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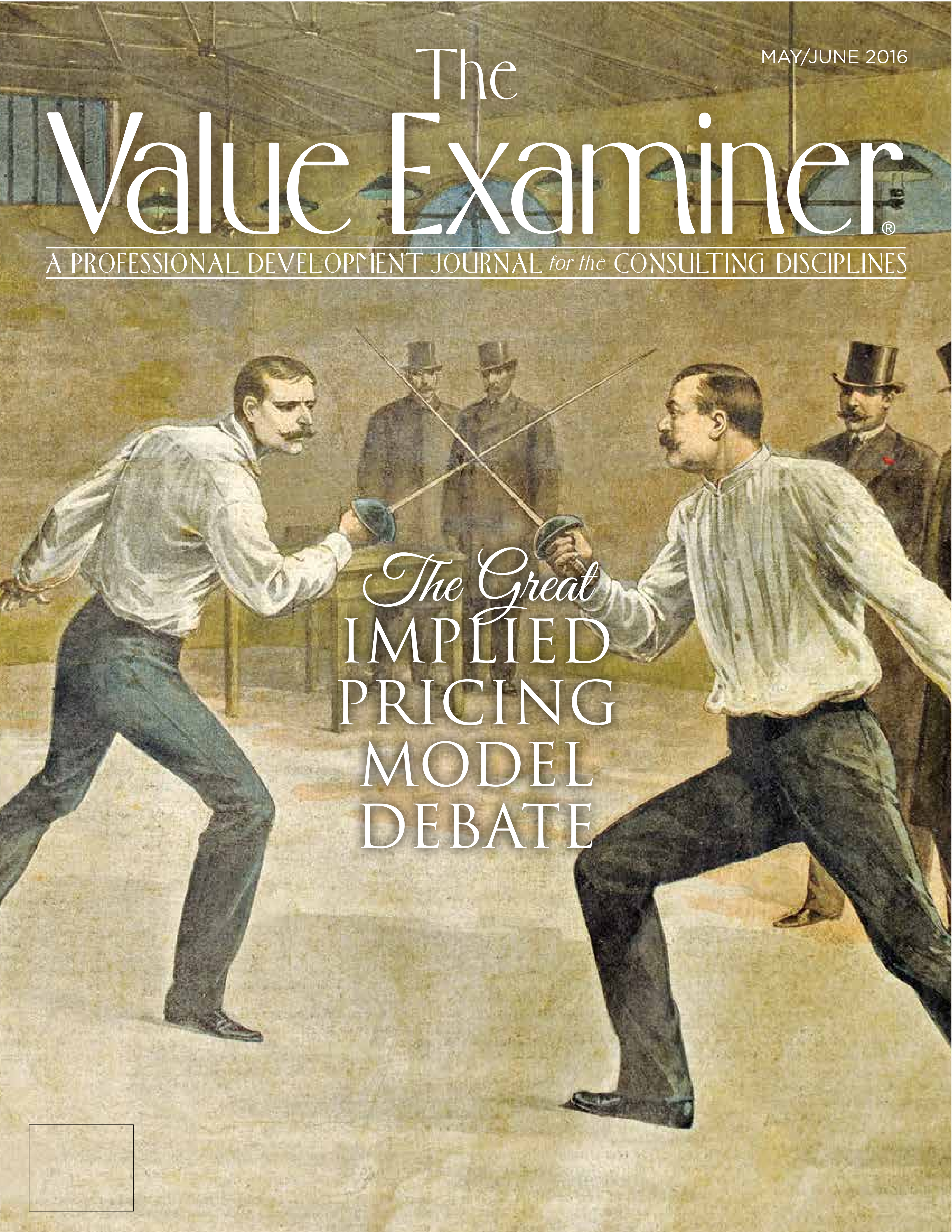


The Great IMPLIED PRICING MODEL DEBATE

VALUATION

Does The Implied Private Company Pricing Line Make Sense? (Part II)

By Richard R. Conn, CMA, MBA, CPA, ABV, ERP

In the January/February 2016 issue of *The Value Examiner*, I was privileged to be invited to publish Part I of the topic: "Does The Implied Private Company Pricing Line (IPCPL) Make Sense?" This is a subject that has been on my mind for some years now. In response to that original 'Does it Make Sense' article in the same issue, Messrs. Burkert, Butler, and Dohmeyer (whom I shall subsequently respectively refer to as BB&D for convenience), and Mr. Gorshunov produced two separate responses with the intent of dispelling my concerns and providing additional support for the IPCPL construct. I have carefully considered their responses—but remain even less convinced about the viability of the IPCPL than I was previously. This article will present a sur-rebuttal to some of the arguments BB&D and Gorshunov offered in the Jan/Feb. issue. A subsequent Part III will be published in the next *The Value Examiner* to provide what I believe is the third main weakness of the IPCPL and give an overall summation of my findings.

In their replies, both BB&D and Gorshunov have offered a defense for the concept that "very small privately held companies have higher total risk, lower debt capacity, and are less liquid than much larger private companies".[1] And, [Conn] "concentrates on the issue of the dependency between the size of the company and its cost of capital".[2]

Well, that is very interesting—but that was not at all the nature of my complaint against the IPCPL. I took no position whatever on the relationship between the size of Enterprise Value (EV) and the cost of capital. The IPCPL postulates that smaller firms have higher risk-rates. I offered no comments either in support of or against this concept.[3]

My complaint against the IPCPL was very specific and is quoted verbatim right in the middle of the BB&D rebuttal: "It just does not make sense that one could expect revenues to be a reliable predictor or determinant of the cost of equity." In order to have any faith in the usefulness of the IPCPL, one must believe that there is a dependable and reoccurring correlation between a firm's revenues and the firm's risk-rate. After all, that is the way the model works—the user inputs the target firm's current revenues and a specific rate (which BB&D apparently now classify as a WACC) is the output.

What BB&D and Gorshunov are really saying is that smaller EV firms have higher costs of capital, ***and*** implicitly, they also mean that there is direct correlation between firm EV size and revenues—the smaller the EV the lower the revenues and vice versa.[4]

1 Burkert, et al., 2016. Rebuttal: The IPCPL Does Make Sense. The Value Examiner. Jan/Feb 2016: 14-16.

2 Gorshunov, I. 2016. Letter to the Editor. The Value Examiner. Jan/Feb 2016: 17.

3 However, for an excellent investigation on the subject, see the soon to be published "Do Valuation Multiples Reflect a Size Effect?" in the Journal of Business Valuation and Economic Loss Analysis by Cornell & Gokhale.

4 For ease of exposition, I will continue to use the term EV (Enterprise Value) of the firm to mean the sum of both the market value of the equity capital and debt invested in the firm (but excluding excess non-operating assets). And, when there is no debt, EV = market value equity capital (albeit, it may be the Private Market we are speaking of). This will avoid the ambiguity of only using the term Market Capital or MVIC.

On the former point, I do not care to offer an opinion and on the latter, I categorically disagree—there is no direct correlation between firm EV and revenues. Nor have I found any empirical evidence that would support this alleged correlation between revenues and EV (apart from the generalization that a $100 million revenue firm will usually be expected to have a larger EV than one with only ten million dollars in revenues).

TABLE 1

	Annual Revenues (000's)	Average Annual Net Free Cash Flows (000's)	Historic Annual Cash Standard Deviation (000's)	Cash Standard Dev. As a percent of Net Free Cash
Firm A	4,000	500	50	10 percent
Firm B	10,000	250	50	20 percent

I do not believe we can rely upon small firm entrepreneurs to be as inept as the IPCPL Model requires. If we were to ask 100 entrepreneurs if they would prefer to own either Firm A or Firm B (see Table 1) and Firm A had four million dollars in annual revenues with $500k in average annual net free cash flows with a historically observed $50k annual standard deviation; or Firm B having ten million dollars in annual revenues with $250k in average annual net free cash flows with a historically observed $50k in annual standard deviation, I suspect the majority would opt for Firm A. The Firm A expected cash returns are twice as large ($500k vs. $250k) and the risk is lower (as proportionally a $50k standard deviation is only ten percent of the expected $500k cash return vs. twenty percent of the $250k return). Therefore, in a world of rational investors, it ***must be*** the case that the EV of Firm A is greater than Firm B. Even without specifically knowing the absolute risk-rates between the two, we can rest assured that the firm with the higher expected cash returns and lower perceived risk is going to be more highly desired by potential investors and, ergo, have a higher EV.[5] The fact that one firm has four million dollars in revenues vs. ten million dollars of the other, is mostly irrelevant. However, the IPCPL is dependent upon Firm B having the larger EV simply because it has greater revenues.

Of course, this anecdotal hypothesis is only economic navel gazing on my part—I am speculating upon how rational, risk-averse entrepreneurs would be expected to act. I am supposing that expected revenues are comparatively unimportant to investors, whereas expected net free cash flows are of a primary all-consuming importance. If BB&D are unwilling to accept my speculation on the subject, they should be willing to accept the empirical findings from their own datasets. The following four panels of Figure 1 employ data directly from the IPCPL and are arranged to show that there is, at best, only weak correlation between revenues and EV.

5 For example, temporarily ignoring the logical assumption that Firm B would have to have the higher risk-rate, even if we assume, for simplicity, that the Capitalization Rate is the same ten percent for both firms, then Firm A would have an EV of $5 million ($500k/ten percent) and Firm B's EV would only be $2.5 million ($250k/ten percent).

FIGURE 1: PANEL A

232 All Cash Transactions

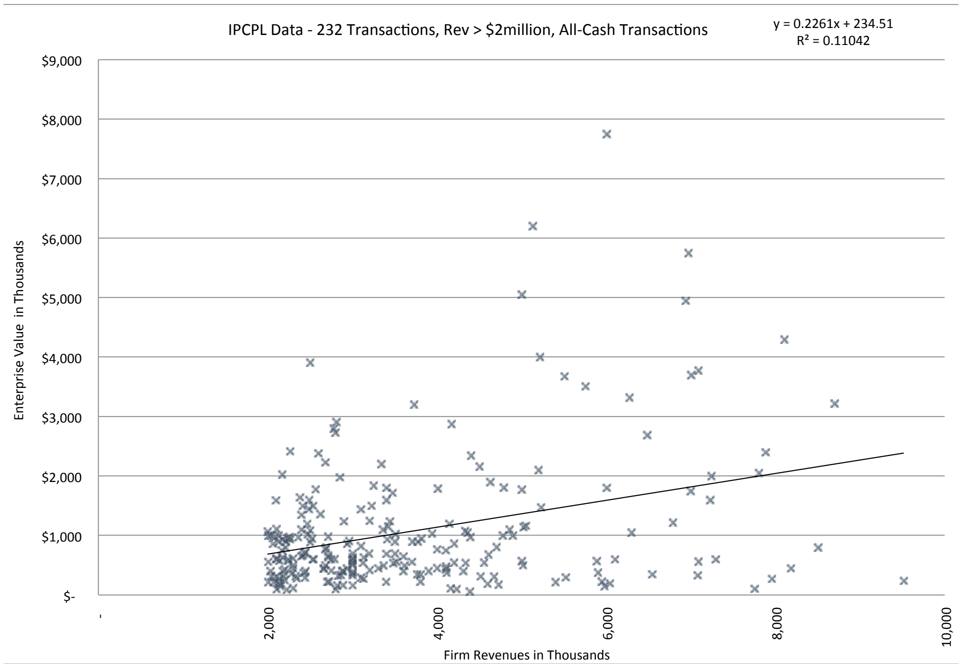


FIGURE 1: PANEL B

752 Transactions—including Panel A data as well as 520 seller-financed deals.

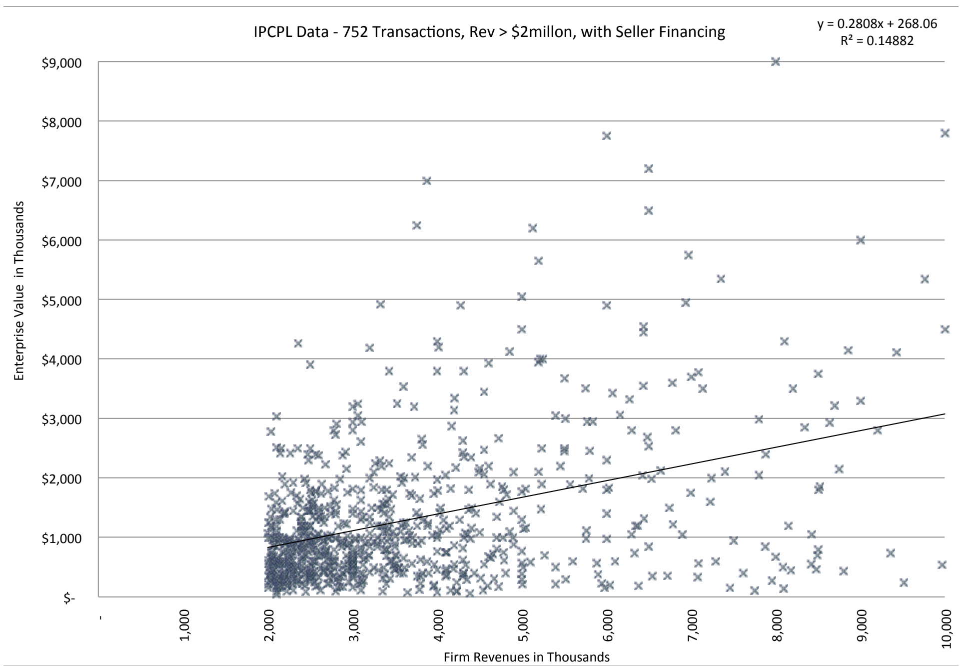


FIGURE 1: PANEL C

706 Transactions—MVIC Adjusted by BB&D to compensate for seller-financing and difference between firm profit/loss reporting date vs. transaction date.

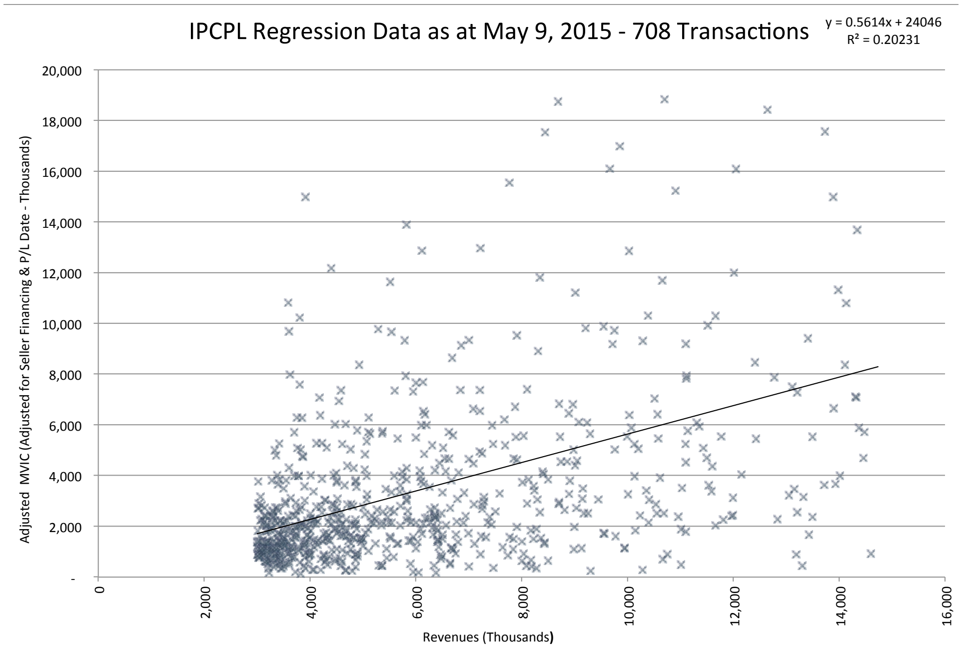


FIGURE 1: PANEL D

708 Transactions—"k" risk-rate = operating incomes (adjusted for owner's compensation) divided by MVIC (adjusted for seller-financing and P/L date lag) plus "g" of 3.63 percent (being 1.25 percent real growth and 2.38 percent average inflation as employed by IPCPL at the time).

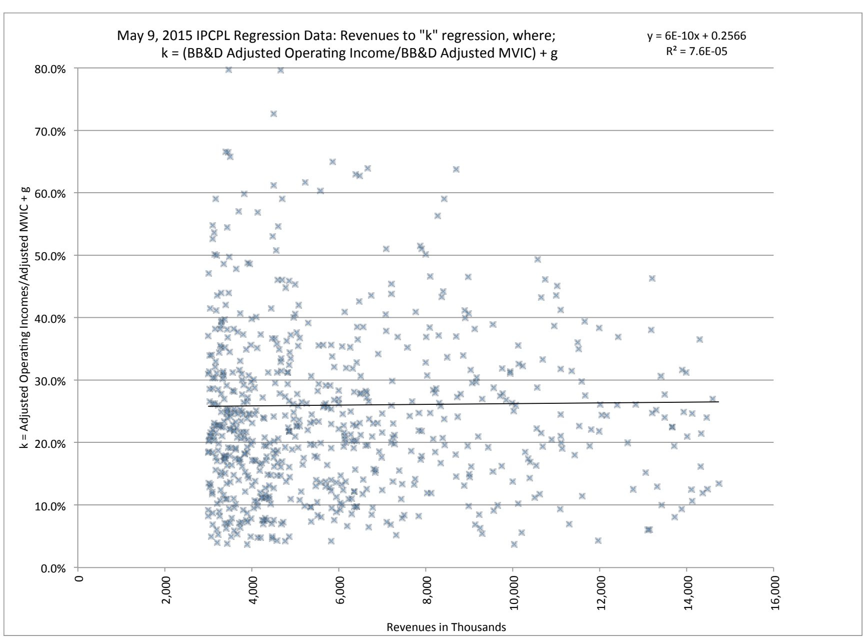


Figure 1, Panels A and B are derived from the dataset that Dohmeyer and Butler published shortly after the appearance of their first paper. It is exactly the same data I used previously to show that there is no correlation between revenues and cost of capital. It is again being used here to demonstrate that there is only a very poor correlation between the explanatory variable revenues (x-axis) and firm EV (y-axis). Of course, if there was a strong correlation between the two, as BB&D and Gorshunov have inferred, one would expect to see a high degree of concentration or clustering of the data points in a positively sloped line (or, perhaps, concave-to-the-origin curve) rising up from left to right. This would confirm, at least for this dataset, that EV's tended to rise in some discernable proportion as small firm revenues increased. Instead, the visual impression here is just random chaos.

Panel A shows there are the 232 firms with revenues exceeding two million dollars sold in all-cash transactions ($1.075 million mean and $698k median sales price). A linear regression has been undertaken which resulted in an R-Squared of only 0.1104 (so, the variation in firm revenues has only managed to explain eleven percent of the change in EV). In other words, the degree of correlation between revenues and EV is quite low. Further, the resulting 'line of best-fit' was found to be: y = $234.51k + 0.2261x where the x coefficient was found to be statistically significant and the y-intercept of $234.51k was not

(P=0.1736).[6] The standard error of the regression is $1.054 million. Applying the Empirical Rule, we know that ninety-five percent of the population observations can be expected to occur between +/- 2 standard deviations from the sample mean ($1.075 million). Therefore, in order to gain a high-level understanding of how useful revenues (ranging between two million dollars and ten million dollars) are as a predictor of EV, we note that this data indicates EV would be expected to range between $1.075 million +/- (2 x $1.054 million) ninety-five percent of the time, or: negative $1,033 (effectively zero) to $3.183 million. Such a large range confirms what the low R-Squared has already highlighted—revenues are a poor predictor of EV.[7]

Panel B are the 752 firms (still with revenues exceeding two million dollars, as required by the IPCPL) that includes the subset of 232 Panel A transactions plus an additional 520 transactions that involved some degree of seller-financing.[8] The data average sales price is $1.305 million and the median is $0.945. Here again, there is no strong visual indication of a central clustering around the expected positively-sloped line or curve. The results appear quite random. A linear regression yielded an R-Squared of 0.1488 (so less than fifteen percent of the changes in firm EV has been explained by the changes in firm revenues). The derived regression line is: y = $268k + 0.281x and, owing to the larger sample size, both the x-coefficient and y-intercept are statistically significant in this case.[9] The standard error of this regression is $1.149 million. The Empirical Rule indicates that ninety-five percent of the time, the population observations would be expected to range between $1.305 +/- (2 x $1.149 million) = effectively zero to $3.603 million. These findings are consistent with the smaller sample and the conclusions would be the same—revenues are not a reliable predictor of EV.

Panel C employs the data IPCPL used to determine the May 9, 2015 Data Point 1 (I have not adjusted the data in any way, other than to exclude the 145 transactions that reported negative adjusted operating profits; this was done so that Panel C would correspond with the positive operating profits required by Panel D). Here the line of best-fit reports an R-Squared of 0.2023 (over twenty percent) and one might conclude that this represents mild positive linear correlation between revenues and EV (which BB&D have classified as Market Value of Invested Capital [MVIC] here).[10] However, if the hope is that this mild increase in revenues-to-EV correlation will also be indicative of an improved revenue-to-risk-rate correlation (which is central to the IPCPL theory), then Panel D shows that this is not the case.

Panel D employs the same 706 transactions as Panel C, but now the regression is run between revenues and risk-rate "k" (where k = [BB&D Adjusted Operating Income]/[BB&D Adjusted MVIC] + g). The R-Squared is virtually zero (at 0.00008) as is the slope of the regression line. There is no correlation here between revenues and risk-rate "k".[11]

BB&D have told us that there is a strong inverse relationship between firm EV and its risk-rate (the smaller the firm, the higher the rate) and also, implicitly, that there is a high degree of direct correlation between a firm's revenues and its EV (the greater the revenues, the larger the EV). However, their own data does not support this correlation—there is only a weak relationship between revenues and EV. And, more importantly, there is virtually no observable correlation between revenues and risk-rates.

6 "P" stands for 'Probability Value'; the lower the "P" stat the better, and lower than 0.05 indicates statistical significance at the ninety-five percent confidence level. The F-Stat of the regression was 28.55 and the standard error of the intercept was $171.8k and 0.0423 for the x coefficient.

7 A more precise appreciation of the breadth of the confidence interval can be had by noting that the y-intercept confidence interval (CI) ranged from -$104k to $573k and the x coefficient CI ranged from 0.143 to 0.309. Therefore, at say the four million dollars in revenues level, EV would be expected to range between (-$104 + 0.143 x $4,000) to ($573 + 0.309 x $4,000) or, $0.468 million to $1,813 million. Proportionally such a wide range in CI relative to the four million dollars in revenues again confirms that revenues are not a reliable predictor of EV.

8 To be fair to BB&D, the dataset has been broken up into these two groups so that the reader can explicitly see the all-cash transactions separately from the larger grouping. Since there is no way of knowing how much transaction prices may have been distorted by the presence of seller-financing, the EV's of this larger dataset needs to be viewed with a higher degree of skepticism.

9 The regression F-Stat is 131.13 and the y-intercept standard error is $99.8k and the x coefficient standard error is 0.024. The ninety-five percent CI for the y-intercept ranged between $72k to $464k and 0.23 to 0.33 for the x coefficient.

10 The F-Stat of the regression is 178.5. The Standard Error of the y-Intercept, at 282.8k is not statistically significant (P = 0.93) whereas the x coefficient, with a 0.042 standard error is (P = 0). For a firm with $4,000 in revenues, the ninety-five percent MVIC confidence interval would range between: $1,711k to $2,825k. Proportionately this wide range in the confidence interval indicates revenues are not a useful predictor of MVIC.

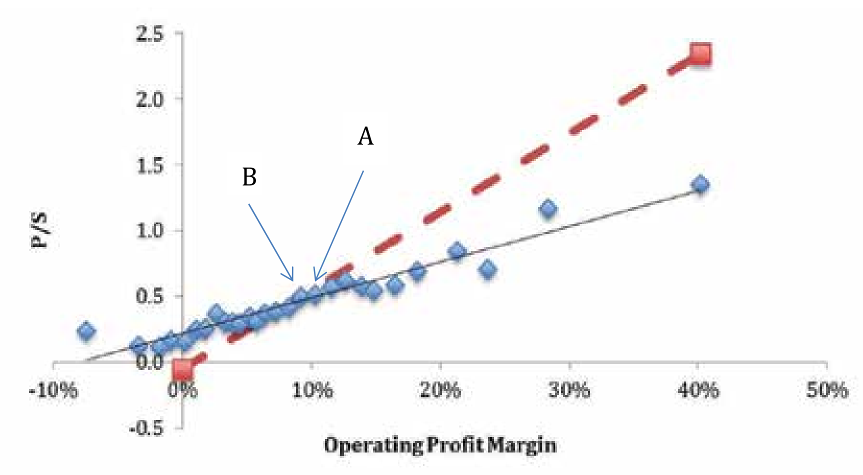
11 As will be discussed in Part III, the regression results were completely insensitive to the selection of the growth rate "g". The R-Squared stat remained at virtually zero regardless of which growth rate was employed between zero to ten percent.

THE GORSHUNOV CHART

Both BB&D and Gorshunov have produced exactly the same graph in their replies against my original article. So both, obviously, believe there is something really important about this representation that supports their case in favor of the IPCPL—but I am unclear as to what this would be. The graph is simple—twenty-eight data points where an OLS (ordinary least squares) best-fit line (the black one) has been regressed through the blue data points showing an upward trend or slope between increasing profit margins and the P/S (Price-to-Sales) Ratio. This kind of regression between a ratio over a ratio turns out to be a special case and 'unit-less' as we shall see.

The independent or explanatory variable (x-axis) is operating profit margin (OPM): the ratio of operating income over revenues (sales). The dependent variable (y-axis) is the P/S statistic: the purchase price over revenues (sales) ratio. For the reader's convenience, I have 'borrowed' Gorshunov's graph and, with the exception of two individual data points, have faithfully reproduced it as Figure 2.

FIGURE 2



Blue Data Points: twenty-eight Median Observations. Gorshunov extracted this from 840 Pratt's Stats transactions

Black Regression Line: Line-of-Best-Fit determined from Gorshunov's regression of the twenty-eight points

Red Reversion Line: Line Gorshunov' hypothesizes would represent mean reversion[12]

Let us be clear upon what this graph and the regression line does and does not tell us. It definitely does tell us that, as the OPM percentage increases, so too can the P/S ratio be expected to increase. Just by visual inspection of the tight clustering of the blue data points around the regression line, we would expect a very high R-Squared—there is very little unexplained variation in the blue dots. Ergo, there is high positive correlation between profit margin percentages and price-to-sales ratios. So, really all this is telling us is that investors are willing to pay higher ***relative*** prices for firms where they get to keep proportionately more of the expected cash generated.[13] But, this tells us nothing about the absolute measures of these firms—these are relative proportions. This fact will be made clear in an example below.

12 It is unclear to me how Mr. Gorshunov can speculate on the ultimate mean reversion of data that is entirely static. After all, the 840 Pratt's Stats transactions are only observed once at the time of sale and never again. However, the issue of margin mean reversion is irrelevant to the viability of IPCPL theory in general and has no bearing on his regression findings of the black line which uses actual Pratt's Stats data.

13 However, these ratios ignore the impact of non-operating expenses and taxes. Rational investors would certainly take these post operating margin effects into account before committing to a price.

The BB&D reply informs us that the equation for this regressed line is: y = 0.21 + 2.73x, where x is the OPM percent. So, let's take the example where we are comparing a Firm D with one million dollars in revenues and a twenty percent OPM to Firm E that has one million dollars in revenues and a thirty percent OPM:

> FIRM D: y = 0.21 + 2.73(20 percent) = 0.756 P/S ratio, therefore, when S = $1 million, EV = $756k
> FIRM E: y = 0.21 + 2.73(30 percent) = 1.029 P/S ratio, therefore, when S = $1 million, EV = $1,029k

Firm E is worth more, in absolute dollars ($273k = $1,029k - $756k) because the investor gets a larger expected absolute return ($300k in annual operating profits vs. only $200k for "D"). But, let's also look at the implied earnings-to-price capitalization rates:

> FIRM D Cap Rate: = E/P = ($1,000k x 20 percent)/$756k = **26.4 percent**
> FIRM E Cap Rate: = E/P = ($1,000k x 30 percent)/$1,029k = **29.1 percent**

Here, the firm with the larger EV also has the ***higher*** capitalization rate. **This is in direct contradiction to what the IPCPL expounds.** The IPCPL would have us believe that larger EV firms have ***lower*** risk-rates. In this case, the reason why the regression results are turning out this way is because of the 2.73 slope of the line.[14] Investors know that the higher the expected OPM percent becomes, the less likely they can count on that continued higher return. Although this may be an oversimplification, it is usually much less risky to count upon a business that has a steady and continuous history of producing, say, a ten percent OPM to continue doing so than to believe a firm that has just produced a single instance of a ninety percent OPM will reliably continue to do so.[15] The mistake in interpreting Gorshunov's chart would be to believe that moving from left-to-right on the horizontal axis (to higher OPM percent's) somehow implied the subject firms were increasing in revenues. No such inference can be made—and this fact can be easily demonstrated.

The Gorshunov chart appears in Figure 2. It is a faithful reproduction but for two data points—which I have indicated as Point A and Point B. I eliminated his original two points which were ***exactly*** at the same coordinates as my replacements (if these were vectors from the origin in R2, they would have precisely the same length and direction as the original vectors I replaced) and substituted two actual firm sales I had found with the same ratios. The first transaction, Point A, is for a typical small private firm that had four million dollars in revenues and $400k in operating profits (and, hence, the observed ten percent OPM). That firm sold for about $2.0 million—explaining the 0.5 P/S ratio ($2 million/$4 million). Point B, which is virtually adjacent to Point A and just a little to the left, represented a transaction that I found in the public market for a firm with $4,369,050,000 in revenues and $410,671,000 in operating profits (and, hence, a 9.4 percent OPM). The EV of the purchase price was $2.1627 billion—explaining the 0.495 P/S ratio ($2,162,700,000/$4,369,050,000).

This is what was meant when I said this regression is 'unit-less'—the absolute level of revenue becomes irrelevant (indeed, undetectable) as a result of the fact that revenues appear in the denominator of both the explanatory and dependent variables of the Gorshunov chart.

Now, had Mr. Groshunov run his regression with my revised dataset—he would have obtained precisely the same results as he had previously observed (as I said, the coordinates of my Points A and B are exactly the same as the two original data points I eliminated). So, what does Mr. Groshunov's chart tell us about the correlation between revenues and the cost of capital when it is entirely plausible that virtually co-located data points can have revenues that are billions of dollars apart? Absolutely nothing, is the correct answer.

In the original paper, "IPCPL and Margin Reversion: Implications for the Valuation of Small Private

14 Indeed, it can easily be shown that, assuming the Operating Earnings/Price ratio is a reasonable proxy for the E/P ratio, as the IPCPL does, and this is representative of a capitalization rate, the E/P ratio in the formula: y = 0.21 + 2.73x is a linearly increasing function of the operating margin percent. At any given level of revenue, Mr. Gorshunov's regression can be used to show that an increase in EV will also lead to an increase in the capitalization rate.

15 Mr. Gorshunov himself points out this fact in explaining the true nature of mean reversion—the returns of under-performing firms tend to improve over time (or they fail) and over-performing firms tend to descend.

Held Companies"[16], Mr. Groshunov finds it remarkable that his more extensive sample parameters (he uses 1997 through 2014 Pratt's Stats data) conforms to the more narrowly defined IPCPL findings of Feb. 15, 2015. As he states: "This is a strong indication that the original IPCPL Point 1 is an accurate estimation."[17] This may indeed be an indication of a high degree of P/S-to-OPM percent central tendency over time. Or, it just may be pure coincidence. While Mr. Groshunov's original sample selection consists of 840 ratios, his actual regression is only based upon twenty-eight individual median data points. In essence, the 840 points are used to determine the twenty-eight median points, and then, 812 of the sample observations are discarded before the regression is run.[18] A regression performed on twenty-eight single data points will not be as statistically robust as one based upon an 840 point sample.

Regardless of the strength of association between the OPM percent and the P/S ratio, we know for certain that these findings give us no indication of the correlation between absolute revenues and cost of capital. This is because the absolute measure of revenues is factored out of the sample data prior to the execution of the regression—as was demonstrated by my substitution of a transaction incorporating billions of dollars in revenues.

16 Gorshunov, I. 2015. IPCPL and Margin Reversion: Implications for the Valuation of Small Privately Held Companies. Business Valuation Review. Summer 2015, Vol. 34, No. 2, pp. 70–73.

17 Ibid.

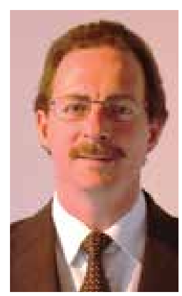
18 Moreover, we are not told what standards are applied in order to define the boundaries of the twenty-eight different OPM percent groupings.

SUMMARY AND CONCLUSIONS

BB&D and Gorshunov have argued that there is a systematic inverse relationship been firm size and risk-rate—the smaller the firm (i.e., EV) the higher the risk. While this ***may be*** the case, they have provided no evidence to show that small firm revenues are systematically related to risk-rates. This was one of my two primary complaints against the IPCPL in Part I. If you are going to rely upon the IPCPL to generate accurate risk-rate estimates, you must implicitly believe that revenues are a dependable yardstick for risk because revenues are the key explanatory variable the IPCPL uses to generate risk-rate outputs.

However, the IPCPL data itself quite conclusively shows that small firm revenues are only mildly related to EV size, at best, and completely uncorrelated to the empirical risk-rates reported in the transactions upon which the IPCPL is based. The Groshunov regression shows that investors are willing to pay higher relative prices for firms with higher operating profit margin percentages—but the word ***relative*** is the key point here. There is nothing in the Groshunov analysis addressing the concern that absolute revenues can be used to predict reliable risk-rates. In fact, the Groshunov regression line shows that, at any given revenue amount, higher EV's lead to higher risk-rates (contrary to IPCPL theory).

In their Jan/Feb rebuttal, BB&D make some remarkable claims in defense of the IPCPL that, to my mind, provide a much stronger argument against the viability of the IPCPL than in support of it. These observations will be presented in the forthcoming Part III, as will my presentation of what I believe to be the third of the three main IPCPL weaknesses. VE



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