

PENGUIN MANUFACTURING: UNSEEN LINKS BETWEEN MANAGERIAL ACCOUNTING, GAAP, AND CREDIT ANALYSIS

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CASE DESCRIPTION

This case focuses on linkages between managerial accounting techniques, the reporting requirements under generally accepted accounting principles, and the potential misunderstandings that can arise when preparers and analysts of financial statements have different understandings of the accounting process and the implications of the reported results. The specific topic dealt with in the case is how indirect costs (more specifically, the depreciation of equipment used in the production of a company's inventory) are absorbed in the production process and how those costs then appear in the financial statements. GAAP requires those costs be reported as a component of the cost of goods sold with any residual amounts incorporated in the work-in-process and unsold finished goods inventories. Companies occasionally do not adhere to this requirement, which can lead to results that can be misinterpreted by analysts. Due to the technical accounting topics covered, the case would be most appropriate for graduate students or senior accounting and finance students studying financial reporting issues or the analysis of financial statements. Although the case deals in part with somewhat arcane accounting topics, the case itself is designed to be taught in one or two class hours and is expected to only require one to two hours of outside preparation by students.

CASE SYNOPSIS

Penguin Manufacturing has been a very successful producer of high-quality machine parts. Despite the severe downturn in the economy the company has continued to expand and to generate profits and positive cash flows. The company is switching to a larger, more sophisticated financial institution that is better suited to meet its growing needs. Top management did not expect to run into any difficulties in securing financing from its new bankers and is perplexed as to why its application for credit was coming under what it believed was excessive scrutiny. Despite Penguin's strong financial statements, the lending officer assigned to the company was having problems interpreting some of the financial ratios generated in the credit analysis process and had requested some additional insights into the company's accounting processes. In their discussions it is discovered that the company has not been fully complying with generally accepted accounting principles related to assigning depreciation expenses associated with the production of the company's inventory to its cost of goods sold. Although this improves some of the company's financial ratios, it makes other ratios appear weaker than they actually would be. After the two parties better understand how such discrepancies cause variances in the analysis of the company's financial statements, they have a

clearer understanding of how to resolve their differences. Through the exercise the students will gain a better appreciation of how managerial accounting topics can impact financial reporting issues, which in turn can affect the analysis of a company's financial results.

INSTRUCTORS' NOTES PEDAGOGY

The focus of the case is the interaction between managerial accounting techniques and financial reporting rules under generally accepted accounting principles. It is assumed that students often compartmentalize their studies and may not fully understand how assigning indirect operating costs such as depreciation of assets used in producing a company's inventory, a matter typically discussed in managerial accounting courses, can affect the reporting of a company's financial statements, a topic covered in financial accounting courses. Assessments of the significance of the financial results are then examined in financial management courses and ultimately analyzed in various capstone strategic management courses.

The case demonstrates one area, absorption cost accounting of depreciation expenses, in which these distinct topical areas are interrelated. Through an analysis of the calculation and interpretation of selected financial ratios, students can gain a better understanding of how cost accounting principles (e.g., absorption cost accounting) affect inventory valuation and the estimation of the cost of goods sold, and eventually various ratios that are dependent on those variables. Not understanding the linkages can lead to misunderstandings or misinterpretations of a company's financial condition and the results of its operations. The students are lead to modify their initial conclusions about a company's financial situation after gaining a better understanding of part of the process linking managerial and financial accounting.

TEACHING PLAN

Class discussion could begin with a basic review of key accounts presented on a company's balance sheet, income statement, and cash flow statement. This would then flow into a review of many of the key financial ratios used in assessing the financial strengths and weaknesses of the reporting entity. Next, a discussion of the principles of absorption cost accounting can be used to highlight some of the areas of concern in which the relative importance of various financial statement accounts may be scrutinized. Instructors may wish to structure the case discussions as follows:

1. Review the purpose and construction of the balance sheet, income statement, and cash flow statement.
2. Define the financial ratios described in the case, with a review of how the results might be interpreted.

3. Review absorption cost accounting rules, with a particular focus on indirect costs such as depreciation, looking at how different approaches could negatively affect the process of analyzing financial statements through ratio analysis.
4. Examine potential differences in the interpretation of financial results, given different approaches to how inventory costs such as depreciation are accounted for and reported.

TEACHING PLAN SOLUTIONS

1. **Review the purpose and construction of the balance sheet, income statement, and cash flow statement.**

Although one cannot completely review all of the basic accounting principles, a quick overview of the purpose and construction of the financial statements may be required to help level the playing field if there is great variance in student backgrounds coming into the course. Students should be directed to review their accounting textbooks or to review online sites such as principlesofaccounting.com or accountingcoach.com. Nonetheless, a concise review of the financial statements may still be necessary.

The balance sheet summarizes the financial condition of a company at a particular point in time and is comprised of assets, liabilities and equity. Assets represent the resources employed by the company and are usually divided into current and noncurrent assets. Current assets are those expected to be used within a year, and noncurrent assets are expected to have longer economic lives. Current assets can include the company's cash and cash equivalents, accounts receivable, which represent credit provided to customers purchasing the company's goods or services, inventory, which represents items the company has made or is making available for sale, and other miscellaneous items such as prepaid expense items. Noncurrent assets are mostly made up of fixed assets such as property, plant, and equipment that are used in producing the company's revenues. Such assets are shown on the balance sheet at their historical cost less the accumulated expenses or write-offs that have taken place in the form of depreciation. Companies may also have intangible assets such as patents and goodwill and any of a wide variety of other long-term assets that are used in their operations.

Liabilities are also usually divided between current and noncurrent liabilities. Current liabilities are obligations expected to be paid within a year and noncurrent liabilities are obligations that involve longer periods of time. Current liabilities are typically comprised of accounts payable, which represent amounts of credit the company has received from suppliers that is often associated with acquiring inventory, accrued expenses such as salaries payable, which are various operating expenses incurred but not yet paid for, and miscellaneous other short-term financial obligations, often in the form of short-term debt or dividends or interest payable. Noncurrent liabilities can include the company's long-term debt financing, usually in the form of bank loans or bonds, and other long-term obligations such as deferred taxes and pension obligations.

Equity represents the residual value of the company, that is, the difference between the assets and the liabilities. The equity accounts will include the amount of capital invested by the owners and the retained earnings of the company, which represents the total amount of earnings

generated by the company throughout its history less any amounts paid out in the form of dividends.

The income statement summarizes the results of the company's activities occurring over a specific period of time. It begins with a summary of the revenues the company has recognized from the sale of its goods or services. This is followed by the cost of sales, which represents an estimate of the costs of acquiring or producing the goods or services that were sold. Next come various other operating expenses, such as selling, general, and administrative costs that are directly charged off against the revenues they helped produce or that are charged off on a periodic basis if there is no direct relationship to the revenues generated. There may be other items that document the financing expenses incurred from borrowing external sources of funds, interest revenue earned on investment assets, and miscellaneous gains and/or losses from selling fixed assets or other investments. A provision for income tax expenses is then reported, representing the amount of tax charged against the company's taxable earnings. The remaining value is the "bottom-line", reported as the net income or loss for the period.

The cash flow statement summarizes the amounts and types of cash inflows and outflows that occurred during the same time period covered by the income statement. The statement is divided into three sections: one that documents the cash flows generated from or used by its operating activities, one that shows the cash flows generated from or used by its investing activities, and one that summarizes the cash flows generated from or used by its financing activities.

The cash flows from operating activities section is arguably the most important of the three for most users of financial statements. It shows how the revenues are related to actual cash receipts and how expenses charged are related to actual cash disbursements. According to current U.S. generally accepted accounting principles, it can be presented in either a direct or indirect method.

The direct method highlights the actual inflows of cash received from customers and other operating activities and the direct outflows of cash paid for inventory items, for other operating expenses, for financing costs, and for income taxes. The indirect method, which is the method most often used, is designed to reconcile the profits reported on the income statement with the amount of operating cash flows generated. It involves making specified adjustments to the reported amount of net income to account for expenses such as depreciation and adjustments to deferred taxes, as well as gains and losses from the sale of investment assets that appear on the income statement, but do not directly involve cash inflows or outflows. It also includes adjustments to account for changes in various current asset and liability accounts such as inventory, accounts receivable, and accounts payable that are used to essentially convert the accrual-based income statement to one that is more cash-based. For example, the revenues from sales is adjusted to incorporate changes (increases or decreases) in accounts receivable and the cost of goods sold is adjusted to incorporate changes in accounts payable and inventory.

The cash flow from investing activities documents cash flows being made for new investments in property, plant, and equipment or other productive long-term assets of the company, less any amounts received from the disposal or sale of existing assets. The cash flow from financing activities highlights cash inflows from issuing new debt or equity securities and cash outflows for repaying existing debt and equity or for paying dividends. The three cash-

generating or cash-utilizing components are then summed together and will equal the overall change in the cash account for the period.

2. Define the financial ratios described in the case, with a review of how the results might be interpreted.

Financial ratios are among the most widely used tools in the analysis of financial statements. They are used in investment analysis, in credit analysis, and in management's own analysis of a company's strengths and weaknesses.

There are a myriad of different types of ratios. In fact, the number of ratios used may only be limited by the number of analysts available to conduct assessments of financial statements. To be able to assess the significance of a particular ratio one must be certain of how it is defined and/or calculated and how the results of those calculations might be interpreted.

One potential problem is that there are few ratios that are precisely defined within GAAP. It may be argued that only two, earnings per share (FASB Codification 260-10-45, originally SFAS 128) and the ratio of earnings to fixed charges (SEC §229.503, Item 503d) are explicitly defined within the accounting literature. Nonetheless, there tends to be a general consensus on how most ratios are defined, although each may be adjusted to suit the purposes of the individual analyst. Within the case the following ratios are used and are being defined or calculated as described below:

1. The *current ratio* can be defined as the ratio of current assets to current liabilities. It is a measure of a company's liquidity, measuring its ability to meet its short-term obligations with readily available liquid assets. As such, larger numbers imply greater means to cover those obligations. The major exceptions would occur whenever the liquidity of individual current assets, most notably inventory or accounts receivable, would be of concern.

2. The *quick ratio* also measures the company's short-term liquidity position but refines the current ratio by excluding less liquid assets in the numerator. It can be defined as the ratio of cash and receivables to current liabilities, although some analysts simply subtract inventory from total current assets to arrive at the numerator. As with the current ratio, larger numbers imply greater liquidity, although the true liquidity of the accounts receivable should also be assessed.

3. The *days' sales in receivables* estimates the time (in days) expected for a company to collect on its outstanding accounts receivable. It can be defined as accounts receivable divided by daily sales, which is estimated as total sales divided by 365. The usefulness of the ratio is largely dependent on the percentage of sales that are indeed made on credit. In any case, a smaller number would typically be preferred as it would indicate less time that cash is expected to be tied up in receivables; however, too small of a figure relative to the company's peers may be indicative of overly tight credit policies. Strict credit policies could reduce potential sales, which in turn could reduce potential profits and cash flows.

4. The *days' sales in inventory* estimates the time (in days) expected for a company to sell its existing inventory. It can be defined as total inventory divided by the daily cost of sales, which is estimated as the cost of goods sold divided by 365. A smaller number would typically be preferred as it would indicate less time that cash is expected to be tied up in inventory; however, too small of a figure relative to the company's peers may be indicative of

overly tight inventory policies. Managing inventory too tightly could reduce potential sales due to stock outages, which in turn could reduce potential profits and cash flows.

5. The *days' sales in payables* estimates the time (in days) expected for a company to repay its outstanding accounts payable. It can be defined as accounts payable divided by the daily cost of sales, which is estimated as the cost of goods sold divided by 365, although some analysts prefer to measure it as daily purchases, adjusting the cost of goods sold figure to account for increases or decreases in the amount of inventory acquired during the period. The usefulness of the ratio is largely dependent on the percentage of inventory acquired on credit. In any case a larger number would typically be preferred as it would indicate longer periods of time during which cash is expected to be borrowed from suppliers. However, too large of a figure relative to the company's peers may be indicative of excess usage of this "free" trade credit, the availability of which could subsequently be reduced or eliminated should the company abuse its privileges.

6. The *cash conversion cycle* estimates the time (in days) in which cash is expected to be absorbed in the company's operations. It can be defined as the sum of days' sales in receivables and days' sales in inventory, less the days' sales in payables. A smaller number would typically be preferred as it would indicate less time that cash is expected to be tied up in operations; however, the ratio might be too low if it reflects poorly on any of the three components described above.

7. The *debt ratio* measures the percentage of the company's assets that is financed by external funds rather than funds provided by the owners. It can be defined as total liabilities divided by total assets, although some analysts prefer to only include total external debt financing (bank loans, bonds, etc.) in the numerator. A smaller number would typically be preferred, at least by creditors, as it would indicate less risk placed on the creditors relative to the owners of the company.

8. The *gross profit margin* essentially measures the price mark-up of goods sold over the cost of acquiring or producing those goods. It can be calculated as gross profits, defined as sales less the cost of goods sold, divided by sales. A larger number would typically be preferred, as it would be indicative of a company's ability to generate excessive revenues from its inventory over the costs needed to produce that inventory.

9. The *net profit margin* measures the "bottom-line", or how much profit the company actually earns from its sales after subtracting out all of its operating and financing costs as well as taxes paid on the profits. It can be defined as net after-tax income divided by sales with a larger number preferred over a smaller one.

10. The *total asset turnover* measures the effectiveness of the company in generating revenues from its overall investment in assets. It can be defined as total sales divided by average total assets over a given time period. A larger number would typically be preferred, as it would indicate greater efficiencies in generating revenues out of the particular set of assets invested in by the company.

11. The *return on assets* measures the effectiveness of the company to generate profits from its overall investment in assets. It can be defined as net after-tax income divided by average total assets over the time period. It can also be viewed as the product of the net profit margin and the total asset turnover.

12. The *operating profit margin* measures the company's ability to generate operating profits from its sales. It excludes the impact of financing (interest expense) and taxes, as well as other non-operating activities that may generate additional revenues or costs not directly related to the company's day-to-day activities. It can be defined as earnings before interest and taxes divided by sales. As with the other profit ratios, higher margins would be preferred over lower ones.

13. The *interest coverage ratio* is a measure of the company's ability to meet its financing obligations. It can be defined as earnings before interest and taxes divided by interest expense. Although the measure can be complicated by other financing activities not directly related to the payment of interest (e.g., lease payments), a larger number would typically be preferred, as it would indicate a greater ability to generate profits, and ultimately cash flows from those profits, to cover the fixed costs associated with the external financing.

14. The *cash flow margin* is a measure of how effectively or efficiently the company converts its sales into cash. It can be defined as cash flow generated divided by sales. Often the cash flow generated figure is assumed to equal the cash flow from operating activities taken from the cash flow statement, but the amount is often defined by proxy. For example, it is not uncommon (as it is found in the Compustat and other financial databases) to find cash flow simply defined as reported net income plus an add-back of the company's depreciation and amortization expenses. As with the other margin and coverage ratios, a larger number would be preferred.

15. The *Altman-Z score* has been a significant tool in credit analysis for more than 40 years. It is based on a weighted average of five other financial ratios with the final result evaluated against predetermined norms. It can be calculated as a sum of the following five variables: the ratio of net working capital to total assets multiplied by 1.2, the ratio of retained earnings to total assets multiplied by 1.4, the ratio of earnings before interest and taxes to total assets multiplied by 3.3, the ratio of market value of equity [stock price times shares outstanding] to book value of total liabilities multiplied by 0.6, and the ratio of sales to total assets multiplied by 0.999. If the final sum is greater than 3.0, the company is assumed to be less prone to bankruptcy; if it is less than 1.8, it is assumed to be highly prone to bankruptcy. Variations of the Z-score model can be found to apply to a wider array of companies, such as those whose equity is not publicly traded.

3. Review absorption cost accounting rules, with a particular focus on indirect costs such as depreciation, reviewing how different approaches could negatively affect the analysis of financial statements.

Absorption cost accounting involves calculating a standard overhead rate that is included when determining manufacturing overhead costs. This cost rate is then applied to the total units of inventory produced. Through absorption cost accounting, as inventory is produced, the depreciation of operating assets used to manufacture inventory is transferred from a manufacturing overhead account into the work-in-process inventory. As the work-in-process inventory is completed and sold, a proportional amount of the depreciation expense is then transferred to the finished goods inventory and ultimately to the cost of goods sold. The main justification for using absorption costing is that it follows one of the basic tenets of accounting:

the matching principle. Fixed manufacturing costs like depreciation are incurred as part of the process of producing inventory. Therefore, all costs of producing inventory are matched against the revenues generated from the sale of that inventory.

Although absorption costing is an integral part of the managerial accounting processes, it can be abused. For example, by increasing inventory production disproportionately to expected sales, a company can increase its profitability by moving fixed costs like depreciation from the income statement to the balance sheet where it is situated in the unsold inventory. Evaluating profitability is made more difficult because changes in net income can be attributed to changes in units sold, changes in prices, and changes in the cost of goods sold that arise from absorbing costs like depreciation into the units of inventory.

Depreciation expenses can become an issue for financial analysis in a variety of ways. For example, there are potential problems with the construction of cash flow statements using the indirect method, in particularly the determination of cash flow from operating activities. In using the indirect method of presenting the cash flow statement, one is required to adjust reported net income for various non-cash expense and revenue items such as depreciation. What is not apparent is whether the amount added back is the amount of depreciation expensed or the amount incurred (Nurnberg, 1989). For many companies, such as merchandising firms, the two depreciation amounts are the same. However, for manufacturing companies, because some of the depreciation is capitalized in the current period within inventories and then expensed as cost of goods sold in later periods, the amount of depreciation expensed can differ from the amount incurred. The difference can be especially significant for companies in which depreciation is a large component of manufacturing costs and inventory comprises a large part of total assets.

Although depreciation by itself does not represent a cash flow, how the figure is used within the analysis of financial statements can still give misleading results, particularly for analysts unaware of the potential problems. For example, financial databases such as Compustat routinely shift depreciation expenses from a company's reported cost of goods sold to other operating expenses. This can cause misunderstandings because the cost of goods sold figure that is used to construct various financial ratios will be understated and gross profits overstated. Likewise, in constructing cash flow ratios such as the cash flow margin, there can be considerable differences between cash flow estimates when using depreciation expensed or depreciation incurred.

Furthermore, there can be issues when reporting companies do not fully understand (or worse yet, attempt to circumvent) absorption accounting guidelines and treat depreciation expenses as regular operating expenses rather than as part of the cost of goods sold. The SEC has become very active in pursuing companies that may be reporting misleading results in their financial statements in this way (Deloitte, 2009).

4. Examine potential differences in the interpretation of Penguin's financial results, given different approaches to how inventory costs are accounted for and reported.

To demonstrate the potential implications in the Penguin Manufacturing case, we find that Penguin reported depreciation of \$840,000 in 2009. If we were to assume that 90 percent of the depreciation was related to manufacturing operations and 10 percent to other activities, \$756,000 of the expense should be associated with the production of inventory and \$84,000

expensed as part of general and administrative expenses. If we further assume that Penguin sold 75 percent of the goods produced during the year, then \$567,000 (75% of the applicable \$756,000) should be charged against 2009 earnings as part of the cost of goods sold while the remaining \$189,000 would remain within the finished goods and work-in-process inventories. To summarize, a total of only \$651,000 (\$567,000 for inventory and \$84,000 for administrative expenses) of the total depreciation expense for the year should actually be charged against 2009 income with \$189,000 of the cost remaining in inventory, where it would remain until the inventory is sold, at which time it would then become part of the cost of goods sold.

However, Penguin has mistakenly been excluding depreciation expenses from its cost of goods sold figure reported on its income statement. This unfortunately can cause significant differences when calculating ratios based on the reported results, ratios based on the assumption that all depreciation was included in the cost of goods sold, and ratios based on including only the amount of depreciation “incurred.” The most glaring example of the problem can be seen when one examines Penguin’s gross profit margin. Using the reported financial statement figures, one would calculate the gross profit margin as $\$3,484,000 \div \$8,806,000$, or 39.56 percent. However, including all of the depreciation expenses (\$840,000) in the cost of goods sold would result in a much lower figure of 30.02 percent ($\$2,644,000 \div \$8,806,000$), which is nearly identical to the industry average of 30.27 percent. And if only the amount of depreciation “incurred” (\$567,000) were included in the cost of goods sold, the value would instead be $\$2,917,000 \div \$8,806,000$, or 33.13 percent.

These different assumptions affect ratio calculations (and interpretations) in a variety of ways. What follows is a listing of some of the key ratios mentioned in the case, showing first the ratio calculated “as-is”, and then with adjustments made to account for the depreciation issues, all of which are compared with the peer averages for the specified ratio.

- *Days’ sales in inventory* = Inventory \div Cost of Goods Sold/365
 As-reported data: $\$1,798,000 \div \$5,322,000/365 = 123.3$ days
 Using depreciation expensed: $\$1,798,000 \div (\$5,322,000 + \$840,000)/365 = 106.5$ days
 Using depreciation incurred: $\$1,798,000 \div (\$5,322,000 + \$567,000)/365 = 111.4$ days
 Peer average: 105.2 days

- *Days’ sales in payables* = Accounts payable \div Cost of Goods Sold/365
 As-reported data: $\$551,000 \div \$5,322,000/365 = 37.8$ days
 Using depreciation expensed: $\$551,000 \div (\$5,322,000 + \$840,000)/365 = 32.6$ days
 Using depreciation incurred: $\$551,000 \div (\$5,322,000 + \$567,000)/365 = 34.2$ days
 Peer average: 34.8 days

- *Cash conversion cycle* = Days’ sales in receivables + days’ sales in inventory – days’ sales in payables
 Although the days’ sales in receivables* is not affected, the cash conversion cycle will be because of changes to the other two components
 *Accounts receivable divided by daily sales = $\$845,000 \div \$8,806,000/365 = 35.0$ days
 As-reported data: 35.0 days + 123.3 days – 37.8 days = 120.5 days
 Using depreciation expensed: 35.0 days + 106.5 days – 32.6 days = 108.9 days
 Using depreciation incurred: 35.0 days + 111.4 days – 34.2 days = 112.3 days
 Peer average: 106.4 days

- *Cash flow margin* = Cash flow* ÷ Sales

*If using cash flow from operating (CFO) activities, there should not generally be any differences from the reported results because of the issues with depreciation. However, they can be a difference if the proxy method is used in which the cash flow is estimated as net income plus the add-back for depreciation, and the different definitions (expensed or incurred) of depreciation are used.

Using depreciation expensed**: $(\$504,000 + \$840,000) \div \$8,806,000 = 15.26\%$

**figure used by Penguin management: net income and total depreciation in the numerator

Using only depreciation “incurred”: $(\$504,000 + \$651,000) \div \$8,806,000 = 13.12\%$

Using cash flow from operations figure in numerator: $\$910,000 \div \$8,806,000 = 10.33\%$

Peer average: 11.20%

The remaining ratios would not be specifically affected by whether or not depreciation was included in the cost of goods sold. For example, the current ratio, quick ratio, and debt ratio only involve balance sheet accounts. The days’ sales in receivables and total asset turnover ratios involve sales revenue, not the cost of goods sold. The net profit margin, return on assets, and interest coverage ratios only involve line items within the income statement that appear after depreciation expenses have been charged, whether included in cost of goods sold or within other operating expenses. And the Altman Z-score involves balance sheet accounts and only one income statement account (earnings before interest and taxes) that first appears after any depreciation expenses. For the sake of completeness, a summary of the calculations for each of these measures is found below:

- *Current ratio* = Current assets ÷ current liabilities
As-reported data: $\$4,350,000 \div \$2,063,000 = 2.11$
Peer average: 1.96
- *Quick ratio* = (Cash + accounts receivable) ÷ current liabilities
As-reported data: $(\$1,420,000 + \$845,000) \div \$2,063,000 = 1.10$
Peer average: 1.18
- *Debt ratio* = Total liabilities ÷ total assets
As-reported data: $\$5,942,000 \div \$8,466,000 = 70.2\%$
Peer average: 57.2%
- *Net profit margin* = Net income ÷ sales
As-reported data: $\$504,000 \div \$8,806,000 = 5.72\%$
Peer average: 6.07%
- *Total asset turnover* = Sales ÷ average total assets
As-reported data: $\$8,806,000 \div (\$8,466,000 + \$7,972,000) = 1.07$
Peer average: 1.11
- *Return on assets* = Net income ÷ average total assets
As-reported data: $\$504,000 \div (\$8,466,000 + \$7,972,000) = 6.13\%$
Peer average: 6.74%

- *Operating profit margin* = Operating income (earnings before interest and taxes) ÷ sales
As-reported data: $\$876,000 \div \$8,806,000 = 9.95\%$
Peer average: 10.34%
- *Interest coverage ratio* = Operating income (earnings before interest and taxes) ÷ interest expense
As-reported data: $\$876,000 \div \$207,000 = 4.2$
Peer average: 4.5
- *Altman-Z score* = $1.2 \times \text{net working capital}/\text{total assets} + 1.4 \times \text{retained earnings}/\text{total assets} + 3.3 \times \text{earnings before interest and taxes}/\text{total assets} + 0.6 \times \text{market value of equity}/\text{book value of liabilities} + 0.999 \times \text{sales to total assets}$.
As-reported data: $1.2 \times (\$4,350,000 - \$2,063,000)/\$8,466,000 + 1.4 \times \$1,593,000 / \$8,466,000 + 3.3 \times \$876,000/\$8,466,000 + 0.6 \times (326,000 \times \$31)/\$5,942,000 + 0.999 \times \$8,806,000/\$8,466,000 = 2.82$
Peer average: 3.15

Therein rests the crux of the problem. By incorrectly including depreciation expenses among the other operating expenses rather than in the cost of goods sold, the company has actually penalized itself in terms of how external analysts, such as those from the bank, might view the company's results. Although the company had rested its laurels on its current ratio, its gross profit margin, and its cash flow margin, the true significance of these variables is probably at best questionable. The current ratio of 2.11 is minimally higher than the peer average of 1.96, but analysts will likely be concerned about what appears to be slow-moving inventory, a factor that may be keeping the current ratio artificially high. If the analysts use the financial statement data as presented, Penguin's days' sales in inventory of 123.3 days is some 18 days longer than the peer average. Yet when depreciation is shifted back to the cost of goods sold, the liquidity of the inventory appears to be much better at 106.5 days, much closer to the industry standard of 105.2. This is tempered somewhat by the days' sales in payables figure that also shrinks (which indicates less use of trade credit) by approximately 5 days. But looking at the combined effect as captured by the cash conversion cycle, the company, which initially appeared to have cash tied up for 14 more days than the industry average (120.5 versus 106.4 days) is actually much more in line with the industry norm at 108.9 days.

Similarly, using the reported data, the gross profit margin is severely overstated at 39.6 percent rather than the 30.0 percent figure when depreciation is included in the cost of goods sold. But since none of the subsequent profit numbers (operating profit, net profit, etc.) are affected by the incorrect placement of the depreciation, the banker's would likely focus more on examining those profit figures, both of which are very near albeit slightly below industry averages.

Rather than profitability, the bankers will likely be more concerned with the cash flows generated by the company, as these would be the primary source of repayment for any external financing. Therefore, the cash flow margin would likely come under greater scrutiny. The

company touted its results (15.3 percent) as being considerably higher than the industry average of 11.2 percent. However, Penguin had based its calculation on the proxy for cash flow (net income plus depreciation) rather than the more standard, and arguably more correct, cash flow from operating activities as a percentage of sales. If the cash flow from operating activities figure of \$910,000 is used as the numerator instead of the proxy amount of \$1,344,000, the cash flow margin would be 10.3 percent, slightly less than the industry average. Thus, the one variable with which the company feels most proud is likely one of the areas of greatest concern for the bankers.

Other aspects of the company's operations can and likely would be examined as part of the loan review process. In terms of credit analysis, besides the variables discussed above, the Altman Z-score would be a key area of concern. The company's value of 2.82 is just below the 3.0 cut-off that is typically deemed a safe value. The score had improved greatly from the previous year's results but remains below the average of 3.15 for the industry. It would likely be closely examined in conjunction with other elements of the analysis, particularly the inventory management issues described earlier.

In summary, careful analysis of financial statements is crucial to many business decisions. It is therefore critically important that those statements be presented in a manner that truly reflects a company's situation, particularly in cases where the company's results are measured against others. When a company overlooks or disregards a basic rule of GAAP, in this case not incorporating depreciation expenses within the reported cost of goods sold, the analysis of that company can be fraught with errors. Penguin might or might not end up receiving the financing it had expected, but it does itself any great favors by misstating its financial reports, misstatements that paint a less flattering picture of its financial health.

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