DEVELOPING A FINANCIAL RATIO BENCHMARKING SYSTEM FOR GWK DISTRICT FARMERS IN SOUTH AFRICA

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Abstract

Knowing the performance of competing farmers in an industry is very important. This provides farmers with an important tool to evaluate their position against the position of their competitors. Benchmarking is an effective method to evaluate the performance of a farm against other competing farms. The research is aimed at developing a benchmarking system for farmers within the GWK district, South Africa, using the Sweet 16 financial ratios as a guideline. This will provide the farmer with a tool to evaluate his performance against competitors from the specific district. The financial analysis was obtained from GWK cooperative who use the financial statements of farmers in their study groups. These statements were analysed using Microsoft Excel, where the data was analysed into 14 ratios, based on the Sweet 16 ratios used by the Farm Financial Standards Council in the USA. The main results from this research show that there are significant differences in the financial performance and correlation from the enterprises in the district. Differences in the ratios can be influenced by several factors, including the cash flow and leverage situation of the farm, which will require different management strategies in order to improve financial ratios of different farms.

Keywords: Financial statements, financial ratios, Benchmarking

Sub theme: Business and Finance

1. Introduction

With farming, the farm operator has to use his financial statements to guide him through the management process. According to Barry et al (1995), financial management can be described as the acquirement and use of financial resources as well as equity protection from various risk sources. Future plans depend on certainty of decision making and the farm operator has to make daily decisions that influence the profitability of the farm.

Benchmarking is an important tool that assists an individual to improve the performance of his farm. Wilson, Charry and Kemp (2004) define benchmarking as a performance indicator value that identifies a specific level of performance that includes best practice performance. Benchmarking involves the comparison of a performance indicator for one farm with the performance indicator for one or more other farms (Wilson *et al.*, 2004).

The objective for this paper is to develop a benchmarking system for GWK district farmers in the Northern Cape, South Africa. When the ratios have been determined it will be compared to ratio norms that are set in other countries. The aim is to develop a benchmarking system that can be available to the public on the internet, and which provides farmers with a tool to benchmark their performance against competitors and decide on management strategies to improve their position.

2. Method

The data used to develop the benchmarking model were obtained from GWK Limited, Douglas, Northern Cape, South Africa. Part of the services provided by GWK is an annual Production Results

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Analysis that is formulated from information supplied by farmers in their study group. Most of the crop farmers in the district are irrigation farmers. The data used in the paper are the financial statements³⁵, the income statement³⁶ and balance sheet. According to the FARM FINANCIAL STANDARDS COUNCIL (FFSC) in the USA, these statements contain enough information to analyse the financial position of a farm, according to 16 financial ratios (Hoag, 2009). The FFSC propose standardized processes to calculate each one of the 16 ratios known as the "sweet 16" (Hoag, 2009) and are illustrated in Table 1. The ratios are divided into five categories: liquidity, solvency, profitability, repayment capacity and financial efficiency. These five categories will be discussed later in the paper.

³⁵ Used to develop the production results analysis.

³⁶ The financial statements of GWK do not include depreciation, for this reason the depreciation expense ratio is excluded from the research. Land is valued according to market value and vehicles and machinery at book value as determined by the agricultural economist of GWK. The term debt ratio has been left out because inconsistency has been found between interest paid and principal payment on term debt. The capital debt repayment capacity only includes interest paid and was included.

Table 2: Calculation of the Sweet 16 ratios as proposed by the FFSC

T						
Liquidity						
Current ratio	Total current farm assets ÷ Total current farm liabilities					
Working Capital	Total current farm assets - Total current farm liabilities					
Solvency						
Debt to Asset	Total farm liabilities ÷ Total farm assets					
Equity to Asset	Total farm equity ÷ Total farm assets					
Debt to Equity	Total farm liabilities ÷ Total farm equity					
Profitability						
Rate of return on	(Net farm income from operations + Farm interest expense -					
assets	Owner withdrawals for unpaid labour and management) \div					
	Average total farm assets					
Rate of return on	(Net farm income from operations - Owner withdrawals for					
equity	unpaid labour and Management) \div Average total farm equity					
Operating profit	(Net farm income from operations + Farm interest expense -					
margin	Owner withdrawals for unpaid labour and management) \div					
	Gross revenues					
Net Farm income	Net farm income, accrual-adjusted (NFI) is calculated by					
	matching revenues with expenses incurred to create those					
	revenues, plus the gain or loss on the sale of business assets,					
	but before taxes.					
Repayment Capacity						
Capital debt	Net farm income from operations +/- Total miscellaneous					
repayment capacity	revenues/expenses+ total non farm income- total income tax					
	expenses total owners withdrawals+ interest on term debt					
Financial Efficiency						
Asset turnover ratio	Gross revenues ÷ Average total farm assets					
Operating expense	(Total operating expenses - Depreciation/amortization					
ratio	expense) ÷ Gross revenues					
Interest expense	Total farm interest expense ÷ Gross revenues					
ratio Net income ratio	Net farm income from operations ÷ Gross revenues					

Source: FFSC, 2008

For each ratio there are some reasonable guidelines to determine the performance of the farm, according to Blocker, Ibendahl and Anderson (2003), these norms are illustrated in Table 2. When a farmer benchmarks his performance against these measures, they supply the farmer with a "warning system". The farmer has a consistent way of deciding what ratios to improve or whether certain investments options would be wise (Blocker *et al.*, 2003).

Table 3: Guidelines to determine reasonable performance

	Тор	Border	Mid point	Border	Bottom
	Performance	ratio	performance	ratio	performance
Liquidity					
Current ratio		≥ 2.0		1.0 ≥	
Working capital		Value		Value	
Solvency					
Debt to asset		≤ 30 %		60 % ≤	
Equity to asset		≥ 70 %		40 % ≥	
Debt to equity		≤ 43 %		150 % ≤	
Profitability					
Net income		Value		Value	
Rate of return on		≥ 5%		1 % ≥	
assets					
Rate of return on		≥ 10 %		5 % ≥	
equity					
Operating profit		≥ 35 %		20 % ≥	
margin					
Repayment					
capacity					
Term debt ratio		≥ 135 %		110 % ≥	
Capital replacement		Value		Value	
Financial					
efficiency					
Asset turnover ratio		≥ 40 %		20 % ≥	
Operating expense		≤ 60 %		80 % ≤	
ratio					
Depreciation		≤ 10 %		20 % ≤	
expense ratio					
Interest expense		≤ 10 %		20 % ≤	
ratio					
Net income ratio		≥ 20 %		10 % ≥	

Source: Blocker et al., 2003

3. Data

The financial statements for each farm were analysed using Microsoft Excel. First the ratios were calculated over 5 years (2005-2009) for a total of 38 farms or 190 financial statements. These ratios were divided into three groups, bottom performance, mid point performance and top performance group. These norm calculations were done in four categories, all farms (38), livestock farms (9), crop producing farms (17) and combined farms (12).

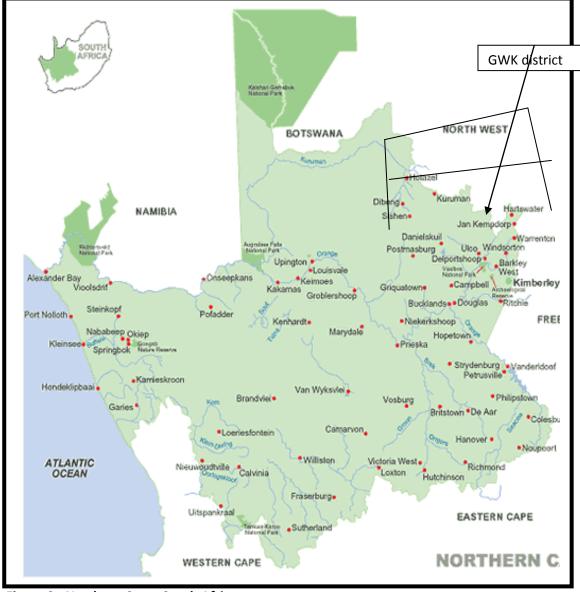


Figure 2: Northern Cape, South Africa

Source: Google (2010)

The financial statements (190) were divided into the three groups, using the Excel functions to identify the 1/3 lowest value and the 1/3 highest value³⁷. The same method was used to determine the groups for the different enterprises.

4. Results and norm discussions

In this section, 14 ratios of the Sweet 16, used for this study, will be explained. Four tables with the results from the GWK district will be followed by an explanation according to the categories and ratios. The results will be in the four category format as mentioned.

³⁷ When the border ratios used in this article were compared with the average of the border ratios for each year it was found that there was a very small difference in the value of the border ratios.

Table 4: Results for all farms of GWK district

Table 5: Results for the combined farm of GWK district

	Top Performance	Border ratio	Mid point performance	Border ratio	Bottom performance		Top Performance	Border ratio	Mid point performance	Border ratio	Bottom performance
Liquidity						Liquidity					
Current ratio		≥ 2.6		1.0 ≥		Current ratio		≥ 1.76		0.78 ≥	
Working capital		R 1 667 894		R 4 968		Working capital		R 2 748 918		R -664 159	
Solvency						Solvency					
Debt to asset ⁴		≤ 14 %		31 % ≤		Debt to asset		≤ 20 %		31 % ≤	
Equity to asset		≥ 86 %		68 % ≥		Equity to asset		≥ 80 %		69 % ≥	
Debt to equity		≤ 17 %		46 % ≤		Debt to equity		≤ 25 %		45 % ≤	
Profitability						Profitability					
Net income		R 5 005 234		R 871 155		Net income		R 6 517 782		R 1 897 922	
Rate of return on		≥ 20 %		8 % ≥		Rate of return on		≥ 19 %		7 % ≥	
assets						assets					
Rate of return on		≥ 28 %		9 % ≥		Rate of return on		≥ 25 %		8 % ≥	
equity						equity					
Operating profit		≥ 56 %		35 % ≥		Operating profit		≥ 48 %		24 % ≥	
margin						margin					
Repayment						Repayment					
capacity		D 5 201 101		R 903 814		capacity		D 5 405 614		D 2 205 200	
Capital debt Repayment capacity		R 5 391 181		K 903 814		Capital debt		R 7 437 614		R 2 205 299	
Financial efficiency						Repayment capacity Financial efficiency					
Asset turnover ratio		≥ 48 %		27 % ≥		Asset turnover ratio		≥ 47 %		27 % ≥	
Operating expense		≤ 43 %		64 % ≤		Operating expense		≤ 47 % ≤ 52 %		69 % ≤	
ratio		2 43 70		04702		ratio		32 70		09 70 5	
Interest expense		≤ 2%		5 % ≤		Interest expense		≤ 3 %		7 % ≤	
ratio				_		ratio		_			
Net income ratio		≥ 57 %		36 % ≥		Net income ratio		> 48 %		31 % ≥	

Table 6: Results for the crop farms of GWK district

Top Border Mid point Border Bottom Performance ratio performance ratio performance Liquidity > 1.75 0.92 > Current ratio Working capital R 1 089 782 R -181 396 Solvency ≤ 17 % 42 % ≤ Debt to asset Equity to asset ≥83 % 58 % ≥ ≤ 20 % 74 % ≤ Debt to equity **Profitability** R 5 385 510 R 1 083 816 Net income ≥ 24 % 10 % ≥ Rate of return on assets Rate of return on > 39 % 13 % ≥ equity ≥ 56 % Operating profit 32 % ≥ margin Repayment capacity Capital debt R 5 353 477 R 1 434 156 Repayment capacity Financial efficiency ≥ 54 % Asset turnover ratio 36 % ≥ ≤ 48 % 69 % ≤ Operating expense ratio ≤ 2 % Interest expense 6 % ≤ ratio

Table 7: Results for the livestock farms of GWK district

	Top Performance	Border ratio	Mid point performance	Border ratio	Bottom performance
Liquidity					
Current ratio		≥ 14.61		5.23 ≥	
Working capital		R 1 524 833		R 382 724	
Solvency					
Debt to asset		≤ 2%		11 % ≤	
Equity to asset		≥98 %		89 % ≥	
Debt to equity		≤ 2%		12 % ≤	
Profitability					
Net income		R 950 917		R 404 390	
Rate of return on		≥ 13 %		5 % ≥	
assets					
Rate of return on		≥ 13%		6 % ≥	
equity					
Operating profit		≥ 72 %		42 % ≥	
margin					
Repayment capacity					
Capital debt		R 1 345 662		R 533 753	
Repayment capacity					
Financial					
efficiency					
Asset turnover ratio		≥ 22 %		13 % ≥	
Operating expense		≤ 24 %		39 % ≤	
ratio					
Interest expense		≤ 0%		2 % ≤	
ratio					
Net income ratio		≥ 76 %		61 % ≥	

31 %≥

≥ 52 %

Net income ratio

4.1 Liquidity

Liquidity measures the ability of the farm to meet all financial obligations as they arise, without causing disruptions to the normal operation of the farming business (FSC, 2008). Liquidity is measured by the current ratio and working capital.

4.1.1 Current ratio

The ratio is an indication of the extent to which the farm's current assets will cover the current liabilities should the farm be liquidated (FFSC, 2008). Liquidity indicates the continuous ability of the farm to meet all the current payments and liabilities that are necessary to continue farming activity. (Van Zyl, Coetzee, Blignaut, Kirsten & Geyser, 1999). The larger the ratio, the better the financial position of the farming business.

In the GWK district, the cut-off point for the bottom group of combined and crop farms are not able to meet their current obligations, as they have ratios below 1 at a level of 0.78 and 0.92 respectively. This can be due to production loans for the farms, especially crop farms where the farms depend on loans to finance production input. This is a clear indication that it is necessary to set separate norms for different enterprises.

4.1.2 Working capital

Working capital is a theoretical measure of the amount of funding available to purchase inputs and inventory, after all the current assets and liabilities are sold (FFSC, 2008). The higher the value of the working capital, the better the financial position of the farm. This ratio is best used as a comparable benchmark with the farm's own historical performance (Blocker *et al.*, 2003).

The results from the GWK district indicate that the different groups from the different enterprises have a positive cut-off point. This is a good indication, as the farms have the ability to use their current assets to finance all the current liabilities, if necessary.

4.2 Solvency

Solvency indicates the amount of borrowed capital, debt, leasing commitments and other expenditure obligations used by the farm, in relation to the amount of owner equity invested in the farm. Solvency provides an indication of the ability of the farm to repay all financial obligations if all the assets are sold (Crane, 2004 & Hoag, 2009). Solvency is measured by the debt to asset ratio, equity to asset ratio and lastly the debt to equity ratio.

4.2.1 Debt to asset ratio

The debt to asset ratio is difficult to interpret, as high debt ratios can be good for a farm in certain circumstances and the opposite is also true - especially in this specific area, were the farms consist of double cropping irrigation farms and extensive livestock ranching. This ratio compares the total debt obligations that are owed by the farm against the total value of farm assets; it is a way to indicate risk exposure (FFSC, 2008). The higher the value of the ratio, the higher the risk exposure of the farm (Blocker *et al.*, 2003). A lower percentage value for the debt to asset ratio is better for the farm, but as indicated, a lower value is not always the best.

When considering the ratios from the district, it can be seen that debt is relatively low on the farms. This is also seen when the cut-off norms for the district are compared with the norms in Table 2.

4.2.2 Equity to asset ratio

The equity to asset ratio measures the portion of farm assets that are financed by the owner's equity capital (FFSC, 2008). Normally, the higher the ratio, the better off the farming business.

The equity to asset ratios from the GWK district indicates that most of the farm assets are financed by equity provided by the owner. When the ratio is compared to the benchmarks in Table 2, it can

be seen that the top performance group cut-off point is the same, but the border ratio point for the bottom performance group is higher than the benchmarks set in Table 2.

4.2.3 Debt to equity ratio

This ratio is an indication of the combination of farm debt capital and farm equity capital (FFSC, 2008). This ratio is an indication of the level of leverage that is used by the farmer (Crane, 2004). This ratio can be interpreted on the same basis as the debt to asset ratio, the lower the percentage of debt in relation to equity, the better for the farming business.

Leverage is an important aspect on the farm as it is a method that can be used to expand the farming business. Comparing GWK farmers to the norms in Table 2. the norms for the farmers are lower than the ones in Table 2. The cause for the better ratios can be because the farmers are not looking to expand their business, as there is limited land available, especially near the river for the irrigation farmers.

4.3 Profitability

Profitability measures to what extent the farming business generates profits from the use of land, labour management and capital (Crane, 2004 & Hoag, 2009). The profitability analysis focuses specifically on the relation between revenue and expenses and on the level of profit generated, relative to the size of investments on the farm (Crane, 2004).

4.3.1 Rate of return on assets

The rate of return on assets (ROA) is often used as an overall index of the profitability of the farm. The higher the value, the more profitable the farm is. (FFSC, 2008).

The different farms in the GWK district indicate positive returns on assets. The top performances from the combined and crop farms show a ROA of around 20%. Livestock farm top performance groups are above 10%, the difference between the top and bottom performance is very small, a reason for this can be that livestock farming is not as asset intensive as irrigation crop enterprises. The values from the GWK district are all better than the norms shown in Table 2.

4.3.2 Rate of return on equity

The ratio measures the return on equity that is employed on the farm. As with the ROA measure, the higher the value, the more profitable the farm is. (FFCS, 2008).

As is the case with ROA, the return on equity also indicates quite a difference between the top and bottom performers, especially for combined and crop farms. The case is relatively different for livestock farms where the difference between top and bottom performers is 7%. The return on equity is important; it can also be seen in Table 2. As this ratio has higher norms set than the rate of return on assets ratio. Once again the group norms from the GWK district are all above the norms mentioned in Table 2.

4.3.3 Operating profit margin

This is also a measure of the profitability of the farm; the farm has two ways to increase profits. The one way is to increase the profits per unit produced or secondly to increase the volume of production (Blocker *et al.*, 2003 & FFSC, 2008).

Operating profit margin gives an indication of the percentage of gross revenue that is available after the expenses³⁸ have been paid. When the ratio from the GWK district is compared, the top performance group of farmers for each enterprise is around 50%. This is a very good indication, as most of the farmers, even the bottom performance groups, have border ratio points of around 30%.

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³⁸ Expenses exclude interest and family expenses

4.3.4 Net income

The net farm income is derived directly from the income statement. As with working capital, this is not a ratio but a value and it is difficult to compare to other farms because of the difference in farm sizes (Blocker *et al.*, 2003). This ratio can also be used as a historical benchmark of the farm's own past performance.

The values from the farms in the district indicate good net farm income values for each of the border ratio points for the different groups. For the farm operator it will be better to benchmark his performance with the farm's own historical performance.

4.4 Repayment capacity

Repayment capacity measures the ability of the farm to repay debt from both farm income and non farm income. This is an evaluation of the capacity of the business to service debt or to invest in additional capital after all the commitments have been seen to (Crane, 2004).

4.4.1 Capital replacement ratio

The capital replacement margin enables borrowers and lenders to evaluate the ability of the farm to generate funds that are necessary to repay medium and long term debts and to replace assets when necessary (FFSC, 2008). This is a currency value and therefore difficult to compare to other farms, so the best way to benchmark this value is with the farm's own historical performance.

The values that were calculated for the district, indicate that the farms that are more likely to use debt to finance activities on the farm have very high capital replacement margins, this include crop and combined enterprise farms. Livestock farms that do not depend so much on debt have a lower margin, but both the top and bottom performance group's border ratio points have positive margins.

4.5 Financial efficiency

Financial efficiency measures how efficient the labour, management and capital are used on the farm. These ratios deal with the relation between inputs and outputs (Crane, 2004).

4.5.1 Asset turnover ratio

Asset turnover ratio is a measure of how efficient the assets are used to generate revenue (FFSC, 2008).

Farms are dependent on the assets that are available on the farm. If the assets that were bought are not used efficiently revenue will not be available on the farm and in effect money will not be available to repay loans and build up equity.

4.5.2 Operating expense ratio

The relation between operating expenses and revenue are illustrated by this ratio (FFSC, 2008).

This is also an important ratio as it gives an indication whether enough revenue is generated from the products used that are covered to operate the farm. It is important that there is enough revenue left, after covering all the operating expenses, to cover other necessary expenses.

4.5.3 Interest expense ratio

The interest expense ratio is a measure of how much interest is being paid by the farm. This ratio should be monitored over time, and it should be declining (Blocker *et al.*, 2003). The ratio will change as the total debt changes, when a new loan is obtained the ratio will increase but should be decreasing after a while (Blocker *et al.*, 2003). The amount of interest paid by the farm is determined by the value of the total debt used on the farm. Farms that specifically rely on production loans, such as crop and combined enterprise, the interest expense ratio can give a good

indication of how expensive the production loans are. A farm operator would like this ratio to be as low as possible, but the same as the debt to equity ratio, when the objective of the farm is to expand, it will also be seen in this ratio.

When the norms set out by Blocker *et al.* (2003), are compared to the norms from the GWK district, the GWK district has lower norms for the different groups. This is a good indication for the farmers in the district. Overall the farmers in the district have relatively low interest on the farm. All the groups from the different enterprises have a border ratio point below 10% for the bottom performance groups.

4.5.4 Net income ratio

Net farm income from operations, measures how much gross profit is left after the expenses have been paid (Blocker *et al.*, 2003).

This is an indication of the money left to cover expenses like debt repayment, family living expenses and other farm and nonfarm expenses. The farm operator would like this ratio to be as high as possible. The ratio norm set by Blocker *et al.* (2003), can be used as a guideline, but when the results from the district are compared with the norms in Table 2, all cut-off points for the different groups are higher.

5. Correlation between ratios

When the correlations between the ratios were tested it was found that there was correlation between the ratios. There were also differences found in the correlations for each of the different enterprise on the farms. The correlation differences between enterprises will not be discussed in this paper.

Table 8: Correlation between the ratios of all the farms

	Current ratio	Working Capital	Debt to assets ratio	Equity to asset ratio	Debt to Equity ratio	Net income	Rate of Return on Assets	Rate of Return on Equity	Operating profit Margin	capital debt repayment capacity	Asset Turnover Ratio	Operating Expense Ratio	Interest Expence Ratio	Net Income Ratio
Current ratio		•								•				
Working Capital	+													
Debt to assets ratio	-	-												
Equity to asset ratio	+	+	-											
Debt to Equity ratio	-	-	+	-										
Net income	-	+	-	+	•									
Rate of Return on Assets	-	-	+	-	+	+								
Rate of Return on Equity	+	-	-	+	ı	+	+							
Operating profit Margin	+	-	-	+	•	+	+	+						
Capital debt repayment														
capacity	-	-	+	-	-	+	+	+	+					
Asset Turnover Ratio	-	-	+	-	+	+	+	+	+	+				
Operating Expense Ratio	-	+	+	-	+	-	-	-	-	-	-			
Interest Expence Ratio	-	-	+	-	+	-	-	-	-	-	-	+		
Net Income Ratio	+	-	-	+	1	+	+	+	+	+	+	-	•	

The correlation between the ratios can be an indication of the relation between ratios. Identification of correlation can help the farmers to identify what the impact will be on the other ratios when one is improved. This is important to the farmer, as this will be important to make decisions regarding the financial position of the farm. The influence of certain factors on the correlation between the ratios will be investigated in future research.

6. Improving the financial position

To improve the ratios one has to improve financial aspects of the farm. There are several options for a farmer to improve his financial performance and the improved performance will be reflected in the financial ratios.

The farmers have to identify whether the problem is short term or long term. To improve the short term financial performance, one of the most important aspects is the cash flow of the farm (Boehlje et al., 1999). To improve the cash flow the farmer can sell some of his current assets, but has to be careful not to sell too much as it will affect his cash flow in the future. There are several possibilities that the farmer can negotiate in terms of his loans. Options include reducing the size of intermediate or long term debt payments or renegotiating the repayment term of the loan. The farmer can even consider to lengthen the period of the term and to add a balloon payment (Boehlje et al., 1999). Short term debt can also be extended to intermediate or long term loans. A possibility for the farmer is to generate non farm income or to seek ways to increase the revenue from non farming activities and/or to reduce the nonfarm expenditure including family spending (Boehlje et al., 1999). One important aspect to remember with cash flow is that farms work with seasonal trends (Boehlje et al., 1999).

When the problem is identified to be a long term problem, the same aspect as in the short term is important, but there are other aspects that will require attention. One of the important aspects is the effective use of resources (Boehlje *et al*, 1999.). The resources must be used effectively to generate revenue and produce profit at such a level to compete with other farmers in the industry and also to meet the farmer's needs (Boehlje *et al*, 1999).

These are a few options available to a farmer; there are also a number of other options available, not discussed in this article.

7. Conclusion

After comparing the results from the GWK district to the norms by Blocker *et al.* (2003), in Table 2, it can be seen that these norms can be used as guidelines. When comparing the different farms from the district is becomes obvious that there is quite a difference in the norms that can be used for the enterprises in different industries, and for different areas. According to the border ratio points for the different performance groups, the farmers in the district are in a relatively good position when compared to the ratios in Table 2. Although most of the performance groups are in good positions, there are some of the farms in the district that are not at the best performance in the area of the study, especially the bottom performance groups.

The benchmarking system will provide these farmers with the opportunity to see what their position is relative to their direct competitors and make decisions according to their relative position in order to improve their own position. To improve their financial performance position the farmer must keep in mind the correlation between the ratios, shown in table 7. An important factor is that, when attempting to improve the financial position one must not concentrate on one ratio only. Improving the one ratio can have a negative influence on some of the other ratios and eventually place the farm in a worse position than before. Therefore not one ratio is more important than another, but they must be seen as a big picture of the farm's financial position.

Future research can include testing the correlation differences between the different enterprises and how the influence of the macroeconomic environment influences the position of the farm and whether a time lag exists between changes in the macroeconomic environment and farm financial positions.

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