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Is It Time to "Retire" Full Costing?

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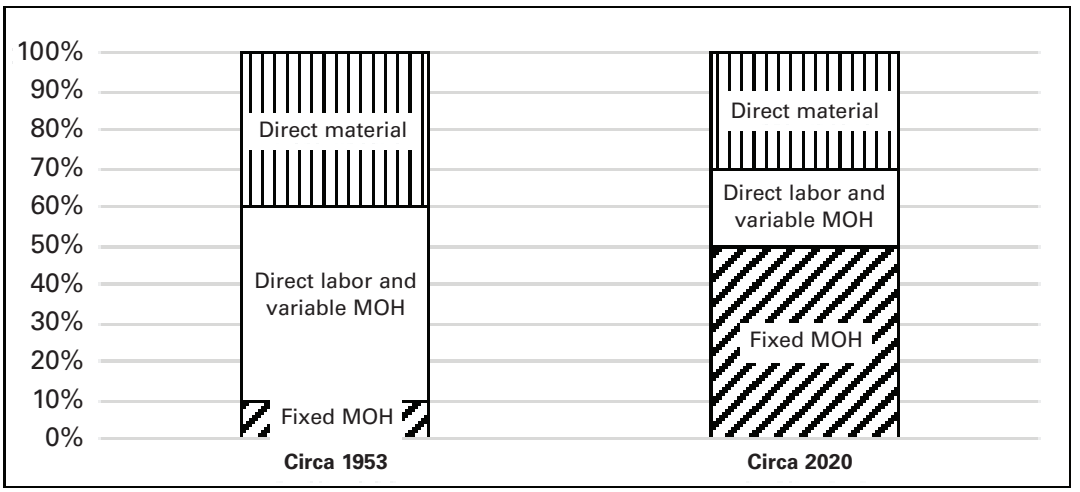
EXECUTIVE SUMMARY

Contemporary cost accounting for manufactured inventories is based on 73-year-old U.S. Generally Accepted Accounting Principles (GAAP) standards. Over this period, fixed manufacturing overhead has grown markedly as a percentage of total manufacturing cost, largely due to multiple waves of technological transformation. This change increases the opportunity for "earnings management" in general purpose financial statements. We make the case to reconsider this aspect of GAAP with a view toward improving alignment with the current business reality, enhancing the quality of financial statement analysis, and improving the reputation of the accounting profession in the eyes of its diverse stakeholders.

Manufactured inventory financial accounting and reporting would seem to be a long-settled matter and an almost sleepy topic for the preparers and users of financial statements. Full costing that includes direct material, direct labor, variable manufacturing overhead, and fixed factory overhead is currently the required method for costing manufactured inventory under U.S. Generally Accepted Accounting Principles (GAAP). The American Institute of Accountants (AIA), which became the American Institute of Certified Public Accountants (AICPA) in 1957, published Accounting Research Bulletin (ARB) No. 29, "Inventory Pricing," in 1947. ARB No. 29 codified full costing as the required method of accounting for manufactured inventory for general purpose financial statements. In 1953, the AIA published ARB No. 43 that restated the first 42 ARBs, but, relative to inventory pricing, ARB No. 43 made no substantive changes to ARB No. 29.

As its name implies, full costing includes both direct and indirect costs. In the 1940s to 1960s, manufacturing overhead, particularly the fixed cost element, was relatively small as a portion of total product cost in contrast to prime costs, direct material, and direct labor. This is largely because of the labor-intensive nature of the production function during the mid-20th Century. The relatively small amount of fixed

Figure 1: Changing Manufacturing Cost Element Relationships over Time



MOH=manufacturing overhead

manufacturing cost, as a percentage of total manufacturing cost, is documented in a popular cost accounting textbook published in 1953 by Theodore Lang, Walter B. McFarland, and Michael Schiff, where the general illustration estimate was 10% of total cost.[1]

Since that time, electronic control, robotics, digital technologies, and computer-aided design and manufacturing have significantly affected, and forever changed, the manufacturing environment. In 1987, *Fortune* reported, "…today some plants turn out thousands of products that require vastly different production processes…. At many companies [overhead] now accounts for half of all production costs. Direct labor, which frequently accounted for 40% of production cost 25 years ago, often represents no more than 5% today."[2]

As we juxtapose today's environment, where manufacturing companies are harnessing the power of data and automation to improve their bottom lines, the shift to an increasingly fixed cost structure has continued.[3] Figure 1 compares the low fixed-cost structure of a labor-intensive manufacturing process circa 1953 with the high fixed-cost structure demonstrative of a present-day, technology-enabled, and highly automated manufacturing process.

We document the origins of full costing embedded in GAAP and explain the changes in the manufacturing environment that impact the inherent assumptions of ARB No. 43. An illustration shows both the distortion in financial reporting for income reporting that results from applying an institutionalized accounting treatment that is more than 70 years old and an alternative view using a direct costing approach. Our recommendations explain how to address this outdated practice and disclosure problem.

To maintain the primary focus of our research, we do not include tax effects related to financial accounting and reporting for manufactured inventories or pursue activity-based costing for manufacturing inventories. Although we focus on GAAP, the International Accounting Standards (IAS) 2 is consistent with GAAP for the points we raise. Consequently, we believe the question "Is it time to retire full costing?" is relevant in a global context.

ACCOUNTING FOR MANUFACTURED INVENTORIES

The pertinent accounting literature explains the genesis and development of accounting for manufacturing inventory that includes promulgations from ARB No. 43 origins to current GAAP.

In 1939, in response to pressure from the U.S. Securities & Exchange Commission (SEC) for an

authoritative body for accounting standards, the AIA reorganized its Committee on Accounting Procedure (CAP) to include 22 CPA members—19 practitioners and three academicians.[4] During its 21-year period, the CAP issued 51 ARBs, including ARB No. 43, to represent a restatement and revision of the first 42. The ARBs were increasingly recognized as authoritative, and they had a pronounced effect on accounting practices.[5] The following also occurred:

- A theoretical document to support the bulletins was not developed;
- The use of research was very limited;
- There was little due process; and
- Practitioners complained they were not given an adequate hearing to express their opinions on proposed ARBs.[6]

ARB No. 43, Chapter 4, Inventory Pricing, superseded ARB No. 29 that came out in July 1947. A side-by-side reading of the two bulletins reveals the underlying statements and discussion to be nearly identical. Consequently, although ARB No. 43 is dated June 1953, relative to inventory pricing, its content has been in effect since 1947.

ARB No. 43 includes 10 statements on inventory pricing that serve to define inventory, emphasize the matching principle, establish cost as the primary basis of accounting, provide options on flow assumptions, clarify when departures from cost are appropriate (for example, lower cost or market), mandate consistent application, and guide the treatment of losses on firm purchase commitments. Two of these apply to our research: Statement 2 and Statement 3.

Statement 2 of ARB No. 43, Chapter 4, Inventory Pricing, reads as follows:

> "A major objective of accounting for inventories is the proper determination of income through the process of matching appropriate costs against revenues."

In its discussion, the CAP notes that inventory has financial significance because revenues may be obtained from its sale, and that inventory is "the balance of costs applicable to goods on hand remaining after the matching of absorbed costs with concurrent revenues." Except for a potential lower cost or market adjustment, there is no discussion on what costs to capitalize on the balance sheet.

Statement 3 of ARB No. 43, Chapter 4, Inventory Pricing, reads as follows:

> "The primary basis of accounting for inventories is cost, which has been defined generally as the price paid or consideration to acquire an asset. As applied to inventories, cost means in principle the sum of the applicable expenditures and charges directly *or indirectly* [emphasis added] incurred in bringing an article to its existing condition and location."

The words "or indirectly" imply the inclusion of fixed overhead. In its discussion, the CAP notes that under certain circumstances, abnormal costs, such as idle facility expense and rehandling costs, may be charged as period costs but excluding all overheads is not an accepted accounting procedure. While this last item reinforces full costing, the CAP does not provide a rationale for capitalizing fixed overhead.

THE ADVANCEMENT OF DIRECT COSTING

In Jonathan N. Harris's seminal 1936 article "What Did We Earn Last Month?" he described and illustrated how direct costing can provide more meaningful financial statements.[7] By treating fixed factory overhead as a period cost, the only fluctuating element of standard cost (fixed cost per unit) would be eliminated, which would ease the development of controllable budgets, simplify the income statement, eliminate confusion associated with the over/under absorption of fixed overhead, and provide greater utility of the standard cost system. Harris acknowledged some direct costing disadvantages, including lower working capital values and concern that sales staff may not understand that lower standard costs do not equate to lower selling prices. But he argued the advantages outweighed the disadvantages, and the disadvantages could be addressed through fixed cost factors and education.

Prior to the release of ARB No. 43, numerous direct

costing conferences and articles followed Harris, and variable costing for decision making became more accepted. In 1953, the editor of the *N.A.C.A. Bulletin* published by the National Association of Cost Accountants, which is now IMA® (Institute of Management Accountants), questioned why it is an accepted practice to inventory fixed costs when it is also an accepted practice to exclude such costs when studying most types of problems.[8] Yet despite arguments favoring direct costing, discussion justifying a full costing approach is absent from both ARB No. 29 and No. 43, reflecting the CAP's limited use of research, due process, and hearings to consider the opinions of practitioners outside of the CAP.

Following the release of ARB No. 43, the direct costing vs. full costing debate continued. In 1973, AICPA examined inventory accounting and published Accounting Research Study (ARS) No. 13. While the author, Horace G. Barden, acknowledged the usefulness of direct costing, he concluded that fixed overhead should be capitalized into inventory.[9] He explained, "I consider it illogical to contend that the cost of the metal being formed in the machine and the labor hours being expended by the operator are part of the product costs but not the costs incurred in managing the manufacturing activities and in providing and maintaining the machine and the lighted and heated facilities in which the operations take place." Yet despite Barden's views, concurrent survey research of 1,200 manufacturing companies found that 671 (56%) companies did not generally allocate all indirect costs to inventory. Exceptions included support department costs, depreciation, insurance, pensions, and property taxes.[10]

More recently, in 2008, Benjamin P. Foster and Sidney J. Baxendale highlighted how full costing facilitates earnings management concerns, such as overproduction to inflate inventory, and the combination of fixed and variable costs makes it burdensome for financial statement users to assess operating leverage to analyze equity risk.[11] Parvez R. Sopariwala acknowledged their concerns and proposed the "absorption-cum-direct costing income statement" that reorganizes the income statement to combine aspects of both direct and full costing as a compromise to end the debate.[12]

Manufacturing inventory accounting is now codified by the Financial Accounting Standards Board (FASB) as *Accounting Standards Codification*® (ASC) Topic 330, *Inventory*. ASC Topic 330 cross-references with ARB No. 43, as well as various Accounting Standards Updates, Emerging Issue Task Force issues, Staff Accounting Bulletins, Financial Accounting Standards, FASB Interpretations, Statements of Position, and federal regulations. The principal content of ASC Topic 330, however, originates from ARB No. 43.

In summary, despite a continued debate of more than 70 years, GAAP still requires the capitalization of fixed factory overhead into inventory, and direct costing is limited to managerial accounting. Concurrent with this long debate, fixed overhead as a percentage of total cost continued to rise.

HOW CHANGES IN MANUFACTURED COST ELEMENTS IMPACT RISKS AND CONTROLS

The transformative shift from labor-intensive manufacturing processes to more capital-intensive manufacturing over the past decades is a reality in varied industries. Examples include food production, semiconductor fabrication, electric razor manufacturing, and high-end camera production.[13] In these industries, the newest plants have virtually zero direct labor. These four industries are quite different in their manufacturing process in terms of complexity, number of parts or ingredients, and cost per unit. What they share, however, is the need to effectively manage cost and quality. Leading companies in these industries embrace the notion that "resting on their laurels" is a recipe for disaster for their stakeholders, and without continuous improvement and innovation, success will be fleeting.

There are several common features of this transformation worthy of note:

1. Manufacturing overhead as a percentage of cost has grown dramatically, concurrent with an increase in the complexity and diversity of the underlying overhead components. Although this does not engender an issue under full costing, from a management accounting standpoint, it does present challenges in understanding the disaggregated costs of individual products manufactured in facilities producing multiple product types. This

can diminish a lucid understanding of production cost for internal decision makers.

2. Although the focus of this research is on the shift between direct labor and manufacturing overhead, the relative amount of direct materials used in production has declined over time. This reduction is principally attributable to improved materials and engineered efficiency gains.
3. The transformative shift in manufacturing has also altered the risk profile associated with the production of goods. For example, a minor software error can proliferate defects in the manufacturing process at a speed exponentially higher than traditional manual operations.

Conflicting Accounting Concepts

In the development of GAAP, discussions often included a variety of accounting concepts that may conflict with one another. The accounting literature we cited, however, emphasizes the matching principle as the conceptual underpinning for the required full costing treatment. We posit that there are other accounting concepts that also merit attention:

■ Conservatism: Considering the dramatic increase in fixed manufacturing overhead and the diminution of direct labor cost, the risk of exaggerating finished goods inventory under full costing and, thereby, increasing reported net income when burdened inventory levels increase, presents itself as a less-than-conservative approach for periodic financial reporting.

■ Historical cost: Full costing includes costs that have expired, such as plant insurance, rent, property taxes, and depreciation on plant and equipment in inventory. This would seem a flagrant violation of historical cost, given that the values of these items at the end of the period are zero, yet the asset value lives on in finished goods inventory—zombie asset style. The historical rationale for this approach includes the notion that companies will price their goods for sale more reasonably if fixed manufacturing cost is included in product cost as a "cushion" to maintain profitability. In today's world, however, cost planning and pricing practices are far more developed than in 1953 and less dependent on GAAP accounting information.

■ Materiality: Per the illustrations in this article, one could argue that the lower percentage of fixed manufacturing overhead in manufactured inventory cost in the 1950s was immaterial to finished goods valuation and net income reporting. Considering the shift toward technology investment and the resulting limited direct labor cost, fixed manufacturing overhead is material.

■ Full disclosure: The separate reporting of fixed manufacturing overhead is not required under GAAP. Without this disclosure, users of the financial statements may find it difficult to analyze operating leverage and/or detect the overproduction of inventory to inflate net income and asset values.

The FASB's Conceptual Framework supports the Board "in setting sound financial accounting standards and helps members of the board's constituency not only understand and apply those standards but also apply them to their development."[14] The FASB lists five intended uses of its Conceptual Framework including "imposing an intellectual discipline on what historically was a subjective and ad hoc reasoning process." Also, the framework "does not establish new standards or change existing GAAP but is a foundation in establishing new standards or amending existing standards."

Given this context, the ARB No. 43 treatment of manufactured inventory that is bolstered by the matching concept alone is in sharp contrast with the weight of four concepts that support the direct costing treatment. The establishment of the approach in ARB No. 43 also appears to reflect one of the five uses for the FASB's Conceptual Framework criteria for change mentioned previously "…on what historically was a subjective and ad hoc reasoning process."

EFFECTS ON OPERATING INCOME AND FINANCIAL REPORTING

Two scenarios illustrate the income effects of a changing cost structure: a low fixed-cost ratio (scenario A) consistent with a labor-intensive cost structure that was typical when ARB No. 43 was published, and a high fixed-cost ratio (scenario B) consistent with a cost structure of a contemporary, technology-enabled, and highly automated facility.

For both scenarios, we assume the same volumes,

Table 1: Underlying Assumptions for Tables 2-4 and Appendices A and B

	Year 1	Year 2
Common Assumptions		
Number of units		
Sold	500	500
Produced	530	470
Normal capacity	500	500
Beginning inventory	40	70
Ending inventory	70	40
Unit selling price	$ 12.00	$ 12.00
Variable selling price per unit	$ 1.00	$ 1.00
Actual variance selling expense	$ 500.00	$ 500.00
Actual fixed selling expense	$ 400.00	$ 400.00
Actual fixed admin. expense	$ 250.00	$ 250.00

Scenario A: Low fixed-cost ratio		
Per unit costs		
Direct material	$ 2.80	40%
Direct labor	2.60	37%
Variable overhead	0.90	13%
Fixed overhead[1]	0.70	10%
Full manufacturing cost	$ 7.00	100%
Planned/actual fixed overhead	$ 350.00	
Scenario B: High fixed-cost ratio		
Per unit costs		
Direct material	$ 2.10	30%
Direct labor	0.35	5%
Variable overhead	1.05	15%
Fixed overhead[1]	3.50	50%
Full manufacturing cost	$ 7.00	100%
Planned/actual fixed overhead	$ 1,750.00	

[1] Planned/actual fixed overhead divided by normal capacity

normal capacity, selling price, and selling and administrative expense amounts. Table 1 lists the common and scenario-specific assumptions supporting Tables 2, 3, and 4 and Appendices A and B. Total cost per unit is also assumed to be the same ($7) in both scenarios; however, the underlying cost elements vary. For the low fixed-cost ratio scenario, we assume annual fixed manufacturing overhead is $350, or $0.70 per unit, when divided by the 500 units of normal capacity, with higher direct unit costs ($6.30 in the aggregate). For the high fixed-cost ratio scenario, we assume annual fixed manufacturing overhead is $1,750, or $3.50 per unit, with lower direct unit costs ($3.50 in the aggregate).

As income differences between the two scenarios will only arise when there are changes in either work-in-process or finished goods inventory, we use a two-year model, with finished goods levels changing from Year 1 to Year 2 but consistent for the full two-year period. Thus, scenarios A and B operating income will differ each year but will be equal for the two-year period.

For simplicity, we assume planned costs are equal to actual costs, second-year pricing and costs are consistent with the first year, and work-in-process inventory balances are zero. We also ignore nonoperating items and income taxes (i.e., we end the illustration at operating income).

The Income Statement Effects of a Changing Cost Structure under Full Costing (GAAP)

Table 2 provides two-year views of the income statement using a full costing (GAAP) approach for both scenarios A and B. The level of detail is consistent with the view that companies provide to external users of the financial statements. Appendix A provides more detailed views, where each item can be reconciled with the assumptions in Table 1. Our illustration assumptions only vary for the number of units produced each year and the elemental cost structures (mix) of each scenario. Therefore, the differences in gross profit and operating income are equal to the changes in fixed manufacturing overhead absorbed into inventory. In scenario A, the effect is modest as margin percentages only change by 1% of sales on a year-over-year basis. In scenario B, however, the effect is more significant as year-over-year margin percentages change by 3%.

Using the assumptions from Table 1 and amounts from Tables 2 and 3 illustrates these differences in greater detail. Again, the assumptions only vary for the number of units produced and elemental cost mix of each scenario. Since inventory levels do not change over the full two-year period, the two-year operating income totals for both scenarios A and B are $2,700. Under scenario A (reflective of a historical manufacturing process), the 30-unit increase in inventory is multiplied by fixed manufacturing overhead of $0.70 per unit to yield a $21 (or 1.6%) lift in operating income. Under scenario B (consistent with a contemporary manufacturing process), the 30-unit increase in inventory is multiplied by fixed manufacturing overhead of $3.50 per unit to yield a $105 increase—five times greater than sce-

Table 2: Income Statements Utilizing Full Costing (GAAP)—External View

	Year 1		Year 2	
Scenario A: Low fixed-cost ratio				
Sales	$ 6,000	*100%*	$ 6,000	*100%*
Cost of goods sold	3,479	*58%*	3,521	*59%*
Gross profit	$ 2,521	*42%*	$ 2,479	*41%*
Selling expenses	900	*15%*	900	*15%*
Administrative expenses	250	*4%*	250	*4%*
Operating income	$ 1,371	*23%*	$ 1,329	*22%*
Scenario B: High fixed-cost ratio				
Sales	$ 6,000	*100%*	$ 6,000	*100%*
Cost of goods sold	3,395	*57%*	3,605	*60%*
Gross profit	$ 2,605	*43%*	$ 2,395	*40%*
Selling expenses	900	*15%*	900	*15%*
Administrative expenses	250	*4%*	250	*4%*
Operating income	$ 1,455	*24%*	$ 1,245	*21%*

nario A and a significant 7.8% of operating income. In Year 2, production is decreased, such that there is no inventory change for the full two-year period. Consequently, operating income under scenario A is reduced by $21 (or 1.6%) and $105 (or 7.8%) under scenario B. From a year-over-year perspective, the operating income variance is $42 under scenario A and $210 under scenario B.

Full costing proponents would argue the company was more efficient in leveraging its fixed manufacturing capacity. Critics, however, would say the illustrated Year 1 inventory buildup generates additional risk, such as obsolescence and carrying costs, overvalues the balance sheet by capitalizing expired fixed manufactur-

Table 3: The Effect of Fixed Under (Over) Applied Fixed Overhead on Operating Income

	Year 1		Year 2		Year 1-Year 2	Two-Year Totals
Scenario A: Low fixed-cost ratio						
Operating income		$1,371		$1,329	$42	$2,700
Increase (decrease) in finished goods inventory units	30		(30)			-
x Fixed overhead per unit-Scenario A	$0.70		$0.70			
Income benefit (detriment)		$21		($21)	$42	-
Scenario B: High fixed-cost ratio						
Operating income		$1,455		$1,245	$210	$2,700
Increase (decrease) in finished goods inventory units	30		(30)			-
x Fixed overhead per unit-Scenario B	$3.50		$3.50			
Income benefit (detriment)		$105		($105)	$210	-

Table 4: Income Statements Utilizing Direct Costing

	Year 1		Year 2	
Scenario A: Low fixed-cost ratio				
Sales	$ 6,000	*100%*	$ 6,000	*100%*
Variable cost of goods sold	3,150	*53%*	3,150	*53%*
Variable selling expenses	500	*8%*	500	*8%*
Variable admin. expenses	-	*0%*	-	*0%*
Contribution margin	$ 2,350	*39%*	$ 2,350	*39%*
Fixed cost of goods sold	350		350	
Fixed selling expenses	400		400	
Fixed admin. expenses	250		250	
Operating income	$ 1,350	*23%*	$ 1,350	*23%*
Scenario B: High fixed-cost ratio				
Sales	$ 6,000	*100%*	$ 6,000	*100%*
Variable cost of goods sold	1,750	*29%*	1,750	*29%*
Variable selling expenses	500	*8%*	500	*8%*
Variable admin. expenses	-	*0%*	-	*0%*
Contribution margin	$ 3,750	*63%*	$ 3,750	*63%*
Fixed cost of goods sold	1,750		1,750	
Fixed selling expenses	400		400	
Fixed admin. expenses	250		250	
Operating income	$ 1,350	*23%*	$ 1,350	*23%*

ing overhead costs into inventory, and may reflect earnings management tactics. For companies under near-term pressure to meet earnings expectations, the high fixed-cost ratio of scenario B creates an increased risk that management will overproduce. The fact that such a distortion would "catch up with them" in the following year of our illustration is of little comfort.

A management team could defer the reversal or even increase the net income benefit by maintaining or building inventory levels. Building inventory is often less challenging than selling it. In the context of short-term earnings management, business leaders may accept the increased economic costs associated with higher inventory levels in exchange for an immediate earnings boost. And finally, for an external user of the financial statements, armed only with the information in Table 2 and disclosure in the inventory footnote, ascertaining the reasons for scenario B's 3% change in profit margins would be challenging. This underscores Foster and Baxendale's argument that a full costing approach makes it burdensome for financial statement users to effectively assess operating leverage and analyze equity risk.[15]

Direct Costing: Illustration of an Alternative Approach

Table 4 provides views of the income statement using a direct cost approach for scenarios A and B. The information could represent the level of detail an external user of the financial statements would receive if direct costing were the accepted methodology. A more detailed view, where each item can be reconciled with the assumptions in Table 1, appears in Appendix B. Under direct costing, fixed overhead is treated as a period cost and not capitalized to inventory.

Relative to our illustration, because fixed manufacturing overhead is treated as fixed cost of goods sold, the year-over-year operating income variances attributable to inventory changes are eliminated, and operating income is consistent at $1,350. We contend the direct costing approach yields higher quality year-over-year reporting than its full costing counterpart as the future utility of fixed manufacturing overhead items has expired and should not be capitalized into inventory. Consistently, operating income variances associated with inventory changes and applied fixed manufacturing overhead rates (under full costing) do not reflect economic reality.

We also contend that the direct costing approach provides more meaningful financial information for financial statement users to assess operating leverage and analyze equity risk. To model future profits within a relevant range of sales volumes, the separation of fixed and variable costs enables users to construct more accurate models. Percentages can be applied to variable items, and dollar amounts can be considered for fixed items. While users may need to make model adjustments for semi-variable and semi-fixed items, we argue that direct costing provides a much stronger starting point than full costing. Today, under full costing, the external user does not receive any information on what is variable and what is fixed and thus must apply guesswork at the beginning of the modeling process.

RECOMMENDATIONS

Surfacing issues in financial accounting, control, and reporting have been exacerbated because of the dramatic growth of manufacturing overhead as a percentage of total manufactured cost during the last half century. Although technology has driven dramatic changes to manufacturing, the preoccupation with short-term earnings has remained consistent. Net income results reported in quarterly and annual reports continue to be "front page" media news, particularly for widely held public companies. Exceeding or particularly failing to meet Wall Street's expectations is often the headline. The high fixed-cost ratio cost structures typical of today's manufacturing industry increase the risk of overproducing inventory to manage earnings. Additionally, absorption costing's rationale rests almost uniquely upon the matching concept.

We have argued that with respect to other equally important fundamental accounting concepts including conservatism, historical cost, materiality, and full disclosure, absorption costing is inconsistent with several key conceptual foundations. For these reasons, we recommend that the FASB should, with an open mind, consider the impact of current practices—established decades ago—on the quality of periodic financial reporting.

We believe direct costing would be an improvement over the practice of absorption costing, and we do not make this recommendation lightly. While a change to direct costing will create short-term implementation challenges, this change will enhance the quality of financial reporting and enable users to better assess operating leverage and equity risk. Inventory will be more appropriately valued, and the risk of earnings management will be reduced. After more than 70 years, is it time to retire absorption costing? The answer is an unequivocal yes. ■

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Appendix A: Income Statements Utilizing Full Costing (GAAP)—Detailed View

	Year 1			Year 2		
Scenario A: Low fixed-cost ratio						
Sales			**$ 6,000**			**$ 6,000**
Cost of goods sold:						
Beginning inventory		$ 280			$ 490	
+ Cost of goods produced						
Direct material	$ 1,484			$ 1,316		
Direct labor	1,378			1,222		
Variable manufacturing overhead	477			423		
Fixed manufacturing overhead	371	$ 3,710		329	$ 3,290	
Cost of goods produced		$ 3,990			$ 3,780	
- Ending inventory		(490)			(280)	
+/- Under (over) applied fixed manufacturing overhead		(21)			21	
Cost of goods sold			**3,479**			**3,521**
Gross profit			**$ 2,521**			**$ 2,479**
Selling expenses			**900**			**900**
Administrative expenses			**250**			**250**
Operating income			**$ 1,371**			**$ 1,329**
Scenario B: High fixed-cost ratio						
Sales			**$ 6,000**			**$ 6,000**
Cost of goods sold:						
Beginning inventory		$ 280			$ 490	
+ Cost of goods produced						
Direct material	$ 1,113			$ 987		
Direct labor	186			165		
Variable manufacturing overhead	557			494		
Fixed manufacturing overhead	1,855	$ 3,710		1,645	$ 3,290	
Cost of goods produced		$ 3,990			$ 3,780	
- Ending inventory		(490)			(280)	
+/- Under (over) applied fixed manufacturing overhead		(105)			105	
Cost of goods sold			**3,395**			**3,605**
Gross profit			**$ 2,605**			**$ 2,395**
Selling expenses			**900**			**900**
Administrative expenses			**250**			**250**
Operating income			**$ 1,455**			**$ 1,245**

Bold-font items are also shown in Table 2.

Appendix B: Income Statement Utilizing Direct Costing—Detailed View

	Year 1			Year 2		
Scenario A: Low fixed-cost ratio						
Sales			**$ 6,000**			**$ 6,000**
Variable cost of goods sold:						
Beginning inventory		$ 252			$ 441	
+ Cost of goods produced						
Direct material	$ 1,484			$ 1,316		
Direct labor	1,378			1,222		
Variable overhead	477	$ 3,339		423	$ 2,961	
Cost of goods produced		$ 3,591			$ 3,402	
- Ending inventory		(441)			(252)	
Variable cost of goods sold		**$ 3,150**			**$ 3,150**	
Variable selling expenses		**500**			**500**	
Variable admin. expenses		-			-	
Total variable costs			$ 3,650			$ 3,650
Contribution margin			**$ 2,350**			**$ 2,350**
Fixed overhead	$ 350			$ 350		
Fixed cost of goods sold		**$ 350**			**$ 350**	
Fixed selling expenses		**400**			**400**	
Fixed admin. expenses		**250**			**250**	
Total fixed costs			$ 1,000			$ 1,000
Operating income			**$ 1,350**			**$ 1,350**
Scenario B: High fixed-cost ratio						
Sales			**$ 6,000**			**$ 6,000**
Variable cost of goods sold:						
Beginning inventory		$ 140			$ 245	
+ Cost of goods produced						
Direct material	$ 1,113			$ 987		
Direct labor	186			165		
Variable overhead	557	$ 1,855		494	$ 1,645	
Cost of goods produced		$ 1,995			$ 1,890	
- Ending inventory		(245)			(140)	
Variable cost of goods sold		**$ 1,750**			**$ 1,750**	
Variable selling expenses		**500**			**500**	
Variable admin. expenses		-			-	
Total variable costs			$ 2,250			$ 2,250
Contribution margin			**$ 3,750**			**$ 3,750**
Fixed overhead	$ 1,750			$ 1,750		
Fixed cost of goods sold		**$ 1,750**			**$ 1,750**	
Fixed selling expenses		**400**			**400**	
Fixed admin. expenses		**250**			**250**	
Total fixed costs			$ 2,400			$ 2,400
Operating income			**$ 1,350**			**$ 1,350**

Bold-font items are also shown in Table 4.