AAE 320 Problem Set #5 **Due November 5, 2021** **Name** **KEY**

For this problem, you will use a balance sheet and income statement for a hypothetical farm. The balance sheet and income statement are based on an excel spreadsheet previously available from Iowa State University Extension. Use this example for this problem set: http://www.aae.wisc.edu/aae320/ProblemSets/SheetsPS5.xlsx. The spreadsheet has several tabs; use the Balance Sheet and Income Statement tabs.

a) Fill in the super brief version of the farm balance sheet below using the information in the Balance Sheet table of the spreadsheet.

	Assets			Liabilities	
	1/1/2020	1/1/2021		1/1/2020	1/1/2021
Current	**708,965**	**810,333**	Current	**341,875**	**375,136**
Non-Current	**9,875,662**	**10,314,229**	Non-Current	**988,764**	**939,356**
			Equity	**9,253,988**	**9,810,070**
Total Assets	**10,584,627**	**11,124,562**	Total Liabilities & Equity	**10,584,627**	**11,124,562**

b) Using the Balance Sheet from part a,

i) What was the Current Ratio on 1/1/2020 and on 1/1/2021?

CR_2020 = 708,965 / 341,875 = 2.07
CR_2021 = 810,333 / 375,136 = 2.16

ii) What was the Debt to Asset Ratio on 1/1/2020 and on 1/1/2021?

D:A_2020 = (341,875 + 988,764) / 10,584,627 = 12.6%
D:A_2021 = (375,136 + 939,356) / 11,124,562 = 11.8%

iii) What was the Equity to Asset Ratio on 1/1/2020 and on 1/1/2021?

E:A_2020 = 100 – D:A_2015 = 87.4% *or 9,253,988 / 10,584,627*
E:A_2021 = 100 – D:A_2016 = 88.2% *or 9,810,070 / 11,124,562*

iv) What was the Debt to Equity Ratio on 1/1/2020 and on 1/1/2021?

D:E_2020 = (341,875 + 988,764) / 9,253,988 = 0.144
D:E_2021 = (375,136 + 939,356) / 9,810,070 = 0.134

v) Briefly comment on these ratios: How is the farm doing?

This farm seems to be doing fine in terms of liquidity (the current ratio over 2.0) and solvency (debt to asset ratio less than 15%). Furthermore, the farm is continuing to decrease the debt to asset ratio.

c) Fill in the super brief version of the farm income statement below using the information in the Income Statement tab in the spreadsheet. I give a value for Unpaid Labor & Management.

Total Cash Revenues	600,306
Cash Operating Expenses (without Interest)	449,277
Interest	25,940
Total Expenses (including Interest)	475,217
Unpaid Labor & Management	85,000
Net Farm Income (as per class notes)	40,089

d) Using the Balance Sheet from part a and the Income Statement from part b,

i) What was Net Farm Income (as per class notes) for 2020?

NFI = Revenue – Costs – Interest – Labor&Mgmt + CapGains = 600,306 – 449,277 – 25,940 – 85,000 – 0 = 40,089

ii) What was the Net Farm Income from Operations in 2020?

NFIfO = Revenue – Costs – Interest = 600,306 – 449,277 – 25,940= 125,089

iii) What was the Return on Assets and the Rate of Return on Assets in 2020?

ROA = NFI + Interest = 40,089 + 25,940 = 66,029
ROROA = ROA/Avg Assets = 66,029 / [½(10,584,627 + 11,124,562)] = 0.62%

iv) What was the Return on Equity and the Rate of Return on Equity in 2020?

ROE = NFI = 40,089
ROROE = ROE/Avg Equity = 40,089 / [½(9,253,988 + 9,810,070)] = 0.43%

v) What was the Operating Profit Margin in 2020?

Profit Margin = ROA / Revenue = 66,029 / 600,306 = 11.0%

vi) How does ROROA and ROROE change if Unpaid Labor & Management is $0?

NFI = Revenue – Costs – Interest – <u>Labor&Mgmt</u> + CapGains = 600,306 – 449,277 – 25,940 – 0 – 0 = 125,089
ROA = NFI + Interest = 125,089 + 25,940 = 151,029
ROROA = ROA/Avg Assets = 151,029 / [½(10,584,627 + 11,124,562)] = 1.43%
ROE = NFI = 125,089
ROROE = ROE/Avg Equity = 125,089 / [½(9,253,988 + 9,810,070)] = 1.35%

vii) Briefly comment on these ratios: How is the farm doing?

In general, this farm seems to be making money, earning more than \$66,000 as ROA after paying him/herself as manager \$85,000. However, the farm has a large amount of assets, worth more than \$11 million, yet is only generating \$66,000 in ROA. As a result, the rate of return on assets (and equity) is quite low. If low rates of return continue to be the pattern, the owner may want to think about hiring or bringing in management help to increase the ROA and thus rates of return.

e) What types of information are missing from the sheets you used to perform this analysis? Compare the spreadsheet to class notes and the sample balance sheet and income statement on the class web page (https://aae.wisc.edu/aae320/FarmFinance/ComboBalanceIncome.pdf). Hint: Look at example balance sheet and see what types of questions you can answer there that you cannot answer with the balance sheet used here for question 1.

Some of the things I found missing were gains/losses from sale of capital assets, no depreciation, no accounting for unpaid labor/management, no accrual adjustments of any sort, and no separation of gains from retained earning versus gains from asset valuation changes. There are likely more.