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MEMORANDUM FOR STUDY GROUP ON CONSISTENCY IN ASSET INTENSITY
ADJUSTMENTS

FROM: ROBERT WEISSLER, APA PROGRAM, CC:INTL:APA

SUBJECT: PARTIAL SURVEY OF ISSUES¹

I am sorry not to be able to attend the September 20-21 meeting in Laguna Niguel. While Russell Kwiat is representing the APA Program at the meeting, I wanted to offer some thoughts.

Asset intensity adjustments deserve a book. A good book would be both a reference for experienced readers and a clear, up-from-scratch text for the newcomer. It would explain the theoretical arguments for and against performing asset intensity adjustments in various circumstances; the conceptual issues about the best way to perform them; and the various mathematical formulas that can be used. (Regarding formulas, it might provide an improved set of definitions and notations.) Throughout, the book would flag how differences in facts and circumstances can affect the choice of approach.

If such a book existed, we would be better able to sort out consistency issues. We would better understand when there is one best way to do things, when the best way depends on circumstances, and when there are multiple valid approaches.

Below I suggest some topics such a book might discuss. I ask many questions, and I believe that often the complete answers are not simple. Of course, substantial work has already been done, and some questions might be ready for an answer.

1. Rationale for Asset Intensity Adjustments

Why do asset intensity adjustments at all? One overall answer is that certain assets tend to increase operating profitability. So asset intensity adjustments correct

¹Thanks to Seyoung (Kris) Kim and Russell Kwiat of the APA Program for helpful ideas and comments.

certain PLIs (e.g., gross margin, operating margin, markup on total costs, Berry ratio) to account for differences in such assets.

Should the adjustments vary depending on which PLI is used? To what extent do asset intensity adjustments convert other PLIs into a return on assets or return on capital employed PLI? Are asset intensity adjustments ever needed when using a return on assets or return on capital employed PLI, for example to give certain assets such as receivables a different rate of return?

To merit an adjustment, a particular type of asset should somehow increase operating profitability. Typically people think in terms of assets actively employed in the business, since for example for non-financial-products firms interest on a big bank account is not part of operating profit. However, a big bank account could indirectly increase operating profit by increasing a company's credibility with business partners. Some assets that typically do increase profit in some cases do not. For example, depending on circumstances, high receivables may indicate customers in distress, and high inventory may indicate slow sales; in such cases, the excess assets do not increase profits. Similarly, some plant, property, and equipment (PPE) may not contribute much to profits if the industry has overcapacity or if the equipment is technologically outmoded.

Specific rationales for doing adjustments are sometimes given for certain types of assets. Some people think of payables and receivables as the simplest cases, arguing that differences in these asset levels imply differences in imputed interest in the sale or purchase price. Others seem to consider that payables, as a negative asset, require a special treatment that is more complex than the treatment of receivables.

For inventory, one can say that more inventory lets a company either pay less to its suppliers or charge more to its customers. In some cases, inventory might alternatively reduce operating expenses. (For example, a distributor that stocked warehouses in several locations might pay less to ship to its customers.)

PPE is often not adjusted for, but it is not always clear why. (One argument for adjusting is to consider two companies that are identical except that one keeps less inventory because it has invested in a just-in-time production system that lets it produce products quickly to order. The equipment increases one company's profitability just as the inventory increases the other company's profitability.) Valuing PPE can be tricky. Should one adjust the purchase price upward for inflation? How should one depreciate the assets for purposes of asset intensity adjustments? How should one handle assets with a fully depreciated book value that are still productive?

There are other assets as well that may be considered, including cash, intangibles (often hard to value), and other current and noncurrent assets and liabilities. What

should be the grounds for inclusion? As a practical matter, should one specify certain assets to adjust, or should one adjust all assets except certain specified ones?

2. Quantifying the Benefit from the Assets

To what extent do the assets in question improve profitability? A standard answer is that in equilibrium a company's assets at the margin provide a benefit equal to the opportunity cost of employing the asset in the business or the carrying cost of the asset. Thus, adjustments are often made by multiplying the difference in asset level by some sort of opportunity or carrying cost.

This answer raises some issues. First, an asset's cost is not always equal to its benefit. Benefits sometimes can exceed costs. As one example, even under the equilibrium assumption in the previous paragraph, inframarginal assets presumably give benefits greater than their opportunity or carrying cost; so if asset levels differ significantly then the carrying cost approach may undervalue the adjustment needed. As another example, a specialized asset in short supply might provide a benefit substantially greater than the opportunity or carrying cost. However, even if one in principle would want to adjust based on benefits rather than costs, quantifying benefits is much harder, so a cost approach is usually used.²

Second, what sort of opportunity or carrying cost should be used? Should one use, for example, a weighted average cost of capital rate (whose? the comparable's or the tested party's?³), a cost of borrowing rate (same question), a prime rate, or an Applicable Federal Rate?

Third, should the cost depend on the type of asset? Should longer-term assets such as PPE use longer-term rates? Should specialized assets that cannot easily be liquidated command a higher cost? Should trade receivables typically command only a debt rate even if other assets command a weighted average cost of capital rate?

One general question is whether the available financial accounting data provide the right information. To value an asset's benefit, one might invoke economic concepts,

²Also, sometimes costs can exceed benefits. For example, as mentioned in section 1 above, excess inventory caused by slow sales might provide no benefit. Even using a cost-based approach, one could still exclude an appropriate amount of the asset (e.g., inventory) from the calculation to take into account the lack of benefit.

³If these two rates differ, one might use a zero base approach described in section 4 below.

such as fixed and variable costs, that do not map cleanly to financial accounting categories such as COGS and operating expense.

Another general question is whether asset intensity adjustments are reliable when asset levels have large differences. One might be cautious for two reasons. First, the methods of valuing the assets' benefits might be so imprecise that for large differences in asset levels the final adjustment has too much uncertainty. Second, a method for valuing benefits might be reliable only for relatively modest differences in asset levels; for example, see the point above on inframarginal benefits (in the second paragraph in this section).

3. What, Conceptually, Gets Adjusted?

Should one think of directly adjusting income items, or of first adjusting balance sheet items and then using the adjusted balance sheet items to recompute income items? For example, if there is a difference in inventory levels, should one think of just adjusting income in one step, or of first adjusting COGS (or alternatively sales, or even operating expenses, or some of each) and then recomputing the profit?

Pertinent to this overall question are three smaller questions. First, is there a real economic meaning to first adjusting the balance sheet item, or is that intermediate adjustment just a mathematical construct to further the calculation? For example, is there economic substance to saying that extra inventory decreases COGS, as opposed to increases sales?

Second, if there is such meaning in the abstract, can the right choice really be determined? For example, can one in a particular case determine whether extra inventory decreases COGS or increases sales? (And to make that determination, should one look to the economic realities of the comparable, the tested party, or both?)

Third, to what extent does the choice of which balance sheet item to adjust affect the final result? For example, deciding whether to adjust COGS or sales for inventory differences would seem to affect the resulting gross and operating margins (because sales is affected) but not the Berry ratio (because gross profit and operating expense are unaffected).

4. Adjust to Zero Assets?

One can go about asset intensity adjustments in at least two ways. Under the "direct" approach, one adjusts each comparable's profit directly to what would have been achieved with the tested party's asset levels. Under the "zero base" approach, one adjusts each comparable's profit to what it would have achieved if its pertinent asset levels were zero; and before comparing the tested party's profit to the range derived

from the comparables, one also adjusts the tested party's profits to what it would have achieved with those zero levels.

When does it make a difference which approach is used? Which approach is better under which circumstances? A standard answer is that the two approaches are mathematically identical, so it does not matter which is used. However, I believe that the direct approach really is a special case of the zero base approach, with the added assumption that the benefits of the pertinent assets of the tested party and the comparable company will all be evaluated in the same way. When that assumption fails, one might need to use a zero base approach.

Thus, a zero base approach might be needed when the carrying costs of the tested party and the comparable are different. This could arise, for example, if the two companies are in different countries with different rates of inflation. Also, if the tested party's and the comparable's years do not precisely overlap, one might use a zero base approach to give each company an appropriate carrying cost for its particular time period (omitting this refinement probably would make very little difference in the result).

A zero base approach might also be needed in the following case. Suppose one is using a return on capital employed PLI, and adjusts for receivables because receivables are to be given a debt rate of return while other assets will be given a weighted average cost of capital return. In such a case, one arguably should remove all the receivables from both the tested party's and comparables' asset pools, which would mean using a zero base approach.⁴

The direct approach is sometimes favored as simpler. However, a zero base approach actually can be simpler in the APA context if the tested party's asset levels in APA years are likely to diverge substantially from its asset levels during the test period. In this case, the tested party's historical levels are not a good proxy for anticipated future levels. If one can predict the future asset levels, one could perhaps use the predicted values from the start, instead of the historical values, in calculating asset intensity adjustments. However, if one cannot predict the future levels, one will need to use them as they turn out to be. One then has a choice of redoing a direct asset intensity adjustment for each year based on that year's data, or plugging in the tested party's actual asset levels to a zero base adjustment done at the beginning. The latter seems simpler.

5. Details of Formulas

⁴Such an approach would seem to differ from reg. 1.482-5(e), Example 5, which uses the direct approach to adjust receivables when using a return on capital employed PLI. The example does not discuss the possibility of a zero base approach.

People often use slightly different formulas to compute asset intensity adjustments. Which variations make much difference, and which choices are correct?

One choice concerns which “denominator” to use in doing direct (not zero base) adjustments. Some use the same denominator as the denominator of the PLI (e.g., sales, COGS, total cost). This approach seems to agree mathematically with the zero base approach. This approach also normally has the advantage of using a figure based on arms’ length pricing, rather than one potentially tainted by related party pricing. Finally, this approach makes some logical sense. For example, with an operating margin PLI, to adjust operating profit per dollar of sales, one should compute imputed interest from receivables per dollar of sales. However, some use another approach to denominators, such as using a sales denominator for adjusting sales and a COGS denominator for adjusting COGS.⁵

Another choice concerns a technical normalization factor for payables and receivables adjustments, to convert a price including credit costs to an equivalent cash price. I believe the correct factor is $i/(1+ih)$, where i is the interest rate and h is the average credit period expressed as a fraction of a year. Some use either no factor or $i/(1+i)$. (The precise factor used normally will make little difference in the result.)

Another issue is whether results of one type of adjustment should be fed as input to other types of adjustments, or whether all adjustments should be done independently using the initial data. For example, should one first adjust for differences in inventory levels, yielding a new value for COGS and thus a new payables level, and then use that new payables level when adjusting for differences in payables levels?

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⁵Also, reg. 1.482-5(e), Example 5, discussed in the previous footnote, without explanation uses a sales denominator when using a return on capital employed PLI.