

By Bryce Knorr



From the boardroom to the barnyard

This DuPont model protects your bottom line with financial analysis.

In this age of high-tech agriculture, farmers don't have many tools that are more than 85 years old. But a powerful system for financial analysis used by Fortune 500 companies dates back to the "parity" days of farming right after World War I.

It's called the DuPont Model, and, no, it doesn't have anything to do with biotech seeds or crop protection. Financial managers at

the chemical company developed the tool in DuPont's early days to guide financial decisions. And, while the calculations are now done with computers, the method remains a textbook way to identify links between strategic shifts and financial performance improvement.

The model can take various twists and turns but focuses on calculating return on equity, a key measure of profitability. Typically this is pre-

sented in the form of a flow chart, like basketball fans use during NCAA's March Madness. Instead of schools, the brackets contain different pieces of a business' financial puzzle: earnings, gross sales, debt, asset value, etc. The model uses this information to show how the three primary drivers of financial performance impact return on equity: profit margin, asset turnover and leverage.

FARM FUTURES

DuPont model calculations

Total assets	\$1,778,000
Total debt	\$623,000
Family withdrawals	\$50,000
Interest expense	\$52,428
Gross revenues	\$715,000
Total expenses	\$649,935
Net farm income	\$65,065
+	
Interest	\$52,428
-	
Family withdrawals	\$50,000

$$\frac{\$67,493}{\$715,000} = \text{Profit margin } 9.4\%$$

$$\frac{\$715,000}{\$1,778,000} = \text{Asset turnover } 40.2\%$$

$$\frac{\$623,000}{\$1,778,000} = \text{Debt/asset } 35.0\%$$

$$\text{Profit margin } 9.4\% \times \text{Asset turnover } 40.2\% = \text{Return of assers } 3.8\%$$

$$\frac{\text{Return of assers } 3.8\%}{1 - \text{Debt/asset } 65.0\%} = \text{Return of equity } 5.8\%$$

DuPont Model Spreadsheet

This simple spreadsheet is an example of the DuPont Model, used for 85 years in corporate finance to see how changes to a business' operation will impact its return on equity.

To use the model, you will need the following information about your farm's finances:

- Gross Revenues
- Total Farm Assets
- Family Withdrawals
- Total Farm Expenses
- Total Farm Debt
- Interest Expense

All figures should be on an accrued basis; either cost or market values for assets may be used, as long as you're consistent.

For more on how to calculate these figures, see the guidelines published by the Farm Financial Standards Council at:

<http://www.ffsc.org/html/guidelin.htm>

What-If Analysis

	Start	Increase acreage	Cut expenses
Assets	\$1,778,000	\$1,778,000	\$1,778,000
Debt	\$623,000	\$623,000	\$623,000
Withdrawals	\$50,000	\$50,000	\$50,000
Interest	\$47,500	\$52,428	\$52,428
Revenues	\$550,000	\$715,000	\$715,000
Expenses	\$496,000	\$649,935	\$597,790
Income	\$54,000	\$65,065	\$117,210
Asset turnover	30.9%	40.2%	40.2%
Profit Margin	9.4%	9.4%	16.7
ROE	4.5%	5.8%	10.4%

ASKING "WHAT IF?"

Having the string of calculations linked mathematically lets managers vary different items to see how they impact the business' bottom line. What happens if sales increase 10%, or the firm's profit margin goes up 5%?

This "what if" is well-suited for the computer, and this month's *Farm Futures* spreadsheet of the month presents a working DuPont model. We've simplified some of the calculations and adapted them for agriculture.

The heart of the model is the relationship between the financial ratios used to measure business performance. Return on equity, for example, can be figured by dividing profit by equity. But it can also be expressed by multiplying the asset turnover ratio by profit margin, then dividing by 1 minus the ratio of debt/assets.

FIND THE KEYS

So why is that important? Well, if a farm can increase its turnover, generating more revenue from the same amount of assets, and keep its profit margins steady, its return on equity should go up. A low turnover ratio might tell the manager the farm has

excess machinery capacity; renting more land, which generates more sales; or reducing machinery capital investment per acre would produce more profit if the farm's margins hold steady.

The table above shows how this might work. Say the farm increases sales by 30% but holds profit margins steady. This increases income around \$11,000 and raises asset turnover by a third, boosting return on equity from 4.5% to 5.8%. Next suppose the farm finds a way to trim expenses by \$50,000. Asset turnover remains steady because sales did not increase, but income and profit margins take off, increasing return on equity to 10.4%.

Of course, not everyone in the world of corporate finance is a true believer in the DuPont Model, and newer ways have emerged to study financial trends. But the model retains a lot of fans, in part because it's an excellent way for financial managers to communicate these details to others in the organization. For many farmers, that could be the real benefit to playing with the spreadsheet: Seeing how financial variables interact is a good way to learn about ratios, analytical tools that are widely under-used by producers. 

Report:

Farmers using more contracts

An Economic Research Report (ERS) released November 2004 from USDA states contracts are being used more and more by farmers in the United States. Among farms with at least \$500,000 in annual sales, 61% used contracts for at least some of their production in 2001, compared with only 8% of farms with sales under \$250,000. Because most U.S. farms are small, only 11% of all farms used contracts in 2001, up from 6% in 1969. But because large farms account for most agricultural production, contracts cover a large and growing share of production—36% in 2001, up from 12% in 1969 and 28% in 1991.

By 2001, contracts covered 54% of cotton and 39% of rice production, compared with 30% and 20%, respectively, in 1991. In just 5 years, from 1996 to 2001, contract coverage grew from one-third to two-thirds of hog production, as spot markets diminished.

The traditional spot market—though it still governs nearly 60% of the value of agricultural production—has difficulty providing accurate price signals for products geared to new consumer demands, like produce raised and certified as organic or for identity-preserved crops modified for special attributes. 