Diversified Electronics

The following exchange occurred just after a capital investment proposal was rejected at Diversified Electronics.

> **Ralph Browning** (Product Development): I just don't understand why you rejected my proposal. This new investment is going to be a sure money maker for the Residential Products division. We can expect to make $230,000 on it annually before tax.
>
> **Sue Gold** (Finance): I am sorry that you are upset with our decision, but this product proposal just does not meet our yearly short-term ROI target of 15 percent. [See Exhibit C for an example calculation.]
>
> **Ralph Browning**: I'm not so sure about the ROI target, but it goes a long way toward increasing our earnings-per-share.
>
> **Phil Carlson** (Executive Vice-President): Ralph, you are right, of course, about the importance of earnings per share. However, we view our three divisions as investment centers. Proposals like yours must meet our ROI targets. It is not enough that you show an earnings-per-share increase.
>
> **Sue Gold**: We believe that our company should increase its return on investment, especially given the interest rates we have had to pay recently. This is why we have targeted 15 percent as the appropriate minimum ROI for each division to earn next year.
>
> **Phil Carlson**: If it were not for the high interest rates and poor current economic outlook, Ralph, we would not be taking such a conservative position in evaluating our new projects. This past year has been particularly rough for our industry. Our two major competitors had ROIs of 10.8 and 12.3 percent. Though our ROI of 10.6 percent after tax was reasonable (see Exhibit C), performance varied from division to division. Professional Services did very well with 15 percent ROI, while the Residential Products Division manager had just 11 percent. The performance of the Aerospace Products Division was especially dismal, with an ROI of only 7 percent. We believe in relative performance evaluation and we expect each division in the future to carry its share of the load.
>
> **Chris McGregor** (Aerospace Products): My division would be showing much higher ROI if we had a lot of old equipment like the Residential Products or relied heavily on human labor like Professional Services.
>
> **Phil Carlson**: I don't really see the point you are trying to make, Chris.

Diversified Electronics was a growing company in the electronics industry. [See Exhibits A, B, and C for financial data.] Diversified Electronics has three divisions—Residential Products, Aerospace Products, and Professional Services—each of which accounts for about one third of Diversified Electronics' sales. Residential Products, the oldest division, produces furnace thermostats and similar products. The Aerospace Products Division is a large "job shop" that builds electronic devices to customer specifications. A typical job or batch takes several months to complete. About one half of Aerospace Products' sales are to

the U.S. Defense Department. The newest of the three divisions, Professional Services, provides consulting engineering services. This division has shown tremendous growth since its acquisition by Diversified Electronics four years ago.

Each division operates independently of the others and is treated essentially as a separate entity. Many of the operating decisions are made at the division level. Corporate management coordinates the activities of the various divisions, which includes review of all investment proposals over $400,000.

Diversified Electronics' measure of return on investment is defined as the division's operating profit before taxes and interest times one minus the average tax rate divided by investment. The investment is defined as interest-bearing debt plus owner's equity. [Calculations of ROI for the company are shown in Exhibit C.]

The details of Ralph Browning's rejected product proposal are shown in Exhibit D.

Exhibit A

DIVERSIFIED ELECTRONICS
Statement of Operating Profits
For 20A and 20B
(*in thousands*)

	Year Ended December 31	
	20A	*20B*
Sales	$141,462	$148,220
Cost of goods sold	108,118	113,115
Gross margin	33,344	35,105
Selling and general	13,014	13,692
Profit before taxes and interest	20,330	21,413
Interest expense	1,190	1,952
Operating profit before taxes	19,140	19,461
Income tax expense	7,656	7,784
Operating profit after taxes	$ 11,484	$ 11,677

Exhibit B

DIVERSIFIED ELECTRONICS
Balance Sheets
For 20A and 20B
(*in thousands*)

	December 31	
	20A	*20B*
Assets		
Cash and temporary investments	$ 1,404	$ 1,469
Accounts receivable	13,688	15,607
Inventories	42,162	45,467
Total current assets	57,254	62,543
Plant and equipment:		
Original cost	107,326	115,736
Accumulated depreciation	42,691	45,979
Net plant and equipment	64,635	69,757
Investments and other assets	3,143	3,119
Total assets	$125,032	$135,419
Liabilities and Owner's Equity		
Accounts payable	$ 10,720	$ 12,286
Taxes payable	1,210	1,045
Current portion of long-term debt	—	1,634
Total current liabilities	11,930	14,965
Deferred income taxes	559	985
Long-term debt	12,622	15,448
Total liabilities	25,111	31,398
Common stock	47,368	47,368
Retained earnings	52,553	56,653
Total owner's equity	99,921	104,021
Total liabilities and owner's equity	$125,032	$135,419

Exhibit C

DIVERSIFIED ELECTRONICS
Ratio Analysis
For 20A and 20B

20A

$$\text{ROI}=\frac{\$20,330(1-40\%)}{\$12,622+\$99,921}$$

$$\text{ROI}=\frac{\$12,198}{\$112,543}$$

ROI=10.8 percent

20B

$$\text{ROI}=\frac{\$21,413(1-40\%)}{\$1,634+\$15,448+\$104,021}$$

$$\text{ROI}=\frac{\$12,848}{\$121,103}$$

ROI= 10.6 percent

Exhibit D

Financial Data for New Product Proposal—Diversified Electronics

1. Projected asset investment[a]

Cash[d] (first year)	$ 400,000
Plant and equipment[b]	600,000
Total	$1,000,000

2. Cost data, before taxes (first year):

Variable cost per unit	$3.00
Differential fixed costs[c]	170,000

3. Price/market estimate (first year):

Unit price	$7.00
Sales	100,000 units

4. Taxes: The company faces a 40 percent tax rate. Assume that depreciation of plant and equipment for tax purposes is as follows: Year 1, $400,000; Year 2, $100,000; Years 3–4, $50,000 per year. Taxes are paid for taxable income in Year 1 at the end of Year 1; taxes for Year 2, at the end of Year 2; and so on.

5. Inflation is assumed to be 10 percent per year and applies equally to revenues and all costs. A 10 percent increase in cash investment is needed at the end of each year.

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[a] Assumes sales of 100,000 units.
[b] Annual capacity of 120,000 units.
[c] Includes straight-line depreciation on new plant and equipment. Plant and equipment are expected to last four years and to have no net salvage value at the end of four years.
[d] Due to an estimated increase in working capital for the duration of the project.

QUESTIONS:

1. Re-perform the one-year ROI calculation that led corporate headquarters to reject Ralph Browning's product proposal.

2. Determine the net present value of the project. Conduct your analysis in nominal terms. The company faces a nominal pre-tax cost of capital of 15 percent for projects of this type. Consider carefully what is likely to happen to working capital at the end of the project.

3. Ralph Browning is determined to see that his new product is implemented. After some investigation, he finds that the necessary plant and equipment for the project can be leased for an annual payment of $225,000. Will this option help "sell" the new product to Sue Gold? Why or why not? (*Hint:* If you know what operating and capital leases mean in a financial accounting context, you may assume the lease is operating. Otherwise, assume leasing means an expense of $225,000 is incurred each year to rent the equipment.)

4. By what amount is the lease option better or worse for Diversified Electronics than purchase of the plant and equipment?

5. Evaluate the manner in which Diversified Electronics implemented the investment center ROI concept. What pitfalls did they apparently not anticipate?