

Operating Leverage

File C1-45

Leverage involves finding ways to increase the value or impact of a resource. Traditional discussions of leverage focus on *financial* leverage where equity funds (net worth) are augmented with borrowed funds to increase the size of a business. Under profitable conditions financial leverage increases the returns to the limited equity funds. Financial indicators such as the Debt-to-Asset Ratio are used to measure the financial leverage of the business.

Operating leverage is also used extensively in farm businesses. Operating leverage increases the returns to limited equity funds by using the money to “control” assets rather than “own” them. Assets can be controlled by renting or

leasing the assets or hiring custom services. Because a smaller outlay of funds is needed to rent acres, a farmer can develop a larger business with the same amount of equity.

Example Assumptions

A typical example of operating leverage in farming involves renting rather than buying farmland. Table 1 shows typical investment estimates for corn and soybean production. The total investment for corn production for a farmer owning their land (including land, machinery and operating expenses) is \$8,375 per acre. However, the total investment for a renter (including land rent, machinery and operating expenses) is only \$1,080 per acre.

Table 1. Operating leverage example (investment per acre)

	Own		Rent	
	Corn	Soybeans	Corn	Soybeans
Yield	200	55	200	55
Farmland investment				
Land purchase	\$7,500	\$7,500		
Real estate taxes	<u>25</u>	<u>25</u>		
Land rent			<u>\$230</u>	<u>\$230</u>
Total	\$7,525	\$7,525	\$230	\$230
Machinery investment	\$497	\$497	\$497	\$497
Operating expense investment				
Seed	\$98	\$50	\$98	\$50
Fertilizer	125	58	125	58
Herbicides	40	49	40	49
Fuel and repairs	80	70	80	70
Miscellaneous	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Total	\$353	\$237	\$353	\$237
Total investment	\$8,375	\$8,259	\$1,080	\$964
Total investment per bushel	\$41.88	\$150.16	\$5.40	\$17.53
Average investment per acre		\$8,317		\$1,022

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Table 2. Returns and risk from a \$1 million investment

Corn/soybean rotation under various combinations of rented and owned land				
Percent owned	100%	67%	33%	0%
Percent rented	0%	33%	67%	100%
Acres farmed ^{1/}				
Acres owned	120	113	97	0
Acres rented	<u>0</u>	<u>57</u>	<u>193</u>	<u>978</u>
Total acres farmed	120	170	290	978
Risk exposure				
Investment per acre	\$8,317	\$5,910	\$3,429	\$1,022
Average annual cost per acre	\$370	\$437	\$507	\$575
Investment/cost ratio ^{2/}	22.5	13.5	6.8	1.8
Profitability				
High price scenario (\$6.00 corn; \$15.00 soybeans)				
Net income	\$77,287	\$97,610	\$146,550	\$428,376
Return on investment (ROI) ^{3/}	7.7%	9.8%	14.7%	42.8%
Low price scenario (\$3.00 corn; \$8.50 soybeans)				
Net income	\$19,725	\$16,264	\$7,929	-\$40,068
Return on investment (ROI) ^{3/}	2.0%	1.6%	0.8%	-4.0%

¹ Total investment divided by average investment per crop acre

² Investment per acre divided by annual cost per acre

³ Return on investment of \$1 million

Size of Farming Operation

The number of acres of corn and soybeans that can be operated with a limited investment of \$1 million is shown in Table 2. Four combinations of owned and rented land are shown. Because of the high investment requirements of owning land, only 120 acres (\$1,000,000 / \$8,317) can be operated if the land is purchased. However, if all land is rented, 978 acres (\$1,000,000 / \$1,022) of land can be operated.

Risk Exposure

Because operating leverage allows more acres to be operated, investment per acre declines. As shown in Table 2, the investment per acre drops from \$8,317 per acre if all land is owned to \$1,022 per acre if all land is rented.

The Investment/Cost Ratio can be used to illustrate the ability of the business to absorb losses.

Investment per acre is divided by the per acre cost of producing the crop. In the example, the ratio declines from 22.5 if all land is owned to 1.8 if all land is rented.

To put this ratio in perspective, if all land is owned, debt-free, the operation can withstand 22 years of total losses (total crop failure, etc.) before it becomes insolvent. However, if all land is rented, the operation becomes insolvent within two years.

So, in addition to being more vulnerable to losses, operating leverage decreases the ability of the operation to absorb losses.

Profitability

The larger land base achieved through operating leverage can produce significantly higher returns if crop prices or yields are favorable. As shown in Table 2, net income under high grain prices increases from \$77,287 if all land is owned, to \$428,376 if all land is rented. Return on investment increases from 7.7% to 42.8%.

If crop prices are low, operating leverage can result in sharply lower net returns due to the higher cost of renting versus owning (debt free) land. Because land rental must be paid every year, the operating cost of producing corn and soybeans on rented land is substantially higher.

As shown in Table 2, if land is owned, low grain prices result in a net income of \$19,725 and a return on investment of 2.0%. However, if all land is rented, low prices produce a net loss of \$40,068 and return on investment of a negative 4.0%. So, the risk of loss under low prices increases substantially with operating leverage. The same relationship exists from low yields.

Risk Management

The need for risk management is greater due to the increased risk exposure from operating leverage. Crop revenue insurance, marketing strategies that reduce risk (options, etc.), and flexible leases are ways of reducing risk.

An operation could increase leverage even farther by changing the ownership structure of other major purchases, for example, leasing machinery, such as the combine or the largest tractor.

Conclusion

Just like financial leverage, operating leverage can substantially increase the size of the operation and the potential income from that operation. However, it also creates a substantially higher risk exposure because equity is spread thinly and the ability to absorb losses is reduced.