Liquidity Analysis of Iowa Farms: Record Net Farm Revenues Provide Cushion Against Market Risks

The accrued net farm income of commercial Iowa farms averaged $341,834 in 2021, according to the analysis of anonymized data from mid- to large-size farms collected by the Iowa Farm Business Association (IFBA). Such income level was 170% higher in real terms than in 2020, and 66% higher than the previous peak income observed in 2012 (Figure 1).

The 2021 average cash net farm income in Iowa was estimated at $153,383, 14% higher than in 2020 and the third-highest level on record after 2012 and 2013. The gap between accrual and cash income is mostly explained by the increase in crop inventory values between January and December 2021.

Despite the observed improvement in average net farm income, not all Iowa farms were profitable in 2021. However, even the bottom third of the farms (arranged according to their annual return to management) averaged positive accrued net farm income levels in 2021 for the second consecutive year after seven years of negative net farm income (Figure 2). In contrast, the top third group has consistently averaged incomes more than twice the size of the state average, reaching $870,901 in 2021. For a more detailed analysis of the three groups, see FM 1789, AgDM File C1-10: Iowa Farm Costs and Returns, store.extension.iastate.edu/Product/1812.pdf.

The financial efficiency of Iowa farms, measured by the rates of return to assets and equity, and the operating profit margin ratio, reached the second highest levels on record in 2021 (Figure 3). The increased income translated into an overall improvement in the financial situation of most Iowa farms.

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The IFBA is an independent association, managed and controlled by its farmer-members.

Deflated with the Consumer Price Index for All Urban Consumers (CPI-U 1982-84=100) published by the US Bureau of Labor Statistics, re-expressed as 2021=100.
The average unweighted increase in working capital between January and December 2021 amounted to $375 per acre. However, not all farms saw their working capital increase. While the share of farms with vulnerable liquidity declined in 2021, their average working capital remained negative.

**Overall Liquidity**

We analyze liquidity using four indicators: the current ratio, the annual change in working capital per acre, the share of farms with less than $250 in working capital per acre, and the share of farms with vulnerable liquidity ratings.

The average ending current ratio\(^3\) for Iowa farms peaked in 2012 at 7.08. It has since declined to 2.77 in 2017, bounced around that level in the following three years before increasing to 4.62 in 2021 (Figure 4). Having 4.62 dollars in cash, inventories, and other liquid assets per each dollar of liabilities that will come due over the next twelve months means that the average farm should be able to comfortably cash flow its normal operation (not accounting for any expansion plans) in 2022. Short-term liabilities declined by 9% and short-term assets increased by 29% in 2021.

A major drawback of comparing financial indicators across all farms in the sample through time is the variability of the sample size and its composition across years. In order to partially address this issue, Figure 5 illustrates changes in working capital per acre between January 1st and December 31st for the same set of farms at those two points in time. In 2021, the average increase in working capital per acre among the 312 farms with detailed balance sheets at both points in time was $375. This gain was the largest over the period for which farm-level data are available.

In an attempt to understand the distribution of liquidity across farms, rather than focusing on the average farm, Figure 6 shows the share of farms with negative working capital, and working capital per acre between zero and $250, between $250 and $500, and beyond $500. The share of farms with negative working capital increased almost uninterruptedly from 10% in December 2014 to 17% in December 2019, and declined to 6% by December 2021. Similarly, the share of farms with working capital below $250 per acre increased from 23% in December 2014 to 34% in 2019, and declined to 12% by December 2021. Furthermore, farms with more than $500 per acre in working capital accounted for 72% in 2021, showing a tremendous improvement in overall farm liquidity.

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3 The ending current ratio is calculated as current assets divided by current liabilities as of December 31.
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Based on farms’ ending current ratios, they were assigned a liquidity rating of vulnerable, normal, or strong. According to the Farm Financial Scorecard⁴, a current ratio above 2 indicates a strong liquidity position; a ratio below 1.3 indicates a vulnerable liquidity position, and a ratio between 1.3 and 2 is normal and indicates that liquidity should be kept under close watch⁵. To avoid outliers, only farms with current ratios between 0 and 50 were selected. Given the large number of farms in the sample with no short-term liabilities, a fourth category is shown in Figure 7, along with the three liquidity categories.⁶ In December 2014, there were 4.2 farms with strong liquidity or no current liabilities per farm with vulnerable liquidity (70.8% vs. 16.8% of the sample, respectively). Five years later, that ratio declined to 2.1, given the increase in the share of farms with vulnerable liquidity to 28.8% and the reduction in the share of farms with strong liquidity or no current liabilities to 61.6%. In December 2021, there were 6.6 farms with strong liquidity or no current liabilities per farm with vulnerable liquidity, as a result of the 10.4 percentage point decline in the share of farms with vulnerable liquidity.

Figure 8 shows the evolution of working capital per acre for each of the four groups of farms presented in Figure 7. The average working capital per acre in December 2021 was the highest on record for all groups of farms, and annual increases ranged from $117 for the vulnerable group to $358 for farms with no current liabilities.

It must be noted that the sample size became smaller through time, from around 550 farms in 2014 to about 300 farms in 2021, affecting the robustness of the comparisons presented in the present section. The next section explores the overall liquidity situation of farms for the same subset of farms over the most recent three years.

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⁵While dairy farms or other farms that have continuous sales throughout the year can safely operate with lower CRs, operations that concentrate sales during several periods each year (such as cash grain farms) need to strive for higher CRs, especially near the beginning of the crop year.

⁶Due to rounding, some shares might not sum to 100%.
Analysis of a Stable Subset of Farms
The declining number of farms in our sample through the years and the changing composition of the annual samples might drive some of the results presented in the previous section. In what follows, the analysis is limited to a subset of 264 farms with detailed balance sheet records across the most recent three years. We interpret the data from January 1, 2019, as data from December 31, 2018. Since some farms in the sample operate integrated crop-livestock operations, we replicate the analyses for farms with no livestock production or “crop-only farms” to evaluate whether qualitative results depend on the mix of enterprises.

Figure 9a highlights the growth in the share of farms with vulnerable liquidity from 29.2% in 2018 to 32.6% in 2019, followed by an abrupt decline to 10.2% in 2021, and the increase in the share of farms with strong liquidity or no current liabilities from 57.6% in 2018 to 77.7% in 2021. Note that while the percentages of farms in each category differ across Figures 7 and 9a, the qualitative results derived from them are similar. Additionally, Figure 9b suggests that crop-only farms have followed a similar pattern of deterioration and then improvement of financial liquidity, but the smaller share of vulnerable farms at each point in time among this subset of farms suggests that integrated crop-livestock operations tend to carry short-term liabilities more frequently than crop-only farms, and that current ratios below 1.3 are more prevalent among the former.

Figure 10a shows that working capital per acre increased for all groups of farms in 2021. This conclusion is similar to the one supported by Figure 8, showing that the changing composition of the farm sample does not affect the qualitative results. The nominal weighted average working capital per acre across the four categories was $387 higher in December 2021 than in December 2020: $916 versus $529. However, the average working capital for vulnerable farms remained negative, at ~$51 per acre.

Figure 10b illustrates a similar pattern for crop-only farms as Figures 8 and 10a. However, analyzing Figures 9 and 10 together, it can be concluded that while a smaller portion of crop-only farms tend to have a vulnerable liquidity rating, the working capital needs per acre for those farms then to be larger (more negative) than for integrated crop-livestock operations. The exception occurred in December 2021, when the average working capital for the crop-only group of farms with vulnerable liquidity amounted to ~$33 and the average working capital for the entire sample amounted to ~$51, in line with the notable improvement in the value of crop inventories.

The findings in this section reinforce the conclusion that overall liquidity improved in 2021 and fewer farms would need short-term financing in 2022.
Conclusions
This article explores the evolution of financial liquidity among mid- and large-size Iowa farms in 2021 against a backdrop of record-high net farm income. All indicators point to a smaller share of farms in vulnerable liquidity situations, and a reduced need for working capital financing at the beginning of 2022.

Multi-year trends suggest that overall farm liquidity has improved substantially in 2021, offsetting most of the persistent erosion of liquidity observed since 2014. However, increasing input costs, cash rental rates, and the uncertainty stemming from weather variability, the war in Ukraine, and supply chain disruptions, are major risk factors in 2022 and the foreseeable future. In order to address the effect of risks on the farming community, an array of confidential and 24/7, free-of-charge resources related to legal issues, finance, stress, crisis, and disaster are available through Iowa Concern (1-800-447-1985 or www.extension.iastate.edu/iowaconcern) and Project Recovery Iowa (1-844-775-WARM or https://covidrecoveryiowa.org).

One tool to help farmers better manage liquidity is the use of a realistic cash-flow budget.

Several publications by Iowa State University Extension and Outreach discuss how to develop and implement effective cash-flow budgets:


AgDM File C5-213: *Cash Flow and Profitability are Not the Same*, www.extension.iastate.edu/agdm/wholefarm/html/c5-213.html


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