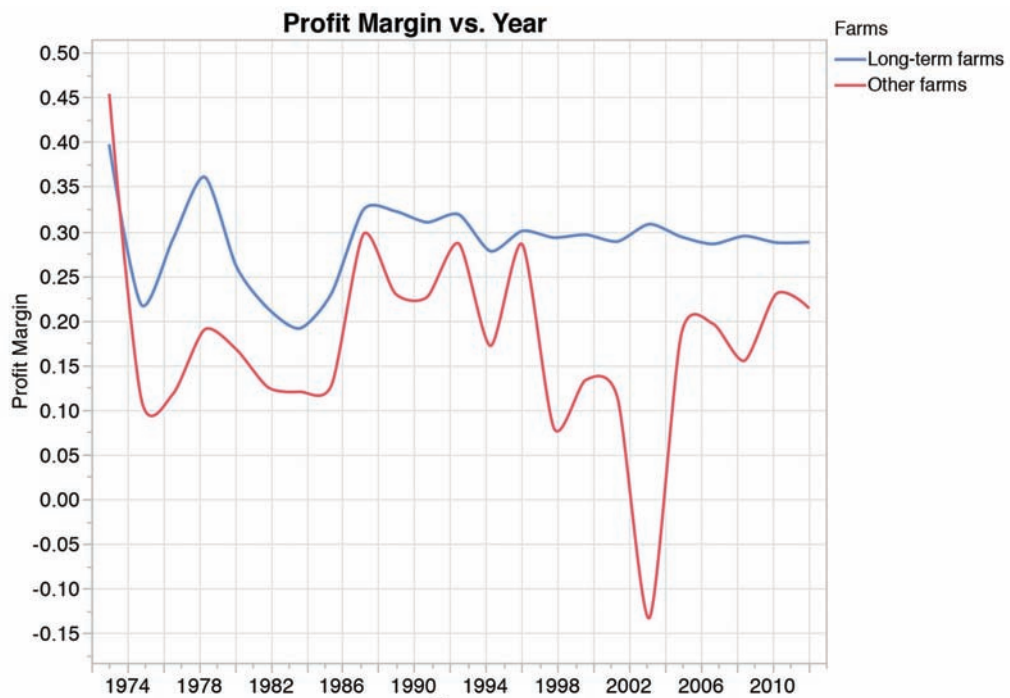


Figure 9. Real NFI as a Function of the Interest Rate Premium

