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Tax Management

# Transfer Pricing

REPORT

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**Analysis**

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**COMPLIANCE****Benchmarking Manufacturing or Distribution Entities  
Against the Profits of Consolidated Companies**By **Brian C. Becker\***

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Comparing consolidated companies that both manufacture and distribute products with independent companies that do one or the other but not both is like comparing apples to oranges: Consolidated entities often earn a higher operating margin by performing the very same tasks as specific function entities do.

Much research has been devoted to the strengths, weaknesses, and processes for benchmarking the profitability of tested party (taxpayer) entities against that of independent firms. This article attempts to add to that body of research by analyzing some of the mathematical and structural issues of comparing a consolidated entity (i.e., one that manufactures and distributes) with one that only performs either the manufacturing or the distribution function. It shows mathematically--among other points--that the operating margins of consolidated entities would generally be expected to be larger than analogous distribution-only operations and often larger than manufacturing-only operations. In this sense, it cautions against using consolidated entities as benchmarks in an operating margin comparison to distribution-only (and manufacturing-only) operations.

Three sections follow to describe these findings. The first summarizes some of the research on benchmarking in the transfer pricing area. Section II presents a financial statement example and analysis of the interaction of operating margins between consolidated entities and "separated" entities (i.e., distribution-only or manufacturing-only.) Section III provides a step-by-step mathematical calculation

of when the operating margins of a consolidated entity would naturally be larger than those of analogous separated entities.

## Benchmarking Research

Profitability benchmarking is one of the more common economic analyses seen in transfer pricing. As a result, economists have published a number of findings on this broad topic. Much research has been devoted to the appropriate profit level indicators to employ. Miesel, Higinbotham, and Yi point out that the return on capital employed profit level indicator may require less "comparability" among benchmarks and the tested parties than others.<sup>1</sup> Other research has focused on the appropriate arm's-length range among the results seen from the benchmarks.<sup>2</sup>

Further research in this area has focused on the mathematical relationships inherent in financial statements and the various profit level indicators. In this sense, the differences (or lack thereof) between the Berry ratio and gross margins have been quantified as well as the differences between operating margins and total cost plus markups.<sup>3</sup> The different types of impacts made by intangibles on certain profit level indicators has also been examined.<sup>4</sup>

The relationships between balance sheet items and income statement profit level indicators have also been considered, with mechanisms to make appropriate income statement adjustments.<sup>5</sup> While such adjustments are common, alternative opinions have been expressed regarding their applicability.<sup>6</sup>

## Financial Statement Analysis

Operating profit margins are a commonly used profit level indicator for a wide variety of tested parties. The results can have different implications depending on the functions of the party being analyzed. In this article, the profitability of one consolidated entity is compared with two other entities: distribution-only and manufacturing-only. This is introduced by providing a summary income statement for a consolidated company that performs both manufacturing (seen in its cost of goods sold) and distribution (seen in its operating expenses) functions.

Financial Item	Dollar Value
Net Sales	\$100

Cost of Goods Sold	\$40
Operating Expenses	\$50
Operating Profit	\$10
Operating Margin	10 percent

While the above reports the profits of a consolidated company, this company could just as easily have formed two separate reporting entities to perform manufacturing and distribution. Without changing any of the operations of the company, the two entities' summary income statements would be influenced by the transfer price (TP) between them:

Financial Item	Distribution Entity	Manufacturing Entity
Net Sales	\$100	TP
Cost of Goods Sold—	TP	\$40
Operating Expenses	\$50	—
Operating Profit	$\$50 - TP$	$TP - \$40$
Operating Margin	$(\$50 - TP)/\$100$	$(TP - \$40)/TP$

With this in mind, it is interesting to note that *the distribution entity could not record an operating margin at or above that of the consolidated entity unless the manufacturing entity lost money*. That is, in this case, the transfer price could be no more than \$40 for the distribution entity to earn a 10 percent operating margin. However, this would leave the manufacturing entity with a 0 percent operating margin. The table below shows that it is possible for the manufacturing entity to earn greater than a 10 percent operating margin without forcing the distribution entity to have losses; however, transfer prices can often be set in a way (see bold rows below, for example) that each of the separate operations earns a lower operating margin than the combined entity.

Transfer Price	Consolidated Operating Margin	Distribution Operating Margin	Manufacturing Operating Margin
\$38	10%	12%	-5.3%

\$40	10%	10%	0%
<b>\$42</b>	<b>10%</b>	<b>8%</b>	<b>4.8%</b>
<b>\$44</b>	<b>10%</b>	<b>6%</b>	<b>9.1%</b>
\$46	10%	4%	13%
\$48	10%	2%	16.7%
\$50	10%	0%	20%

## Mathematical Formulation

The Section above showed the existence of situations where the separated entities could each earn operating profit margins below those of the consolidated entity. In this section, I define the various income statement items and profit level indicators in a way to mathematically define when such situations occur. That is, what transfer prices force each of two separated entities to each earn lower operating margins than they would have earned as a combined entity. The table below allows for these calculations by assigning each of the items/profit level indicators with a variable, and X is the transfer price markup to the manufacturing costs (i.e., the markup on the manufacturing costs):

<b>Financial Item</b>	<b>Consolidated Entity</b>	<b>Distribution Entity</b>	<b>Manufacturing Entity</b>
Net Sales	A	A	B*X
Cost of Goods Sold	B	B*X	B
Operating Expenses	C	C	—
Operating Profit	A-B-C	A-B*X-C	B*X – B
Operating Margin	(A-B-C)/A	(A-B*X-C)/A	(B*X – B)/(B*X)

This model allows one to define the situations when the consolidated entity earns

a higher operating margin than the distribution entity:

$$(A-B-C)/A > (A-B*X-C)/A$$

This reduces to cases in which:

$$(A-B-C) > (A-B*X-C)$$

$$- B > -B*X$$

$$1 < X$$

That is anytime, the manufacturing entity earns a profit, the distribution entity earns a lower operating margin than the consolidated entity.

Analogous calculations can be made regarding the manufacturing entity. That is, the consolidated entity earns a higher operating margin when:

$$(A-B-C)/A > (B*X-B)/(B*X)$$

This reduces to cases in which:

$$B*X*(A-B-C) > A*(B*X-B)$$

$$B*X*A - B*X*B - B*X*C > B*X*A - A*B$$

$$X*A - X*B - X*C > X*A - A$$

$$- X*B - X*C > - A$$

$$X*B + X*C < A$$

$$X*(B + C) < A$$

$$X < A/(B + C)$$

That is, the manufacturing entity is less (operating margin wise) profitable than the consolidated entity when the transfer price markup to the manufacturing entity is greater than the arm's-length markup to all of the consolidated entity's costs. For both the manufacturing and distribution entities to have lower operating margins than the consolidated entity, the following conditions must exist:

$$1 < X < A/(B + C)^7$$

The width of this range depends on a number of factors; including the overall profitability of the consolidated entity<sup>8</sup> and the level of manufacturing intensity (relative to distribution related expenses).

## Conclusion

This article highlights the apples to oranges problem of comparing consolidated and specific function entities. In particular, it shows through an example and mathematics that the consolidated entity often earns a higher operating margin by performing the same tasks--especially so with distributors.

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<sup>1</sup> Miesel, Victor; Higinbotham, Harlow; and Yi, Chun; "International Transfer Pricing: Practical Solutions for Intercompany Pricing Part II, *International Tax Journal*, Winter 2003.

<sup>2</sup> For example, Stuart Thiel advocates using the "interdecile" range instead of the commonly used interquartile range of results seen from the benchmark firms' profit level indicators. Thiel, Stuart, "False Positives and the Interquartile Range Test," DePaul University Working Paper, October 2003.

<sup>3</sup> **Becker**, Brian, "Three Technical Aspects of Transfer Pricing Practice" (5 *Transfer Pricing Report* 97, 5/19/96).


<sup>4</sup> That is, the effect differs depending on whether the intangible impact lowers unit costs, increases unit sale prices, or increases sales volume. **Becker**, Brian, "Comparable Profits Method: Accounting for Margin and Volume Effects of Intangibles" (10 *Transfer Pricing Report* 831, 2/6/02).

<sup>5</sup> **Becker**, Brian, "Capital Adjustments: A Short Overview" (5 *Transfer Pricing Report* 613, 1/29/97).

<sup>6</sup> Silva, Ednaldo, "The Fallacy of Asset-Based Adjustments to Profits," *FTI Working Paper*.

<sup>7</sup> In the example from Section II above, this translates to transfer prices between

approximately \$40 and \$44.44.

<sup>8</sup> If a benchmark entity is excessively profitable, its profits may be partially due to intangibles. 

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