CHAPTER 26
SHORT-RUN ALTERNATIVE CHOICE DECISIONS

Changes from the Eleventh Edition

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Approach

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In this chapter, the principal pedagogical difficulties seem to relate to (1) distinguishing between differential costs and full costs, particularly allocated costs, and (2) sunk costs. Several of the examples are intended to explain the difference between differential costs and full costs, and it may be desirable to go through these calculations. Illustration 26-3 is designed to explain the irrelevance of sunk costs and is probably worth detailed attention. Several of the questions focus on these matters also.

Some believe that it is not necessary to describe each of the types of alternative choice problems in detail, as is done in the latter part of the chapter, because the same approach applies to all of them. Others prefer to treat each type separately because students may in fact have difficulty in relating the general approach to specific situations. The only specific type of problem that introduces new substantive material is Economic Order Quantity; the instructor can announce that this section be omitted if he or she wishes, for it is not required for any subsequent chapter, and it is usually a difficult topic (although the technique is widely used).

The "just one" fallacy section ties this chapter both to the expanded coverage of step-function costs in Chapter 16 and activity-based costing in Chapter 18. We hope this section corrects what we view as the overselling of short-term contribution analysis in business schools over the past 25 years.

The automobile example is a situation with which almost all students are familiar, and thus provides a good setting for a review of the differential cost concepts. A student may be asked to suggest other problems that might arise in connection with the use of an automobile (such as loaning it to a friend on a cost-sharing basis, loaning it on a full-cost reimbursement basis), and another student may then be asked to suggest how each such problem should be tackled.

Cases

(**Note**: *Case 16-1, Hospital Supply, Inc., can be used here if not previously assigned.*)

Import Distributors, Inc. requires the identification of differential costs as a basis for deciding discontinuance of a department.

Former Carpet Company involves a pricing decision where cost-volume relationships are key to identifying the differential costs.

Precision Worldwide, Inc. is a relevant cost case. It necessitates the use of the concepts of sunk cost, opportunity cost, and contribution analysis.

Baldwin Bicycle Company deals with analysis of the profitability to a company of a major potential

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1. 1. CHAPTER 26 SHORT-RUN ALTERNATIVE CHOICE DECISIONS Changes from the Eleventh Edition All changes to Chapter 26 were minor. Approach Despite the introduction of the concept of contribution margin in Chapter 16, students often have difficulty making the transition from the full cost accounting structure in Chapters 17-21 to the differential accounting approach described here. Even after the first case study to "jar" their previous ways of thinking about costs, at least one or two more cases are needed before students become comfortable with the differential approach. In this chapter, the principal pedagogical difficulties seem to relate to (1) distinguishing between differential costs and full costs, particularly allocated costs, and (2) sunk costs. Several of the examples are intended to explain the difference between differential costs and full costs, and it may be desirable to go through these calculations. Illustration 26-3 is designed to explain the irrelevance of sunk costs and is probably worth detailed attention. Several of the questions focus on these matters also. Some believe that it is not necessary to describe each of the types of alternative choice problems in detail, as is done in the latter part of the chapter, because the same approach applies to all of them. Others prefer to treat each type separately because students may in fact have difficulty in relating the general approach to specific situations. The only specific type of problem that introduces new substantive material is Economic Order Quantity; the instructor can announce that this section be omitted if he or she wishes, for it is not required for any subsequent chapter, and it is usually a difficult topic (although the technique is widely used). The "just one" fallacy section ties this chapter both to the expanded coverage of step-function costs in Chapter 16 and activity-based costing in Chapter 18. We hope this section corrects what we view as the overselling of short-term contribution analysis in business schools over the past 25 years. The automobile example is a situation with which almost all students are familiar, and thus provides a good setting for a review of the differential cost concepts. A student may be asked to suggest other problems that might arise in connection with the use of an automobile (such as loaning it to a friend on a cost-sharing basis, loaning it on a full-cost reimbursement basis), and another student may then be asked to suggest how each such problem should be tackled. Cases (Note: Case 16-1, Hospital Supply, Inc., can be used here if not previously assigned.) Import Distributors, Inc. requires the identification of differential costs as a basis for deciding discontinuance of a department. Former Carpet Company involves a pricing decision where cost-volume relationships are key to identifying the differential costs. Precision Worldwide, Inc. is a relevant cost case. It necessitates the use of the concepts of sunk cost, opportunity cost, and contribution analysis. Baldwin Bicycle Company deals with analysis of the profitability to a company of a major potential 1
2. 2. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant customer account; the decision has strategic implications. Problems Problem 26-1: Dover Rubber Company The Dover Rubber Company is faced with having to choose between two alternatives, which can be evaluated as follows: Contribution Margin Analysis Sell 500,000 Tires @ $41.65 Sell 100,000 Tires @ $73.50 ea.
   Revenue.....$20,825,000 $7,350,000 Variable costs @ $34.30 per
   tire.....17,150,000 3,430,000 Contribution
   margin.....$ 3,675,000 $3,920,000
   This analysis indicates a $245,000 differential contribution margin in favor of rejecting the contracts. Although the decision seems relatively clear on the basis of this analysis (i.e., reject the offer from the auto maker), it should be pointed out that Dover might pursue other avenues for utilization of its implied unused manufacturing capacity of 400,000 tires annually. Another alternative course of action might be for Dover to subcontract for 100,000 tires in order to use its excess capacity and fill the auto maker's order for the 500,000 tires, thus obtaining all or most of the $3,675,000 contribution margin which the contract would provide. Also the analysis presumes (1) no effect on current normal market price and normal volume, and (2) no effect of the increased production on nonvariable

costs. Problem 26-2: Vulcan Swimsuit Co. The product income statement for women's beach robes can be used in the new Vulcan Swimsuit Co. case to calculate the contribution margin for the line. Contribution Margin Analysis
Revenue.....$950,760
Variable costs of goods sold: Total cost of
sales.....$861,840 Less: Fixed costs
(a).....100,548 761,292 Contribution
margin (over variable costs).....$189,468 (a) $861,840 x 35% x 1/3 = $100,548 The key point in this decision is that Vulcan would be better off to continue the "losing" beach robe line. The product line statement indicates that the $100,548 fixed manufacturing overhead (assuming static inventory levels) and the selling and administrative expenses probably would be incurred by the company whether or not the line was produced and sold. On a full costing basis, the line is operating at a loss; however, dropping the product line would decrease profits by approximately $189,468, since this is the contribution to fixed costs and profits. (Note: the above analysis assumes that selling and administrative expenses are fixed, which may not be the case.) Problem 26-3: George Jack's a. (1) Differential cost of the order is: Costs incurred to fill order.* 2

3. 3. ©2007 McGraw-Hill/Irwin Chapter 26
Material.....$22,500
Labor.....40,000 Special
overhead.....4,500 Added
costs.....$67,000 Costs reduced for
standard products:
Material.....8,000
Labor.....9,000
Other.....900 Reduced
costs.....17,900 Net differential
costs.....$49,100 *Depreciation, rent, and heat and light are not affected by the order. Power might be depending upon the particular requirements of the special units. It is assumed here that the same amount of power will be used in each case. (2) The full cost of the order is: Costs incurred to fill order (from
1).....$67,000
Depreciation.....3,600
Power.....400
Rent.....1,000 Heat and
light.....100 $72,100 (3) The opportunity cost of taking the order is the net cash flow given up. Sales of standard
product.....$25,000 Less:
Material.....8,000
Labor.....9,000
Power.....400
Other.....900 Costs
saved.....$18,300 Opportunity cost of
special order.....$ 6,700 (4) The sunk costs are the costs that don't change as a result of choosing one order or the other.
Depreciation.....$3,600
Power.....400
Rent.....1,000 Heat and
light.....100 $5,100 b. On the basis of the data on the question, it would pay Jackson to accept the order: New
sales.....$80,000 Less: Standard
sales.....25,000 Net increased
sales.....$55,000 Differential costs [from a
(1)].....49,100 Cash advantage to special
units.....$ 5,900 3
4. 4. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant Other factors must be considered such as the long-term consequences of failing to satisfy standard parts customers, the reliability of the cost estimates, and the importance of this valued customer. Problem 26-4: Taylor Electronics, Inc. Variable costs: Direct materials $2.05 ($2.30 - .25) Direct labor 3.60 Variable manufacturing 2.70 Overhead Variable selling expenses .90 Total variable costs $9.25 Any price above $9.25 will provide a contribution that will cover a portion of Taylor's fixed expenses. Problem 26-5 Tran Company Objective function: Maximize P = 4Y + 5Z (Contrib.) Constraints: 1.0Y + 0.8Z < 240 (Dept. A) 0.5Y + 2.0Z < 480 (Dept. B) Z < 200 (Z sales) Y ≥ 0 2 ≥ 0 (cannot make a negative number) 4
5. 5. ©2007 McGraw-Hill/Irwin Chapter 26 Contributions at vertices of feasible set: At point p: P = ($4.00 x 240) + ($5.00 x 0) = $ 960 At point q: P = ($4.00 x 80) + ($5.00 x 200) = $1,320 At point r: P = ($4.00 x 0) + ($5.00 x 200) = $1,000 Thus Tran Company should manufacture at point q (i.e., 80 units of Model Y and 200 units of Model Z, as this maximizes contribution). Note that the Department B capacity is not a "binding" constraint, as the optimal solution (in fact, any feasible solution) leaves excess capacity in B. Thus the company might want to consider expanding Department A, or purchasing similar services from an outside contractor in order to utilize all available capacity in Department B. Cases Even if the instructor does not plan to teach Chapter 27, if students have been exposed to discounting and net present value, cases from Chapter 27 can be used with the present chapter. In my experience, most finance courses emphasize discounting mechanics, but require of students very little cost analysis; and the real challenge in capital budgeting is cost (and revenue) identification, not discounting mechanics. 5
6. 6. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant Chapter 27's cases address this challenge. Note on Use of Cases The following notes relate not only to the cases in Chapter 26, but also to those in Chapter 27. 1. In executive

development programs, instructors sometimes find it to be good strategy to give students part of the figure-work solution at the time the case is assigned. Adults are often reluctant to go through all the calculations involved in some of the cases. These partial solutions can usually be given orally with little difficulty, and figures in the commentary for the case can be used for this purpose. It is usually desirable to require the students to do some calculations, however. 2. Figures in the commentaries are often shown in unrounded form. This is done because it helps to show the derivation of the figures. As a practical matter, when the problem is discussed in class, rounded figures should be used. In fact, when students put forth figures with more significant digits than their accuracy warrants, it may he desirable to explain to them the notion of significant digits. This serves to emphasize the inevitable roughness and inaccuracy of the figures involved in these problems, which is a matter that is very easy to overlook. 3. There is a tendency for the class to concentrate on the financial aspects of a case so that not enough time remains to discuss the nonfinancial aspects. This makes it difficult to arrive at a balanced decision on the issue. It is therefore sometimes necessary to cut off discussion of the numbers in order to avoid giving the impression that issues of the type discussed here can be decided solely or primarily on the basis of quantifiable informative. Case 26-1: Import Distributors, Inc.* Note: This case is unchanged from the Eleventh Edition. Approach This is an introductory case on the identification of differential costs based on an analysis of full-cost accounting data. Nevertheless, this short case can be used to raise all the issues surrounding analyses of dropping a product (1) possible impact on other products' sales; (2) costs that will be saved immediately versus long-term savings; and (3) the inevitable fuzziness about the extent to which accounting allocations of joint costs reflect the true savings potential if one of several joint activities is eliminated. Although some later differential cost cases have quantitative outcomes that seem quite conclusive irrespective of possible qualitative arguments, in this case the decision is not so clear-cut, and probably rests primarily on the student's assumptions regarding the degree of interdependence of sales among the three IDI lines, and the amount of seasonality in wholesaler television revenues. Comments on Questions Exhibit A shows what might have happened to revenues and costs had the television department not been * This teaching note was prepared by Professor James S. Reece. Copyright © by James S. Reece. 6

7. 7. ©2007 McGraw-Hill/Irwin Chapter 26 operated in the first quarter of 1994. The exhibit incorporates the following assumptions, each of which can be discussed in class: 1. All gross margin will be lost, because it is assumed that cost of goods sold was completely variable (and hence differential) with sales revenues. At least initially, it is assumed that sales in the other two departments will not be affected. Exhibit A Impact of Discontinuing Television Department Forgone gross margin.....$(189,930) Cost savings:..... Personnel expenses.....$10,140 Department manager's office.....12,393 Inventory taxes and insurance.....37,274 Delivery costs.....32,248 Sales commissions.....80,621 Interest costs.....23,708 Total savings.....196,384 Impact on operating profit.....$ 6,454 2. Even though warehouse personnel serve all three departments, since the television line is one-third of total sales, it is assumed that about the same ratio of total labor (i.e., the full amount now allocated to the television line) can be saved if this line is discontinued. 3. If the department is discontinued, all of the department manager's office costs can be saved. Students may argue for assuming only part is saved; this is valid, but I suggest to them that rather than worry too much about the exact amount, we make the extreme assumption that all of the cost is saved. If the quantitative analysis turns out not to favor one alternative overwhelmingly, then we can reexamine this and other assumptions to see if different reasonable assumptions cause the numbers to favor the opposite alternative. 4. No rent will be saved, because of the noncancellable lease. It is conceivable, but not likely, that IDI might sublease some space freed up if the television line were dropped; if so, the forgone sublease revenue is an opportunity cost of retaining the television line. 5. With no television inventory, the inventory taxes and insurance should be saved. 6. Since the entire warehouse probably has to be heated and lighted regardless of its degree of utilization, few, if any utilities will be saved. 7. Delivery cost savings are highly debatable. If retailers expect deliveries at certain intervals, IDI might have to make as many delivery runs as before, but with less-full trucks. In the short run, then, many of these costs may be nondifferential. In the longer run, however, if a company loses one-third of its volume, it should be able to redeploy its delivery resources in a way that requires only about two- thirds of the former resources. Again, I prefer to make the extremely favorable assumption that all $32,248 can be saved; if with this assumption keeping the department looks advisable, it would be even more advisable if only a portion of the $32,248 can be saved. 8. Sales commissions should be differential, even though each salesperson now sells all three lines. If a salesperson has a minimum guarantee, and if that amount would be higher than his or her commissions excluding television sales, then in the short run not all of the commission expense will be differential; but if this is the case, in the medium term IDI should be able to reduce the number of 7

8. 8. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant salespersons so that everyone's commission again is above the guaranteed minimum. 9. Given that there was a separate expense category, "department manager's office," it is doubtful that many of IDI's other administrative costs would be saved. Exhibit A assumes no savings. 10. Note 7 to Exhibit 1 of the case states that only one-third of the imputed finance charge on inventory was out-of-pocket interest cost. Since this department presumably accounted for about one-third of total inventories, if all of the interest cost referred to in Note 7 is related to inventory financing, then all of IDI's out-of-pocket inventory interest costs could probably be saved if television inventories were eliminated. This is tricky to handle in class because: a. Students who haven't caught on yet to the differential cost concept will claim the full $23,708 as savings, but for the wrong reason (i.e., they'll assume all the expenses in Exhibit 1 can be saved). b. Students with some insight into the differential concept will say $7,903 (one-third of $23,708) will be saved; but this implicitly assumes that IDI would use only one-third of the funds from liquidating the television inventory to repay inventory-related debt and would use the other two- thirds for some other purpose. Generally, students who claim $7,903 savings don't recognize that they have made this implicit assumption. c. The best students will say $23,708 will be saved, because the funds from liquidating the television inventory should be adequate to repay all the inventory-related debt. With this assumption, IDI would have been about $6,500 better off in the first quarter of 1994, without the television line. But recall that this result includes "favorable" assumptions about all department manager's office costs and delivery costs being differential. Nevertheless, based on Exhibit A and the related assumptions, the decision is not very clear-cut. At this point,

students often point out the following: (1) the assumption that dropping one of three lines will have no unfavorable impact on the other two is questionable; and (2) with many television sales at the holiday season, the first quarter of the year is probably the lowest for IDI. Both of these points strengthen the argument for retaining the television department. Case 26-2: Forner Carpet Company* Note: This case is unchanged from the Eleventh Edition. Approach If used as the first case on differential cost, I let the students grope around with the cost data here, until they discover for themselves the differential costs that are needed in the analysis. Usually, someone will quickly conclude that the price should be $4.75 since at all volumes shown in Exhibit 2 the indicated cost is higher than $3.95. After some discussion, I end up with the figures shown below on the board. I ask the students to define the nature of the problem here: we want to know the differential revenues between the two price-volume combinations and the differential costs. In this case, the differential costs are the variable costs, because we are considering costs at two nonzero volumes. I emphasize that we are not interested in variable costs per se, but in differential costs. (In the Hanson case, which involves dropping a product, some of the fixed costs may also be differential.) We then examine Exhibit 2, line by line. Students have no trouble identifying raw materials cost as variable, because the amount per unit is constant. But many say that materials spoilage, direct labor, and department direct overhead are semivariable, because they don't remain constant per unit. I then ask them * This teaching note was prepared by Professor James S. Reece. Copyright © by James S. Reece. 8

9. 9. ©2007 McGraw-Hill/Irwin Chapter 26 what graphs of unit cost versus volume look like for variable, semivariable, and fixed costs (see Illustration 16-3); and then ask what graphs of materials spoilage, direct labor, and department direct overhead in Exhibit 2 look like. They then realize that the graphs are "ideal models," and that the spoilage, labor, and department direct fit closest with the variable cost model (i.e., unit cost vs. volume is a horizontal line). Department indirect overhead costs are demonstrably fixed. At each volume, the unit cost times the volume equals $62,000. Moreover, a commonsense reading of the footnote in Exhibit 2 should cause one to believe that these costs are fixed (supervision, depreciation, heat, and light). General overhead costs throw the students. On a per-unit basis, they appear to be variable; but this is solely because they are charged at a rate of 30 percent of direct labor, which is a variable cost. (It's always discouraging to me that so many students forget all about overhead absorption rates as soon as we leave Chapter 20.) Again, given the items that are included in departmental overhead costs, the only remaining factory costs that can be included in general overhead are such things as the plant manager's salary, taxes on the factory building, and so on: i.e., costs (or at least costs that would not be differential for a volume swing of 75,000 yards on a product that in total constitutes only about 3 percent of company sales). Once they understand general overhead, students see quite readily that selling and administrative costs are also an allocation based on an average costing rate (45 percent of factory cost). Since the sales force sells the entire line, and they are on a salary (not commission) basis, it is not likely that there would be a significant change in selling costs for a change in volume that represents such a small percentage of total company activity. Comments on Questions Question 1 I do not think that the company's need for capital funds has a great bearing on the pricing decision. The course of action that generates the largest differential cash flow would seem to be best, whether or not the company has a great need for funds. In fact, that may be exactly the thinking of Forner competitors, who are said to be in "poor financial condition, they may be generating more cash flow at the $3.95 per price than they were at $4.75. Of course, if this were not a mature product (as it seems, in fact, to be) an argument could be made for cutting prices—even at a sacrifice in total cash flow—in the short run in order to establish a larger market share for the longer run. Question 2 The analysis described above leads to these numbers: Price (per sq. yd.).....$4.75 $3.95 Volume (sq. yds.).....75,000 150,000 Variable costs per unit Raw materials.....$0.520 $0.520 Materials spoilage.....0.051 0.051 Direct labor.....0.989 0.975 Dept. direct overhead.....0.544 0.520 Total variable.....$2.104 $2.066 Approach I: Difference Unit contribution.....$ 2.646 $ 1.884 * Volume.....*75,000 *150,000 9

10. 10. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant =Total contribution.....$198,450 $282,600 + $84,150 Approach II: Revenues.....$356,250 $592,500 $236,250 - Variable costs.....157,800 309,900 - 152,100 = Total contribution.....$198,450 $282,600 + $84,150 I prefer the second approach because it is easier for students to begin by calculating differential revenues. We can then say, before any cost calculations are performed, that if the differential costs of producing another 75,000 yards (150,000 - 75,000) are less than $236,250, we know Forner will be better off financially if the price is lowered to $3.95. Also, whichever approach is used, I stress that it is not differential contribution in which we are interested in general, but differential cash flow (or differential income, which is usually equivalent). It just happens in this case that maximizing contribution will maximize cash flow, because the "fixed" costs are nondifferential (i.e., it is unlikely that this volume change in just one product with relatively low sales will enable reduction of any step-function costs over this six-month period). Question 3 This question asks the student to calculate the volume at $4.75 at which Forner will be indifferent (relative to the cash flow criterion) between the $4.75 price and the expected sales at a price of $3.95. Unit Contribution @ $4.75 * Volume = Contribution @ $3.95 $2.646X = $282,600 estimatedthanmore930. 000,750 000,750590,819 or = – This can be compared with the expected market share of at least 11.9% (75,000/630,000) at the $4.75 price. Assuming competitors raise their prices back to $4.75, it can also be compared with the share Forner has gotten in the past when all companies charged the same price (35 percent). Question 4 A more thorough analysis would include (1) information on different total industry volumes at different industry price structures (instead of assuming a constant volume of 630,000 sq. yds.); (2) probabilities of competitors' price decisions given an announced price by Forner; and (3) probabilistic estimates of Forner's market share at various industry price structures. I display this approach with a decision tree shown on the next page. This makes it clear that in question 2 we calculated only two of a

multitude of possible endpoint values. Question 5 Analysis of Exhibit 1 reveals that market share has been 35 percent in every period for which all companies charged the same price. Assuming (admittedly, somewhat unrealistically—though not totally so for a derived-demand product) that industry sales would have been the same had Forner charged $3.95 in 1993; we have the following (approximate) pro forma contributions: 1993 - 1: 450,000 * .35 = 157,500 * $1.8841 = $296,730 1993 - 2: 562,500 * .35 = 196,875 * $1.8612 = 366,384 $663,114 Actual (approximate) contributions: 10

11. 11. ©2007 McGraw-Hill/Irwin Chapter 26 1993 - 1: 135,000 * $2.6841 = $362,340 1993 - 2: 112,500 * $2.6993 = 303,638 $665,978 1 Based on costs at volume of 150,000 sq. yds. 2 Based on costs at volume of 175,000 sq. yds. 3 Based on costs at volume of 125,000 sq. yds. This suggests that the decision was a good one for 1993□1 and for 1993 as a whole but was not a good one for 1993□2 (when market share dropped significantly). Decision This is a good case, in part because either decision can be defended. I take a vote, which always results in most students' choosing the $3.95 price. I then argue for $4.75 on the assumption that if Forner holds out the price "umbrella" one more time, the competition will finally climb under it, in part because their costs should be higher than Forner's. (The case says Forner is more efficient, and—since Forner is the market- share-leader—learning curve theory supports this.) The calculation for question 3 shows that with all competitors at the higher price, Forner would need its share to recover only to 17.0 percent (not the historical 35 percent when all competitors charge the same price as Forner) to be as well off as they expect to be if they drop their price to $3.95; and if their share recovers to 35 percent, they are obviously far better off. This argument is based heavily on the implied inelasticity of the total market for this product; i.e., the industry as a whole, and each company in it, can make higher profits at a higher price, and at lower prices every company's share will restabilize at its traditional level if everyone charges the lower price. 11
12. 12. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant 12
13. 13. ©2007 McGraw-Hill/Irwin Chapter 26 Case 26-4: Baldwin Bicycle Company* Note: This case is unchanged from the Eleventh Edition Approach The broad issue in this case is the analysis of the profitability of a company's sales to specific customers. Most differential cost cases dealing with incremental volume are such that the student can reasonably assume that the "great majority (if not all) of the differential cost items will be variable costs. In this instance, a possible medium-to-long term volume increase of 22 percent suggests that many costs that are fixed in the short term for small increments in volume may be differential for this proposal. Also, very few differential cost cases (other than capital budgeting cases) explicitly ask the student to deal with the additional administrative and holding costs (both added funds cost and other asset-related costs) associated with significant increases in receivables and inventories. Thus, this case presents a good bridge between the traditional short-run differential cost case and the typical capital budgeting analysis. Comments on Questions The typical student will present an analysis based on only variable costs' being differential. For logical consistency, such a student should also base incremental asset holding costs on increases in assets related to variable costs. For example, if one assumes the incremental cost of a bike is $69.20, then one should increase finished goods inventory by $69.20 for one additional bike. Increasing inventory by the full cost of $83.90 is equivalent to charging holding costs on over absorbed overhead, rather than on the actual incremental economic investment. Such an incremental analysis on an annual basis is shown below. Note that the 1988 gross margin of 26 percent is used to impute revenue of $113.38 per bike in the lost sales' contribution analysis. Some students will use the 1988 average price ($10,872,000/98,791 = $110.05); but that is arguably too low, since 1988's average unit full cost was $81.43 ($8,045,000/98,791), not $83.90 as for the Challenger bikes. Since the amount of variable costs in this $81.43 is not given, I use a $113.38 price and the same $69.20 variable costs as for the Challenger bikes. Of course, students can estimate variable costs based on $81.43 full cost, which is fine, and does not change the result significantly. Also, the assumptions as to which inventory holding costs should be included can be discussed. I have not included the 6 percent handling cost for WIP on the assumption that the direct laborers move WIP from work station to work station. Similarly, it can be argued that Baldwin would not incur the costs for receivables associated with a single added customer. It should be pointed out, of course, that none of the alternative assumptions changes the numbers enough to alter the conclusion, based on this variable cost analysis, that the proposal would be profitable. Also, I have avoided the discounting (time value of money) issue by stating in the case that the numbers are, in effect, constant dollar amounts, and by explicitly building added financing costs into the analysis. The analysis is as follows: 1. Contribution of Challenger bikes: Revenue.....$ 92.29 Variable costs: Materials.....$39.80 Labor.....19.60 * This teaching note was prepared by Professor James S. Reece. Copyright © by James S. Reece. 13
14. 14. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant Overhead ($24.50 * 40%).....9.80 69.20 Unit contribution.....$ 23.09 Times annual volume.....*25,000 Total contribution.....$577,250.00 2. Lost contribution from regular bikes: Revenue (based on $83.90 full cost and $2,827 / $10,872 = 26% normal margin) $ 113.38 Variable costs .....69.20 $ 44.18 Times lost annual volume.....*3,000 $132,540 A student may convincingly argue that if Hi-Valu is committed to private-label bikes, Baldwin will lose these sales whether Baldwin or another company supplies Hi-Valu; in this case, the lost contribution is not differential. 3. One-time added costs. It is doubtful that they are differential, since these tasks probably will be performed by Baldwin's employees who do these kinds of tasks as part of their normal job responsibilities. But I include them if the student is clear that he/she assumes they will require differential outlays, or if a cogent ABC/step-function argument is made. 4. Added assets and related costs: Materials: (25,000 / 6) * $39.80 * 23.0% = $ 38,142 WIP: 1,000 [$39.80 + ½ ($19.60 + $9.80)] * 17.0% = 9,265 Finished goods: 500 * $69.20 * 23.0% = 7,958 55,365 Finished goods at Hi-Valu:(25,000/6) * $69.20 * 13.5% = 38,925 Hi-Valu receivables: (25,000 / 12) * $92.29 * 13.5% = 25,957 $120,247 Some students will subtract for reduced assets associated with lost sales, which is more thorough than the analysis above. Also, occasionally a student suggests that added materials would be financed by additional interest-free accounts payable. Thirty days' payables would be $83,000; 45 days' would be $125,000, or $14,375 avoided financing costs at an annual rate of 11.5 percent, making total holding costs $105,872. 5. Summary (assuming only variable costs are differential): New contribution from Hi-Valu.....$ 577,250 Contribution lost on regular sales.....(132,540) 444,710 Added asset holding costs.....120,247 (or $105,872) Net added

contribution.....$324, 463 (or $338,838) If time permits, it is useful now to repeat the analysis on a full-cost basis. The numbers for this are as follows: 1. Incremental profit of Challenger bikes:
Revenue.....$ 92.29 14

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Costs.....83.90 Unit
margin.....$ 8.39 Times annual
volume.....*25,000 Total
profit.....$209,750 2. Lost profit from
regular bikes: Revenue (as in first analysis).....$ 113.38
Costs.....83.90 Unit
margin.....$ 29.48 Times lost annual
volume.....*3,000 $ 88,440 3. One-time added costs (zero still seems reasonable: the $5,000 cost is insignificant, even if it is differential). 4. Added assets and related costs: Materials (as before) = $ 38,142 WIP: 1,000 [$39.80 + 1/2 ($19.60 + $24.50)]*17.0% = 10,515 Finished goods: 500 * $83.90 * 23.0% = 9,649 58,306 Finished goods at Hi-Valu (25,000/6) * $83.90*13.5% = 47,194 Hi-Valu receivables (as before) = 25,957 $131,457 (or $117,082) 5. Summary (assuming full costs are differential): New profit from Hi-
Valu.....$209,750 Lost profit on regular
sales.....(88,440) 121,310 Added asset holding
costs.....131,457 (or $117,082) Net added profit
(loss).....$(10,147) (or $4,228) Thus, when the analysis is based on full costs it appears that (at best) the deal would have little impact on profit. This, then, leaves us with the question of which analysis is "right." From the data gathered by Ms. Leister, one cannot say with any certainty. This is a potentially long-term volume increase of about 22 percent, which, when added to base sales of 97,000 units (100,000 is about 75 percent of capacity, we are told), pushes Baldwin to about 92 percent of capacity. Thus, if Baldwin's regular sales increased above current expectations, or if Hi-Valu needed more than 25,000 bikes a year, Baldwin might well find itself incurring incremental costs in excess of variable costs (for adding overtime or a second shift, for example). Conversely, if Baldwin turned down this deal, and volume held at about 100,000 bikes a year, in the longer term Baldwin might reduce some of its current ''fixed" (i.e., step-function) costs by gradually reducing capacity from the present level of about 133,000 to closer to 100,000. Also, if we think about the problem as one of analyzing customer profitability, the case for full costs becomes stronger, since a company's customers must collectively provide revenues in excess of total costs. Thus, the best we can do is make some conditional statements, based on assumptions about the degree to which a 22 percent volume increase would increase costs. If one believes the increase would be well less 15

16. 16. Accounting: Text and Cases 12e – Instructor's Manual Anthony/Hawkins/Merchant than the $324,000 added contribution calculated above, then the indication is that Baldwin should accept Hi-Valu's proposal. (Presently, production overhead at normal volume is $1.47 million per year; $324,000 is 22 percent of this amount.) Of course, discussion and related sensitivity analysis should be entertained concerning other assumptions in the analysis: added Hi-Valu volume, additional sales losses if current dealers drop Baldwin's line, and so on. Students should end the class recognizing that an initial analysis, based on a quick compilation of data, is conclusive in some cases (e.g., it was in question 1 of Hanson Manufacturing Company), and is therefore worthwhile, since the added cost of unnecessary data refinement is avoided. They should also realize that sometimes, as here, the initial analysis is inconclusive, and more detailed information on cost behavior must be gathered before a definite conclusion can be reached. The main thing, of course, is that they clearly see which assumptions' validity must be researched, and that they henceforth will be sensitive to the matter of incremental current asset holding costs. From the perspective of a longer-term analysis of customer profitability (as opposed to viewing this strictly as a shorter term incremental volume question), I feel the Hi-Valu account is of dubious attractiveness, unless a higher unit price can be negotiated. Addendum to Commentary: Strategic Analysis In the Spring 1988 issue of the Sloan Management Review, Professors John K. Shank and Vijay Govindarajan wrote a strategic analysis of this case, entitled "Making Strategy Explicit in Cost Analysis: A Case Study." This article looks at the issue not only in terms of cost analysis, but also in terms of the decision as an important shift in corporate strategy (especially marketing strategy). Instructors wishing to take this tack are urged to read this article, and to use the Baldwin case for two sessions. I have successfully used the case this way in management development programs, giving teams the assignment to analyze the case, having them make a brief presentation to the whole class of their recommendations, and then leading the class through the strategic analysis following all of their presentations. In brief, the approach is as follows: At present, Baldwin is a marginal operation: its $255,000 net income, represented only a 2.3 percent return on sales, a 3.2 percent return on assets, and an 8.2 percent return on equity. Asset turnover is only 1.34 times, owing to 46 days' receivables (not bad) and 125 days' inventory (alarming, given bicycle sales are seasonal and this is the calendar year-end figure). Thus, especially assuming that only the variable costs would be differential, the $324,000 added pretax profit on about $1.967 million differential sales ($92.29 * 25,000 - $113.38 * 3,000) seems very appealing. The debt/capitalization ratio is 33 percent, which may raise a question whether the firm has the debt capacity to finance the $610,000 additional assets (net of $125,000 additional payables) needed for the new business. Nevertheless, the opportunity seems attractive. But what market niche will the Challenger bikes fill? It can be argued that they fit in a new niche between Baldwin's present mid-price, mid-quality bicycles and low-price, low-qua1ity ones—i.e., Challenger would be mid-quality but low-price. Assuming typical discount house versus bicycle shop margins, and allowing for freight costs, Hi-Valu might retail the Challenger bike for about $130, whereas the bicycle shop would be likely to charge $180 or more for the similar Baldwin-brand bicycle. Although the bicycle shop would provide some additional services for its price (free assembly and post-purchase adjustments), there is a real risk that the impact on Baldwin's traditional sales—and thus on its traditional retailers— would be far greater than the estimated 3,000 units. (Suppose for example, that Consumer Reports tested bicycles and said that the Challenger was "essentially similar" to the higher priced Baldwin.) As some clothing companies have discovered, they run a risk of full-price merchandisers' dropping their line if similar (or identical) merchandise is distributed through discounters. A "worst-case scenario" goes something like this. Assuming that all of Baldwin's other expenses in 1988 were fixed ($2.354 million), and including the $1.47 million fixed production costs, the current breakeven 16

17. 17. ©2007 McGraw-Hill/Irwin Chapter 26 volume is about 87,000 bikes, or two-thirds of capacity (assuming a unit contribution of $44). If Baldwin lost substantially all of its traditional outlets (remember, this is a worst-case analysis), the unit contribution would drop to about $23 and the breakeven volume would be 166,000 bikes, which is 34,000 over one-shift capacity. (Thus, the breakeven would be even higher, since fixed costs would go up with a second shift added.) Clearly, with its current cost structure, Baldwin would be hard pressed to survive if it were selling solely to discounters. Thus, this is not just a simple differential business decision it is a strategic choice with potentially disastrous consequences. On the other hand, maybe the days of Baldwin-quality-level bicycle sales through other-than-discount retailers are limited, and Baldwin needs to figure out how to make the best of this opportunity to make what will eventually become a necessary shift. In either event, it's clear that Baldwin needs to get its house in order as regards costs and inventory controls. 17

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