

Lecture XXV: Costs and Benefits of Debt

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1 A Comparison of Two States

- Balance Sheets
- Income Statements

A Comparison of Two States

- As a starting point, let us assume that each farmer wants to increase the scale of his operation by roughly 10 percent – adding 40 acres.
- First we assume that 15 percent of the value of Land and Buildings can be allocated to buildings.
 - This leaves \$ 996,935 in land in the Arkansas farm and \$ 1,716,167 in the Georgia farm.
- Next, we divide by the average price of real estate in Arkansas of \$ 2,390 per acre and for the Georgia farm of \$ 4,100 per acre implying that the farm in Arkansas farms 417.13 acres while the farmer in Georgia farms 418.58 acres.
- This would imply a purchase of \$ 95,600 and \$ 164,000 for the Arkansas farmer and the Georgia farmer respectively.
- The question is then: Is this purchase a good deal for each farmer?

Balance Sheets

	Arkansas	Georgia
<i>Balance Sheet</i>		
Assets		
Current Assets	242,610	141,062
Non-Current Assets	1,697,099	2,422,285
Land and Buildings	1,172,865	2,019,020
Farm Equipment	483,041	345,925
Other	41,193	57,340
Total Assets	1,939,709	2,563,347
Liabilities		
Current	123,937	92,485
Non Current Liabilities	261,843	324,555
Real Estate	226,149	290,037
Non-Real Estate	35,694	34,518
Total Liabilities	385,780	417,040
Owner Equity	1,553,929	2,146,307

Income Statements

	Arkansas	Georgia
<i>Income Statement</i>		
Gross Cash Income	915,884	910,424
Cash Expenses	639,648	710,889
Net Cash Income	276,236	199,535
Depreciation	63,202	61,359
Net Income	213,034	138,176
Interest Expense	26,407	34,920
<i>Operating Ratios</i>		
Returns to Assets	239,441	173,096
Rate of Return on Assets	12.34	6.75
Implied Interest Rate	6.85	8.37

- To examine the financial consequences of purchasing the additional farmland using debt, we need to decide how this investment is going to change the “bottom line”.
- This could be done either with partial budgeting (i.e., asking what the farmer is going to do with the land and building up the additional revenues and costs) or by using the income statement.
- For our current example, we divide the income statement presented in Table 2 by the number of acres for each farm to generate an income statement per acre (presented in Table 3 – this is similar to the analysis of the common sized income statement presented in Section 4.8).

Returns and Expenses per Acre

	Arkansas	Georgia
Gross Cash Income	2,195.69	2,175.04
Cash Expenses	1,533.48	1,698.35
Net Cash Income	662.23	476.70
Depreciation	151.52	146.59
Net Income	510.72	330.11

- We assume that the additional acres will not significantly change the equipment requirements (so that we can ignore the potential additional cost for equipment).
- We also assume that there is no significant economies or diseconomies of scale from this marginal investment.
- The question is how to estimate the additional revenue (Gross Cash Income) and expense (Cash Expense net of Interest Cost) associated with the expansion.
- To do this we subtract the Interest Paid (taken from Table 1) from the Cash Expenses of each state (resulting in a Cash Expense for Arkansas and Georgia of \$642,300 and \$675,969 respectively).
- The Net Cash Income for the original acreage and Net Cash Income per acre are presented in Table 4.

Returns Gross of Interest Expense

	Arkansas	Georgia
Farm Returns		
Gross Cash Income	915,884	910,424
Cash Expenses (Net Interest)	613,241	675,969
Net Cash Income	302,643	234,455
Returns per Acre		
Gross Cash Income	2,195.69	2,175.04
Cash Expenses (Net Interest)	1,470.15	1,614.92
Net Cash Income	725.54	560.12

Pro-Forma Income Statement

- We can estimate the gross returns for the Arkansas farm by

$$2,195.69 \times (417.13 + 40) = 1,003,711. \quad (1)$$

	Arkansas	Georgia
Gross Cash Income	1,003,711	997,424
Cash Expenses (Net Interest)	672,047	740,566
Net Cash Income (before Interest)	331,665	256,858
Depreciation	63,202	61,359
Net Income (before Interest)	268,453	195,499

Gain to Land Purchase

	Arkansas	Georgia
Net Income (before Interest)	268,463	195,499
Original Interest	26,407	34,920
Purchase Price	95,600	164,000
At Original Interest Rate	9,646	17,646
12.5 Percent Interest Rate	11,950	20,500
Net Income - Original Interest Rate	232,410	142,933
Gain from Expansion	19,376	4,757
Net Income - 12.5 Percent Interest Rate	230,106	140,079
Gain from Expansion	17,072	1,903