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Guideline Companies in Valuation: The Economist's View of the Market Approach

Dr. David Tabak



One of the standard methods of valuation is termed the market approach. This method generally involves finding a representative multiple of value to a financial measure from a set of guideline (or peer or comparable) companies and applying that multiple to the financial measure of the company being valued. While there are many circumstances in which the market approach works well, economists recognize that there may be market conditions under which particular care is needed in applying the method. In this paper, we provide an overview of those types of situations and show how a careful approach to the market method can yield more defensible valuations that are also more in line with the *Daubert* criteria for expert testimony.

Overview of the Market Approach

Business valuation techniques are often characterized as being based on one of three approaches: the cost or asset approach, the income approach, and the market approach.¹ In this paper, we focus on the market approach, in which an appraiser estimates the value of a company² by reference to market data on the value of other companies. Our goal is to show how an economist can bring tools to bear on this type of valuation, particularly in cases of complex commercial disputes, which can help distinguish reliable from unreliable uses of the market approach to valuation.

¹ See, for example, *Caracci v. Commissioner of Internal Revenue, No. 02-60912, Fifth Circuit Court of Appeals*. ("The expert witnesses for both the taxpayers and the Commissioner agreed that traditional valuation methodology uses three approaches: (1) income; (2) cost; and (3) market.") Similarly, USPAP Standard 10 2a(ix) states that "exclusion of the market approach, asset-based (cost) approach, or income approach must be explained." See also the American Institute of Certified Public Accountants' June 2007 *Statement on Standards for Valuation Services: Valuation of a Business, Business Ownership Interest, Security, or Intangible Asset*, par. 31: "the valuation analyst should consider the three most common valuation approaches: ·Income (Income-based) approach ·Asset (Asset-based) approach ... ·Market (Market-based) approach."

² Any of the valuation approaches can also be applied to divisions or individual projects. For ease of exposition, I refer to company valuations throughout this paper.

While there are no definitive guidelines on how to implement the market approach, the generally accepted series of steps can be listed as follows: first, the appraiser selects publicly traded companies that he or she believes are similar in nature to the company being valued. In addition to selecting companies, the appraiser may also examine transactions in which a company was purchased. Next, the appraiser selects relevant financial measures for the reference or guideline companies, such as revenues, earnings, or EBITDA. He or she then finds the multiple for each financial measure (i.e., the ratio of company value to the level of the financial measure for that company) for each guideline company. This process gives the appraiser a dataset of multiples, from which he or she can select a representative multiple, such as the mean or median of the guideline companies' multiples.

The appraiser then takes this representative multiple and applies it to the financial measure of the company being valued. If necessary, her or she adjusts that financial measure to account for extraordinary or one-time events. Finally, the appraiser considers whether any premiums or discounts, such as control premiums or discounts for lack of marketability, are warranted.

In the following sections, we review some of these choices, focusing on areas where an economist's understanding of markets and statistics may help assess or improve a valuation based on the market approach. The same economic or statistical understanding can be especially useful for an economist reviewing the work of an appraiser, allowing the economist to focus on areas where he or she has a comparative advantage, while potentially accepting the analysis in areas where the appraiser has the appropriate skill set.

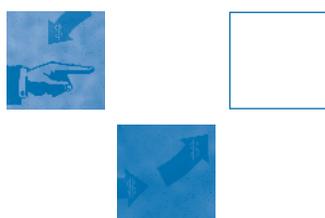
The Selection of Guideline Companies or Transactions

As noted above, the selection of guideline companies or transactions is often considered the first step in a market approach to valuation. In practice, the guideline companies are generally chosen by an appraiser using his or her knowledge of the company to be valued, any knowledge they have about the industry, and a great deal of subjective decision-making.³ As one academic article notes, "Some practitioners even suggest that the selection of comparable firms is essentially 'an art form' that should be left to professionals. Yet the degree of subjectivity involved in their application is discomfoting from a scientific perspective."⁴

On the one hand, if there is no reason to believe that the appraiser is biased and we are simply interested in getting the best possible appraisal, then it may make sense to allow the appraiser to use her own judgment and subjective considerations. There may be little point in trying to formalize and document a procedure when everyone trusts the results. Unfortunately, these circumstances are generally not present in complex commercial disputes, in which each party may legitimately fear that the other side may be attempting to push the appraised value up or down. In those circumstances, subjective decisions on the choice of guideline companies and transactions may be subject to attack, with little to defend them other than the word of the appraiser. In particular, choices that are made by the appraiser on her own with no support from outside factors are neither replicable nor governed by any known controlling standards, and have unknown error rates.

³ Some appraisers have adopted the convention of calling these companies guideline companies because they provide guidance for the valuation even if they are not truly peers or in all ways comparable to the company being valued.

⁴ Sanjeev Bhojraj and Charles M. C. Lee, "Who Is My Peer? A Valuation-Based Approach to the Selection of Comparable Firms," *Journal of Accounting Research*, 2002, at 408. (Internal citations omitted.)





Due to their experience in collecting and analyzing data, economists are generally comfortable with creating rules that will allow them to develop a guideline group for valuation purposes. For example, an economist could start with all companies in the same industry according to SIC or other classification codes. It has been noted that, “companies are not completely comparable merely because they are in the same industry, and often factors such as product and geographic markets, size, growth rates, profit margins, and other industry and economic considerations warrant adjustments.”⁵ While this citation suggests adjustments, a simpler method could be to narrow the list of guidelines by, for example, limiting the guideline group to those with a financial measure, such as revenues that were within 50% of the revenues of the company to be valued in each of the last three years. There are obviously numerous ways to narrow the list, including looking at different financial measures such as revenues, cash flows, or earnings; looking at growth rates in addition to levels; and allowing for different degrees of closeness between the financial measure of the potential guideline group members and that of the company to be valued.⁶ In that sense, there is still some subjectivity in the process for selecting guideline group members, but the subjectivity has been pushed back to the selection of rules (where it will often be unclear how a different rule will affect the ultimate valuation) from the selection of actual guideline companies (where it is more clear how including or excluding potential guideline members with high or low multiples will affect the valuation).

The existence of these rules means that the actual selection of guideline companies can be replicated by an opposing party, and in fact an opposing party could also create their own set of guideline selection rules to provide an alternative valuation. Examples of such rules exist in the peer-reviewed literature and serve as controlling standards for the guideline company selection. Ultimately, the use of rigorous selection rules will help the economist provide evidence on the suitability of the guideline companies.

The Selection of Multiples

Once they have selected the guideline companies or transactions, appraisers often next turn to the selection of the relevant financial measures for computing multiples. There is often little discussion of the process for selecting the financial measures, and some or all of the usual suspects—revenue, earnings, and EBITDA—tend to appear in most valuations. Once the financial measures and the representative multiples (discussed in the next section) are selected, appraisers typically derive valuations for each of those measures. For example, there may be an estimate of value based on

⁵ *Lippe v. Bairnco Corp.*, 288 B.R. 678 (SDNY Jan. 28, 2003) at 693.

⁶ Qualitative rules on products or operations can also be implemented by establishing rules on words that would either have to be in or have to be excluded from company descriptions. Moreover, sometimes there will be an interplay between the allegations in a complex commercial dispute and the selection of guidelines, whereby, for certain types of disputes, one may want to select guidelines to what a company would have been in the absence of a dispute rather than guidelines to the company that actually existed.

⁷ The selection rules are thus a form of the type of care required in the selection of guideline companies. See, for example, *Estate of Josephine T. Thompson v. CIR, T.C. Memo.* 2004-174. (“In utilizing, however, public companies to estimate the value of private, closely held companies, care must be taken to ensure that the public companies used are sufficiently comparable to the private companies being valued. In this regard, Rev. Rul. 59-60, 1959-1 C.B. 237, 242, cautions as follows: ‘Although the only restrictive requirement as to comparable corporations specified in the statute [sec.2031(b)] is that their lines of business be the same or similar, yet it is obvious that consideration must be given to other relevant factors in order that the most valid comparison possible will be obtained. * * * Courts recognize that a comparable company valuation may be rejected where the companies relied on are not sufficiently similar to the company being valued.’”) See also *Eckelkamp v. Beste*, 315 F.3d 863 (8th Cir. 2002), in which the appellate court affirmed the exclusion of an appraiser based in part on the district court’s finding that the appraiser used guideline “companies that in many ways were not comparable to” the company being valued.

revenue multiples, one based on earnings multiples, and one based on EBITDA multiples. The final valuation conclusion is often drawn by examining the individual valuations, either taken as a range or, with the selection of a central measure of those individual valuations (e.g., the mean or the median, or a weighted average), as the point estimate of the valuation.

One of the standard instruments in an economist's toolbox is regression analysis. At its heart, regression analysis is a statistical procedure that examines how one variable, such as the market value of a publicly traded firm, can be statistically explained by other variables, such as revenues and earnings. Consequently, when sufficient data are available, an economist can use regression analyses to determine which financial measures actually had a statistically significant correlation with market values for the guideline companies.⁸ But the benefits of regression analysis go beyond that. One result of the regression analysis is the calculation of a representative multiple with desirable statistical properties, meaning that one does not have to blindly rely on the mean, median, or other measure.⁹ And the statistical analysis can go beyond just finding a simple multiple that assumes that value is directly proportional to a financial measure; it can also test and determine the proper coefficients for a model in which there is another form of relationship.¹⁰ Finally, regression analysis allows for an objective means of combining the data from different financial measures. For example, by running a regression comparing the guideline companies' market values to their revenues and earnings, an economist might find that the values are best represented by an expression such as two times revenues plus five times earnings. Thus, rather than weighting the valuations based on the two individual representative multiples equally or by some subjective weighting, the regression analysis provides an objective basis for combining the two measures.¹¹

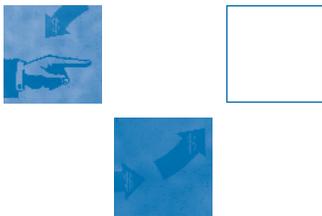
Overall, the use of regression analysis to determine the relationship between value and financial measures is more beneficial than examining a number of valuations based on individual financial measures. As discussed above, a regression analysis allows for a statistical estimation of the representative multiple and also for an objective method for combining the information in various financial measures. As a statistical procedure, regression analysis brings with it a large quantity of peer-reviewed literature discussing controlling standards to its operation and the potential error rate from its implementation.

⁸ The amount of data needed depends on the analyses being performed. In the valuation context, one should be careful of the argument that a regression on a small number of data points is not reliable if the alternative is calculating a mean or median on the same number of data points. Because a small number of data points may affect the reliability of most analyses, one must be careful that this criticism is not used to discard the regression analysis in favor of something even less reliable.

⁹ Appraisers often make subjective adjustments to these measures of the representative multiple. However, as noted by one court, "the more the appraiser deviates from the medians the more biased and subjective the analysis arguably becomes." (*Gotham Partners, L.P. v. Hallwood Realty Partners, L.P.*, 2003 855 A.2d 1059, n. 31 (Del. Ch. July 8, 2002)). The advantage of the regression approach is that any deviation from a median or other measure is based on objective standards rather than just the say-so of the appraiser.

¹⁰ One example of this procedure is in Exhibit 11-2, "Correlation between Price/Revenues and Return on Revenues," in Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweihs, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*, Fourth Edition, 2000.

¹¹ See, for example Bhojraj and Lee, *op. cit.*, p. 411. ("The advantage of a regression-based approach is that it allows us to simultaneously control for the effect of various explanatory variables. For example, some firms might have higher current profitability, but lower future growth prospects, and higher cost-of-capital.") More complicated analyses could allow for a combined estimation of the relevant financial measures and the guideline companies. For example, once the financial measures are selected, one can test whether potential guideline companies' stock prices moved with changes in the financial measures.



Selecting the Representative Multiple

A blind selection or use of multiples can often produce bizarre results. For example, consider three firms, each with a market value of \$100 per share: Firm A has earnings of \$1 per share, Firm B has earnings of \$0.50 per share, and Firm C has earnings of \$0.02 per share.¹² Their price:earnings ratios are thus 100, 200, and 5,000, respectively. As shown in Row (1) of Table 1, the mean multiple across the three companies is 1,767; the median multiple is 200; and the harmonic mean multiple is 197.4.¹³

First, consider what happens if there is a slight decrease in earnings at Firm C, such that its earnings drop to \$0.01, meaning that its multiple rises to 10,000, as shown in Row (2) of Table 1. The mean multiple across the three companies is now 3,433; the median multiple is still 200; and the harmonic mean multiple is now 198.7. The mean multiple gets nearly cut in half by this one cent (or alternatively, 50%) change in the earnings of only one of the three companies, while the median multiple is completely unresponsive to this change. Neither one of those results is terribly appealing.

Next, suppose, as in Row (3A) of Table 1, that the earnings at Firm C further decrease by another \$0.02, so that Firm C now is showing a loss. Its naïvely calculated multiple is -10,000. If one just plugs this value into the standard equations, the mean multiple is now -3,233; the median multiple is now 100; and the harmonic mean multiple is now 201.3. The mean multiple has suddenly become dramatically negative. The median multiple also moves in a strange way, dropping from 200 to 100, despite the fact that Firms A and B have not changed, and Firm C is being rewarded with the same valuation even though it is making even less money.

Table 1

	Firm A	Firm B	Firm C	Mean	Median	Harmonic Mean
Earnings (Base case)	1.00	0.50	0.02			
(1) P:E	100	200	5000	1767	200	197.4
Earnings (C higher)	1.00	0.50	0.01			
(2) P:E	100	200	10000	3433	200	198.7
Earnings (C lower)	1.00	0.50	- 0.01			
(3A) P:E (naïve median)	100	200	- 10000	- 3233	100	201.3
(3B) P:E (without Firm C)	100	200	nmf	150	150	133.3
(3C) P:E (proper median)	100	200	- 10000	- 3233	200	201.3

Appraisers often attempt to fix these problems by simply dropping firms with negative multiples from consideration, as in Row (3B). But this tactic results in the mean multiple dropping from 3,433 when all three firms are considered and Firm C was earning \$0.01 a share to 150 when Firm C's

¹² We assume that the earnings have been adjusted or normalized if there are any reasons that the reported figures do not represent the true economics of the companies.

¹³ The harmonic mean is the average of the reciprocals of the multiples. The reciprocals of the multiples of 100, 200, and 5,000 are 0.01, 0.005, and 0.0002, respectively, and their mean is 0.00507. The reciprocal of the mean is 197.4. The use of harmonic means is advocated by Malcolm Baker and Richard Ruback, "Estimating Industry Multiples," a Harvard Business School working paper, available at <http://www.people.hbs.edu/mbaker/cv/papers/Multiple.pdf>. See also Shannon P. Pratt, *The Market Approach to Valuating Businesses, Second Edition*, p. 140 ("Although the harmonic mean is not used frequently, probably because it is unfamiliar to most readers of valuation reports, it is conceptually a very attractive alternative measure of central tendency").

revenues turn negative. The result is even more bizarre when we realize that if we measured Firm C's earnings to fractions of a penny, the average multiple would shoot up toward infinity as Firm C's earnings fell toward zero, but would then suddenly drop to 150 the moment we discarded Firm C's multiple. Similarly, the median multiple would suddenly drop from 200 to 100 the moment Firm C's earnings became negative.¹⁴ Thus, simply dropping negative values leads to perverse results.

Economists' training and familiarity with the statistical issues created by discontinuous variables gives them an ability to recognize and deal with these issues, helping them to avoid creating valuations that are not sensible. Moreover, by knowing the types of errors that can arise when a faulty selection methodology is employed, economists can intelligently assess and comment on other parties' selection of the representative multiple, pointing out instances where the selected representative multiple is unduly biased because of the mathematical procedure used to make that selection. In some cases, this is as simple as showing the biases from dropping firms with negative multiples; in others, it may require digging deeper into the economist's toolbox.

Selecting the Representative Multiple: Potential Problems with Making Subjective Adjustments

Another issue that arises in the selection of representative multiples is what to do when the appraiser wishes to depart from some measure, such as the mean, median, or harmonic mean, of the "center" of the distribution of guideline company multiples. For example, the well-known appraiser Z. Christopher Mercer states, "Quite often, ... an appraiser may believe that a private company should be valued at a discount to the measures of central tendency of a selected guideline group. ... One way to accomplish this task would be to select a statistical measure other than the median as the base multiple. For example, an appraiser might, based on comparisons of revenues, growth, margins, leverage, or other factors, conclude that a private company should most appropriately be compared with a specific portion of the entire guideline group, for example, the lower half of the group's multiples, rather than the entire group."¹⁵

While such a procedure may be useful in certain circumstances where one is not disputing the valuation (e.g., when the parties trust the appraiser to bring his or her best unbiased efforts to bear on the problem), this type of approach should and could face serious criticism in the context of a complex commercial dispute. Because a representative multiple derived from the bottom half of the multiples will result in a lower valuation than taking the median multiple, there should be a good justification for ignoring half the data. This also begs the question of why the appraiser is focused on the bottom 50% of the multiples, as opposed to the bottom 75% or the bottom 25%. Ultimately, in this case how far the appraisal will be pushed down depends on how much or how little of the bottom of the set of guideline companies the appraiser uses in his or her calculation of the representative multiple.

Moreover, economists recognize that making guideline company selections based on the observed multiples rather than on the characteristics of the firm itself is a form of statistical error known as sample selection bias. For example, suppose that there are six essentially identical firms that

¹⁴ Interestingly, the proper way to deal with this is to recognize that negative multiples are actually the largest possible show of support for a company, because the multiple has in effect grown beyond positive infinity, as shown in Row (3C). Of course, one must first check whether the market capitalization of the firm is based on its future earnings ability, as opposed to, for example, an expected distribution to shareholders should the firm declare bankruptcy, a situation in which the calculated multiple does not reflect the cash-generating ability of the company's operations.

¹⁵ Z. Christopher Mercer, *Valuing Enterprise and Shareholder Cash Flows: The Integrated Theory of Business Valuation*, 2004, pp. 189-190.



should all have a price:earnings multiple of 5.0. Because earnings are measured with error, let's assume that the calculated multiples of the six companies are 4.7, 4.8, 4.9, 5.1, 5.2, and 5.3. These fluctuations in earnings still leave the mean and median multiple as 5.0, so we have not created a biased set of multiples by introducing those fluctuations. However, if one just selects the bottom half of the multiples, the revised mean or median is only 4.8. Because in this example the variations in the multiples are due to random fluctuations and not any true difference between the companies, selecting the set of guideline multiples based on the observed multiples can lead to a change in the representative multiple even though this change does not reflect the selection of companies that were any more representative of the firm being valued. This is simply an example of one of the maxims of statistical analysis with which economists are familiar: data should be selected on the basis of the inputs (i.e., the financial measures) and not the output (i.e., the multiple) being studied.

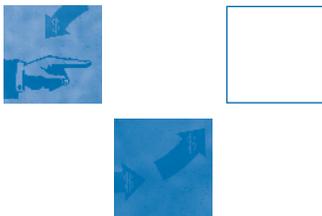
In response to the concerns about what financial measures to examine, economists could use accepted statistical measures to see if the financial and other measures such as revenues, growth, margins, or leverage do affect multiples in the guideline group. If so, then an objective, statistically-based adjustment could be made to the representative multiple, based on the measures of those characteristics in the company to be valued. This type of procedure would dramatically reduce the subjectivity of the adjustment, and because it would be performed under the controlling standards of a statistical analysis, it would yield potential error rates.

Finally, the same tools, such as regression analysis, can be employed by economists to evaluate subjective adjustments to multiples made by other parties. For example, some appraisers will make adjustments to the baseline representative multiple due to factors such as the size, leverage, or profit margin of the company being valued. Here, economists can bring both statistical and economic evidence and reasoning to see if the adjustments are reasonable. If size, for example, has a negative effect on multiples, then one can test statistically whether larger guideline companies have smaller multiples than larger ones. By looking at the exact guideline group in the same time period used by the appraiser making the adjustment, the economist can go beyond simply citing literature that discusses size premiums in general and provide evidence on the reasonableness of the adjustment.¹⁶

Economists can also help explain why certain subjective adjustments may or may not make sense. For example, profit margin was given earlier as a reason for adjusting the representative multiple. Yet, if an appraiser uses a low profit margin as a justification for adjusting both price:earnings and price:revenue ratios down by the same amount, they would be making a mistake because the lower profit margin already affects earnings and thus is already accounted for in the price:earnings ratio.¹⁷ To illustrate, suppose that a firm consistently had revenues of 100 and a profit margin of 10% each

¹⁶ As an example of the failure to distinguish a disagreement from evidence of error, see *In re Omnicom Group, Inc. Securities Litigation* 2007 WL 2376170 (S.D.N.Y.) at *14. ("...the parties' valuation experts differ in their assessment of how to value these assets, just as they differ markedly in their assessment of an independent valuation done for Omnicom by the Murray Devine consultants in December 2001. Although plaintiffs' specialist criticizes the Murray Devine methodology, it appears that he is, in large measure, simply offering an alternative set of assumptions without demonstrating that the Murray Devine approach is necessarily incorrect. In contrast, defendants' valuation specialist notes that the Murray Devine approach is consistent with professional standards, and points out (without contradiction on the current record) that plaintiffs' expert misstates certain key facts and fails to follow all steps of the approach he purports to apply and that courts have approved as appropriate for these purposes.") (Internal citations omitted. For purposes of full disclosure, we note that the author of this paper was defendants' valuation expert in this case.)

¹⁷ At best, one could argue that the low earnings add an additional form of risk that still requires an adjustment to the price:earnings ratio. But if a non-zero adjustment is made, it should still be smaller for the price:earnings ratio than for the price:revenue ratio.



year. The company then changes strategy in such a way that it will consistently have revenues of 200 but a profit margin of only 5% each year. Because the annual profit available for shareholders is 10 both before and after the strategy shift, the value of the firm should not be expected to change. If the value of the firm was, and remains at, 100, then the price:earnings ratio starts at 10 and ends at 10, indicating that there is no need to adjust this multiple for the profit margin. On the other hand, the price:revenue ratio falls from 1.0 to 0.5, which shows that price:revenue multiples are sensitive to, and ideally should be adjusted for, differing profit margins.

Valuation Ranges

As one court noted, “Common sense and the authorities in the area suggest that an opinion as to the value of a business should be expressed as a range of values rather than as a single number.”¹⁸ This may be exaggerating the state of actual practice, in which valuations are often given as ranges, with a particular value presented as the best estimate within the range.¹⁹ The question is then how that range should be generated and what it means. In some appraisals, a range of valuations using different techniques is presented, while in others ad hoc sensitivity tests, including adjusting terminal values up or down by a factor such as 10%, are employed. Yet it is often unclear how meaningful these ranges are to the case at hand or whether they in fact have any true meaning at all. After all, one can always turn a single estimate into a range by assuming that the valuation could be as much as 10% lower to 10% higher. Among the benefits that economists bring to the analysis of ranges is their familiarity with statistical confidence intervals, in which ranges have a meaningful interpretation. For example, a 95% confidence interval is defined as a range applied around an estimate such that if we were to calculate numerous estimates, we would expect 95% of the ranges to include the unknown true value. One benefit of using statistical confidence intervals is that they convey information about the precision of the valuation: a tight statistically-based confidence interval indicates that we likely have a good estimate of the true value, while a wide statistically-based confidence interval indicates that we have less certainty in the result.²⁰ Thus, using an economist’s toolkit, ranges that have some useful meaning can be presented when appropriate, instead of simply presenting an arbitrary range around an estimate.

Conclusion

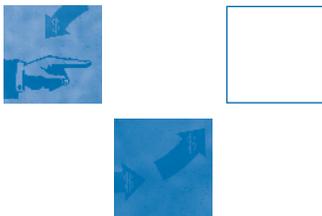
It is well known that “when it comes to valuation issues, reasonable minds can and often do disagree.”²¹ However, the sources of that disagreement can either be based on subjective disputes or on testable hypotheses. As discussed above, economists’ training in market analysis and statistics can help them define many valuation disputes in the market approach in terms of testable mathematical hypotheses about the comparability of guideline companies or multiples. This lets them both prepare more defensible valuations and examine the reasonableness of the valuation of another professional.

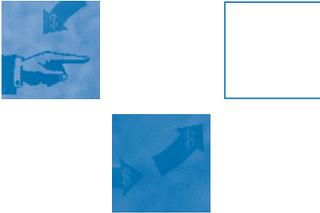
¹⁸ *Lippe* at 690.

¹⁹ In complex commercial disputes often the end result will be a payment from one party to another, thus ultimately requiring the selection of a particular value and not just a range.

²⁰ For example, the greater the spread in the multiples of the guideline companies, the wider the confidence interval would be, displaying the fact that we are less sure about the level of the multiple to apply to the company being valued. The important thing to note is that for any given degree of confidence (e.g., the 95% level) the width of the confidence interval is driven by the amount of variance in the data and thus is neither fixed across all valuations nor is it simply a subjective choice for the appraiser.

²¹ *Peltz v. Hatten*, 279 B.R. 710 (D. Del., 2002) at 737.





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Contact

For further information and questions, please contact the author:

Dr. David Tabak

Senior Vice President

+1 212 345 2176

david.tabak@nera.com