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The Nuts and Bolts of Cash to Accrual Conversion

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*This article is written with an objective academic approach to encourage critical thinking and discussion, and has no reflection on practices being used by Farmer Mac, the lenders, or regulators with which I work.

The recent Graduate School of Banking at Louisiana State University brought cash to accrual conversion to the forefront. This was after I mentioned that not doing cash to accrual analysis was one of the seven biggest challenges and risks facing agriculture and the ag lending industry. A young banker stated, whether accurate or not, that three years of tax records would even out any variations. He then stated that the regulator said accrual adjusted records were not necessary, and 3 to 5 years of tax records were sufficient. Now, I did not verify who the regulator was, but this banker's perspectives are very common in the ag lending industry.

In my last article in the GPS Column, I discussed that failure to do cash to accrual conversion, particularly on highly-leveraged and/or growth-oriented accounts is a possible mistake being covered up recently by appreciated land values. A study entitled "Measurement Issues in Assessing Farm Profitability through Cash Tax Returns" by Dr. Freddie Barnard of Purdue University, Dr. Paul Ellinger of University of Illinois, and Dr. Christine Wilson of Kansas State University provides validity to this argument.

Their study of 1,045 Illinois farms found that the median absolute annual percentage difference between three-year average cash and three-year average accrual-adjusted net farm incomes was 57 percent for farms of stable size. Drilling down, this percentage was 43 percent for farms with annual gross farm revenue increasing at a rate of less than 5 percent; 50 percent for farms growing revenue at a 5 percent to 10 percent rate; 58 percent for farms showing over 10 percent growth in revenue; and 61 percent for farms with a debt to asset ratio greater than 40 percent. This is compelling evidence that highly-leveraged and/or growth-oriented farms are making 5, 10, and even 20-year long-term decisions based on information that lacks accuracy. The same could be said for lenders who are making long-term loans based on inaccurate information.

Now, let's dust off my old book, *Weighing the Variables*, written in 1991-92. While cleaning out my office at Virginia Tech, my colleague, Dr. Alex White, found ten copies still in wrap. We receive many requests for this out-of-print book annually, so I wonder, would selling a few on eBay fund my retirement?

First, what do you need to conduct the cash to accrual analysis? You need a beginning and end-of-period balance sheet. Next, pull out a Schedule F tax statement that represents the operating period between the dates of the two balance sheets.

Remember that an accrual-adjusted income statement measures revenue when generated and expenses when they are incurred, even if the revenue or expenses are not cash. On the revenue side, accrual-adjusted income statements incorporate changes in inventory, accounts receivable, and investment in growing crops from the beginning to ending balance sheets. In the expense section, adjustments are made for changes in supplies, prepaid expenses, accrued expenses, and accounts payable from the beginning to ending balance sheets. Adjustments made for sale of capital items and culled breeding stock are included on the accrual statement as well.

Now let's take each adjustment one at a time to determine the accrual-adjusted net income. An increase in inventory would be treated as revenue, even if it is not sold and cash is not received. A decrease in inventory likewise reflects a decrease in revenue. Changes in inventory can result from value changes, quantity/price changes or both. According to the Illinois study, inventory adjustment captures about 70 percent of the discrepancy between cash and accrual basis. As a lender, ask if inventory has risk protection, such as hedging or options. This could apply to investments in growing crops, as well. Are crops growing in the field covered by risk protection or crop insurance? The same analysis could be applied to collectable receivables. I caution lenders to ask whether receivables have a reasonable chance of being collected. Recently a hay grower found his \$700,000 receivable was not collectible, which really hit his profits hard, along with working capital and equity.

On the expense side, if accounts payable increase, this would reduce net farm income, while a reduction in accounts payable represents an increase in net farm income. An increase in prepaid expenses represents an increase in net income, and a decline in prepaid expenses represents a reduction. The same could be said for accrued expenses such as taxes, wages and accrued interest.

Now let's illustrate the cash to accrual conversion process using a simple example in Table 1. The Schedule F net farm income was \$50,000. There was no sale of breeding livestock above normal culling rates.

A \$20,000 increase of inventory, either in crop or livestock or both, either through price or quantity was apparent from the beginning to ending balance sheets. This, of course, would add to net farm income for the period. The farm had an increase of collectible accounts receivable, which resulted in a \$5,000 increase in net farm income. Similar analysis of the balance sheets shows an increased value in investment in growing crops either through acreage or inputs of \$10,000 added to the net accrual income. A decrease of supplies of \$1,000 represents a decline in the income on an accrual basis. Prepaid expenses increased from the beginning to ending balance sheet by \$20,000, resulting in increased net accrual income. The farm also had a \$5,000 reduction of accrued expenses and accounts payable declined \$7,000 over the period, each increasing net farm income. There was no gain, sale, or loss of capital assets.

Table 1: Cash Conversion to Accrual-Adjusted Income

		<u>Year ending 12/31/YY</u>
Schedule F Net Cash Farm Income (Profit or Loss)	+	\$50,000
Proceeds from sale of culled breeding livestock ¹	+	
Increase in inventory (livestock & crop)	+	\$20,000
Decrease in inventory (livestock & crop)	*	
Increase in accounts receivable	+	\$5,000
Decrease in accounts receivable	*	
Increase in investment in growing crops	+	\$10,000
Decrease in prepaid expenses (investment in growing crops, supplies)	*	
Increase in supplies	+	
Decrease in supplies	*	(\$1,000)
Increase in prepaid expenses	+	\$20,000
Decrease in prepaid expenses	*	
Decrease in accrued expenses	+	\$5,000
Increase in accrued expenses	*	
Decrease in accounts/rent payable	+	\$7,000
Increase in accounts/rent payable	*	
		\$116,000
Accrual-adjusted Net Income from Operations		\$116,000
Gain/loss from sale of farm capital assets excluding culled breeding livestock ²		
Accrual-adjusted Net Farm Income		\$116,000
¹ Found on tax form 4797 of income tax return "normal culling practices" ² Normal capital transactions (i.e. machinery, equipment, real estate) + increases accrual-adjusted net income, * reduces accrual-adjusted net income		

The net income of \$50,000 that was reported to Uncle Sam on a cash basis on Schedule F ballooned to \$116,000 on an accrual basis. This illustrates a large distortion in profits when calculating various ratios pertaining to the income statement. This analysis could also be useful for both producers and lenders in developing loan structuring packages when there are apparent large differences in these balance sheet items over the period. It can also assist the lender in properly servicing the account.

The purpose of this article is to present the potential magnitude of difference between net income calculated on a cash versus accrual approach, and the graphic example was designed to show an extreme case. Cash to accrual analysis is quite simple. If one obtains a Schedule F tax statement and beginning and ending balance sheets, and then makes seven adjustments and two entries of proceeds, it provides a clearer picture of true profitability for long-term capital expenditure decisions and financing.

Increased volatility in prices and cost only increase variation between cash and accrual income. The economic good times in agriculture have masked the need for analysis of accrual-adjusted income statements. A downdraft in the super cycle will expose agricultural financial analysis and underwriting standards based on Schedule F tax records very quickly, particularly on large growing and/or leveraged accounts.

Lender Tip

The power of cash to accrual statements came to light during a side conversation with an agricultural producer in the Upper Midwest. He had become disabled seven years ago due to a bout with cancer. He had disability insurance; however, the company was not going to honor claims due to the losses on his farm reported on Schedule F. He was required to have positive net business income to generate claims. I suggested that he work with his lender, farm management instructor, and Dr. Freddie Barnard to do cash to accrual analysis for the period. By completing the adjustments, a loss on the farm tax records became a sizeable positive net income which allowed him to draw disability. This is another compelling reason to do the in-depth analysis.

Global Economics

All eyes have been on the European Union (EU) as economic, political and social forces are being played out like a slow moving train on a collision course. Twelve of the 17 Eurozone nations are in recession with Germany and France teetering on the economic down side and pulling out all stops to stay out of recession. Some economic pundits state that EU economics has little impact on the U.S. economy because of decoupling. In my judgment, the global economy is interconnected more now than ever. With the EU representing 26 percent of the world economy, difficulties are bound to result in economic turmoil worldwide. As stated in my last article, since China is the EU's biggest trading partner and China is importing a large amount of U.S agriculture production, the monitoring of this region is very important for outcomes of many sectors of the agricultural industry.

Watch for northern Europe's appetite to provide economic and financial assistance to southern Europe, particularly the PIIGS, that being Portugal, Ireland, Italy, Greece and Spain. Do not be surprised if Greece leaves the Eurozone despite the election of the party that will accept assistance. Some experts indicate that there is a 35 percent chance that the Eurozone will break up. If this occurs, economic turbulence will be felt throughout the globe and none of the Eurozone nations would be represented in the top ten of global economic output by 2020.

China has lowered its interest rates to prevent a hard landing and India's economy now represents flat line growth not seen in over six years. Only time will tell how this convergence of events will influence sustained lower commodity prices, including corn, beans, wheat, cattle, oil, gas, and steel.

Domestic Economics

The leading economic indicators foretelling the health of the U.S. economy are still positive, but seem to be inconsistent with the Federal Reserve's outlook on the economy. The leading economic index (LEI) is slightly up, and the LEI diffusion index is 70, indicating that seven out of ten of the factors are positive. The purchasing manager index (PMI) was down to 53.5, but is still above 50, a sign of a growing, expanding economy.

Oil prices have softened as the dollar has strengthened to other major currencies. Oil supplies and inventory are very strong and demand has softened domestically, which has resulted in gasoline and oil prices coming down about \$0.40 from the spring peak.

U.S. factory utilization is very strong at 79.0, which is near full utilization, showing signs of manufacturing's resurgence in the U.S. as factories have mechanized and are using technology upgrades to improve efficiency and quality of output.

Core and headline inflation are within the Federal Reserve's benchmarks, suggesting very little chance of interest rate increases. Headline inflation year over year has declined faster than core inflation due to the decline particularly in fuel prices with some softening of food prices.

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The reported unemployment rate now stands 8.2 percent, with U-1 to U-6 unemployment being 14.8 percent. This is way too high and will be a debated issue in the fall Presidential election. No doubt the fiscal cliff uncertainty of regulation, taxes, and healthcare are impacting companies' appetite for hiring new workers and making investments.

Housing starts are still a major drag on the economy. At last report, housing starts are a meager 708,000, far below the ideal metric of 1.1 million annually. The U.S. economy is in a slow growth mode with GDP being downgraded from 2.2 percent to 1.9 percent growth rate for the first quarter of 2012. It appears the days of 4 percent growth in the U.S. economy are a long ways away.

Lender and Business Dashboard Economic Indicators (for the month of May)

<u>Indicator</u>	<u>Current</u>	<u>Green</u>	<u>Yellow</u>	<u>Red</u>
Leading Economic Index - LEI	95.8	✓		
LEI Diffusion Index	70%	✓		
Purchasing Manager Index - PMI	53.5	✓		
Housing Starts (millions)	0.708			✓
Factory Capacity Utilization	79.0%		✓	
Unemployment Rate	8.2%			✓
Core Inflation	2.3%		✓	
Headline Inflation	1.7%	✓		
Oil Price (\$/barrel)	\$102.75			✓
Yield Curve	1.50		✓	

Lender and Business Dashboard Economic Indicator Benchmarks

<u>Indicator</u>	<u>Green</u>	<u>Yellow</u>	<u>Red</u>
The Conference Board Leading Economic Index® - LEI	Increasing	Flat to Decline	Decline 0.3% for 3 consecutive months AND >1% over the period
LEI Diffusion ¹	>60%	40%-60%	<40%
Purchasing Manager Index - PMI	>50	41.7-50	<41.7
Housing Starts (millions)	>1.5	1.0-1.5	<1.0
Factory Capacity Utilization	>80%	70%-80%	<70%
Unemployment Rate	5%-6%	6%-8%	>8% or <5%
Core Inflation	0%-2%	2%-4%	>4% or <0%
Headline Inflation ²	0%-4%	4%-5%	>5% or <0%
Oil Price ³ (\$/barrel)	<\$50	\$50-\$100	>\$100
Yield Curve ⁴	Steep	Flattening	Inverted

¹Ten indicators make up the LEI - measures % that are increasing; ²Includes food & energy;

³Consumer's perspective; ⁴3-Month Treasury Bill rate to 10-Year Bond rate