

D. T. HICKS & CO.

Cost Measurement and Management Consultants
25882 Orchard Lake Road – Suite 207
Farmington Hills, Michigan 48336
Tel: 248.761.3706 – Fax: 248.471.6572
www.dthicksco.com

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Dear Executive:

During the past quarter, one of the topics that has been a “soapbox” issue for me for nearly twenty years has begun to pop up over and over again. That topic is the inappropriate use of profit as a percentage of sales as a measure for determining the value of a job or product to a manufacturing firm. As a result, I thought I’d use this quarter’s letter as an opportunity to revisit that issue despite the fact that I’ve touched on it once or twice in previous letters.

Almost every manufacturing firm looks at gross margin or profit as a percentage of sales as a way to measure the value of a job or product. Sometimes it even cuts fixed costs and/or non-cash costs (like depreciation and amortization) out of the calculation and uses EBITDA or contribution margin as a percentage of sales. When business is quoted, costs are added up and a target profit percentage added to arrive at a quoted price. Considering the nature of manufacturing and the ultimate objective of a for-profit organization, such a measure is totally illogical.

The purpose of a for-profit organization is to earn its investors the highest possible return on their investment, not to generate the highest possible profit as a percentage to sales. So why would a manufacturing firm want to remove half of the return on investment formula in measuring the value of the individual products that make up its portfolio of business? Would an investor look only at the dollar return on each individual investment he or she makes without taking into consideration how much of their available funds are required to generate that dollar return? Of course they wouldn’t. But most manufacturing firms totally ignore investment in making product profitability decisions every day.

Let’s consider SmallCo, a small manufacturer with two products – Product A and Product B – that have equal sales volumes of \$500,000 and that each generate a profit as a percentage of sales of 10%. The owner’s investment in SmallCo amounts to \$600,000. Exhibit I summarizes this information.

	Product A	Product B	Totals
Sales	\$500,000	\$500,000	\$1,000,000
Profit	\$50,000	\$50,000	\$100,000
Profit % to Sales	10.0%	10.0%	10.0%
Investment			\$600,000
Return on Investment			16.7%

Exhibit I – Summary of SmallCo’s Financial Information by Product

As you can see, the return on investment generated by this manufacturer is 16.7%. From all appearances, these two products are of equal value to SmallCo's investor. Their profits as a percentage of sales are exactly the same.

Let's further break down the company's financial information by separating its costs into two categories: materials and components purchased from vendors and the cost of activities it performs in turning those materials and components into the products it sells. Exhibit II documents that breakdown.

	Product A	Product B	Totals
Sales	\$500,000	\$500,000	\$1,000,000
Purchased Material/Components	\$150,000	\$300,000	\$450,000
Activity Costs	<u>\$300,000</u>	<u>\$150,000</u>	<u>\$450,000</u>
Profit	<u>\$50,000</u>	<u>\$50,000</u>	<u>\$100,000</u>
Profit % to Sales	<u>10.0%</u>	<u>10.0%</u>	<u>10.0%</u>
Investment			\$600,000
Return on Investment			16.7%

Exhibit II – SmallCo's Financial Information with Cost Breakdown

On the surface, this breakdown of costs adds nothing to our understanding of the value of each product; both products still appear to be of equal value to SmallCo. But further examination of the data shows one very relevant difference between the two products; it takes twice as much work to turn Product A's materials and components into a finished product as it does to turn Product B's into a finished product. \$300,000 of activity cost is required for Product A while only \$150,000 is required for Product B. Does this mean anything?

At a manufacturing firm, it is very likely that a product that requires twice the work of another in its manufacture also ties up its capital equipment (and major investment) about twice as long. Although this relationship is not exact, it is much closer to reality than assuming that the capital equipment is occupied in proportion to sales dollars. Capital investment at a manufacturing firm is used primarily to produce products so it is quite likely that it is dedicated to products in proportion to the amount of work performed in the manufacture of those products. (Of course, in the "real world" the relationship is more complex, but for our simple example this assumption is close enough to reality to make a fundamental point). SmallCo has only two products and since twice as much work is performed on Product A, \$400,000 of the \$600,000 investment can be attributed to that product and only \$200,000 to Product B. Adding this to our analysis of the company's financial information reveals the results shown in Exhibit III.

Product B provides twice Product A's return on investment – 25% vs. 12.5%. Wouldn't this make Product B twice as valuable to SmallCo as Product A? Based on the ultimate financial objective to the company – to generate the highest possible return on investment to its investor – it certainly would seem to be so. Yet the industry's generally accepted measure of product value – profit as percentage of sales – hides this fact. Both products appear to be of equal value.

Note the percentage relationship that has been added to Exhibit III; profit as a percentage of activity cost – the profit earned on the work actually performed. It "tracks" the return on investment of each product much more closely than does profit as a percentage of sales.

	Product A	Product B	Totals
Sales	\$500,000	\$500,000	\$1,000,000
Purchased Material/Components	\$150,000	\$300,000	\$450,000
Activity Costs	<u>\$300,000</u>	<u>\$150,000</u>	<u>\$450,000</u>
Profit	<u>\$50,000</u>	<u>\$50,000</u>	<u>\$100,000</u>
Investment	<u>\$400,000</u>	<u>\$200,000</u>	<u>\$600,000</u>
Profit % to Sales	<u>10.0%</u>	<u>10.0%</u>	<u>10.0%</u>
Profit % to Activity Costs	<u>16.7%</u>	<u>33.3%</u>	<u>22.2%</u>
Return on Investment	<u>12.5%</u>	<u>25.0%</u>	<u>16.7%</u>

Exhibit III – SmallCo’s Financial Information with Investment Attribution

Exhibit III should also make another thing apparent; if SmallCo could use its investment to sell three times the volume of Product B at the same price and drop Product A altogether, it would improve its return on investment from 16.7% to 25% with no increase in investment and without improving its profit as a percentage of sales at all. The outcome of such a move is shown in Exhibit IV.

	Product A	Product B	Totals
Sales	\$0	\$1,500,000	\$1,500,000
Purchased Material/Components	\$0	\$900,000	\$900,000
Activity Costs	<u>\$0</u>	<u>\$450,000</u>	<u>\$450,000</u>
Profit	<u>\$0</u>	<u>\$150,000</u>	<u>\$150,000</u>
Investment	<u>\$0</u>	<u>\$600,000</u>	<u>\$600,000</u>
Profit % to Sales	<u>0.0%</u>	<u>10.0%</u>	<u>10.0%</u>
Profit % to Activity Costs	<u>0.0%</u>	<u>33.3%</u>	<u>33.3%</u>
Return on Investment	<u>0.0%</u>	<u>25.0%</u>	<u>25.0%</u>

Exhibit IV – SmallCo’s Projected Financial Results Selling Only Product B

As noted earlier, the relationships at “real world” manufacturers are more complex than in this simple example, but that does not alter the fundamental fact that profit as a percentage of sales is a misleading and dysfunctional measurement of a product’s value to a manufacturing firm. Profit as a percentage of activity costs, the more meaningful measurement suggested here, is a much better metric, but still not the perfect solution to the problem. The most meaningful solution is to incorporate a cost of capital that includes a targeted return on investment for investors into the basic cost structure and product costing rates of the manufacturer. That solution, unfortunately, is far beyond the reach of a vast majority of manufacturers who continue to rely on the traditional, direct labor-based costing methods whose inaccuracy and irrelevance to a 21st Century manufacturing firm have been well documented.

Recent Developments

This topic has started to become an important issue recently in industries where cost-based pricing still predominates and customers closely scrutinize their vendor's quotations and "cost build-ups" – the automotive supply industry in particular.

Customer cost analysts have begun to realize that companies should earn a profit on "the work they do," not on the total cost of the product being produced. They correctly claim that work involved in procuring, handling, storing, testing and otherwise managing materials and components is a legitimate part of the "mark-up base," but the price paid for those materials and components is not. As often happens, however, those analysts take an economic truth and then add an economic fallacy or two that twists that truth into a distorted theory that they use to justify cutting vendor prices and slowly drive their suppliers toward oblivion.

The economic fallacy added by these analysts is that the profit percentage added to activity costs (the work performed by the supplier) should be the same as the percentage that had been used in the past to "mark up" total costs to arrive at a sales price. If the supplier marked up total cost by 10%, it should now mark up activity cost by 10%. Some even attempt to lure the supplier into agreeing to the new approach by increasing that percentage by a small amount and allowing a small percentage to be added to materials and components. To be successful in such a situation, suppliers must understand that the analysts' basic premise is correct – the base for profitability should be activity costs, not total cost including materials and components – but that the appropriate profit as a percent of activity cost measure is not the same percentage as when total cost was used as a base.

Let us suppose that one of SmallCo's contracts is expiring and it is bidding on three new jobs to fill the capacity opened by the loss of the old contract. SmallCo's investors have a return on investment target of 18%. The company has also estimated that its total activity costs when operating at practical/attainable capacity are \$500,000. Using that information, the company determines that it needs a 21.6% profit as a percentage of activity costs for an individual job to provide the targeted return on investment as shown in Exhibit V.

Investment	\$600,000
Targeted Return on Investment	18.0%
Profit Required for Targeted Return on Investment	\$108,000
Activity Costs at Practical Attainable Capacity	\$500,000
Required Profit % of Activity Costs for ROI	21.6%

Exhibit V – Determining SmallCo's Targeted Profit as a Percentage of Activity Costs

The three jobs on which the company is bidding would each require 20% of the company's capacity and – since we're assuming that activity costs track investment utilization – each would require 20% of its practical/attainable-capacity level activity costs.

Using its old method of bidding jobs at a 10% profit margin, the quotations for the three products would be developed as shown in Exhibit VI. This results in quoted returns on investment ranging from 13.9% (far below the targeted return on investment) to 23.1% (far above the targeted return). Should the company's bid be accepted for Product C, it would be accepting a job with a return below its target and it would have to somehow make it up on another product if it is to meet its overall a ROI target.

	Product C	Product D	Product E
<u>Profit % to Sales Method</u>			
Purchased Material/Components	\$50,000	\$100,000	\$150,000
Activity Costs (20% of Capacity)	<u>\$100,000</u>	<u>\$100,000</u>	<u>\$100,000</u>
Total Costs Attributable to Products	\$150,000	\$200,000	\$250,000
Markup to Achieve 10% Profit % to Sales	<u>\$16,667</u>	<u>\$22,222</u>	<u>\$27,778</u>
Quoted Sales Price	<u>\$166,667</u>	<u>\$222,222</u>	<u>\$277,778</u>
Investment Attributed to Product (20%)	<u>\$120,000</u>	<u>\$120,000</u>	<u>\$120,000</u>
ROI Targeted by Quoted Sales Price	<u>13.9%</u>	<u>18.5%</u>	<u>23.1%</u>

Exhibit VI – SmallCo New Business Opportunities Quoted Using Traditional Method

The customer explains that they can no longer allow a 10% margin on total cost because allowing such a markup on materials and components is a conceptually invalid economic concept. Since they are such a magnanimous customer, however, they will now allow a 12% margin on activity costs and a 4% margin on materials and components (known as trying to pull a “fast one”). This would result in a sales price and return on investment on the three products as shown in Exhibit VII.

	Product C	Product D	Product E
<u>Customer's "Fast One" Method</u>			
Purchased Material/Components	\$50,000	\$100,000	\$150,000
Activity Costs (20% of Capacity)	<u>\$100,000</u>	<u>\$100,000</u>	<u>\$100,000</u>
Total Costs Attributable to Products	\$150,000	\$200,000	\$250,000
Markup to Achieve 12% Profit % on Activity Costs	\$13,636	\$13,636	\$13,636
Markup to Achieve 4% Profit % on Purchases	<u>\$2,083</u>	<u>\$4,167</u>	<u>\$6,250</u>
Quoted Sales Price	<u>\$165,720</u>	<u>\$217,803</u>	<u>\$269,886</u>
Investment Attributed to Product (20%)	<u>\$120,000</u>	<u>\$120,000</u>	<u>\$120,000</u>
ROI Targeted by Quoted Sales Price	<u>13.1%</u>	<u>14.8%</u>	<u>16.6%</u>

Exhibit VII – Pricing Formula Proposed by Customer

The “generous” proposal by the customer results in .6% to 2.8% lower costs for the customer and SmallCo’s failure to reach its targeted ROI on any of the products.

Using the more (although as mentioned earlier not most) economically sound “percentage of activity costs’ method of understanding the economic value of the three products, SmallCo determines its target prices as shown in Exhibit VIII.

As can be seen from the analysis, SmallCo actually needs a \$4,933 higher price, not a lower price, to meet its ROI target on Product C. On Product D it can accept a somewhat lower price and on Product E it can accept a \$6,178 lower price and still meet its ROI target. For all three products the price is higher than that calculated using the customer’s proposed “magnanimous deal,” but for Products D and E it would be still be lower than under its traditional “profit as a percentage of sales” measure providing the customer with lower costs while still meeting SmallCo’s financial objectives.

	Product C	Product D	Product E
<u>Profit % to Activity Cost Method</u>			
Purchased Material/Components	\$50,000	\$100,000	\$150,000
Activity Costs (20% of Capacity)	<u>\$100,000</u>	<u>\$100,000</u>	<u>\$100,000</u>
Total Costs Attributable to Products	\$150,000	\$200,000	\$250,000
Markup to Achieve 21.6% Profit to Activity Costs	<u>\$21,600</u>	<u>\$21,600</u>	<u>\$21,600</u>
Quoted Sales Price	<u>\$171,600</u>	<u>\$221,600</u>	<u>\$271,600</u>
Investment Attributed to Product (20%)	<u>\$120,000</u>	<u>\$120,000</u>	<u>\$120,000</u>
ROI Targeted by Quoted Sales Price	<u>18.0%</u>	<u>18.0%</u>	<u>18.0%</u>

Exhibit VIII – SmallCo Prices Required to Meet Targeted Return on Investment

Negotiating prices is a complex process that incorporates more than just base-level profit margins. For sound pricing decisions, however, it is imperative that decision makers have economically sound financial measurements for each job quoted if they are to stock the organization’s portfolio with business that enables it to thrive and grow in today’s ever more complex and competitive marketplace.

Conclusion

Profit as a percentage of sales only works at manufacturers whose ratio of purchased materials and components to activity costs is relatively constant for all of the products it produces. Even then, it only works by default; not because it is an economically sound concept. The ideal method would be for a manufacturer to incorporate a cost of capital that includes the investors’ targeted return on investment into its basic costing methodology. That, however, is beyond the near-term capabilities of those manufacturers with traditional, GAAP-driven cost systems. Using profit as percentage of activity costs to measure a product’s value to the company – a method well within the capabilities of most manufacturers – is much more accurate gauge of product value and provides decision makers with the wherewithal to make pricing decisions that lead to a more successful financial future.

Profit as a percentage of sales is only one of the many seldom-questioned, standard accounting concepts that continue to undermine a company’s profitability. If you haven’t already done so, you can read about others in my most recent book “I May Be Wrong, But I Doubt It: How Accounting Information Undermines Profitability.” You can check out the book’s reviews and order yourself a copy at www.amazon.com.

I hope the new year finds your company recovering from the difficulties of 2009. I look forward to hearing from any of you who have questions or comments regarding this quarter’s letter. As always, please feel free to forward a copy of this letter to anyone you believe would be interested.

Very truly yours,

Doug

Douglas T. Hicks, CPA, CMC
President