An Analysis of Family Living of Kansas Farm Families

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Introduction

The lower grain prices Kansas farmers have experienced over the last several years have caused net farm incomes to drop across the state. This has important implications for how much money farm families can use for family living expenses as many families get the majority of their income from the farm business. This paper examines net farm income and family living expenses to see how families have adjusted their spending with lower net farm income.

Background

The Kansas Farm Management Association (KFMA) has been keeping computerized farm records since 1973 (the program has been in operation much longer but with paper records). Typically there are around 2,500 farms in the program with over half of these farms providing certified records that can be used for analysis.

The KFMA program mainly keeps track of farm expenses and revenues but also collects some production information such as crop acres and yields. In addition, a subset of these farms also keep track of their family living expenses. These family living expenses are divided into: food, household operation, house upkeep and repairs, furniture and equipment, personal and recreation, education, child care, clothing, gifts, contributions, doctor, health insurance, life insurance, auto expense, utilities, bank interest, and miscellaneous.

Family living expenses have been tracked in the computerized database from the beginning. However, in 1993 a change was made to the database to certify family living separate from the farm records. Thus, the family living records are probably more reliably analyzed from 1993 onward as it is difficult to sometimes determine if the family living was reported accurately just based on the farm certification. In 2014, there were 368 farms that had certified family living expenses. This number drops to 270 when only considering the farms with both certified farm financial data and family living expenses.

Procedure

Only farms that had both certified farm financial records and family living records were used in the analysis. Because of data unpredictability, only years 1993 through 2014 were included.

All the net farm income numbers were adjusted by the CPI index to account for inflation. Thus older numbers should be comparable to current numbers. For some of the analysis, a rolling average was used to help smooth the numbers. In addition, to examine how family living responded to net farm income, some of net farm income numbers are averaged over a period of years.

The first part of the analysis examines family living for the entire state and compares that to the net farm income from those same farms. Various lengths of moving averages of net farm income are then compared to the family living to find the highest correlation. In the second part of the analysis, family living of the six KFMA regions are compared. Because of more variability from the regional data, a two-year rolling average of family living is used to help smooth out the data to better show trends.

Other models that try to predict family living as a function of net farm income (and other factors) will be examined in future papers. For this analysis, only various lengths of the rolling average of net farm income were considered.

Results

Figure 1 shows the comparison between family living and net farm income for the entire state for those farms that have both certified farm and family living expenses. This figure has a double Y axis with net farm income plotted on the left axis and family living on the right axis.

There is only one line representing family living (green line). As can be seen on the graph, family living has varied from $45,000 up to $70,000 (right axis in green). Family living (adjusted for inflation) rose slowly from 1993 until 2008 when net farm incomes dramatically increased. Family living increased right along with net farm income until 2012 where it leveled off at around $70,000. Despite net farm income declining the last two years, family living has stayed near its peak.

The left axis (in purple) shows the net farm income numbers for those farms with family living. The thin black line shows the average net farm for a given year while the dotted purple line is the rolling average of net farm income. The purple line labeled, NFI - ave4, is the rolling average of the current year's net farm income plus the three years previous (4 years in the average). This four-year rolling average of net farm income is the one with the highest correlation when compared to the family living numbers.

The correlation of the family living to the current net farm income is 0.73. This correlation increases up to 0.94 for the four year rolling average of net farm income. The correlation was 0.84 and 0.92 respectively for the two and three year rolling averages of net farm income.

Figure 2 shows the family living by region. These family living numbers are a two-year average to help provide some smoothing. The red lines are for the western part of the state, the purple lines are for the central part of the state, and the green lines are for the eastern part of the state. The north and south parts of the east, central, and west are shown by the dotted lines with the square symbols.

As with the state family living numbers, each region of the state increased family living as net farm increased starting in 2008. However, the regional increases were not uniform. The northeast and the southwest saw family living drop in 2007 and 2008 before starting to increase.

The western region had the highest family living before the increases in net farm income in 2008. The northwest currently has the highest family living but it is the only region that shows a significant downward adjustment to their family living. The south central and the southwest regions also show signs of family living adjustment.

The north central and the southeast regions started with the lowest family living expenses and ended with the lowest family living expenses. These two regions didn't increase their family living as dramatically as did some of the other regions when net farm incomes increased.

Conclusions

Based on the correlations, it appears that farm families are basing their family living decisions by considering 4 years of past net income history. This is fine for when incomes are increasing but could be problematic if incomes are decreasing. If lower grain prices persist for several years, many farm families may have wished they started the family living adjustment sooner.

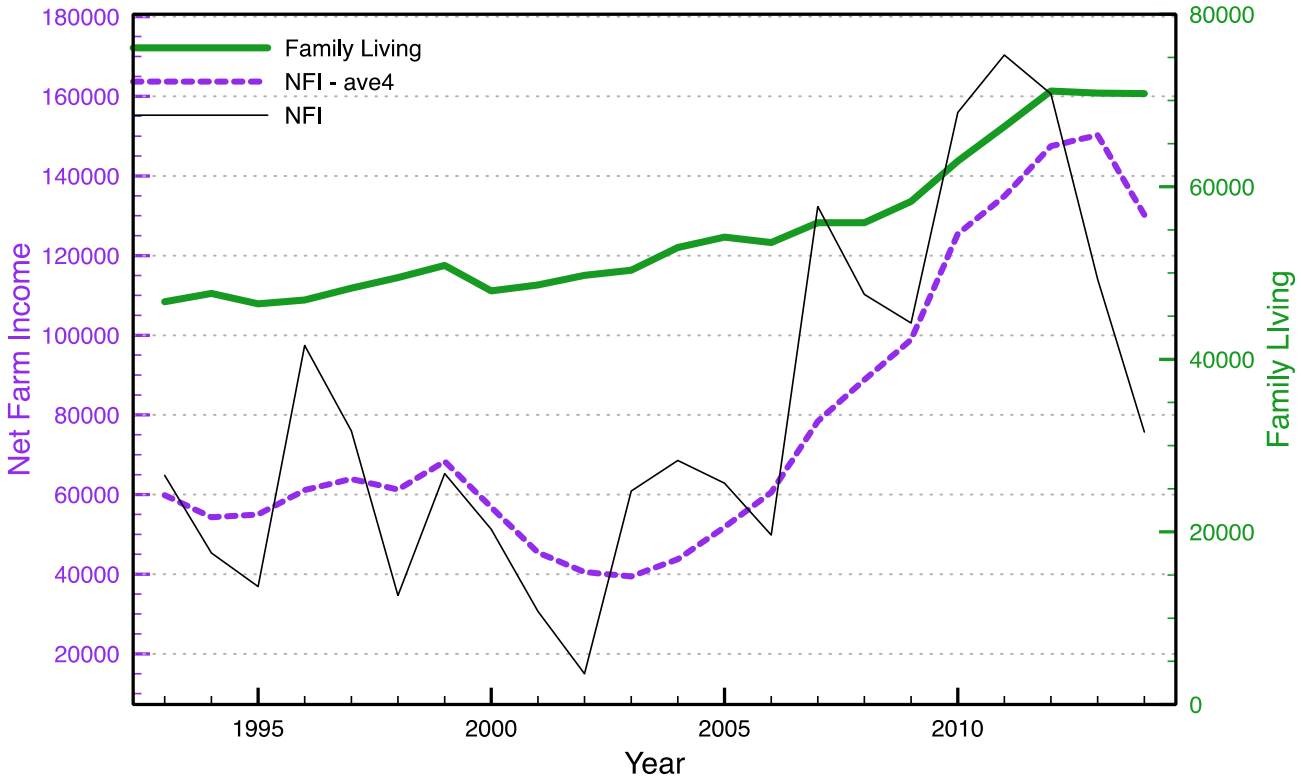

Figure 1. Family Living Compared to NFI for the Entire State

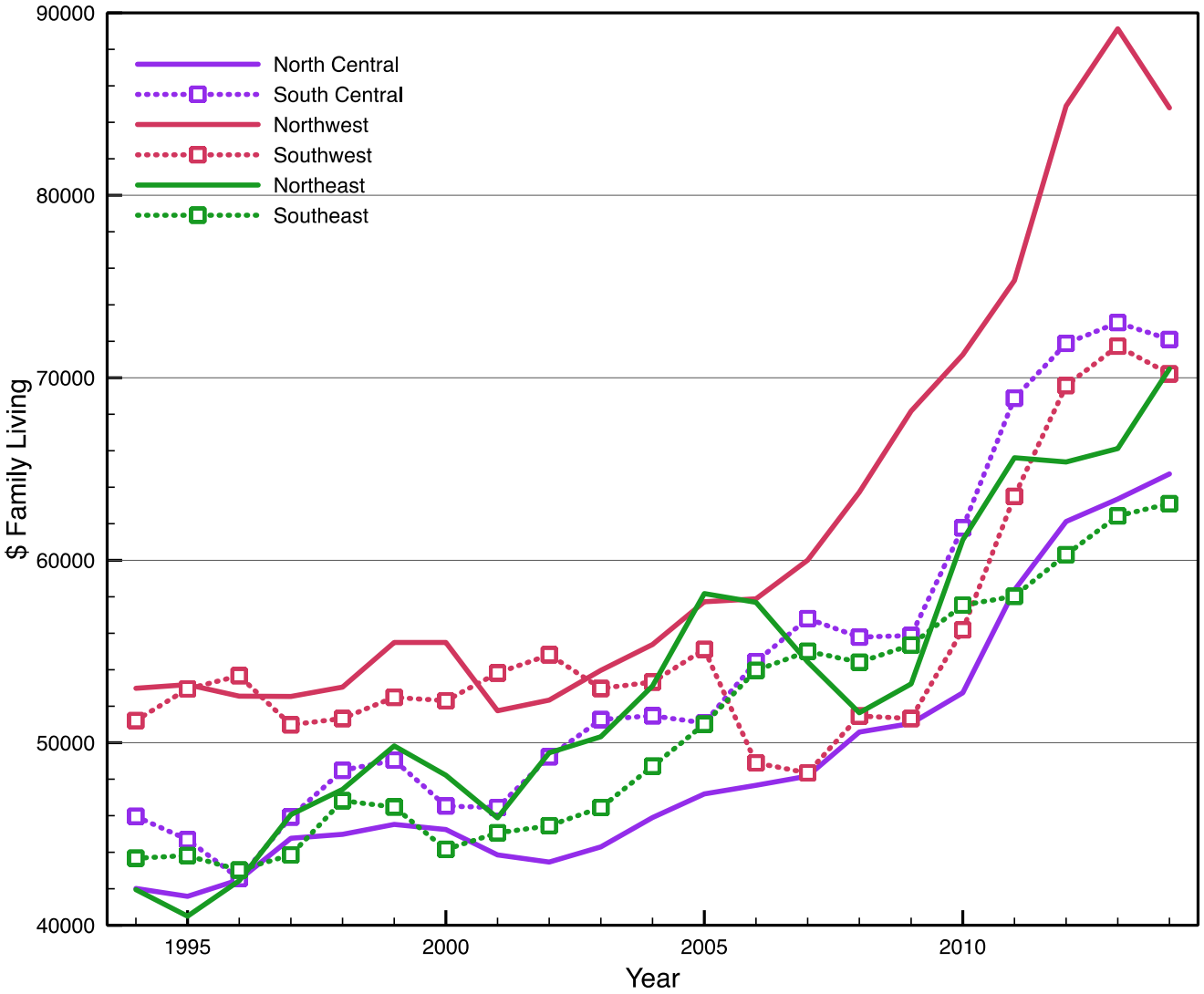

Figure 2. Two Year Rolling Average of Family Living by Region

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