

Standardized Financial Benchmarks for Canadian Farm Financial Statements

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Foreword

Standardized operating statements produce comparably calculated financial ratios useful as performance benchmarks. They are used in CTEAM, a management training program for farmers. Their value in helping farmers understand and improve their management performance led to collaboration between AME and BDO Canada to introduce standardized statements and ratios to BDO's farm clients.

This paper explains the collaboration between the two companies and extensions of the concepts to additional farmers in Canada and the US by GlobalAgAdvisors Ltd. (GAA). The structure and rationale of the standardized statement are presented in this paper. The resulting ratios are defined and their management performance implications are examined.

Their value in application is demonstrated by application to three example farms. The applications identify areas in which the farms are performing well and those in which they have performance issues.

Next steps for the collaboration are identified.

AME would like to thank Farm Management Canada for supporting this project.

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1.0 Introduction and Objectives

For 20 years, farmers in AME's CTEAM (Canadian Total Excellence in Agricultural Management) program consistently voiced two criticisms: "From my financial statements, I don't understand where I am financially or managerially"; and since generally no two accountants seem to use the same format for their clients' accounting statements, "it's impossible to gauge my performance by benchmarking against others."

This lack of standardization blocks progress in farm financial management because it limits farmers' ability to understand their performance, diagnose performance issues and focus on what needs improving. In CTEAM a standardized operating statement for farms and attendant performance benchmarks are developed. Watching the results causes appreciation of the power this has for helping farmers improve their management practices. Improvements are in operations (production), human resource, and marketing management as well as finance because the resulting ratios are tied to those aspects of the farm business.

This situation was described to BDO's National Agricultural Committee and illustrated with examples of how to use the standardized model and ratios to diagnose and address problems. The Committee felt that the approach would be a useful one for the firm because it would allow the company to provide valuable information to their farm customers. This was the beginning of the relationship that will be described in this paper.

In addition to working with a national accounting firm to help them provide a powerful management tool for their farmer-customers, this project had three additional sources of interest for AME and the authors.

- The benchmarks we use in CTEAM were created by examining farm records by another accounting firm nearly 25 years ago (Betker). They have apparently not been updated since then. It is important to ensure that the material is current and accurate.
- The structure and content of the operating statement has evolved in one important way as explained below. The result is a slightly different measure of ratios than was used 25 years ago. This also needs updating.
- The data used to develop the benchmark ratios were mainly Western Canadian farms that focused on grain and some livestock production. As will be explained below, there is good reason to expect a number of the benchmarks to be different for different types of farms because of the nature and relative cost of production operations on each type. To test this requires a more comprehensive sample of farms.

As a result of the shared interests of AME and BDO, the two organizations collaborated on a project to update and extend the financial benchmark ratios for Canadian farms. The desire and need to do so is not limited to the participants in this collaboration. The work is in line with suggestions by a number of authors to use farm financial statements to provide management information (eg Barnard and Boehlje; Farm Financial Standards Council; Blonde) and measure competitiveness (CAPI).

This paper describes the initial phase of the collaboration and its results. Its objectives are:

- Explain the standardized statement. This is done in Section 2.0 below.
- Illustrate how the statement's ratios can assist in diagnosing and improving management issues. This is the focus of Section 3.0.
- Present the initial results of the collaboration's research. Results are presented in Section 4.0.

2.0 The Standardized Operating Statement

The standardized operating statement is organized based on two principles:

- Managing operations is different than managing capital/finances and the operating statement should be organized to reflect each of the two independently.
- *All farms*, no matter what commodities they produce, have five standard sets of costs.

The first principle means that we separate the cost components into operations and capital activities and use the concept of EBITDA. The components before EBITDA reflect operations. Those following it reflect capital and financing.

The second principle means that the operating statement is organized into the five standard categories that fit all farms. Then margins are calculated for each category with attendant ratios that allow benchmarking across farms.

2.1 Revenue from Farming Operations

The five cost categories are explained below, but prior to that, we start by defining the revenue used at the “top” of the operating statement. It includes only revenue from farming operations. It does not include government program payments (except crop insurance payments), earnings on investments, gains or losses on disposals, off-farm work, or other non-farm income. It includes sales from farm production, changes in inventories of marketable products, gains or losses from legitimate hedging programs, and crop insurance payments. Income items deemed not from farming operations are included at the end of the operating statement in a category called “other income and expenses”. This distinction is important because the fundamental goal is to be able to measure the performance of and diagnose problems in the management of the farming operations. A gain or loss on farm assets, off-farm income, government payments or speculative gains on non-farm assets would skew the performance of the farming operation.

2.2 The Cost Categories

There are three operating and two financing cost categories. The operating categories are based on the nature of agricultural production. The three operating components are defined by the following sets of activities:

- Farms convert raw materials into intermediate or final products, incurring the cost of those raw materials.
- Farms use labour and equipment to produce and transport their inputs and products.

These first two categories are correlated with production: e.g. producing 500 tonnes of grain normally requires less fertilizer, seed, machinery use and operational labour than 1500 tonnes of the same grain assuming the same weather conditions.

- The third operating category is less directly related to production. It includes office costs, sales and marketing costs, insurance, professional fees, and management salaries.

Based on these three categories, we define three sets of cost with the following specific definitions:

- ***Cost of Goods Sold (COGS)***. For crops, farms convert seeds (or use trees, bushes or vines), fertilizers, and pesticides into forage, grain, fruits or vegetables. For livestock, they convert the offspring of parent animals, feed, and medicines into meat animals or dairy products. So COGS includes things farms buy to transform into intermediate and final products. We also include crop insurance premiums in this category because it helps manage the risk of physical losses of crops.
- ***Direct Operating Expenses (DOE)***. These include direct operating labour costs (as opposed to management, sales and administrative), machinery operating expenses (fuel & lubricants), custom work, repairs and maintenance, small tools and equipment, and transport costs.

Often rent or lease payments are treated as operating costs. However, leasing or renting are alternative ways to access capital assets such as machinery, equipment and/or land as opposed to owning these assets. To separate them from depreciation of owned equipment means that the underlying cost ratios are not comparable for farms that own assets vs those who rent or lease. Hence, these expenses are placed in the capital component of the operating statement.

As a result, all farms, no matter how they access machinery, equipment and land have the same cost categories in this component: fuel, repairs and maintenance, transportation costs and operational labour are common costs for nearly all types of machinery access. Similarly, all the costs of access, whether depreciation, interest or leasing payments are included in the capital component.

Obviously, this still gives some problems in comparability: depreciation is often listed as CRA alternatives for tax purposes instead of economic depreciation; owned land is not depreciable, so there is no annual capital cost. But these problems exist in any classification system. This system at least groups related cost items so that the problems are focused in the right areas. Economic depreciation can be substituted for tax-purpose depreciation when available.

- ***Operating Overheads (OH)***. This category is often called selling, general and administrative expenses. It includes costs not directly related to production and transportation. Common items are office expenses, management salaries, advertising and promotional expenses, sales staff salaries and expenses, office support salaries, insurance, electricity (not associated with operations), professional fees, etc.

The two capital cost categories are annual cost of capital and interest costs, and are outlined below in detail.

- **Depreciation/Amortization/Financing (Annual Cost of Capital (ACoC)).** These are the costs of accessing capital assets: machinery, equipment and land. They include depreciation/amortization of machinery, equipment, and buildings, property taxes, leasing and rental costs of capital assets, as well as land clearing costs.

To further underline the logic of accounting for leasing costs as part of capital, both Ernst and Young as well as Price Waterhouse Coopers have published reports indicating that accounting for leases as part of capital is now standard procedure under the new International Financial Reporting System (IFRS). Lease payments appear on the operating statement as capital costs, and the total lease obligation appears on the balance sheet as a liability. The interest portion of lease payments should be listed separately under interest expenses.

- **Interest Expenses.** This is interest on short and longer term financing.

2.2 Format and Margins

Margins are calculated for each set of costs. With these definitions the standardized operating statement has the following format:

Figure 2.0: General Format

(+)	Revenue from Farming (Sales)
(-)	Cost of Goods Sold (COGS)
(=)	Gross Margin (GM)
(-)	Direct Operating Expenses (DOE)
(=)	Contribution Margin (CM)
(-)	Operating Overheads (OH)
(=)	EBITDAR
(-)	Depreciation/Amortization/Financing (CoC)
(=)	EBIT
(-)	Interest Expenses (FIN)
(=)	EBT from Operations
(+/-)	Other Income/Expenses
(=)	Net Income before Taxes

Margins and Ratios

Margins and ratios are defined below as are their current benchmarks. Communication with Backswath Management confirms that sources of benchmarks are varied – some from literature such as that cited above, some from lenders and a few from proprietary analysis performed more than two decades ago. Part of the project with BDO is to test the benchmarks with a rigorous multiyear analysis.

Gross Margin Ratio (%GM)

Gross Margin (GM) is Revenue minus Cost of Goods Sold (COGS), and the GM ratio is GM/Revenue. GM is operating returns remaining after paying for costs of material. Four factors underpin the ratio: product prices; input prices; input quantities; and yields. If this ratio is consistently lower than the benchmark, then management can focus on issues in production or marketing.

The current benchmark for most farms is 65% or more of revenue – i.e. Cost of Goods Sold is 35% or less of revenue. Literally, it means the most profitable farms have at least \$.65 left of every dollar of sales after purchasing materials that are transformed into final products.

Consistent low ratios over time likely mean that a farm has poor productivity, needs to improve marketing, or consider whether it is producing the right products. An example is two dairy farms, one with %GM of 75% and the other at 56%. Since this industry in Canada has administered prices roughly equal for everyone, it's apparent that the second farm needs to improve its productivity.

Consistently poor performance when there are no clear production problems, sometimes leads to the decision to change products because market returns are inadequate in the one chosen.

This standard is likely too low for horticultural operations and too high for beef feedlots or swine farms that finish weaners. Horticultural operations tend to have relatively high value production (eg wine grapes) compared to the cost of seed, seed stock, fertilizer and chemicals. Feedlots have very high outlay for feeders, along with feed, leading to much lower margins and higher turnover.

Contribution Margin Ratio (%CM)

Contribution margin is calculated by subtracting Direct Operating Expenses from Gross Margin, and %CM is CM/Revenue. It is what remains from each dollar of sales after paying all variable input and operating expenses. For farms with Gross Margins of 65%, the current benchmark for % CM is 45-50%. Conversely, Direct Operating Expenses should be 15-20% of revenue. If the latter are higher, there are generally three potential problems. One is that labour costs are too high, either because of too much labour, inefficiency of the capital stock with which labour has to work, or insufficient revenue generated from the labour.

A second potential contributor is over use of machinery and equipment, thereby making operating costs too high. This may be a sign of over (or under) investment in this category.

Again, the benchmark is helpful in diagnosing and managing problems. For example, if DOE is 30% for a farm, it suggests there is a problem. Often, especially in DOE, it's not difficult to isolate the potential source of the problem because the likely culprits will be those with the largest expenses in the category. So, if small tools and equipment are 1%, it's obvious that cutting it by half won't fix the problem. But if repairs and maintenance or operating labour are each 12% of revenue, they are clear candidates for improvement. The next step is to drill down in these categories to search for ways to improve.

Again, this benchmark is likely different for horticulture and it may be higher now for all farms. Limited samples for horticulture suggest that, because of their much higher labour

requirements, the range should likely be at least 25-30% for DOE. If that is correct and %GM should be 75%, then the %CM should be the same at 45-50%, but the costs would be redistributed differently between the two categories.

The reason to suggest it may be higher for all farms is that it contains expenses (energy, labour and labour in repairs and maintenance) whose prices have risen relative to many others over the past few years.

Operating Efficiency Ratio (%EBITDA)

EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization) is calculated by subtracting Operating Overheads (OH) from contribution margin. Operating Efficiency Ratio is EBITDA/Revenue. EBITDA is a measure of operating income that has long been used, especially outside of agriculture, to understand the ability of an operation to generate cash over operating expenses.²

For farms the benchmark is 35%, or \$.35 for every dollar of revenue. Therefore, OH should be 10-15%, and the cost analysis should proceed as above with DOE when OH is too high. In our experience, this category is not usually a problem. But when it is, the specific numbers will show its source.

%EBIT Ratio and %EBT Ratio

EBIT is earnings before interest and taxes is calculated by subtracting financing costs (CoC) from EBITDA. Then interest expenses are subtracted to get earnings before taxes (EBT). The ratios are then found by dividing EBIT and EBT by revenue. Having had limited experience with these two ratios in this format, the benchmarks are not finalized, though %EBIT likely should be in the 20% range. This suggests that financing capital should cost in the neighborhood of 15% of revenue.

2.3 Additional Ratios

Space limitations for this paper prevent detailed explanation of the balance sheet, though there is less variation among their structures by Canadian accountants. Therefore, there are essentially no standardization changes.

Two sets of ratios that include the balance sheet are important in assessing performance.

Current Ratio (Current Assets/Current Liabilities)

This is the standard measure of short term liquidity, along with working capital (Current Assets – Current Liabilities), for most types of business. Values under 1.5 show potential liquidity problems, especially if it is a relatively low percentage of annual operating costs. Producers in Canada's dairy and poultry industries probably can go to 1.2 because of their low price risk and steady cash flow.

Debt/EBITDA

² With the change to the new IFRS standard that treats leasing costs as capital costs the term is now properly called EBITDAR, to include earnings before rental costs along with operating expenses as discussed in Quora.

Debt/EBITDA is a measure of long term solvency risk. It can be calculated as either Total Liabilities/EBITDA or Bank Debt/EBITDA. Literal interpretation is, if the operation uses all of its annual operating earnings to only pay debt principal, it will require the calculated number of years to pay it off. So, if the ratio is 6.3:1, then it will take 6.3 years of operating earnings to pay down principal. This means paying no interest, no taxes, no profits to owners and no new investment for 6.3 years.

It is useful from a management perspective to separate bank debt from other debt such as shareholders' loans, or other "softer" debt that is more easily extended or forgiven. Ratios calculated with only bank debt and/or with total liabilities, give a more complete picture of at risk obligations. Banks usually get their money, but shareholders may not. With bank debt in the numerator, the risk of loans being called is more evident when the ratio is high.

Outside of agriculture lenders often impose covenants on credit facilities above Debt/EBITDA of 3.5:1. Previous research suggests that the **average** for Canadian farms is 5:1. Agriculture receives more tolerance because of its high "off-balance sheet" value resulting from land and/or quota appreciation. Obviously, anything above 5.0 is highly leveraged from an operational perspective: farms in this range are often living on their equity and/or on hopes of improved future earnings.

In our experience, many top managers keep this ratio under about 2.5. Some excellent operations keep it even lower until they are ready to make a major investment. At that point they may push it much higher, but don't make additional major investments until they pay down enough to bring the ratio below a target number such as 2.5.

3.0 Using the Benchmark Ratios to Diagnose Management Issues

The joint project of AME and BDO will be explained in the next section. In this one, the application of the framework and benchmarks to farms is shown using data from three example farms. The three farms had sales and ratios for 2015 shown in Figure 3.1.

Figure 3.1: Performance Ratios, Three Farms 2015

	<u>Farm A</u>	<u>Farm B</u>	<u>Farm C</u>	<u>Benchmark</u>
Revenue (\$MIL)	\$1.58	\$1.64	\$1.43	
%Gross Margin Ratio	65 23	73 45	65 27	65%
% Contribution Margin Ratio	42 11	28 2	38 4	45-50%
Operating Efficiency Ratio	31 12	26 18	34 50	35%
% EBT Ratio	19	8	(16)	
EBT (\$000)	\$300	\$131	\$(229)	

The three farms each had over \$1 million in revenue. Farm A had net earnings of \$320,000, Farm B earned \$131,000, while Farm C lost \$229,000. What caused the differences?

The answers become apparent by examining the ratios:

- All three achieved the benchmark performance on gross margin, though Farm B outperformed the other two.
- None of the three achieved the benchmark on contribution margin: subtracting their %CM's from %GM's gives 23%, 45% and 27%. So their direct operating costs all exceed the benchmark. At 23%, A is closest to the benchmark of 15-20%, B far under performs it at 45%, a major problem, and C's performance is in between the other two.
B's 45% DOE flags a problem, less so for C. Delving deeper into their financial statements, we find that repairs and maintenance for Farms A and B are 7% and 6% of revenue, while for Farm C, they are 10%. This contributes to C's performance issue. Similarly, while A and C spend 5% and 4% of revenue on labour, Farm B's labour expense is 23%. There may be a logical explanation for this, but it certainly raises a flag about where to focus.
- Operating overheads at 12%, 2%, and 4% of revenue for the three are reasonable, though A could examine this area for improvement.
- Total financing costs are 12% and 18% of revenue for Farms A and B, but an extremely high 50% for Farm C. Looking deeper at Farm C's statement reveals that it invested substantially in land clearing, which will likely have a pay off in the future. But the farm lost money even without this expenditure. Interest, land rent and amortization are the largest entries in the capital cost component. This suggests that Farm C is substantially over capitalized for the amount of revenue it is generating.

In summary, Farm A has the best overall performance with net earnings at 19% of revenue. Its performance against all the benchmarks is the best. Operationally, A needs to tweak all areas to find small improvements. Depending on its balance sheet ratios, its strategic intents, in addition to continuous improvement in its operations, are likely to focus on growth.

B clearly has an issue with Direct Operating Expenses: so, B's strategic issue is to find ways to either reduce labour costs or generate more revenue with the labor it's carrying. It generates far too little operating income to warrant substantial new investment.

C is weak on direct operating expenses and incurred land clearing expenses that may improve profits later. But C's main issue is that the farm appears to be overcapitalized for the amount of revenue it generates. Strategically, it needs to focus on either reducing those capital costs or using the capital to generate more income. It does have some flexibility because its 34% operating efficiency ratio means that it has reasonable cash flow, so there are likely things that can be done to employ the capital more effectively and/or to reduce the capital cost.

These examples illustrate how the standardized ratios and benchmarks can be used to potentially identify issues and lead to solutions about how to correct them.

4.0: The AME/BDO Collaboration

Conversations between the senior author and senior management at BDO over approximately two years focused on the standardization concept and on the improvement shown by CTEAM participants in their management after using their standardized financial statements to focus on clear problems. BDO is committed to investing in ways to add value to their farm customers.

This led to two presentations to BDO's National Agricultural Committee describing the standardized statement and pointing out how it can be used to improve management decisions. The National Committee saw the potential benefit and committed initially to developing a template that extracts the line items from a few 2015 and at least 78 2016 farm statements so they can be summarized in the proper order (with the permission of their clients).

BDO developed its own template to pull the right line items from each account and then group them into the categories described above to calculate the ratios. It was used to test the viability of the template by drawing the small sample of client farms from 2015 – ie to test whether the template functions accurately.

Starting with the 2016 tax year, a set of the company's clients from a number of BDO's agricultural offices had or will have their financial statements done in the format discussed. The ratios will be calculated, including from the two previous tax years so that arbitrary events in a given year can be avoided, and to start providing the clients with trends on the various ratios.

These clients will receive a summary of their ratios, with definitions and directions on how to understand their performance and how to diagnose problems. In subsequent years, clients will receive the foregoing as well as an analysis of their trends on the various ratios to help them assess progress. AME will provide support in developing the material and procedures for the project.

4.1 The Benchmarking Process

In the initial phase of the project, the 78 records were used to update and develop benchmark ratios. This was done by testing the operating statement ratios discussed above. The farms' profitability was calculated two ways: returns on assets, and profit/dollar of sales. Both measures use Earnings before Taxes (EBT) as the numerator. The first uses the current value of total assets as the denominator. The second uses revenue from farming as the denominator.

Using these two measures, the farms were arrayed in quartiles from the most profitable 25% to the least profitable 25%. Then the various ratios were compared for each quartile to identify differences.

A basic result is that both measures of profitability identified essentially the same farms in the upper quartile and the ratios associated with them were the same. Therefore, for the remainder of this report, the numbers used are for the quartiles based on Earnings before Taxes as a percentage of total revenue from farming operations.

4.1.1 Overall Profitability, by Type of Farm and % Gross Margins

Table 4.1 contains the net profit ratio by quartile and their attendant gross margin ratios. The numbers are presented by predominant type of farm and for all the farms.

Examining the overall profitability (last row of the tables) is instructive. Net profits were 10.5% of revenue for the top 25% of all farms – ie after accounting for all costs and expenses, the most profitable farms made 10.5 cents per dollar of sales. Interestingly, when the farms are separated into commodity types, profitability doesn't change much: cash crop, dairy and horticulture, for which there are the largest number of records, are all within 2% of the overall average.

Another observation is that there is clearly more variation in profitability within any group of farms than between groups. While the sample size is too small for statistical significance, after showing that there is only 2% variation among the top 25% in the overall group and the three major farm types indicated above, variation within the largest group, crop farms, is mammoth. The most profitable has net profits of 45.9% and the least is -43.4%, a difference of 89%. Comparing the top 25% with the lower 25% of crop farms shows 10.4% vs. -12.2%, a range of 22.6%. Examination of the table reveals that the same holds for the other types. This conclusion is one that has been observed in many other contexts where a large number of farms is involved.

A third observation is the relationship between the net profit ratios and gross margin ratios. Gross margin is a measure of how much value the farm adds to the cost of the raw material it buys. Clearly, a higher number indicates a higher value added. Looking at the numbers for all farms, it is clear that there is positive correlation between the two ratios. The 25% most profitable farms had average %GM of 67.2%, the 50% level had %GM of 60.3%, and the lower 25% had %GM of 53.7%.

These are substantial differences. If one assumes that the average revenue for the sample farms is \$3 million, the difference of 13.5% between the top and bottom tiers is \$405,000 of added value.

A final observation is that there appears to be differences in %GM among the farm types, as would be expected. Again, it is very important to note that sample size is too small to rely on the number statistically, but the upper 25% of beef farms have a much lower %GM than the average, while the upper 25% of horticulture operations have a higher %GM. Neither is surprising. Beef *feedlot* operations, as opposed to cow-calf, purchase almost all of their inputs and turnover their cattle more than once a year. They would be expected to have a low gross margin compared to crop farms that have one turnover.

The opposite is the case for horticulture. In most cases, hort products are relatively high value, so their revenue compared to the costs of inputs is high. Therefore, we would expect a higher gross margin. At the same time, operating labour is generally a significant expense for horticultural operations, so we would expect %Direct Operating Expenses to be higher.

NET PROFIT RATIO (NPR, excl. other income)									
	POP COUNT	0%	25%	50%	75%	100%	MEAN	MEDIAN	STD DEV
Beef	8	-3.04%	0.80%	6.49%	13.70%	25.07%	7.92%	6.49%	9.69%
Cash crop	33	-43.40%	-12.17%	3.94%	10.32%	45.86%	0.64%	3.94%	17.74%
Dairy	16	-4.22%	-0.76%	4.93%	12.60%	27.75%	6.50%	4.93%	8.79%
Horticulture	15	-34.33%	-10.40%	3.08%	11.66%	21.71%	-0.14%	3.08%	15.34%
Other	2	-52.53%	-37.99%	-23.44%	-8.89%	5.66%	-23.44%	-23.44%	41.15%
Swine	4	-10.93%	-5.88%	-0.70%	2.86%	3.03%	-2.32%	-0.70%	6.64%
All	78	-52.53%	-5.73%	3.59%	10.47%	45.86%	1.67%	3.59%	15.75%
	MEAN								
	POP	MIN	25%	50%	75%	MAX			
GROSS MARGIN RATIO									
Beef	35.94%	18.72%	17.09%	38.56%	49.55%	52.72%			
Cash crop	63.22%	66.36%	58.56%	62.87%	68.46%	67.71%			
Dairy	69.14%	55.17%	67.76%	67.14%	74.52%	80.68%			
Horticulture	65.73%	20.30%	47.42%	69.61%	77.24%	81.32%			
Other	41.98%	26.06%	26.06%	n/a	57.91%	57.91%			
Swine	39.83%	29.53%	29.53%	38.33%	53.14%	53.14%			
All	60.37%	26.06%	53.71%	60.32%	67.15%	67.71%			
				difference to 25%:	13.44%				

4.1.2 Results of the Ratio Analysis

Table 4.2 contains the results for all the farms when the various operating statement ratios are compared to profitability.

Looking at the top 25% (ie 75% and above), the operating statement ratios are: 67.2 % as already shown for %Gross Margin; 40.24% for %Contribution Margin; 35.4% for Operating Efficiency; and 21.2% for %EBIT.

In some ways these are remarkably close to the benchmark ratios identified in section 2.0 before the analysis of BDO clients. 67% for the Gross Margin is not much different than 65%. The results for Operating Efficiency and %EBIT are remarkably close to the originals.

What is different is the %Contribution Margin at 40%. Underlying this are changes in %DOE and %OH. %DOE is now 27% (67% GM-40% CM) instead of the 15-20% originally. This change likely comes from two factors. DOE is made up of labour costs and machinery operating costs. The latter includes fuel and maintenance and repairs. Maintenance and repairs, when supplied by service companies, also has a large element of

wage rates in it. It is likely that wages and fuel costs have risen faster than farm product prices, especially at 2016 price levels, than when the original benchmarks were calculated several years ago. So, one factor is differential effects of inflation.

Table 4.2 Ratios Across All Farms by Profitability Category

NET PROFIT RATIO GROUPS	WHOLE SAMPLE	0%	25%	50%	75%	100%
Group thresholds	78	-52.53%	-5.73%	3.59%	10.47%	45.86%
Gross Margin Ratio	60.37%	26.06%	53.71%	60.32%	67.15%	67.71%
Contribution Margin Ratio	30.59%	-1.13%	19.84%	31.17%	40.25%	58.81%
Operating Efficiency Ratio	24.67%	-15.16%	12.23%	25.60%	35.36%	55.58%
EBIT / REV (often tax driven)	4.50%	-52.53%	-15.25%	6.14%	21.15%	45.86%

A second factor may be that today's equipment is much more complex than that of a few years ago, so that the cost of repairs and maintenance is relatively greater compared to changes in revenue.

Another difference from the original benchmarks is that the %OH costs are five percent instead of 10-15. This appears to be mainly due to the fact that most of farms include management compensation with operating labour costs. They should be separated.

A third potential reason is that the earlier benchmark was developed with leasing and rental costs included in operating costs instead of capital.

4.2 Applying the Benchmarks

Section 3.0 above illustrates some applications of the benchmarks. In general, if an individual farm's cost ratios are higher than the benchmarks, this may be an indication of a management problem. For example, if Cost of Goods Sold is greater than 33%, this may be because yields aren't high enough, selling prices are too low, input costs are too high, or the farm is producing the wrong mix of products.

Similarly, if Direct Operating Expenses are greater than 27%, it may signal that labour costs or machinery maintenance costs are out of line.

It should be clear that the benchmarks only provide guidelines and that many factors can affect an individual farm's ratios. Obviously, they are affected by weather (yields) and prices from one year to the next. Similarly, a farm going through transition may have sub-par ratios at a point in time, eg if expansion is taking place in an orchard or livestock operation and the expense has been incurred for trees of breeding stock, but its revenue has yet to be realized.

For these reasons, it is best to have a few years of data to ensure true representation that may not be reflected in a given year's data. Understanding the situation of the individual

farm is fundamental to understanding whether there is a management problem. Also, for most farms, one of the best benchmarks is to show progress over time on its own ratios. If there are no structural issues, the benchmarks can provide powerful information against which to gauge performance.

Balance sheet ratios are not examined in this report because there is no reason to expect a relationship between them and profitability over many observations. However, as implied in section 3.0, for an individual farm there may be considerable interaction that affects its strategy.

For example, if a farm intends to make major investment in expansion either horizontally or downstream, having operating efficiency of 20% and funded debt/EBITDA of 8.0:1, it may (and likely should!) be difficult to get financing for new investment. Therefore, while expansion may still be a long term strategic intent, it may be supplanted in the short to medium term by an intent to improve operating earnings and pay down debt.

Compared to the benchmark of 35%, this farm is leaving \$150,000 of operating earnings on the table per million dollars of revenue. By definition, improved operating earnings alone will lower debt/EBITDA. But it also means that, if accomplished, the farm will be able to pay down debt, thereby reducing the ratio even more. When it gets low enough, the long term strategic intent of expansion can be pursued because the farm has much better ability to service debt. Moreover, having the ability to show a lender what has been accomplished in terms of improved profitability and ability to service debt will go far toward ensuring that financing can be obtained.

4.3 Further Extensions to the Analysis

As discussed above, the benchmarks can be used to diagnose problems in management. But if a cost ratio at this level is out of line, how does one pinpoint where the problem lies?

A first general step is to examine the individual line items in a category to determine what is material. For example, if a farm's %DOE is 39% but repairs and maintenance are 5% of revenue, it's not likely that R&M is material: %DOE is 12% above the benchmark. Cutting the cost of R&M in half would not materially address the DOE problem. Often this materiality test is enough to isolate the problem.

A second step is to determine whether there are clear benchmarks for subcategories of cost. As an initial step, the following subcategories were investigated. These are costs that could be significant on many farms.

- Cost of Goods Sold
 - Fertilizer
- Direct Operating Expenses
 - Repairs
 - Fuel
 - Labor
- Over Heads
 - Mgt. salaries

- Cost of Capital
 - Capital cost equipment
 - Land Cost
- Financing charges
 - Long & Short Term Interest

Each of these sub-categories was used to calculate a ratio relative to revenue in the sample of 78 farms. The results are as follows. Table 4.3 contains the ratios for Fertilizer and the Direct Operating Expense Ratios.

Table 4.3 Cost of Goods Sold and Direct Operating Expense Ratios

NET PROFIT RATIO GROUPS	WHOLE					
	SAMPLE	0%	25%	50%	75%	100%
FERT / REV	13.70%	0.00%	21.86%	10.56%	11.53%	21.25%
REPAIRS / REV	4.91%	4.90%	7.58%	4.38%	3.25%	2.26%
FUEL / REV	3.25%	1.28%	4.15%	3.11%	2.62%	2.60%
LABOUR / REV	11.20%	0.00%	12.46%	10.24%	11.77%	2.04%

The results show that there is no discernible relationship between the categories of profitability and either fertilizer expenses or labour. Labour costs for all farms can be an issue because of labour requirement on different types of farms. This may show a very different outcome when there is a large enough sample. However, the most profitable farms have lower costs of repairs and maintenance and fuel.

Table 4.4 contains the results of the analysis of overhead, capital and financing costs. Management and office salaries constitute a lower percentage of sales for the most profitable farms, while overall salaries and wages don't seem to have a strong relationship. For both of these variables it is important to point out that the number of observations for both of these is relatively small.

There is a strong inverse relationship between all of the capital and interest ratios and profitability. The most profitable quartile of farms have machinery and equipment capital costs of 8.5% of revenue, while the least profitable group are at 15.7%.

To give this perspective, the average revenue from farming for the group of farms is \$3.9 million. This means that if the most profitable farms had sales equal to the average, their annualized capital costs would be \$331,500. Compare this to the least profitable group whose 15.7% translates to annual costs of \$612,300, almost twice as much. If one assumes that the average useful life of machinery and equipment is eight years, then the most profitable farms have \$2.65million in capital stock while the least profitable have \$4.9 million.

This benchmark may be useful in helping farms to avoid being over capitalized.

Land cost and interest expense ratios show the same pattern as machinery and equipment costs: the ratios rise as profits fall.

Table 4.4 Overhead, Capital and Interest Cost Ratios

NET PROFIT RATIO GROUPS	WHOLE SAMPLE	0%	25%	50%	75%	100%
MGT & OFFICE SALARIES / REV	0.56%	0.00%	0.98%	0.51%	0.23%	0.00%
ALL SALARIES & WAGES / REV	11.76%	0.00%	13.44%	10.75%	12.00%	2.04%
CAPITAL COST EQUIPMENT / REV (no custom work)	12.38%	34.54%	15.70%	12.59%	8.65%	4.04%
Land Cost (no opportunity cost for own land)	7.80%	2.84%	11.79%	6.87%	5.57%	5.68%
Long & Short Term Interest / REV	2.83%	0.00%	3.12%	2.96%	2.30%	0.00%

4.4 Limitations of the Analysis

While these benchmarks may be quite useful, it has limitations, some of which have been pointed out in the narrative above. The limitations are discussed below.

- The sample size is limited. It is relatively small overall and too small to have reliable differences by type of commodity.
- It is only for one year. As discussed above, ratios can change from one year to the next for a number of reasons, not least weather and prices. For most farms, some of the best value from knowing their ratios likely comes from assessing multiple years and in being able to see trends over time.

Adding time may also allow analysis of balance sheet ratios that will help with understanding how best to grow. Debt/EBITDA and profits per dollar of assets likely change with the stage of the business: early on or just after a major expansion, debt may be high because of new investment and profitability may take time to evolve from those investments, often for biological reasons. Similarly, when a farm business is winding down, there may be low investment and a tendency to cash in on equity. Factors such as these are difficult to assess in cross-sectional data without detailed knowledge of the stage and strategy of the farm.

- For some of the subcategories of cost it would be very useful to calculate them per acre or hectare. Some people, especially in grain and oilseed production, think about costs per acre. They are expressed here as cost per dollar of revenue. Adding farmed acres to perform per acre comparisons (individual farm vs. area average etc.) would be extremely useful.
- As has been pointed out in the document, most financials use CRA-defined rules for capital depreciation. They may not be representative of economic depreciation. It would be good, but likely difficult, to use economic depreciation if a consistent

methodology in calculating it can be agreed. This issue applies to any approach to capital costing, not just this one. Some people apparently assume that useful life is twice the CRA rate. Adjusting everything by the same factor would make little difference in the outcome of the analysis because it doesn't change the underlying variation in a distribution.

- It is not always clear whether the same costs are included in the same categories for all farms. Three questions that need to be answered as clearly as possible that can affect the results are:
 - Labour and management payments. As indicated above, it would appear that many farmers lump them together. The better the accounting allocation between the two, the more meaningful is the analysis of labour costs.
 - Bank charges and interest. Many farms lump the two together and, though often bank charges are not material, they can affect the capital and interest ratios when they are. The same applies to interest charges in lease payments.
 - Changes in inventory. Changes in the value of inventory of products to be sold are increases or decreases to revenue. Changes in the value of inventory of inputs, including inventory or breeding stock, are changes in cost and should be included in Cost of Goods Sold. They are often lumped together and can misstate the Gross Margin. It is important to account for them separately.
- This way of organizing the operating statement changes the calculation of EBITDA. While there is no generally accepted definition of EBITDA by the accounting profession, most people calculate it by adding back depreciation and interest to net profits. In this approach, leasing and rent payments are included in capital costs. Also, factors such as gains or losses asset disposal and government payments are brought in after calculating profits from operations.

Different people handle these items differently. In particular, as more lenders use funded debt/EBITDA in covenants, it is important for the individual farm to understand whether and how their lender approaches them. Moving these items below calculated EBITDA can understate it. They can be added back if necessary to be consistent with a lender's practice.

As noted earlier, accounting for leasing and rental costs as costs of capital means that this format calculates EBITDAR, not EBITDA in its normal sense. When working with lenders it is important to underline this and adjust as necessary.

5.0 Closing Comments, Next Steps and Further Extensions

Based on this preliminary analysis of 78 farms, it would appear that the structure of a standardized operating statement proposed here gives financial benchmarks that are generally in line with expectations, changes some and adds some, especially in the capital cost area.

Different people have different approaches to financial analysis. If one was the “right one” there probably wouldn’t be a huge variation in the way statements are structured among agricultural accountants. The one followed here results from a desire to find an approach that makes sense for farmers and that will assist BDO in providing useful management information for their farm clients.

It is based on two sets of principles that apply to most farms. The first is that managing capital is different than managing operations. This is widely recognized outside of agriculture by companies that have both a Chief Financial Officer and a Chief Operating Officer. It is explicitly recognized in the standardized operating statement by having separate categories for capital and interest after operating expenses.

The second principle is that there are five standard cost categories common to all farms no matter what they produce. Two are the capital and interest costs mentioned above. The other three are operating cost categories which we call Cost of Goods Sold (CoGs), Direct Operating Expenses (DOE) and Overhead Costs (OH). The first two are variable and the third tends to be quasi-fixed.

A major consequence of this organization of the operating statement is that leasing and rental costs as well as property taxes and land clearing costs are included as capital costs, not operating costs. Leasing and rentals are alternative methods to control capital assets, so it seems logical to call them what they are: capital costs, as is increasingly occurring in the evolving International Financial Reporting System standards.

Including leasing as operating costs creates major issues in benchmarking: if one farm leases, another owns and a third has a combination, the benchmark ratios will be a rather meaningless mixture.

Some might argue that this approach is inappropriate because leasing and rental costs are variable costs and should not be in capital. We would argue that this is an empty argument from a profession that increasingly puts depreciation and amortization in Cost of Goods Sold on many farm accounting statements. Moreover, the references cited regarding changes in international reporting standards suggest that including them in capital is quite appropriate.

Next steps on the project follow from the discussion of limitations in Section 4.4. Following the first set of data described here, there is now a clear plan to materially increase the sample size so that the small sample issue is overcome, and to add years. The benchmarking process, by type of farm, with feedback to BDO’s customers will be available each year. AME will analyze the data to continue to verify and expand the benchmarks and work with BDO to address the other issues identified in section 4.4 to improve data consistency.

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