FINBIN

2017

Report on Minnesota Farm Finances

Prepared: May 2018

Center for Farm Financial Management
University of Minnesota

Acknowledgements:

- Contributing Minnesota producers
- Minnesota Farm Business Management Education, Minnesota State
- Southwestern Minnesota Farm Business Management Association
- Thank you to Brittni Lamoreux for her help

This project was partially funded by a National Farm Business Management and Benchmarking Grant from the USDA National Institute of Food and Agriculture.

United States Department of Agriculture
National Institute of Food and Agriculture

2017 FINBIN Report on Minnesota Farm Finances

Dale Nordquist and Pauline Van Nurden
Center for Farm Financial Management

The 2,306 Minnesota farms included in the FINBIN database represent a broad cross-section of Minnesota production agriculture. While there is no "typical" Minnesota farm, these farms include a large enough sample to provide a good barometer of commercial farming in Minnesota. FINBIN data is provided by farms that participate in Minnesota State Farm Business Management Education programs and the Southwestern Minnesota Farm Business Management Association. These farms represent about 3 percent of the farms in the state and 14% of commercial farms with sales of over $250,000.[1]

Highlights

- Despite a third consecutive year of record crop yields, net income for Minnesota farms in 2017 degraded slightly from the previous year. The median net farm income for all Minnesota farmers included in FINBIN was $28,620, down from $36,159 in 2016.
- Crop farm earnings retreated to the historically low levels seen in 2014 and 2015. The median crop farm earned $24,170 in 2017, down from $46,831 in 2016. Prices continued their decline that started in 2014.
- Dairy farm profits improved in 2017, led by profits received in the first half of the year. The median dairy farm earned $42,260 compared to $27,666 in 2016. The average price received for milk was $17.92 per hundred pounds, up from $16.58 in 2016.
- Pork producer earnings saw the largest improvement in 2017. The median pork producer earned $101,307, up from $26,847 in 2016.
- The median beef producer saw breakeven profitability in 2017, making just $7,261. For the second straight year, the median beef farm did not produce any income toward meeting family living needs.
- The average farm earned a rate of return on assets of 2.3%, up from 2.0% in 2016 (based on adjusted cost or book valuation of assets). Liquidity continued to decline slightly. Working capital declined by almost $9,000 for the average farm. Term debt coverage averaged 1.12:1, meaning that the average farm earned just enough to cover scheduled debt payments.
- Government payments were down 26%, at $16,624 for the average farm. Payments represented only 2% of gross revenue.
- The average farm's net worth increased by almost $66,000. Seventy-five percent of that net worth growth resulted from farm and non-farm earnings while the other 25% resulted from increases in the estimated market value of farm assets. The average farm's debt to asset ratio increased slightly to 42%, up from 41% in 2016.
- Regionally, earnings were mixed. Earnings were highest in Northwest and Southwest Minnesota, while earnings were very low in the North Central/East Central region.
- As is usually the case, profits generally increased with farm size. Additionally, the larger the farm, the greater the rate of return on assets, giving larger farms the economic advantage. In 2016 the opposite was true. Last year, mid-sized operations had the economic advantage, with those operations having a greater rate of return on assets than larger farms.
- The average family spent $59,589 on family living expenditures, up less than 1% from the $59,384 spent on family living in 2016.

[1] Minnesota Ag News – Farms and Land in Farms, United States Department of Agriculture, National Agricultural Statistics Service, Washington, D.C., February 16, 2018.

Below are financial trends for these farms over the past three years.

Highlights (MN Average)	2015	2016	2017
Gross revenue ($)	785,941	778,598	779,675
Total expense ($)	742,494	721,453	718,817
Average net farm income ($)	44,520	58,804	62,884
Median net farm income ($)	27,478	36,159	28,620
Rate of return on assets (%)	1.2	2.0	2.3
Rate of return on equity (%)	-0.8	0.5	0.8
Corn yield (bu.)	198	200	204
Soybean yield (bu.)	53	56	48
Spring wheat yield (bu.)	69	67	73
Corn price received (bu.)	$3.74	$3.42	$3.24
Soybean price received (bu.)	$9.45	$9.07	$9.25
Spring wheat price received (bu.)	$5.26	$4.78	$5.47
Milk cows per dairy farm	184	193	206
Production per cow (lbs)	23,775	24,336	24,647
Milk price received (cwt)	$17.95	$16.58	$17.92
Market hog price / cwt. sold	$54.90	$49.87	$54.56
Wean pig price paid / head	$42.78	$39.71	$41.15
Finished beef price / cwt. sold	$148.24	$118.85	$119.54
Feeder calf price paid / cwt.	$218.32	$153.79	$150.48

Table 1: FINBIN Farm Financial Database Highlights, 2015 - 2017

Profitability

Minnesota farms experienced a fifth consecutive year of low profits in 2017. The median net farm income for all farms was $28,620, down from $36,159 in 2016 (Figure 1). There have not been three consecutive years with earnings as low as 2015-2017 in the 21 years included in the FINBIN database. Remarkably, Minnesota farms have produced record crops in each of the past three years. For a second year, over 30% of the farms analyzed lost money.

Average net farm income for all participating farms was $62,884, up 7% from the previous year. The fact that average income was higher than the median (middle) indicates the most profitable farms were profitable enough to positively skew the average for all farms.
Even with depressed prices, some farms were very profitable. The median net income for the most profitable 20% of these farms was $209,186; however, the median income for the least profitable 20% was -$57,990. As has been the case in each of the past five years, some very large operations reported very large losses in 2017.

Crop farm earnings decreased from the levels seen in 2016. The 2017 earnings retreated back to the extremely low levels of 2014 and 2015. In contrast, profits for all major types of livestock operations increased from 2016 levels. In particular, profits for intensive pork and dairy operations, those that do not also sell significant cash-crops, improved year over year. Beef operations endured a third year of breakeven profit levels in 2017.

Government payments were down in 2017. Most producers received an ARC payment for wheat. Payments on corn base acres were highly variable, with some counties receiving a payment and others not. These payments were reduced due to high yields in 2016 and lower prices used to calculate the benchmark revenue. Payments for soybeans were negligible. (Payments included are the cash payments received in 2017 and actually accrue to the 2016 crop year.) The average farm received $16,624 in total government payments in 2016, down from $22,454 in 2016. Government payments represented 2% of gross farm revenue and 26% of net farm income.

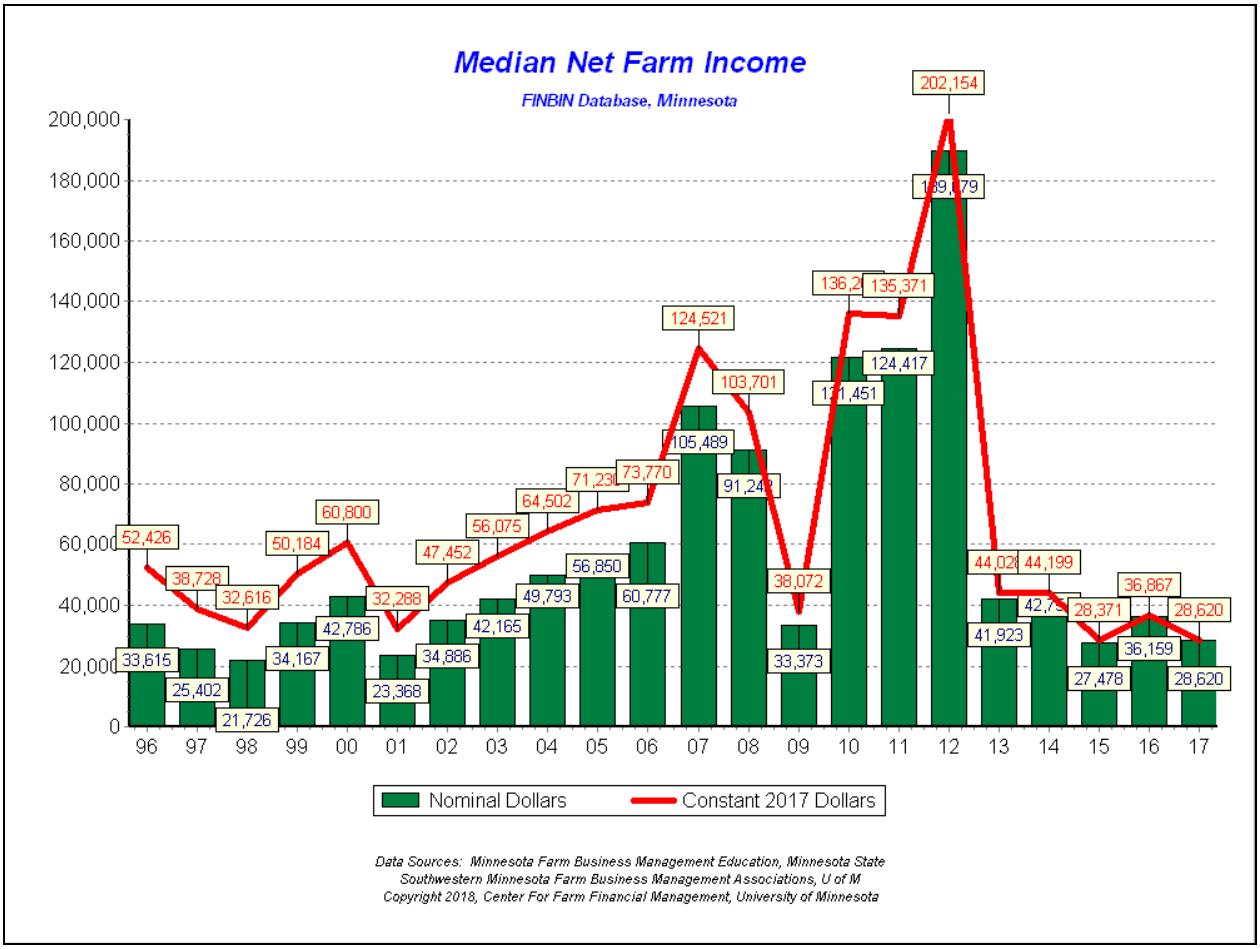

Figure 1: Median Net Farm Income

While Figure 1 may make it look like farm earnings have just returned to "normal" returns of the late 90's and early 2000's, it is important to note that today's farms are managing much larger operations (see Solvency below). The average farm earned a rate of return on assets (ROA) of only 2.3% (assets valued at adjusted cost basis[2]). Only in 2015 and 2016 has this group of farms earned lower returns in the 21 year history of the FINBIN database.

Rate of return on equity (ROE) improved over the gains made in 2016. These levels are well below the typical ROE producers have experienced over the 21 year time span of this report. Figure 2 shows the historic relationship between ROA and ROE. This relationship is a good barometer of sector profitability. Years when the ROE is higher than ROA are good years. When this is the case, borrowed capital earned more than its cost (ROA was higher than the interest rate paid on borrowed capital). When ROE is lower than ROA, as in 2017, the average producer lost money on every dollar borrowed. Current low interest rates somewhat protected highly leveraged operations from the consequences of these low rates of return.

Asset valuation is a major factor in measuring rates of return. Figure 2 is based on the adjusted cost or book value of assets. This provides the best picture of returns on funds actually invested by business owners. When assets are valued at estimated market value, ROA and ROE were somewhat higher, at 2.5% and 2.1%, respectively. This includes capitalization of estimated increases in asset values during the year in addition to actual farm earnings.

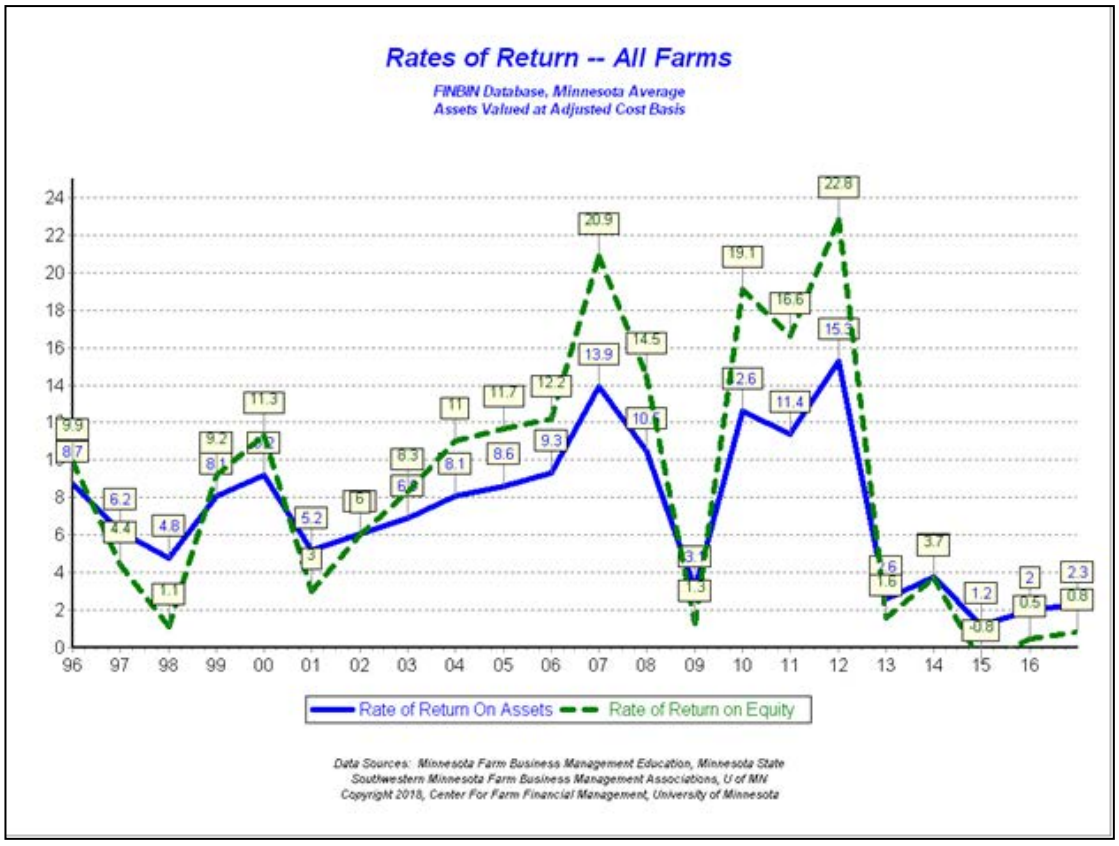

Figure 2: Rates of Return on Assets and Equity (%)

[2] FINBIN includes assets valued at cost (book) and at their estimated market value. Cost valuation of capital assets is based on "economic depreciation" which depreciates assets at a rate generally slower than allowed by tax law. The profitability measures displayed here are based on the cost value of assets.

Liquidity

Working capital has been a major focus for producers and ag lenders for the past several years. It is the major financial resource farms have to survive a period of depressed financial conditions like the one currently facing Midwest farmers. These farms built working capital rapidly during the "golden years" of 2007 through 2012. The average farm came into this period of declining profits in outstanding position.

Liquidity, based on working capital (current assets minus current debt) and the current ratio, continued its slow slide in 2017. Working capital declined by about $9,000 for the average farm. However, these farms, on average, have consumed $235,000 of working capital over the past five years, more than half of the $439,000 they had at the end of 2012.

The current ratio for the average farm was 1.60:1 (Figure 3) at the end of 2017 ($1.60 of current assets to cover each dollar of current debt), down slightly from 2016. The current ratio for MN farms has declined sharply over the past four years. Even with this decline, the average farm was still in a rather strong liquidity position. But given this deterioration, more farms than usual are likely experiencing financial stress.

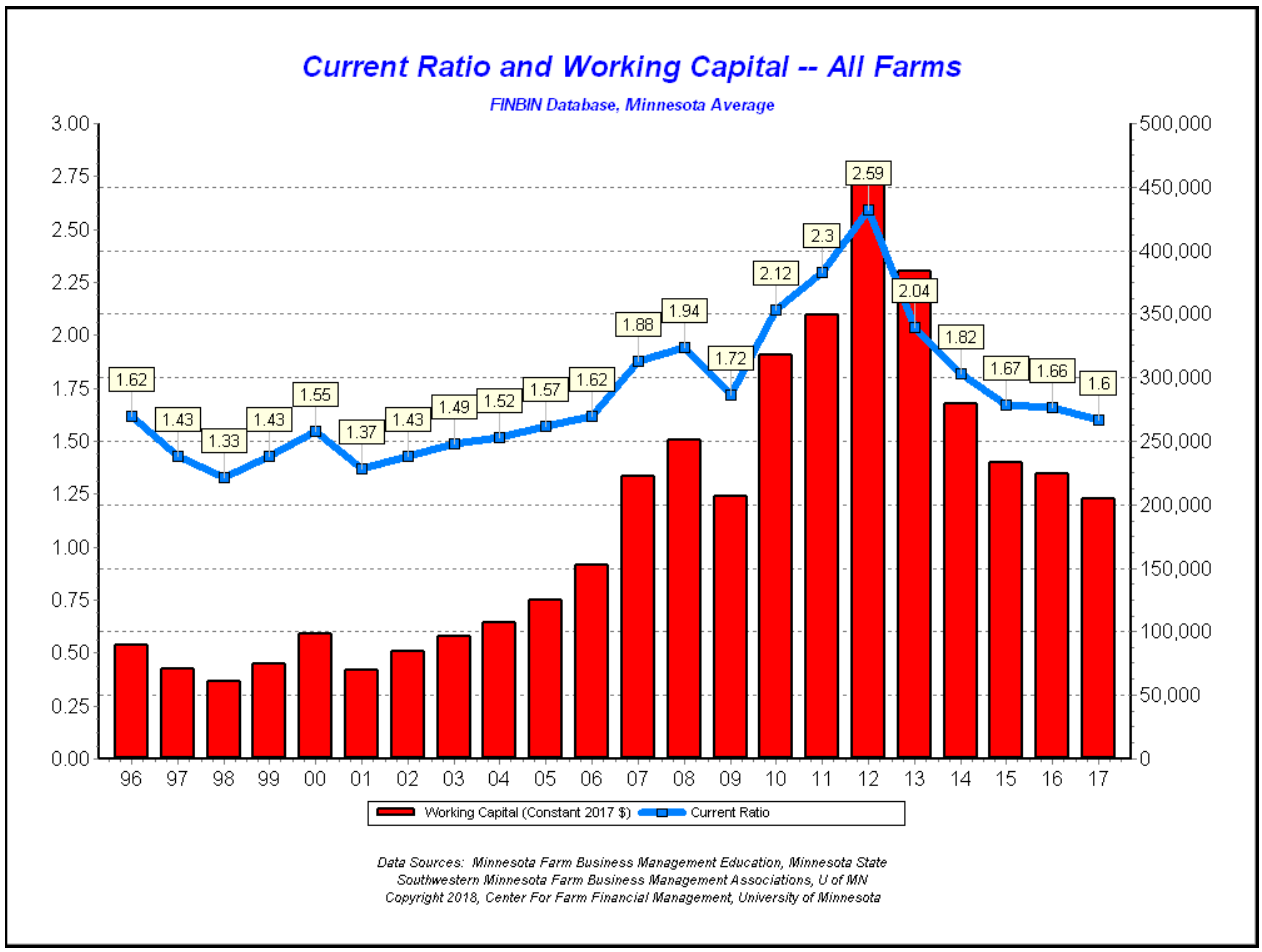

Figure 3: Current Ratio and Working Capital

Working capital to gross revenue may be a better measure of liquidity in that it relates the level of liquidity to business size. Figure 4 shows the relationship between working capital and gross revenue for these farms by type of farm. By this measure, the liquidity position for crop farms continued its slow decline. Dairy operations continued to lose liquidity, while hog and beef farms saw improvements in their liquidity position during 2017.

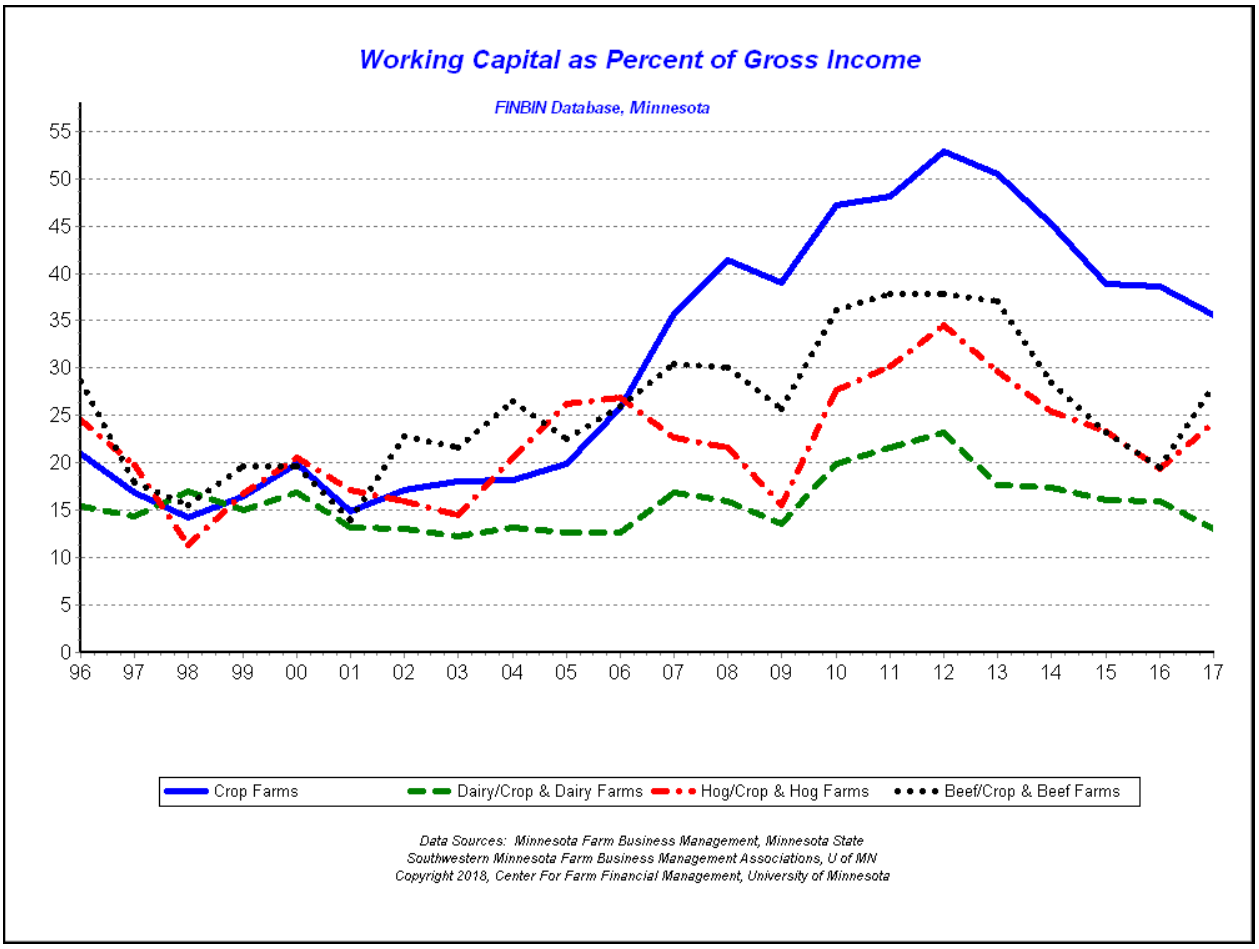

Figure 4: Working Capital to Gross Revenue

The average crop farm still had just over 35% of a year's gross revenue available in working capital at the end of 2017, down from a peak of 53% in 2012. At 35% working capital to gross revenue, the average crop farm is still above the recommended benchmark of 30%. It is concerning that the working capital to gross revenue measure dropped 3% on crop farms from 2016 to 2017. Strong yields helped maintain this level, but it is concerning that the 2018 crop may return to more average, trend line yields.

The average livestock farm, on the other hand, was below the recommended 30% benchmark. Dairy farms in particular, at 13%, are vulnerable to a sustained downturn. While dairy farms have never maintained high liquidity levels, this is a more serious concern now given the recent volatility of milk prices. Pork and beef farms each gained significant liquidity in 2017 and are much closer to the recommended 30% benchmark than they have been for several years.

The data does not tell us how much debt has been restructured in recent years. It is likely that the liquidity position of a number of farms has been enhanced by refinancing current debt with longer term credit.

With continued declines in liquidity over the past three years, there are certain types of operations that are in weaker liquidity positions and are more vulnerable to continued low profits than the average farm:

- All 1,163 crop farms lost liquidity in 2017. Those 61 crop farms with a debt to asset ratio over 80% ended the year with a negative working capital position.
- More than half of the dairy farms had decreasing or negative working capital positions. Most concerning is their working capital to gross revenue position is at 8% or less.

Solvency

The average farm's net worth increased by almost $66,000 in 2017. Of that, just over half was "earned net worth change," resulting from farm and non-farm earnings exceeding owner withdrawals for family living and taxes. The other portion resulted from changes in the estimated value of farm assets.

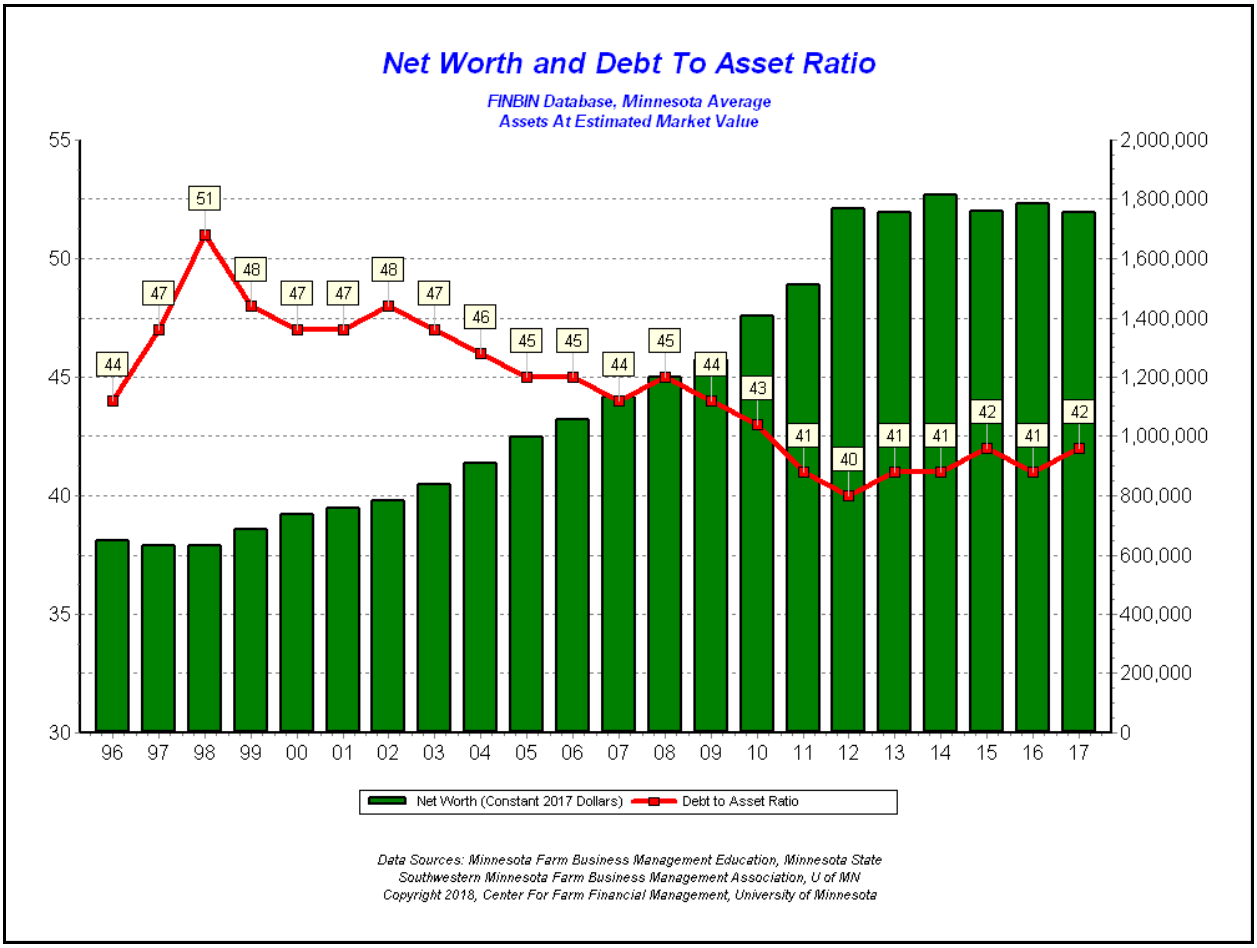

Figure 5: Debt to Asset Ratio (%) and Net Worth

The average farm's debt-to-asset ratio was unchanged at 42% when deferred tax liabilities are included. When deferred liabilities are excluded, the ratio was 32%, unchanged from the previous year. The net worth levels depicted in Figure 5 are a bit deceiving in that they appear to show decreases in 2013, 2015 and 2017. In fact, the average farm has reported a net worth increase in every year included in the FINBIN database. Apparent decreases result from changes in the mix of farms analyzed.

Debt to Asset Ratio	Under 40%	Over 60%
Number of farms	991	578
Rate of return on assets	3 %	2 %
Rate of return on equity	2 %	-6 %
Current ratio	3:1	1:1
Working capital to revenue	51 %	2 %
Term debt coverage	1.7:1	0.7:1

Table 2: Impact of Financial Leverage, 2017

Table 2 shows the impact of financial leverage (or debt-to-asset position) on the financial performance of these farms. Highly leveraged farms were slightly less profitable than lower debt farms, based on ROA. That lack of profitability, combined with their debt position, is magnified in their ROE. They are much more vulnerable based on liquidity and repayment capacity measures.

While debt-to-asset ratios have not changed a great deal in recent years, there have been major changes on the balance sheets of these Minnesota farms. The average farm has grown rapidly (Figure 6). In constant dollars, total assets have increased by almost $1.9 million over this period. Total debt increased by over $750,000 over the same period. As a result, the average farm has gained over $1.1 million of net worth over the past twenty-one years in today's dollars. This equates to 8% growth in net worth per year.

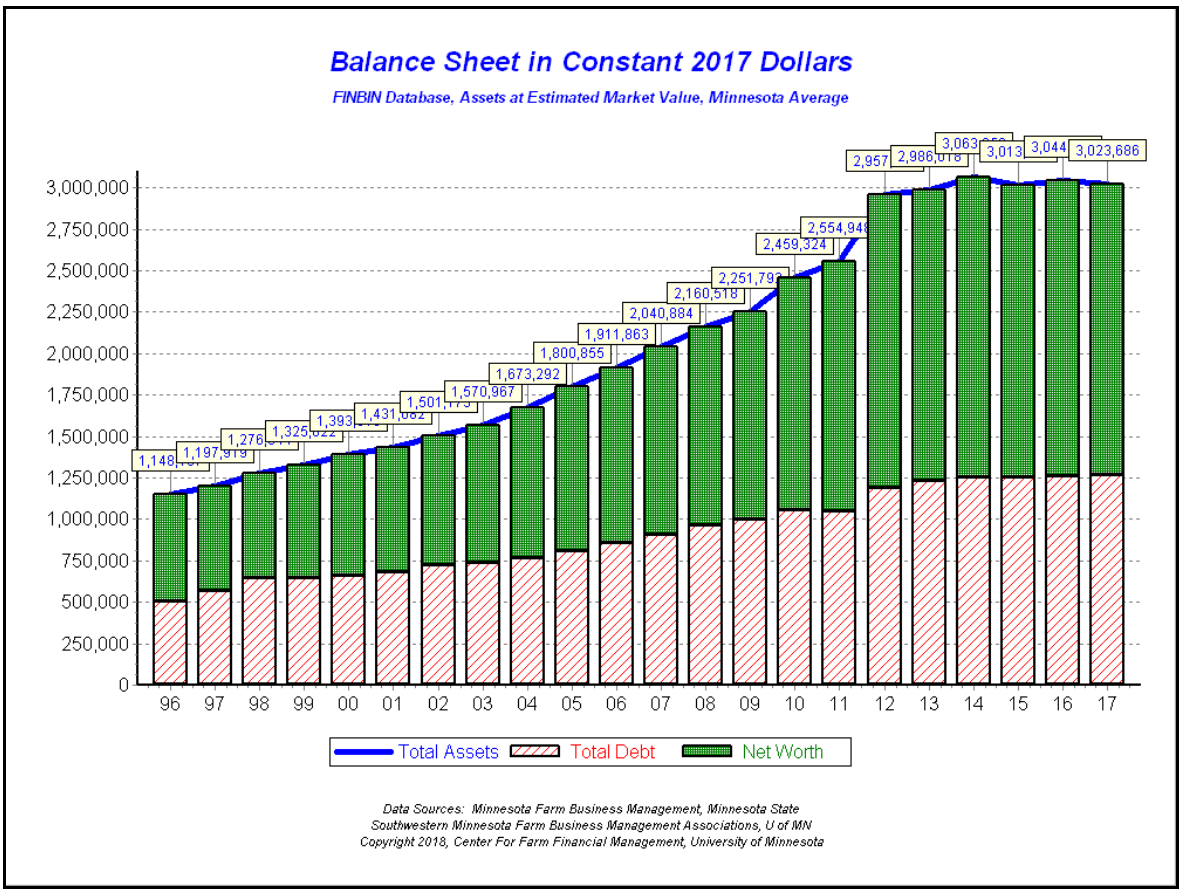

Figure 6: Balance Sheets at Market in Constant 2017 Dollars

Net worth change can have two sources – the amount resulting from retained earnings and the amount resulting from changes in the valuation of assets. Over this twenty-two year period, from 1996 to 2017, 75% of net worth growth for these farms was earned. Retained earnings result when farm and non-farm income exceed the amount consumed by family expenditures and income taxes. The remaining 25% of net worth growth resulted from asset appreciation.

It should be noted that the individual farms included in FINBIN change somewhat each year, as some farms exit and new farms join the contributing educational programs.

Debt Repayment Capacity

Debt coverage is a primary measure lenders monitor when extending credit to businesses. The term debt coverage ratio (TDCR) compares dollars available for debt repayment after family living and income taxes versus scheduled debt repayment on term (non-current) debt. A TDCR of 1:1 indicates that income available for debt repayment exactly equaled scheduled payments. While other measures of business soundness, such as current ratio and debt to asset ratio, tend to change very little from year to year, TDCR shows much more variation. Therefore, it is probably a better indicator of year-to-year financial stress.

Debt coverage continued to improve slightly for the average farm in 2017. 2015 was the only year during this span where TDC was below 1:1. The average TDCR for these farms in 2017 was 1.12:1. At 1.12 for the average farm, it is clear that nearly half the farms did not generate enough income to meet their debt commitments. For many this may be the third or fourth consecutive year of a shortfall. That doesn't mean they did not make their payments; it means that they had to consume working capital to meet their financial obligations.

All farm types had a 1:1 debt repayment level or greater, on average. Crop farms were the only farm type to see their TDC deteriorate year over year, going from a 1.25:1 in 2016 to 1.0:1 in 2017. All major types of livestock operation, dairy, beef and pork, had improved debt repayment and met the 1:1 benchmark. Beef farms, on average, generated only $1.01 for every dollar of schedule debt payments; hog farms $1.31; and dairy farms $1.15. The deteriorating repayment capacity on crop farms contributed to the $26,000 reduction in working capital reported by the average crop farm.

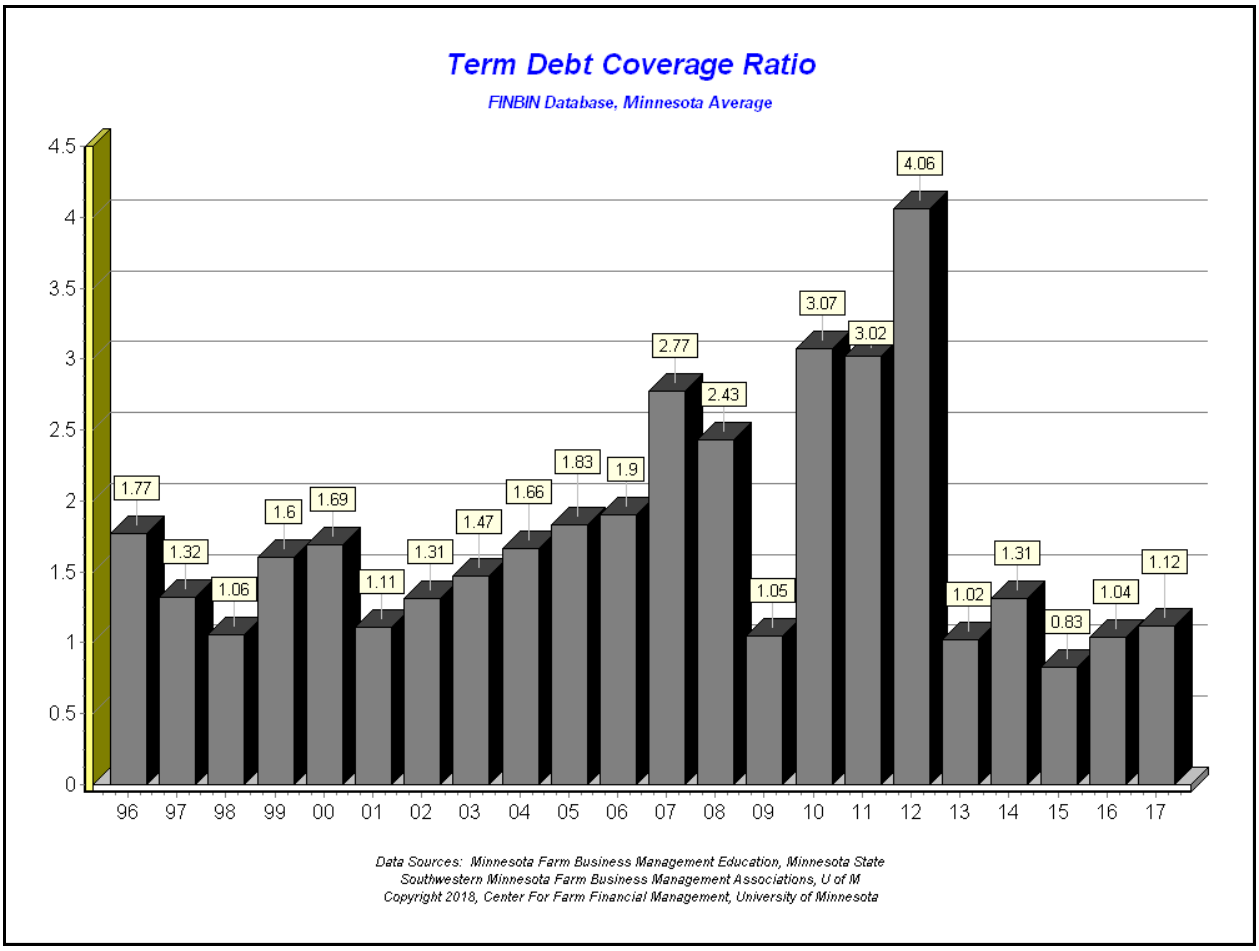

Figure 7: Term Debt Coverage Ratio

Regional Profitability

Incomes levels varied significantly by region of the state. In most regions, incomes were historically low and retreated from the income levels of the previous year. Incomes decreased in the Northwest, as compared to 2016, but were still the highest levels in the state. This is like due to above average yields and lower rental rates compared to areas to the south. The median crop farm in the Northwest earned almost $84,000, far more than crop farms in other regions of the state.

The only region experiencing increased income in 2017 was Southeastern Minnesota. The profitability of this region was likely driven by dairy farmers. These dairy farms had higher profits than other dairy farms in the state. It should be noted though, the profitability level of this region, along with all regions of the state, remain low, as compared to historical levels.

Incomes were lowest in the North Central/East Central region. This is traditionally a low income region of the state. While yields were above average in 2017, farms overall saw limited profitability.

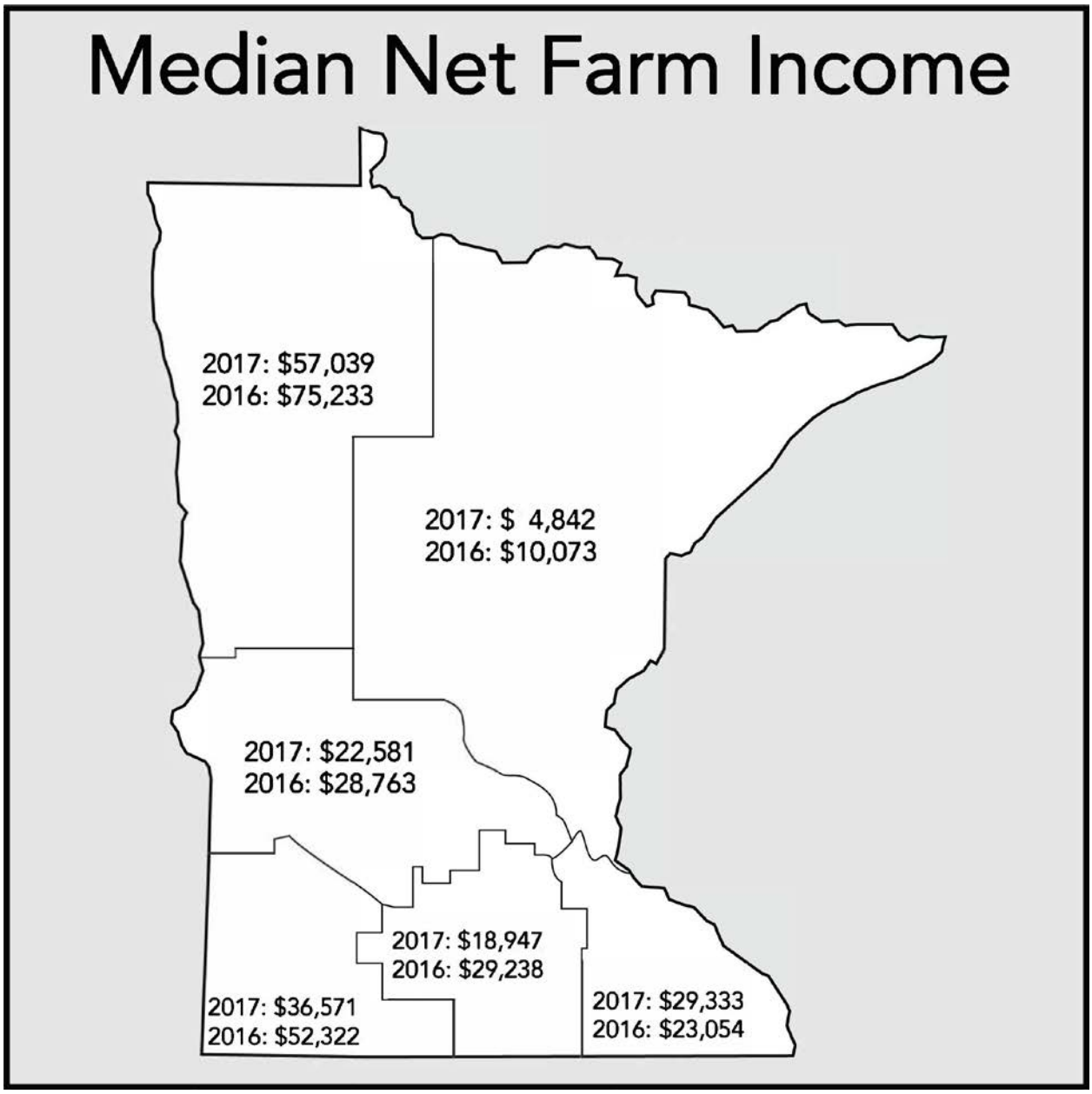

Figure 8: Median Net Farm Income by Region

Type of Farm[3]

Much like the previous year, 2017 was not a stellar year for any of the major types of farming operation in Minnesota. Pork production was the most profitable commodity, while crop producers saw their already low profits take a further dip. Dairy and beef farm profits improved, but remained below the family living needs of the average family. Most farms that produced crops for sale or feed benefited from another outstanding growing season but for many, that did not protect them from low profits.

Crop Farms

The 1163 crop farms in the 2017 group earned a median net farm income of $24,170, down from $46,831 the previous year. 2017 was the fifth consecutive year of low earnings for these Minnesota crop producers. Low earnings have taken a bite out of working capital. Although the average crop farm still has working capital equal to over 30% of gross revenue, the average crop farm has lost almost $300,000 of working capital in the past five years. The average farm's debt-to-asset ratio has increased only one percent, however, over this period.

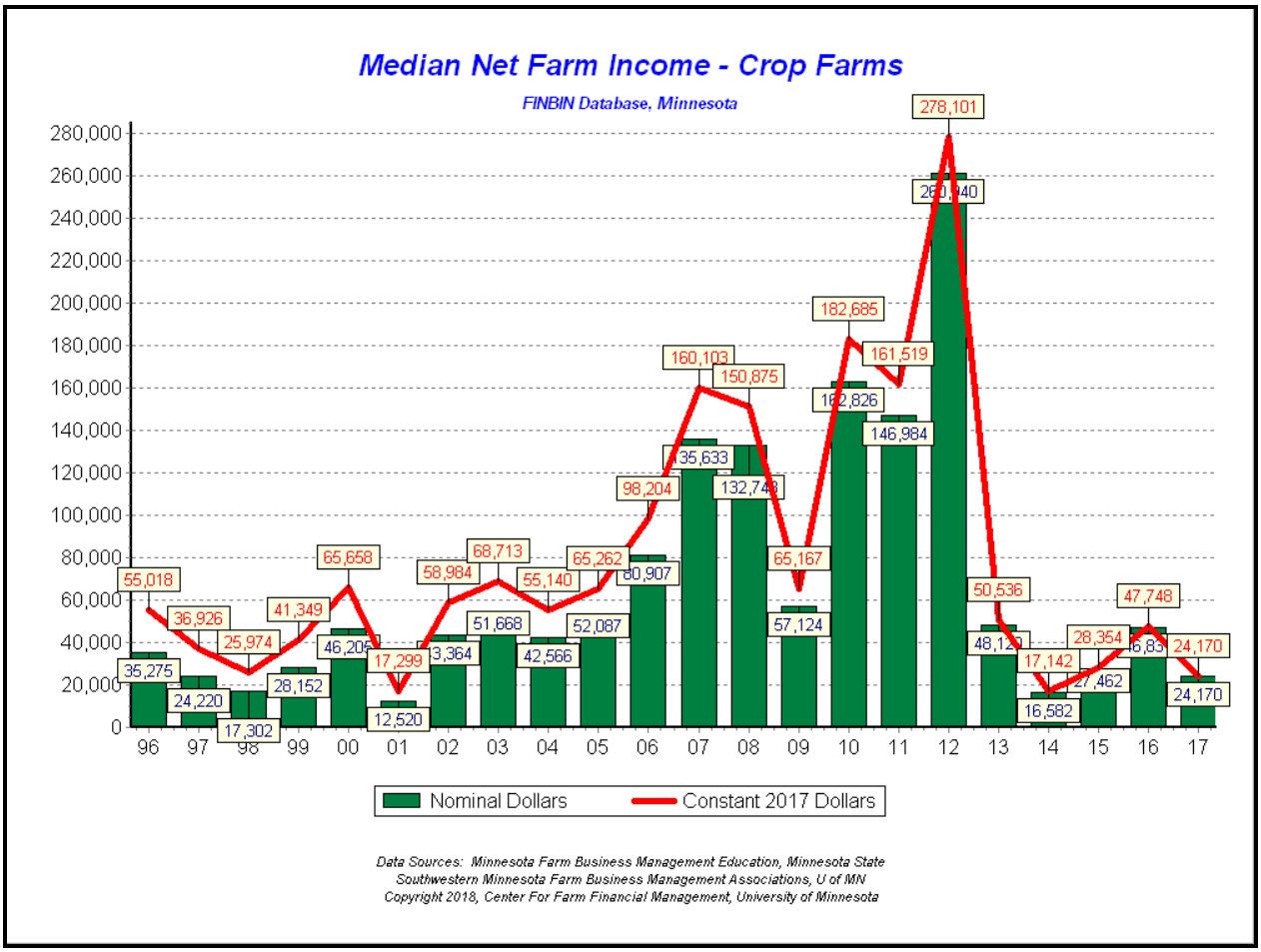

Figure 9: Median Net Farm Income, Crop Farms

[3] Farms are categorized based on 70% of gross receipts from the respective enterprise. For this report, hog, dairy and beef farms were categorized based on 70% of gross receipts from the livestock enterprise or a combination of that enterprise plus crop sales.

Yields for Minnesota's major cash crops were outstanding for third consecutive year. Corn yields broke the state record previously set in 2016[4]. Corn yields for farms included in FINBIN averaged 204 bushels per acre, 32 bushels over the average for the previous 10 years. Soybean yields were lower than in 2016 at 48 bushels per acre, but were still 3 bushels above the 10-year average for participating farms. Spring wheat averaged 73 bushels per acre, 22% above the 10-year average for these farms. Sugar beet yields also exceeded the previous 10-year average by 30%.

Crop Farms	**2015**	**2016**	**2017**
Rate of return on assets	1.4%	2.6%	1.6%
Rate of return on equity	-0.4%	1.8%	0.1%
Working capital to gross rev.	39%	39%	36%
Change in working capital	$-18,773	$15,234	$-26,618
Term debt coverage ratio	0.9:1	1.3:1	1:1
Net worth change	$35,321	$71,334	$66,547

Table 3: Crop Farm Returns

Prices were mixed compared to the previous year. The average sales price for corn was $3.24, down from $3.42 in 2016. Soybeans prices, however, were up from $9.07 in 2016 to $9.25, while spring wheat prices were also improved, from $4.78/bushel up to $5.47 in 2017.

Cost of production for corn was down very slightly. Fertilizer cost was down 13% (after decreasing by over 20% in the previous two years) and cash rents were down 3%. However, these savings were substantially offset by increases in drying and fuel costs. The net result was total corn expense were down only $5 per acre. Total costs per acre for soybeans and spring wheat were up very slightly.

The net effect was that, even with record yields, producers lost $24 per acre on corn production on cash rented land. They made $28 on soybean production, $102 per acre on spring wheat, and $177 per acre on sugar beets.

Given the weakened financial position of many crop producers after five years of low profits, record yields in 2017 likely saved some from major financial losses. Many producers are still facing a high degree of financial stress. For example, the 232 crop farms in the low profit 20% group had negative earnings of $107,000 in 2017. That group lost an average of $114,000 of working capital in 2017 and has only $64,000 of working capital left.

[4] Minnesota Ag News, 2017 Crop Production, National Agricultural Statistics Service, United States Department of Agriculture, January, 2018.

Corn	2015	2016	2017
Yield (bu.)	198	200	204
Price received / bu.	$3.74	$3.42	$3.24
Cost of production / bu.	$3.77	$3.60	$3.55
Cost per acre	$753	$714	$708
Soybeans			
Yield (bu.)	53	56	48
Price received / bu	$9.45	$9.07	$9.25
Cost of production / bu.	$8.34	$7.88	$9.22
Cost per acre	$456	$441	$443
Spring Wheat			
Yield (bu.)	69	67	73
Price received / bu.	$5.26	$4.78	$5.47
Cost of production / bu.	$5.37	$5.23	$4.91
Cost per acre	$372	$349	$357

Table 4: Crop Yields, Prices and Cost of Production for Major Minnesota Crops

Dairy Farms

Dairy farm earnings were up in 2017, albeit from a very low level. The median net farm income for the 456 participating dairy farms was $42,260, up from $27,666 in 2016. These increased earnings surprised many, given the very low milk price for the last portion of the year. In total, though, milk prices were up for the year, averaging $17.92 per hundredweight (cwt) compared to $16.58 in 2016.

The average dairy farm's liquidity positon tightened in 2017, with working capital to gross revenue of 13%. Working capital declined for the third consecutive year. These dairy farms have traditionally carried less working capital than other types of farm, providing less buffer for a prolonged period of reduced income. Their solvency position deteriorated very slightly, with debt-to-assets increasing from 42 to 43%. Debt coverage improved, up to $1.15 generated to cover each $1 of scheduled payments.

As has been the case for several years, the farms with the largest herds were most profitable. The average herd of over 500 cows earned $362,157 and a 4.3% rate of return on assets. Earnings and rates of return increased consistently with herd size. These largest herds, however, had weak and deteriorating liquidity. The average of the 500-cow-plus herds had working capital equal to only 10% of a year's income at the end of the year and used up over $110,000 of working capital during the year.

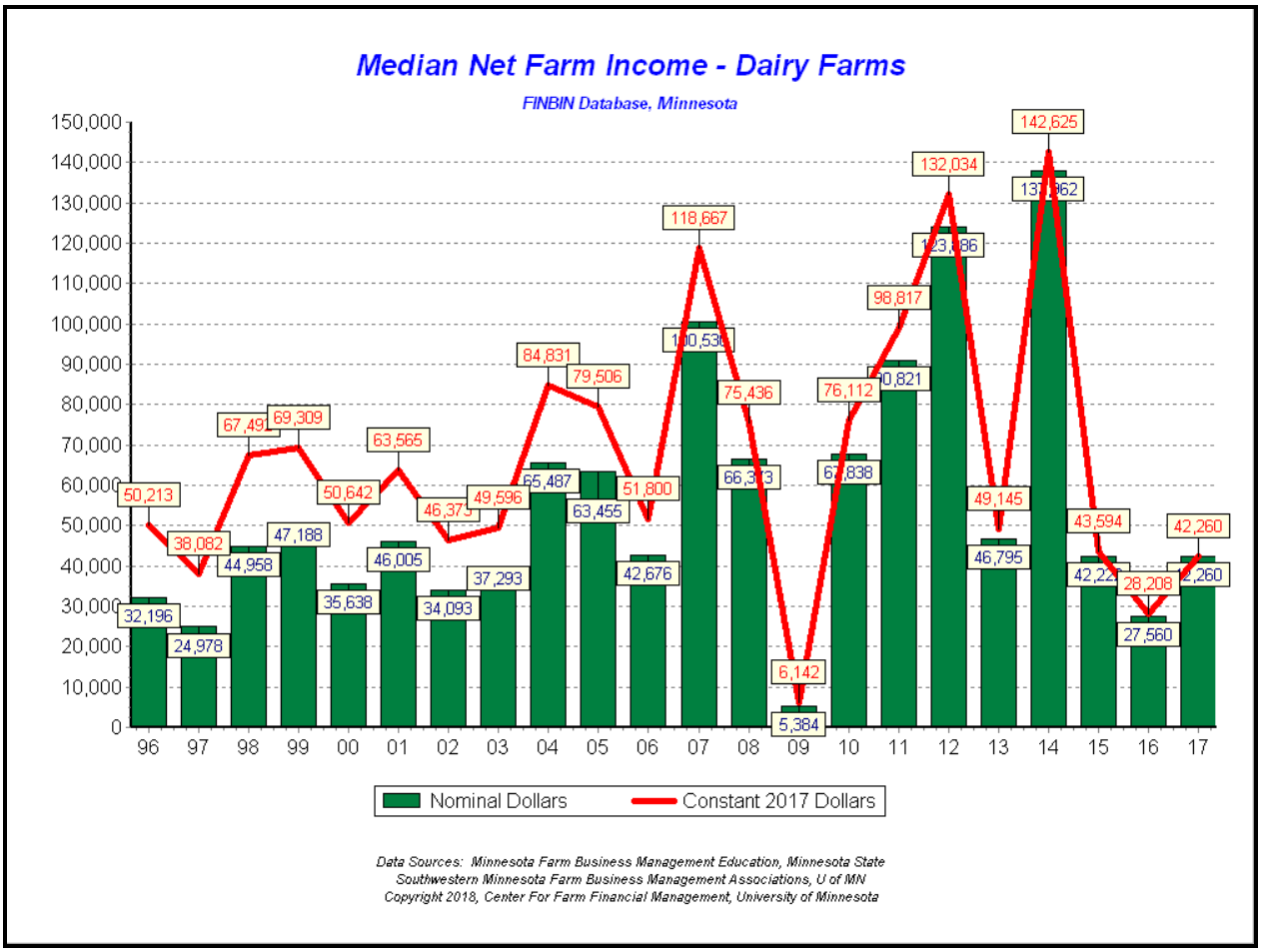

Figure 10, Median Net Farm Income, Dairy Farms

While milk prices increased, the cost of production increased too. On average, it cost $17.22 per cwt to produce milk in 2017, up from $16.79 the previous year. Total expense per cow increased by 4%. Feed cost increased by 2% while hired labor increased 7%. Energy related costs (fuel, custom hire, hauling) as well as repairs accounted for most of the cost increase.

Dairy Farms	**2015**	**2016**	**2017**
Rate of return on assets	2.1%	1.1%	2.6%
Rate of return on equity	0.6%	-1.3%	1.3%
Working capital to gross rev.	16%	16%	13%
Change in working capital	$-46,323	$-21,093	$-14,537
Term debt coverage ratio	1.0:1	0.8:1	1.2:1
Net worth change	$43,576	$36,218	$55,303

Table 5: Dairy Farm Returns

One of the noticeable trends for Minnesota dairy farms in recent years has been the production performance of large operations. While milk production per cow averaged 24,647 pounds across all operations, herds of over 500 cows averaged 27,119 pounds per cow. Large herds also have higher costs per cow, mainly higher feed costs and significantly higher labor costs. Total cost per cow trended from $2,494 for the smallest herds (1 – 50 cows), up to $4,161 for those with over 500 cows. On a per hundredweight basis, given higher production per cow, large herds produced milk at a lower cost than any other herd size. On the bottom line, the net return per cow was $466 for large operations compared to $295 for all smaller herds.

Dairy Farm Highlights	2015	2016	2017
Number of dairy enterprises	392	418	394
Average number of cows	184	193	206
Production per cow (lb)	23,775	24,336	24,647
Price received / cwt	$17.95	$16.58	$17.92
Cost of production / cwt	$17.50	$16.79	$17.22
Cost per cow	$3,873	$3,648	$3,777

Table 6: Dairy Enterprise Highlights

While profits for conventional dairy farms have declined in recent years, organic dairies have been very profitable. The average organic herd netted $1,268 per cow compared to $344 per cow for conventional herds of all sizes. Organic herds were not as profitable as the previous two years, with the average organic price declining to $32.75, down from $35.02 in 2016. Over the years, organic dairy herds have typically netted higher returns per cow than conventional herds. That pattern was temporarily reversed in 2014 but it has returned in the past three years. The median net farm income for organic dairy farms was $102,035.

While profits were up for Minnesota dairy farms in 2017, it seems that more dairy farms are experiencing severe financial stress than any other farm type. Relatively low profits for the past three years, coupled todays severely low prices have taken a toll. Based on futures markets, prices are expected to remain low for the first half of the year, then recover in the second half. Farm management instructors report that several dairy farms have liquidated their herds in the past year and, given the current outlook, many more will likely stop milking in coming months.

Pork Farms

Pork production farms were the only farm type that generated significantly higher profits in 2017. The median participating pork producers made $101,307 from farm operations in 2017, up from $26,847 in 2016. While improved profitability is welcome, it is important to note that these operations tend to be some of the largest operations in the database, with very high investment. Rate of return on assets for these farms improved to almost 4%, still low by historical standards.

Note: While these farms quite large, they are not large by pork industry standards. The farrowing operations, in particular, are smaller than industry averages and results may not be representative of the industry.

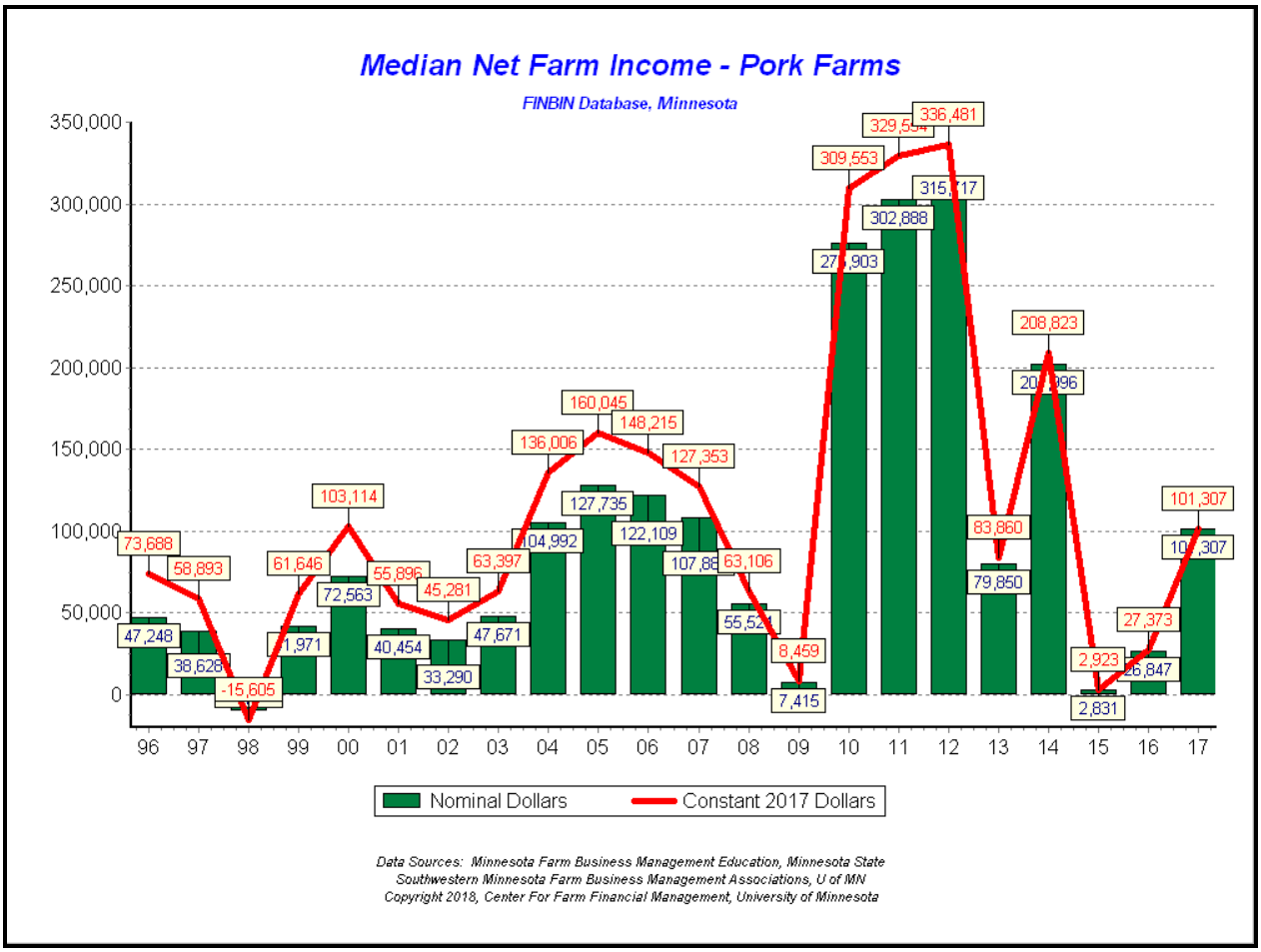

Figure 11, Median Net Farm Income, Pork Farms

Participating pork operations tend to carry more debt than other farm types. The average pork farm's debt-to-asset ratio stood at 45% at the end of 2016. After losing over $250,000 of working capital in the previous two years, the average farm added over $25,000 to working capital in 2017. Debt coverage was also markedly improved, going from under the 1:1 benchmark for the past two years to 1.3:1 in 2017. The average operation's net worth increased by $145,000, with almost $100,000 of that resulting from earnings.

Pork Farms	**2015**	**2016**	**2017**
Rate of return on assets	-0.9%	1.0%	3.9%
Rate of return on equity	-4.9%	-1.7%	3.9%
Working capital to gross rev.	23%	19%	24%
Change in working capital	$-180,709	$-84,552	$26,764
Term debt coverage	0.3:1	0.6:1	1.3:1
Net worth change	$29,380	$11,332	$145,066

Table 7: Pork Farm Returns

The limited number of Minnesota farrow-to-finish operations included in FINBIN had a big turn-around in 2017. After losing over $100 per litter in each of the previous two years, they made almost $150 per litter in 2017. The price received improved from $66.16 per cwt of carcass in 2016 to $71.21 in 2017. Producers also sold more pigs per litter. Feed costs increased by almost $1 per cwt produced. Total cost per cwt produced decreased from $74.93 in 2016 to $68.98, mostly due to increased production per litter.

Hog Farm Highlights	2015	2016	2017
No. farrow-to-finish farms	8	11	9
Average number of sows	431	416	324
Pigs weaned per sow	20.6	21.1	16.7
Price received / cwt (carcass)	$74.63	$66.16	$71.21
Cost of production / cwt	$78.96	$74.93	$68.98
No. pig finishing enterprises	65	67	54
Number of pigs finished	13,032	12,248	13,939
Price received / cwt (carcass)	$73.69	$66.99	$71.92
Cost of production / cwt	$76.10	$70.48	$70.23

Table 8: Pork Enterprise Highlights

Participating wean-to-finish operators operate on a much larger scale. The average wean-to-finish farm sold over 18,000 pigs. In 2017 these operations made over $11 per head after losing $3 per head in 2016. Their price received per hundredweight carcass improved to $71.92, up from $66.99 in 2016. Costs of production for finishers decreased very slightly. Feed efficiency improved, resulting in a decrease in feed cost per cwt of gain from $25.88 in 2016 to $24.29. The cost to purchase a weaned pig was $41.15, up $1.30 per head.

Another important segment of the Minnesota pork industry is those producers who contract to grow pigs for larger pork producers. One hundred twelve (112) producers reported contract growing income in 2017. The average wean-to-finish grower reported a net return of almost $10 per pig space. Returns for these enterprises have been positive and consistent for the past several years.

Figure 11 shows the cyclical nature of pork producer profits. It would appear that 2017 was the beginning of another upswing in profitability. Current uncertainty in international trade, as well as increased feed costs, temper this outlook. The latest forecast from Purdue University suggests these operations will likely produce pork at a small loss in 2018.[5]

Beef Farms

Profits for Minnesota beef operations improved slightly but remained very low in 2017. The median of the 172 beef operations in the farm management programs in 2017 made $7,261 from farm operations in 2017, up from 2016 when the median farm made only $647 (Figure 12). This group of farms includes both cow-calf operators and cattle finishers. In 2017, cattle finishers fared much better than cow-calf operations.

[5] Hurt, Chris, "Pork Tariffs Sour Industry Outlook," farmdocdaily.illinois.edu, April 2, 2018.

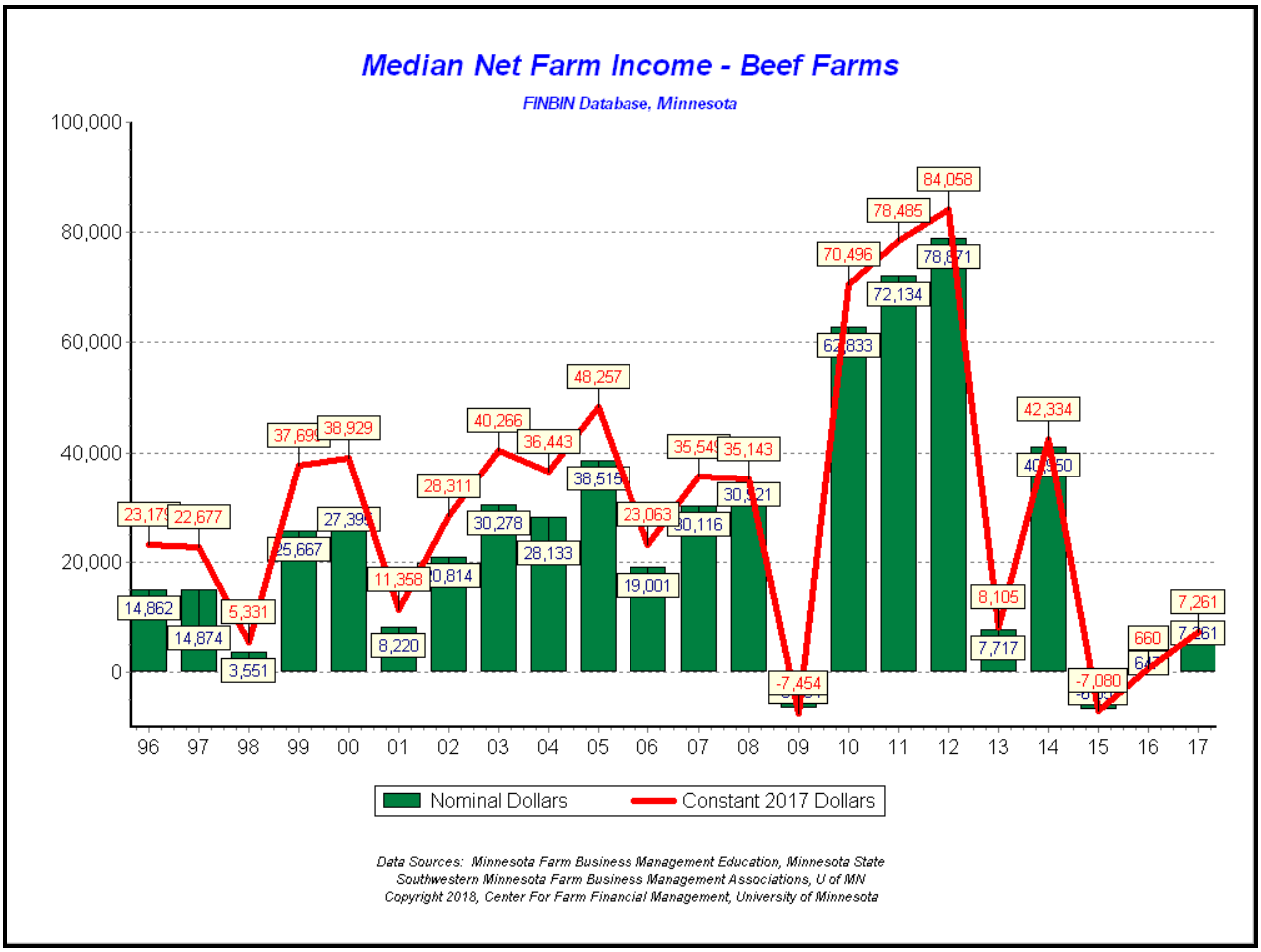

Figure 12: Median Net Farm Income, Beef Farms

While the improvement in profits for beef operations was modest in 2017, the overall financial position of these operations improved substantially. The average farm's working capital improved by almost $20,000 after deteriorating by over $120,000 in the previous two years. The average farm's net worth improved by over $40,000. Debt coverage reached the 1:1 level for the first time in three years.

Beef Farms	**2015**	**2016**	**2017**
Rate of return on assets	-2.2%	-0.5%	1.7%
Rate of return on equity	-9.0%	-6.1%	-1.1%
Working capital to gross rev.	23%	20%	20%
Change in working capital	$-87,605	$-30,068	$19,003
Term debt coverage ratio	0.1:1	0.4:1	1.0:1
Net worth change	$14,627	$15,393	$41,610

Table 9: Beef Farm Returns

Cow-calf producers enjoyed six consecutive years of profits from 2010 to 2015. In 2017, they experienced losses for the second year in a row, although losses were not as severe as in 2016. The average producer lost $13 per cow in 2017 compared to a loss of $83 in 2016. Calves sold for $148.09 per cwt, down from $156.33 in 2016. Costs for cow-calf producers were unchanged. Feed cost reductions were offset by increases in other expenses.

Beef Farm Highlights	2015	2016	2016
No. of cow-calf enterprises	112	115	112
Number of cows	70	68	70
Calf weaning percentage	90%	89%	87%
Calf sales price / cwt	$205.60	$156.33	$148.09
Calf cost of production / cwt	$160.14	$170.20	$170.41
No. beef finishing enterprises	61	75	78
Number of head finished	228	235	215
Average daily gain	2.49	2.63	2.78
Purchase price per cwt.	$218.32	$153.79	$150.48
Finished beef price / cwt	$148.24	$118.85	$119.54
Finishing cost of production / cwt	$173.12	$127.08	$112.11

Table 10: Beef Enterprise Highlights

Cattle finishers enjoyed a big turn-around in 2017. After losing almost $80 per head in 2016, they made almost $150 per head in 2017. The average price received was almost unchanged at $120 per cwt, but the cost of feeder cattle was down slightly, at $150 down from $154 per cwt in 2016. Cattle finishers have made remarkable reductions in cost of production in the past several years. A big part of that reduction has been the reduced cost of feeders. Last year it cost cattle feeders $112 per cwt when the cost of feeders is included. Feed costs were down almost $20 per head.

Expansion of the national beef cow herd continues. “Where beef and cattle prices wind up in 2018 will depend in part on the strength of both domestic and export demand,” says Purdue economist James Mintert. He projects increased supplies pushing prices down to the $115 per cwt level, likely resulting in lower profits for 2018.[6]

Size of Farm

Figure 13 shows how farm income varied with farm size. The blue line shows the median net income of all farms within each size group. The green line shows the median income of the high income farms, and the red line shows the median of the low income farms in each size group based on gross revenue.

[6] James Mintert, “Cattle Inventory Growth Slowing Down, But Beef Production Still Increasing,” farmdocdaily.illinois.edu, February 5, 2018.

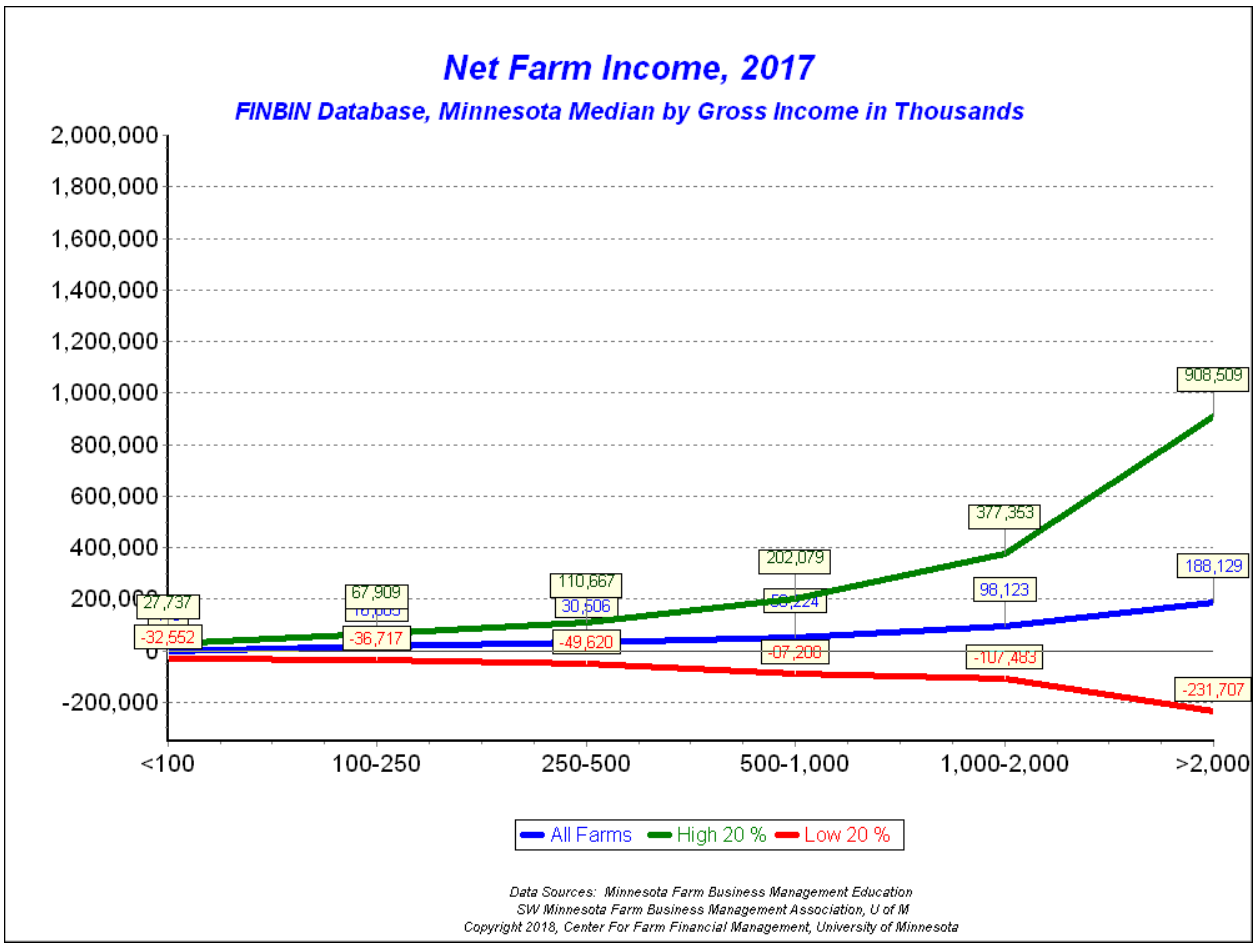

Figure 13: Net Farm Income by Farm Size

While large operations in general earned more than smaller operations that difference has not been as large recently as in the past. In fact, there has been as much or more variability within the size groups as there is between them in recent years. There were large numbers of farms within each group that were very profitable. But there were also large numbers in each group that experienced substantial financial losses.

Every year there are producers who, for various reasons, suffer financial losses. It is not unusual for small operations that may rely on non-farm earnings for most of their living needs to suffer losses. What has changed in recent years is the size of losses suffered by some very large producers. In each of the past five years, many large farms have not only lost money but they have lost a lot of money. On the other extreme, there are still many large operations that have been very profitable, even in these challenging financial times. In 2017 this pattern held across all enterprises, crop farms, dairy farms, and pork producers.

In profitable years, large farms' incomes are multiplied by volume. In low income years like 2017, size can work against operations as losses are multiplied. While this was not the case for all large operations in 2017, it does appear to have been the case for a subset of large operations of every farm type.

We have tracked this contrast between large farms that are very profitable vs. those large operations that are struggling financially for the past five years, particularly for crop farms. Generally the data indicates that profitable farms have performed a little better in several different areas, including production, capital investment, cost control, and marketing. When combined, all of those small differences add up to major whole farm advantages.

Table 11 shows the characteristics of low profit and high profit farms among the largest crop farms (those that grossed over $1 million). This table is, for the most part, consistent with the previous several years. The difference in balance sheet position has increased over the years, indicating differences in liquidity and solvency may be a result of financial performance rather than a cause. The loss of working capital in 2017, and their resulting working capital position at the end of 2017, is very concerning for the low income group of farms.

Crop Farms with Greater Than $1,000,000 Gross Sales	**Low Income Farms**	**High Income Farms**
Gross sales	$2,136,000	$2,244,000
Median net farm income	$-192,000	$520,000
Debt to assets (excludes deferred liabs)	40%	24%
Current ratio	1.2:1	2.3:1
Working capital to gross revenue	11%	58%
Change in working capital	$-315,000	$94,000
Term debt coverage (accrual)	-0.4:1	2.7:1
Asset turnover rate	34%	31%
Operating profit margin	-12%	22%
Age of principal operator	51	50
Total crop acres	3,173	3,390
Percent crop acres owned	17%	30%
Corn yield	198	209
Soybean yield	49	45
Corn price	$3.16	$3.32
Soybean price	$9.24	$9.30
Machinery investment per acre	$613	$593

Table 11: High Income vs Low Income Large Minnesota Crop Farms, 2017

Some characteristics have held in each of the past five years. Based on asset turnover rates, the low income group is not over-invested, at least not more than their high income neighbors. The big difference has been in the operating profit margin. The high profit farms appear to have controlled costs across the board more effectively than the low profit group. Small cost savings per unit make a big difference in operations of this size.

It must be remembered that farms move in an out of these categories from year to year. Just because a farm is in the low profit group this year does not mean that they will struggle next year. But in general, these low profit farms face much higher financial risks.

Family Expenses

For the first time in five years, following the farm income collapse of 2012, family living costs ticked up. Approximately one-quarter of the families included in the Minnesota FINBIN database keep detailed family living records in addition to their farm financial records. The average of these farms spent $59,589 on family living expenses in 2017 when family consumption of farm produce is included (Figure 14). Medical care and health insurance, when added together, were the highest single expenditure at $9,588. Health insurance was down 14% while medical care cost increased by 6%. Food and meal expenses increased by 7%.

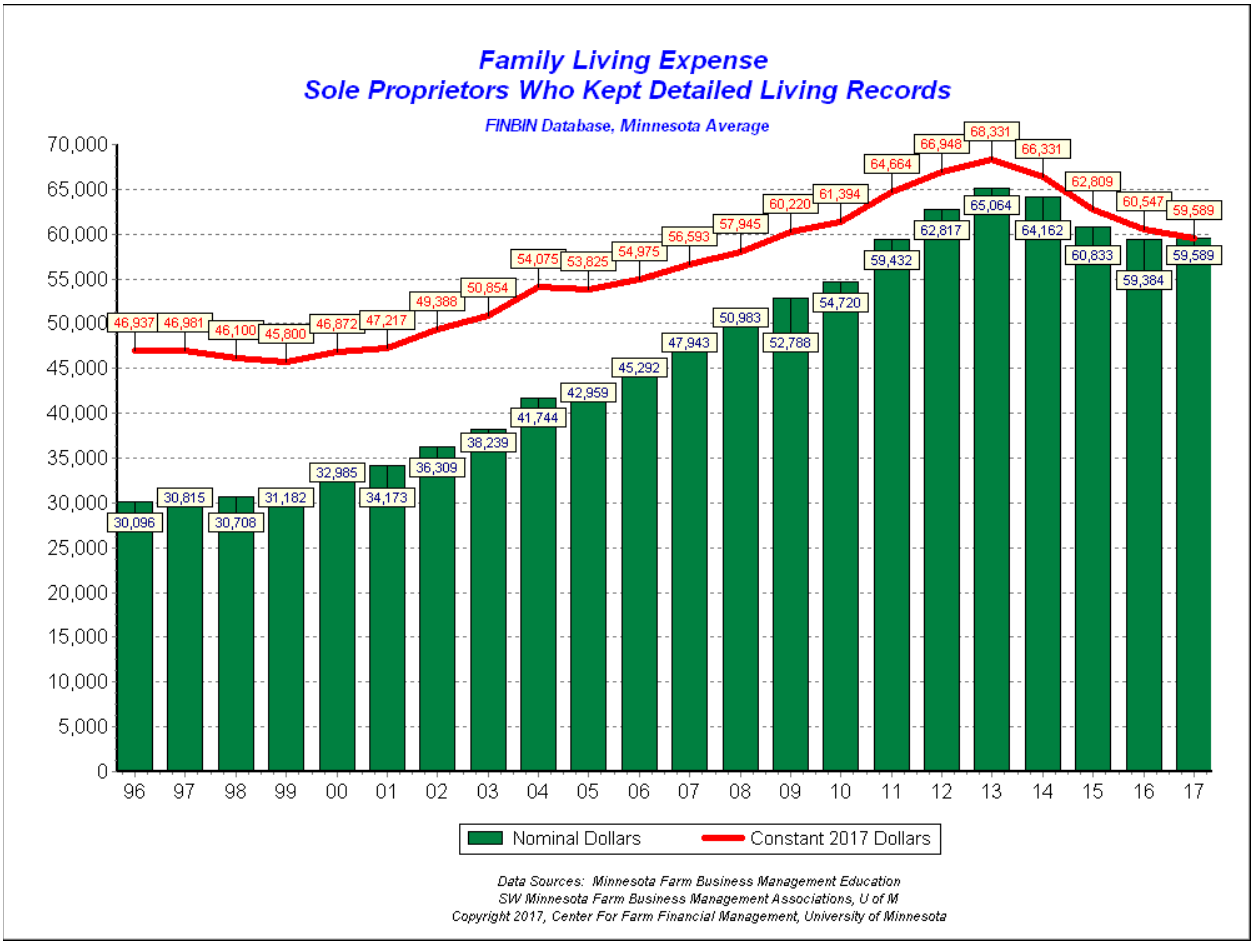

Figure 14: Family Living Expense

In addition to family living, the average family paid income and social security taxes of $15,385 and another $6,600 for household furnishing, non-farm vehicles, and other non-farm, non-real-estate capital purchases. In total, the average family needed to earn over $81,000 from farm and nonfarm sources to cover family consumption and taxes, and thereby grow net worth.

Data Sources

The Minnesota data included in FINBIN is provided by producers who are participants in farm business management education programs throughout the state. The majority of the farms included (2,148) are participants in the Farm Business Management Education programs offered through Minnesota State. More information is available on these programs at https://agcentric.org.

Another 99 farms are members of the Southwest Minnesota Farm Business Management Association. More information is available on SWMFBMA at: http://swroc.cfans.umn.edu/ag-programs/swmfbma.

Fifty-nine farms were contributed by other affiliated groups.

FINBIN data is not survey data. Participating producers complete a comprehensive financial analysis of their operation at the end of each year, with the help of a farm management educator. The farm financial data is processed through several levels of screening for accuracy and completeness. Every effort is made to verify the integrity of each set of farm financial data included in the database.

Sales Class	Total Minnesota Farms	Number of Farms in FINBIN	Percent in FINBIN
< $100,000	48,100	257	0.5%
$100,001 – $250,000	8,400	440	5%
$250,001 – $500,000	6,400	561	9%
$500,001 – $1,000,000	5,000	546	11%
> $1,000,000	5,300	502	9%

Table 12: Size of Farms included in FINBIN vs. Minnesota Farm Population

The FINBIN database includes a substantial share of Minnesota commercial farms. Table 12 compares the farms included in FINBIN to all Minnesota farms based on USDA/NASS data. Based on these figures, FINBIN includes 10% of Minnesota farms that grossed over $250,000 and a lower percentage of smaller Minnesota farms. It must be stressed, however, that this is not a random sample of Minnesota farms. These farms choose to be involved in Farm Management programs and there may be characteristics of farms that participate in these educational programs that make them different from other farms in the state.

Bibliography

farmdocdaily, University of Illinois, www.farmdoc.illinois.edu.

FINBIN Center for Farm Financial Management, University of Minnesota, www.finbin.umn.edu.

Minnesota Ag News, 2017 Crop Production, National Agricultural Statistics Service, United States Department of Agriculture, January, 2018.

Minnesota Ag News – Farms and Land in Farms, United States Department of Agriculture, National Agricultural Statistics Service, Washington, D.C., February 16, 2018.