Financial Health - How do You Measure Up?

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Financial economics is based on the tenets that we prefer more to less and that we seek to maximise our wealth in order to maximise our happiness. Performance appraisal merely seeks measures of how well we have achieved this objective. If my tax paid wealth at the start of a period was $100 and at the end was $110 how have I done? I've earned 10% for sure, but just how well I have performed depends on what other people have earned having invested similar amounts in assets of similar risk and whether this year's earning is an improvement on previous years. In principle it is no different when assessing the overall performance of a dairy farm. Sure, there are a lot of other things to take into account, but basically the increase in wealth relative to our investment at the start of the period represents our overall return.

In 1952 Professor Gordon developed his "continuous growth" model of performance. This has been used in one form or another by investment analysts ever since. In an adapted form it states:

$$ROE = \frac{\text{Amount of consumption} + \text{change in wealth after consumption}}{\text{wealth at the start of the period}}$$

where ROE = return on equity invested

For example:

if:	V_0	=	$100	where V_0 = the value of the asset(s) at the beginning of the period
	C_1	=	$4	where C_1=consumption at the end of the period (e.g. drawings for the year)
	V_1	=	$106	where V_1=the value of the asset(s) at the end of the period

then:

$$ROE = \frac{\$4 + (\$106 - \$100)}{\$100} = 10\%$$

While this looks simple, it's not easy to apply to a farming situation and while it provides an overall measure of success it doesn't necessarily tell us where in particular we can look to improve the situation.

Many years ago the US giant duPont faced the same dilemma. Their answer was to use fourth form algebra to outline the determinants contributing to their overall wealth maximising objective. Then they could assess the critical components of their business and its managers. The model they developed is:

$$ROE = \frac{NI}{E} = \frac{Sales}{Assets} \times \frac{NI}{Sales} \times \frac{Assets}{Equity}$$

So what are these components? They encompass:

- the intensity with which we use our assets (sales turnover or production efficiency)
- the margins that we can earn on our sales (profit margin)
- the extent to which we have used debt in the capital structure (equity multiplier)

These components need a little more explanation to justify their selection in the arithmetic.

Asset turnover

The maximisation of the sales/assets ratio is critical to the performance of a business. This does not mean that sales should be increased beyond a point where profitability declines, but without sales there is no income. Asset turnover represents the efficiency with which the assets of the business are used to generate revenue. In its simplest form this can be seen as analogous to milk per hectare where milk is a proxy for sales and hectares for assets.

Profit margin

Sales is one thing; profitable sales is another. The profit margin represents the contribution of sales to the operating income of the business. Assuming that overhead expenses are incurred wisely, maximising the gross margin will maximise net income. The profit margin reflects the financial and operating structures of the business. Net income incorporates not only revenue items but also all of the expense items. It's analogous to EFS.

Equity multiplier

Comparing the return on a firm's investment in its operating assets and the cost of its debt signifies whether or not the business should be financed with debt. Put very simply, we know two things about financial leverage:

- If the return on assets (ROA) exceeds the cost of debt then the return on equity (ROE) will exceed the return on assets and the leverage is favourable. So borrow. And if the return on assets is less than the cost of debt the leverage is unfavourable and the return on equity will be less than the return on assets; so don't borrow.
- Even if the return on assets exceeds the cost of debt today, both of these measures vary and therefore the more you borrow, the greater your assumption of financial risk and the greater your chances of getting into financial strife in the event of an industry downturn.

The advantage of considering ROE in this way is that because the ROE is broken down into its component factors, management can identify which factors ought to be adjusted to improve ROE. It provides focus.

Notice though that the duPont model ignores the value changes that we discussed when we first looked at Gordon's model. We'll come back to this point later.

Let's break some of these parameters down further. If we multiply the first two of these measures together we get

$$\frac{\text{Sales}}{\text{Assets}} \times \frac{\text{NI}}{\text{Sales}} = \frac{\text{NI}}{\text{Assets}}$$

Now, NI/Assets reflects a combination of operating and financial efficiency. To get a better handle on these two components we need to separate them.

$$\frac{\text{NI}}{\text{Assets}} = \frac{\text{EBIT (Net operating income)}}{\text{Assets}} - \frac{\text{(Interest + Tax)}}{\text{Assets}}$$

The important measure of operating efficiency is

$$\frac{\text{EBIT}}{\text{Assets}} = \text{ROA pre tax}$$

Using this measure we can compare two farms' ROAs quite effectively to demonstrate which farm is operating best. ROE doesn't tell us this. For example,

	Farm A	**Farm B**
Assets	1000	1 000
Debt @ 8%	–	500
Equity	1 000	500
Sales	350	300
Operating expenses	225	190
EBIT	125	110
Interest	0	40
Tax (assume zero rated)	0	0
Net income	125	70
ROA	12.5%	11%
ROE	12.5%	14%

Which farm performed best? What should the farms do? What is apparent is that A is technically superior, 12.5%>11%. However, B makes better use of its money, 14%>12.5%. So what option would you prefer?

Farm A should borrow some money and expand.

	Was	Improved
Assets	1 000	1 333
Debt @ 8%	–	333
Equity	1 000	1 000
Sales	350	467
Operating expenses	225	300
EBIT	125	167
Interest	0	27
Tax (assume zero rated)	0	0
Net income	125	140
ROA	12.5%	12.5%
ROE	12.5%	14.0%

Notice that the same level of technical efficiency is evident (A is the better farmer) but now the financial efficiency is the same as B (who was the better financier).

Farmer B on the other hand needs to improve technically to achieve the performance of A. If this can be done, the ROE will improve even further:

	Was	Improved
Assets	1000	1 000
Debt @ 8%	500	500
Equity	500	500
Sales	300	350
Operating expenses	190	225
EBIT	110	125
Interest	40	40
Tax (assume zero rated)	0	85
Net income	70	
ROA	11%	12.5%
ROE	14%	17%

You can see here that now B is technically as good as A but still retains the financial advantage because he is borrowing at 8% to earn 12.5%.

The third model that you may be familiar with is the standardised EFS model that is used by industry analysts to provide standardised comparative data. A very quick summary of this methodology will help to define the things that we need to consider.

Economic farm surplus

- EFS = GFI – FWE
- Where GFI = gross farm income
- This represents the amount available to pay interest, management and provide an ROE

Interest surplus

- Interest surplus = EFS – WOM

- Where WOM = computed wages of management
- This represents the amount available to provide a reward for the total farm capital invested.

It is analogous to ROA.

Equity surplus

- Equity surplus = EFS – WOM – interest on debt
- This represents the amount available to provide a reward for the equity investment of the owner

OK, now let's try and bring these three approaches together. Gordon defines the total return as being:

$$\text{Return} = C_1 + (V_1 - V_0)$$

$$= \text{EFS} + \text{capital gain in assets}$$

The next step is to include value changes in our EFS calculation:

$$\text{Standardised return} = \text{EFS} + \Delta\text{TFC}$$

where TFC = total farm capital

It follows that the standardised return on equity would be:

$$\text{ROE} = \frac{\text{EFS} + \Delta\text{TFC}}{\text{Equity}_0}$$

where Equity_0 = equity at the beginning of the period

You can see from this that the need to incorporate value changes doesn't change the factors that we look at to assess component performance.

Is it realistic to include an amount for capital accretion in our returns calculation? Sure it is. To do otherwise would be irrational. Forget the "dirty insinuations" that go with the words "capital gains," they are nonsense. Capital accretion is not "unearned." It is a very rationally determined component of the risk-reward trade-off and arises, at least in part, from good management practices and the need to maintain real value. Among other things it results from:

- Maintenance of "real" value - inflation (2-3% at present)
- Improvements - better management; better technologies; better genetics
- Increased profitability - better prices; better production; better cost efficiency
- Changing land uses - new agricultural uses; urban pressure

Indeed if the value of TFC was not increasing over time by something like 5-7% per year, ignoring the urban effect, you would have to ask "what's going wrong?"

So, what variables do we need to consider? What we need be able to do is to calculate the values of these variables for an individual farm in such a way that we can compare the performance of different farms on a standardised basis. It is not the purpose of this workshop to run through in detail exactly how we calculate such things as EBIT, or the interest surplus, or the standardised economic farm surplus. Suffice it to say that if we begin with EBIT, (the same as net operating income), and we adjust this for a realistic wages of management and some other measures incorporating private usage of farm assets, we can come up with a dollar figure that represents exactly what the asset has earned. In addition to this we need to determine:

- The market value, both at the start of the period and at the end of the period, of the assets that we use to generate this income. The full methodology is attached as Appendix I to this paper.
- A whole bunch of ratios that we can use to support the overall measures that we have been talking about and to provide us with guidance in answering the four critical questions that we require answers for?
    - Where are we now?
    - How did we perform in the past?
    - How have we performed relative to others?
    - Where can we improve?

A full set of the ratios that we can use to assist us in answering these questions cab be obtained from the author, but basically what we are looking for are ratios which guide us as to:

- the solvency of the firm
- the activity of the firm
- the stability of the firm
- the profitability of the firm

These same figures can provide us with guidance as to the technical or operating efficiency of this particular farm and as to its financial efficiency. On a slightly different dimension we can group these ratios in such ways as to provide us with measures related to:

- the structure of the business
- how it compares with others of a similar type
- how it is performed over time

Let's apply this material to a case study.

Case study

Consider the cases of two young dairy farmers. Rua and John. These two guys are as alike as peas in a pod, they went to the same school, they played in the same rugby team, they attended the

same ballet class and they both started sharemilking at the same time. They also bought their farms at the same time. However, there are some differences.

While they both bought their farms on similar quality land, John bought his farm closer to town. To do this he had to borrow more money. The counter to this is that his asset is increasing in value faster than Rua's and both know it. John expects his farm assets to increase by 10% per year, whereas Rua is more likely to achieve 7%. When you look at their financials you also see other differences.

Parameters						
Interest	8%		Tax	25%		
Capital accretion	8%		10%		7%	
Financial Performance	**Average**		**John**		**Rua**	
Gross farm income	46 350	100%	500 000	100%	600 000	100%
Farm working expenses	229 167	49%	250 000	50%	320 000	53%
Plant "maintenance"	27 691	6%	25 000	5%	30 000	5%
Net operating income (EBIT)	206 492	45%	225 000	45%	250 000	42%
Interest	62 690	14%	86 400	17%	62,400	10%
Net farm profit	143 802	31%	138 600	28%	187 600	31%
Tax	35 951	8%	34 650	7%	46 900	8%
After tax profit	107 852	23%	103 950	21%	140 700	23%
Drawings	23 956	5%	28 950	6%	28 950	5%
Incr in equity from farm opns.	83 896	18%	75 000	15%	111 750	19%
Capital accretion	145 242	31%	210 000	42%	126 000	21%
Incr in wealth	229 138	49%	285 000	57%	237 750	40%
Opening balance sheet						
Total farm capital	1 815 526	100%	2 100 000	100%	1 800 000	100%
Long term debt	781 728	43%	1 080 000	51%	780 000	43%
average overdraft	20 000	1%	20 000	1%	20 000	1%
Equity	1 013 798	56%	1 000 000	48%	1 000 000	56%
"Operating" ROA	11.4%		10.7%		13.9%	
"Operating" ROE	14.2%		13.9%		18.8%	
"Wealth" ROE	23%		29%		24%	

Reliability of efficiency measures

If reliable standards are to be ascertained, then accuracy and full knowledge are required. The multitude of different analytical tools and measures can be meaningless unless information is accurately and correctly interpreted.

The greatest variable on a given property is management:

- By analysing and comparing similar properties within seasons and by finding the trend on an individual property over a number of seasons it is possible to find the most efficient system of management.

- These measures could perhaps pinpoint weaknesses and strengths of the system and the management and so be used to assist in improving the overall financial profitability.

Standardisation requires some subjective assessments which may vary from one analyst to another, and while the concept of analysis is the same for different organisations, the method used may vary, i.e. the same ratio as calculated by two different analysts may vary, and cannot be compared without further adjustment.

Workshop summary

John Greer of Lincoln University delivered the paper which was put together by Derek Newman.

Main points

In practice dairy farmers must start to focus more on other components of financial performance. Traditionally, EFS, and physical performance indicators have been used as signs of how the business is performing. The philosophy expounded was that return on equity and return on capital are two indicators to look at how to improve the performance of the business, not just where we are at now. Do not discard the other performance indicators, just look at these ones as well.

$$\text{Return on Assets} = \frac{\text{Earnings Before Interest \& Tax + Capital Accretion}}{\text{Total Farm Capital}}$$

$$\text{Return on Equity} = \frac{\text{Net Income + Capital Accretion}}{\text{Equity}}$$

Summary of discussion

- Depreciation and tax are two factors that have a major effect on farm performance
- If comparing farms, EFS has been used because it is easier to calculate, and there is not so many variables (for example, tax and capital accretion) as ROE and ROC
- Where do we get capital cost from? - Is it an opportunity cost (WACC) or do we get it from actual farm figures?
- The ROC should be calculated on the capital that was invested at the start of the year, not from the final capital value.
- Dairy company shares must be included in the value of capital, because they have to be there in order to have a dairy farming business.
- Capital performance should include capital accretion (increase in value) because it is a real increase in wealth, even though it is a non-cash value.
- If the payout price decreases, and capital value remains the same, the returns from your business looks considerably bleaker.

Points for the future

- How to work the taxation effect into the calculation of ROE and ROC?
- Should ROE be based on gross returns?
- How to take risk into account, it wasn't incorporated into this paper, but does need to be looked at.
- Should we use an international dollar, to see where we are at, globally, and to see whether we should be investing overseas?
- We should be including productivity as a performance indicator as well