Adjusting Seller-Financed Selling Prices to Their All-Cash Equivalent Value: A Response to Toby Tatum

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Once again Toby Tatum has written an illuminating article in *Business Appraisal Practice*, Third Quarter 2012, that requires a response and an alternative methodology for determining a cash equivalent price when seller financing is involved in a purchase and sale transaction. But first, I need to point out that the t-test for two means (assuming unequal variances) that Tatum performed on the total *Bizcomps* database and presented in Figures 2a and 2b of the article is not accurate, and the result could be misleading. This is because to test the hypothesis that there is no difference between the mean cash Price/Seller's Discretionary Earnings (SDE) ratio and the mean terms Price/SDE ratio, the parametric model he used requires that both data sets be normally distributed, or at least be near bell-shaped. That is, skewness and kurtosis for each category need to be between -1 and +1. Because there are hundreds of transactions with Price/SDE ratios greater than 4 in each category, both of the uncensored or complete categories are kurtic and are heavily skewed to the right. In fact, skewness and kurtosis for the all-cash deals were 13.7 and 291.2, respectively, and for the seller-financed deals they were 18.9 and 474.1, respectively. With skewness and kurtosis values so large, the category distributions are very far from being near bell-shaped. Therefore, the correct test to use on the uncensored *Bizcomps* categories is a non-parametric test, to wit, the Mann-Whitney Rank test. However, there is another solution, and that is to censor the two categories by removing enough outlier transactions such that skewness and kurtosis fall to between -1 and +1. This allows us to use the more powerful parametric t-test for two means with assurance that the results will be accurate and meaningful.

Tatum had already removed from the database all those transactions that reported either negative or zero SDE, so for this procedure I made no other adjustments. Using Excel's standardize function, I separately converted each category's Price/SDE ratio into a standard score which indicates by how many standard deviations an observation is above or below the mean. For both the term and the cash categories, any transactions that were in excess of three standard deviations were removed iteratively until no transaction remained with a standardized value in excess of 3, thereby getting skewness and kurtosis to be within the range of -1 to +1. This resulted in removing 452 transactions from the 7,220 initial transactions in the terms category and 255 from the 4,504 initial transactions in the cash category. I then ran the t-test for two means (assuming equal variances) on the two censored categories and found the t statistic to be 10.820, indicating that the difference in means was highly statistically significant. This result confirms that Tatum's original results that produced a t-statistic of 5.428 were also highly statistically significant, but now we have the comfort and assurance that comes from performing the correct test. The average ratio of cash to terms was .912, and the weighted harmonic mean ratio of cash to terms was .916, compared to Tatum's uncensored database results of .850 and .898, respectively.

While this was an interesting process, it does not produce any information that we can use in our quotidian business valuation work as we value businesses using the market approach based on the SIC or NAICS Codes for the subject's industry. At this point, we need to turn our attention to the two specific SIC Codes I have chosen for this demonstration, 782 for lawn maintenance and 7349 for janitorial services, and first test to see if there is a statistically significant difference between mean selling prices for cash and terms. If there is, we will then proceed to convert the terms' selling prices to their all-cash equivalent prices using the tools already provided to us by Toby Tatum.

Listed below are the individual steps in the process.

- Select your SIC Code of choice from *Bizcomps,* download it into an Excel workbook and then remove all the transactions that have either zero SDE or Revenue, depending on your model of choice.

- Copy the downloaded worksheet and sort the entire worksheet on the "% Down" column, but first convert all the transactions that are Small Business Administration financed into the 100% down category. Segregate the seller-financed transactions from the all-cash transactions with about six empty rows between the two categories.
- Depending on your model of choice, in the immediate four rows at the end of each category, enter the Excel formulas for average, standard deviation, kurtosis and skewness in the column headed either SP/Revenue or SP/SDE. (See Figures 1 and 2 for the seller-financed transactions).
- To the right of the column you have chosen insert two columns – one headed "Standard Score" and the other headed "Outlier." Populate the column headed Standard Score using Excel's "standardize" formula. Populate the column headed Outlier with a formula that will produce an "X" if the absolute standard score is greater than 3. Do this for both categories using each category's own average and standard deviation values. (See Figures 1 and 2 for the seller-financed transactions).
- Re-sort each section individually based on the "outlier" column and proceed to eliminate the rows in each category that contain an "X." Continue to do this until skewness and kurtosis for each category are between -1 and +1. This will usually require you to iteratively remove all the rows in each category that show an "X" in the outlier column. Sometimes you will need to change the cutoff figure from 3 to something less, say 2.95 or so, in order to meet the -1 to +1 requirement. For SIC Code 7349, janitorial services, we removed ten seller-financed transactions out of 144 (6.9%) and two all-cash transactions out of 92 (2.2%) to reach the -1 to +1 condition while maintaining a cut-off figure of 3.
- Now we can test to see if the average value for each category is statistically significant from the other. But before we run that test, we have to determine if the variances in each category are equal or not, as the answer will determine which t-test for equal means we use. To do this, we will use Excel's F-Test Two-Sample for Variances found in the Data Analysis Tools on the data ribbon. In the tool dialogue box be sure to enter as Variable 1 the category with the larger standard deviation, and enter .025 for Alpha as we want a two-tailed test with 5% level of significance. The ouput of the tool needs to be changed to account for the two-tailed test – P(F<f)one-tail should be changes to read P(F>f) two-tail, and the value in the corresponding cell needs to multiplied by 2. Our results show a two-tail p-value of .1624, indicating that we cannot reject the null hypothesis of equal variances at the 5% level of significance. (See Figure 3). Therefore, we will use Excel's t-Test: Two-Sample Assuming Equal Variances to test for the equality of the category means.
- Excel's t-Test: Two-Sample Assuming Equal Variances is also found in Data Analysis Tools on the data ribbon. Set the Hypothesized Mean Difference to zero and leave Alpha at .05. Either category's SP/SDE ratios or SP/Revenue ratios as the case may be, can be entered as either Variable 1 or Variable 2. Our results show a two-tail p-value of .0021, indicating that we can reject the null hypothesis of equal means at the 5% level of significance. (See Figure 4). Consequently, as the average SP/SDE ratios of the two categories are not equivalent, we need to convert the seller-financed deals into their all-cash equivalent prices. We note that the mean for the SP/SDE terms category is 1.8879, the mean for the SP/SDE cash category is 1.6199, and the ratio of cash to terms means is .8581.
- To perform the conversion, copy the worksheet one more time, delete the two columns headed "Standard Score" and "Outlier," convert all transactions stated in months to fractions of a year and then enter four blank columns to the right of the column headed "Term." To use Excel's Text to Columns tool in the Data Tools section of the Data Ribbon, first select the terms column in the seller-financed category only, then click on the Text to Columns tool, select the "Delimited" radio button, choose "Space" as the delimiter, select "General" as the column data format, and for "Destination" select the first cell of the first blank column you just inserted, and click on "Finish." Delete the two columns that contain "@" and "Yrs."
- There are various alternative methods to impute the value of a missing variable. We will use that method that assigns the mean of the category of variable it came from. Therefore, compute the average of the term in years and the average interest rate and using Excel's paste special – values command, and enter these averages into the appropriate cells that are missing this data. We now have an interest rate and a term in years for all the seller-financed transactions.
- We can now convert the selling prices from the seller-financed category to their cash equivalents using the methodology that Tatum set forth in his seminal book, *Transac-*

tion Patterns, albeit with one crucial difference. Rather than use the 14% designated by Tatum as the base interest rate for seller-financed deals, I use the 14% as a place holder, and then using Solver I change the 14% to make the ratio of average cash price to average terms price equal to the same ratio, or .8581 in this case, that was previously developed above. For the janitorial services SIC Code the 14% place holder became a 19.3% base interest rate for the seller-financed deals in order to achieve the .8581 ratio. (See Figures 5 and 6). Having converted the seller-financed transactions to the all-cash equivalents, we can now combine the 134 seller-financed transactions with the 90 all-cash transactions and proceed to value our subject company.

Applying the same steps to *Bizcomps*' SIC Code No. 782, which contains 275 lawn maintenance companies, we find that skewness and kurtosis each fall to between -1 and +1 after first removing four transactions that have zero SDE, and then nine outliers out of 177 seller-financed transactions (5.1%) and two out of 94 all-cash transactions (2.1%). After outlier removal, the ratio of average cash price to average terms price is .8758. The variances of the two categories are equal, and the difference in means of .227 (1.829 – 1.601) is found to be statistically significant with a p-value of .008. Converting the seller-financed selling prices to their all-cash equivalents requires a base interest rate of 9.3% to make the ratio of average cash price to average terms price equal to .8758. Note that the base interest requirement for SIC Code No. 782 is 10% less than that of SIC Code No. 7349, 19.3% vs. 9.3%, even though the ratios of average cash price to average terms price are quite close, .8758 vs. .8581. This is to be expected as the 14% that Tatum used was an average base rate that adjusted the total *Bizcomps* database, and therefore individual industries should have base rates both above and below the 14%.

Before wrapping up this article, I need to say a few things about outlier removal. As we have seen, outliers are extreme observations that for one reason or another do not belong with the other observations in our data sets. There are two ways that outliers can be introduced into the *Bizcomps* databases, the first of which results from incorrect recording, or especially, data entry errors that can put wild values into the data sets. The second cause of outliers is that data sets are not homogeneous to which a single regression model applies, but rather a heterogeneous mix of two or more types of transactions, one of which is more frequent. The infrequent observations of the other types appear as outliers. For example, if those transactions that are seller-financed have not been converted into a cash equivalent selling price, then a scatter graph of price to SDE or Annual Revenue will include outliers caused by the less frequent observations, which might be either of the two types of selling prices, depending on the makeup of the data set.

What one does when outliers are identified in the data set is not without controversy. If the outlier is a result of a data entry error or is otherwise suspect in terms of its reliability or accuracy, then it should be clearly removed from the data set or repaired before any further analysis. But what should be done about outliers that are not clearly erroneous, such as those that lie between two and four standard deviations from the mean of the regression line? Somehow, leaving those observations in the data set has come to be viewed as the "honest" thing to do, and that removing them is viewed as "cherry-picking" or "cheating" or "making it work."

The issue of outlier removal is greatly influenced by what one is trying to accomplish. If you are performing basic science and trying to establish a relationship between, say the number of cigarettes smoked and the onset of lung cancer, then outliers are important to your research as they will be counter-intuitive to what was expected and therefore spark new research.

For our purposes, the relationship between SDE and selling price is a fundamental axiom of business valuation - it does not need to be established or proved. Therefore, outliers are not helpful sources of new research, but are anomalies. Outliers typically represent either:

1) input errors,
2) fools for buyers who have overpaid,
3) fools for sellers who have accepted less than fair market value,
4) distressed sellers, or,
5) synergistic buyers.

Items 2 - 5 violate the fair market value standard of value, and therefore do not belong in the data set. For that reason, it is necessary to delete them along with the obvious data input errors. If your data set contains 75 data points, and 65 of them are within three standard deviations of the mean, why do you need the other ten, and what helpful information do they contain?

If a data set is heterogeneous and contains all types of transactions, why wouldn't you want to exclude those that do not fit the fair market value standard of value? By definition, it is true that any transaction outside the mainstream does not conform to that standard, whatever the reason. For example, how can a sale that is 4.5 standard deviations from the mean be at fair market value? Mustn't it be at investment value - value to a particular buyer? Even if you make the heroic assumption that a sale at 4.5 standard deviations is truly a fair market value transaction, this question remains: why did it sell for such a high multiple? Perhaps it has the best location, the best management, superior service,

loyal customers, etc. All these things tend to make its SDE far in excess of the average enterprise in its SIC Code No. Therefore, it sold at a premium, i.e., not only was its SDE multiplied by the average multiple, but the buyer paid a premium for its superior performance, and the fact that its recipe for success has been systematized by management such that it will survive the closing.

Now, ask yourself – does your subject company enjoy such profits, have such systems in place, etc.? If not, then how can the outlier company be similar and relevant to your valuation assignment? It can't be, and therefore, it should be removed from the data set. So, remove the outliers because they either do not represent fair market value transactions, or remove them even if, in the extreme, they do. Do not fear that you are "making it work." The cutoff metric is set before you start to eliminate outliers, and it robotically makes the selections. Hence, you are not "cherry picking" the transactions that you keep in the data set – an algorithm decides what transactions fall outside the test metric you have set to determine fair market value.

At this point you can now proceed to value your subject company using your model of choice, be it a ratio model such as the weighted harmonic mean, or a linear regression model. The advantage of the conversion method developed above over what Tatum proposed in his article is that each transaction's cash equivalent selling price is a function of its interest rate and term in years, rather than the imposition of an average diminishment developed from the *Bizcomps* database as a whole which will cause half of the values to be overstated and half to be understated.

To reiterate the process, obtain your SIC Code data set, clean up the data, remove the outliers, test for equal variances, and then run the t test for two means. If the test produces a significant result, then do the cash equivalency procedure as I have outlined it above. If the test result is not significant, then you have a choice. You can either assume it is not significant because your sample size is too small, and proceed as indicated above to convert the seller-financed price to its cash equivalent. Or you can assume that the sample size is large enough, and that this particular dataset has no significant difference between the average cash and terms ratios, and therefore there is no need to convert to a cash equivalent price.

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Figure 1

ROW	B	C	D	L	M	N	O	P
2	**SIC**	**NAICS**	**BUSINESS TYPE**	**SP/REV**	**SDE/REV**	**SP/SDE**	**STANDARD SCORE**	**OUTLIER**
3	**Seller-Financed Deals (After Outliers Removed)**							
4	7349	56172	Janitorial Service	0.364	0.289	1.258	-1.055	
5	7349	56172	Janitorial Service	0.204	0.194	1.053	-1.398	
6	7349	56172	Janitorial Service	0.407	0.23	1.774	-0.191	
7	7349	56172	Janitorial Service	0.545	0.227	2.397	0.852	
8	7349	56172	Cleaning-Comm/House	0.412	0.247	1.667	-0.370	
9	7349	56172	Pressure Cleaning	1.5	0.464	3.235	2.255	
10	7349	56172	Pressure Cleaning	1.309	0.56	2.336	0.750	
11	7349	56172	Maid Cleaning Service	1.033	0.331	3.125	2.071	
12	7349	56172	Bath Tub Refinishing	0.24	0.15	1.6	-0.482	
13	7349	56172	Janitorial Service	0.721	0.288	2.5	1.025	
14	7349	56172	Maid Cleaning Service	0.568	0.23	2.468	0.971	
15	7349	56172	Janitorial Services	0.329	0.357	0.92	-1.621	
16	7349	56172	Janitorial Service	0.318	0.222	1.435	-0.758	
17	7349	56172	Janitorial Service	0.749	0.286	2.621	1.227	
18	7349	56172	Commercial Cleaning	1.225	0.53	2.311	0.708	
19	7349	56172	Janitorial Service	0.902	0.368	2.449	0.939	

Continued on next page

Figure 1 *(continued)*

ROW	B	C	D	L	M	N	O	P
2	**SIC**	**NAICS**	**BUSINESS TYPE**	**SP/REV**	**SDE/REV**	**SP/SDE**	**STANDARD SCORE**	**OUTLIER**
104	7349	56172	Janitorial Service	0.547	0.222	2.463	0.963	
105	7349	56172	Construction Cleanup	0.374	0.21	1.782	-0.177	
106	7349	56172	Janitorial Service	0.613	0.305	2.007	0.199	
107	7349	56172	Janitorial Service	0.558	0.429	1.302	-0.981	
108	7349	56172	Maid Cleaning Service	0.363	0.321	1.133	-1.264	
109	7349	56172	Janitorial Service	0.531	0.238	2.237	0.585	
110	7349	56172	Janitorial Service	0.677	0.375	1.806	-0.137	
111	7349	56172	Pressure Cleaning	1.163	0.535	2.174	0.479	
112	7349	56172	Janitorial Service	0.64	0.407	1.572	-0.529	
113	7349	56172	Sweeping/Snow Removal	0.83	0.589	1.41	-0.800	
114	7349	56172	Janitorial Service	0.518	0.359	1.443	-0.745	
115	7349	56172	Property Maintenance	0.694	0.334	2.075	0.313	
116	7349	56172	Janitorial Service	0.868	0.354	2.451	0.943	
117	7349	56172	Maid Cleaning Service	0.647	0.401	1.613	-0.460	
118	7349	56172	Chimney Sweeping	0.394	0.512	0.769	-1.873	
119	7349	56172	Window Cleaning Service	0.5	0.94	0.532	-2.270	
120	7349	56172	Janitorial Service	0.778	0.418	1.862	-0.043	
121	7349	56172	Maid Cleaning Service	0.317	0.238	1.333	-0.929	
122	7349	56172	Janitorial Service	0.305	0.233	1.313	-0.963	
123	7349	56172	Window Cleaning	0.97	0.343	2.827	1.572	
124	7349	56172	Janitorial Service	0.685	0.321	2.135	0.414	
125	7349	56172	Janitorial Service	0.877	0.398	2.206	0.533	
126	7349	56172	Bathtub Resurfacing	1.456	0.709	2.054	0.278	
127	7349	56172	Pressure Cleaning	0.722	0.278	2.6	1.192	
128	7349	56172	Restr Equipment Cleaning	0.481	0.538	0.894	-1.664	
129	7349	56172	Pool Cleaning Service	0.836	0.375	2.232	0.576	
130	7349	56172	Construction Cleanup	0.833	0.407	2.048	0.268	
131	7349	56172	Janitorial Service	0.681	0.282	2.416	0.884	
132	7349	56172	Janitorial Service	0.448	0.181	2.473	0.980	
133	7349	56172	Window Washing	0.525	0.286	1.837	-0.085	
134	7349	56172	Maid Service	0.767	0.341	2.251	0.608	
135	7349	56172	Janitorial Service	0.627	0.236	2.654	1.283	
136	7349	56172	House Cleaning Service	0.646	0.488	1.325	-0.942	
137	7349	56172	Restr Equipment Cleaning	0.4	0.347	1.154	-1.229	
138				Average		1.888		
139				Standard Deviation		0.597		
140				Skewness		0.211		
141				Kurtosis		-0.225		
142				Count		134		

Figure 2

ROW	B	C	D	L	M	N	O	P
2	**SIC**	**NAICS**	**BUSINESS TYPE**	**SP/REV**	**SDE/REV**	**SP/SDE**	**STANDARD SCORE**	**OUTLIER**
3	**Seller-Financed Deals (After Outliers Removed)**							
4	7349	56172	Janitorial Service	0.364	0.289	1.258	=STANDARDIZE(N4,$N$138,$N$139)	=IF(ABS(O4)>3,"X","")
5	7349	56172	Janitorial Service	0.204	0.194	1.053	=STANDARDIZE(N5,$N$138,$N$139)	=IF(ABS(O5)>3,"X","")
6	7349	56172	Janitorial Service	0.407	0.23	1.774	=STANDARDIZE(N6,$N$138,$N$139)	=IF(ABS(O6)>3,"X","")
7	7349	56172	Janitorial Service	0.545	0.227	2.397	=STANDARDIZE(N7,$N$138,$N$139)	=IF(ABS(O7)>3,"X","")
8	7349	56172	Cleaning-Comm/House	0.412	0.247	1.667	=STANDARDIZE(N8,$N$138,$N$139)	=IF(ABS(O8)>3,"X","")
9	7349	56172	Pressure Cleaning	1.5	0.464	3.235	=STANDARDIZE(N9,$N$138,$N$139)	=IF(ABS(O9)>3,"X","")
10	7349	56172	Pressure Cleaning	1.309	0.56	2.336	=STANDARDIZE(N10,$N$138,$N$139)	=IF(ABS(O10)>3,"X","")
11	7349	56172	Maid Cleaning Service	1.033	0.331	3.125	=STANDARDIZE(N11,$N$138,$N$139)	=IF(ABS(O11)>3,"X","")
12	7349	56172	Bath Tub Refinishing	0.24	0.15	1.6	=STANDARDIZE(N12,$N$138,$N$139)	=IF(ABS(O12)>3,"X","")
13	7349	56172	Janitorial Service	0.721	0.288	2.5	=STANDARDIZE(N13,$N$138,$N$139)	=IF(ABS(O13)>3,"X","")
14	7349	56172	Maid Cleaning Service	0.568	0.23	2.468	=STANDARDIZE(N14,$N$138,$N$139)	=IF(ABS(O14)>3,"X","")
15	7349	56172	Janitorial Services	0.329	0.357	0.92	=STANDARDIZE(N15,$N$138,$N$139)	=IF(ABS(O15)>3,"X","")
16	7349	56172	Janitorial Service	0.318	0.222	1.435	=STANDARDIZE(N16,$N$138,$N$139)	=IF(ABS(O16)>3,"X","")
17	7349	56172	Janitorial Service	0.749	0.286	2.621	=STANDARDIZE(N17,$N$138,$N$139)	=IF(ABS(O17)>3,"X","")
18	7349	56172	Commercial Cleaning	1.225	0.53	2.311	=STANDARDIZE(N18,$N$138,$N$139)	=IF(ABS(O18)>3,"X","")
19	7349	56172	Janitorial Service	0.902	0.368	2.449	=STANDARDIZE(N19,$N$138,$N$139)	=IF(ABS(O19)>3,"X","")
104	7349	56172	Janitorial Service	0.547	0.222	2.463	=STANDARDIZE(N104,$N$138,$N$139)	=IF(ABS(O104)>3,"X","")
105	7349	56172	Construction Cleanup	0.374	0.21	1.782	=STANDARDIZE(N105,$N$138,$N$139)	=IF(ABS(O105)>3,"X","")
106	7349	56172	Janitorial Service	0.613	0.305	2.007	=STANDARDIZE(N106,$N$138,$N$139)	=IF(ABS(O106)>3,"X","")
107	7349	56172	Janitorial Service	0.558	0.429	1.302	=STANDARDIZE(N107,$N$138,$N$139)	=IF(ABS(O107)>3,"X","")
108	7349	56172	Maid Cleaning Service	0.363	0.321	1.133	=STANDARDIZE(N108,$N$138,$N$139)	=IF(ABS(O108)>3,"X","")
109	7349	56172	Janitorial Service	0.531	0.238	2.237	=STANDARDIZE(N109,$N$138,$N$139)	=IF(ABS(O109)>3,"X","")
110	7349	56172	Janitorial Service	0.677	0.375	1.806	=STANDARDIZE(N110,$N$138,$N$139)	=IF(ABS(O110)>3,"X","")
111	7349	56172	Pressure Cleaning	1.163	0.535	2.174	=STANDARDIZE(N111,$N$138,$N$139)	=IF(ABS(O111)>3,"X","")
112	7349	56172	Janitorial Service	0.64	0.407	1.572	=STANDARDIZE(N112,$N$138,$N$139)	=IF(ABS(O112)>3,"X","")
113	7349	56172	Sweeping/Snow Removal	0.83	0.589	1.41	=STANDARDIZE(N113,$N$138,$N$139)	=IF(ABS(O113)>3,"X","")
114	7349	56172	Janitorial Service	0.518	0.359	1.443	=STANDARDIZE(N114,$N$138,$N$139)	=IF(ABS(O114)>3,"X","")
115	7349	56172	Property Maintenance	0.694	0.334	2.075	=STANDARDIZE(N115,$N$138,$N$139)	=IF(ABS(O115)>3,"X","")
116	7349	56172	Janitorial Service	0.868	0.354	2.451	=STANDARDIZE(N116,$N$138,$N$139)	=IF(ABS(O116)>3,"X","")
117	7349	56172	Maid Cleaning Service	0.647	0.401	1.613	=STANDARDIZE(N117,$N$138,$N$139)	=IF(ABS(O117)>3,"X","")
118	7349	56172	Chimney Sweeping	0.394	0.512	0.769	=STANDARDIZE(N118,$N$138,$N$139)	=IF(ABS(O118)>3,"X","")
119	7349	56172	Window Cleaning Service	0.5	0.94	0.532	=STANDARDIZE(N119,$N$138,$N$139)	=IF(ABS(O119)>3,"X","")
120	7349	56172	Janitorial Service	0.778	0.418	1.862	=STANDARDIZE(N120,$N$138,$N$139)	=IF(ABS(O120)>3,"X","")
121	7349	56172	Maid Cleaning Service	0.317	0.238	1.333	=STANDARDIZE(N121,$N$138,$N$139)	=IF(ABS(O121)>3,"X","")
122	7349	56172	Janitorial Service	0.305	0.233	1.313	=STANDARDIZE(N122,$N$138,$N$139)	=IF(ABS(O122)>3,"X","")
123	7349	56172	Window Cleaning	0.97	0.343	2.827	=STANDARDIZE(N123,$N$138,$N$139)	=IF(ABS(O123)>3,"X","")
124	7349	56172	Janitorial Service	0.685	0.321	2.135	=STANDARDIZE(N124,$N$138,$N$139)	=IF(ABS(O124)>3,"X","")
125	7349	56172	Janitorial Service	0.877	0.398	2.206	=STANDARDIZE(N125,$N$138,$N$139)	=IF(ABS(O125)>3,"X","")
126	7349	56172	Bathtub Resurfacing	1.456	0.709	2.054	=STANDARDIZE(N126,$N$138,$N$139)	=IF(ABS(O126)>3,"X","")
127	7349	56172	Pressure Cleaning	0.722	0.278	2.6	=STANDARDIZE(N127,$N$138,$N$139)	=IF(ABS(O127)>3,"X","")
128	7349	56172	Restr Equipment Cleaning	0.481	0.538	0.894	=STANDARDIZE(N128,$N$138,$N$139)	=IF(ABS(O128)>3,"X","")
129	7349	56172	Pool Cleaning Service	0.836	0.375	2.232	=STANDARDIZE(N129,$N$138,$N$139)	=IF(ABS(O129)>3,"X","")

Continued on next page

Figure 2 *(continued)*

ROW	B	C	D	L	M	N	O	P
2	**SIC**	**NAICS**	**BUSINESS TYPE**	**SP/REV**	**SDE/REV**	**SP/SDE**	**STANDARD SCORE**	**OUTLIER**
130	7349	56172	Construction Cleanup	0.833	0.407	2.048	=STANDARDIZE(N130,$N$138,$N$139)	=IF(ABS(O130)>3,"X","")
131	7349	56172	Janitorial Service	0.681	0.282	2.416	=STANDARDIZE(N131,$N$138,$N$139)	=IF(ABS(O131)>3,"X","")
132	7349	56172	Janitorial Service	0.448	0.181	2.473	=STANDARDIZE(N132,$N$138,$N$139)	=IF(ABS(O132)>3,"X","")
133	7349	56172	Window Washing	0.525	0.286	1.837	=STANDARDIZE(N133,$N$138,$N$139)	=IF(ABS(O133)>3,"X","")
134	7349	56172	Maid Service	0.767	0.341	2.251	=STANDARDIZE(N134,$N$138,$N$139)	=IF(ABS(O134)>3,"X","")
135	7349	56172	Janitorial Service	0.627	0.236	2.654	=STANDARDIZE(N135,$N$138,$N$139)	=IF(ABS(O135)>3,"X","")
136	7349	56172	House Cleaning Service	0.646	0.488	1.325	=STANDARDIZE(N136,$N$138,$N$139)	=IF(ABS(O136)>3,"X","")
137	7349	56172	Restr Equipment Cleaning	0.4	0.347	1.154	=STANDARDIZE(N137,$N$138,$N$139)	=IF(ABS(O137)>3,"X","")
138				Average	=AVERAGE(N4:N137)			
139				Standard Deviation	=STDEV(N4:N137)			
140				Skewness	=SKEW(N4:N137)			
141				Kurtosis	=KURT(N4:N137)			
142				Count	=COUNT(N4:N137)			

Figure 3

ROW	B	C	D
2	F-Test Two-Sample for Variances		
4		*Cash*	*Terms*
5	Mean	1.6199	1.8879
6	Variance	0.4658	0.3567
7	Observations	90	134
8	df	89	133
9	F	1.3057	
10	P(F>=f) two-tail	**0.1624**	
11	F Critical one-tail	1.4541	
	Notes: Alpha in Analysis Tool dialog box = .025 Cell B10 changed from P(<=f) one-tail Output in Cell C10 multiplied by 2		

Figure 4

ROW	B	C	D
2	t-Test: Two-Sample Assuming Equal Variances		
4		*Cash*	*Terms*
5	Mean	1.6199	1.8879
6	Variance	0.4658	0.3567
7	Observations	90	134
8	Pooled Variance	0.4004	
9	Hypothesized Mean Difference	0	
10	df	222	
11	t Stat	-3.1072	
12	P(T<=t) one-tail	0.0011	
13	t Critical one-tail	1.6517	
14	P(T<=t) two-tail	**0.0021**	
15	t Critical two-tail	1.9707	

Figure 5

ROW	B	C	D	E	F	H	I	J	K
2					**Base Interest Rate**		**19.3%**		
3	**Actual Selling Price**	**% Down**	**Amount Financed**	**Interest Rate**	**Term in Years**	**Monthly Payment**	**Discount Rate**	**Present Value**	**Cash Equivalent Selling Price**
4	273	0.0%	273	7.7%	4.69	$5.79	29.3%	$176	176.21
5	100	0.0%	100	7.7%	4.69	$2.12	29.3%	$65	64.54
6	149	0.0%	149	7.7%	4.69	$3.16	29.3%	$96	96.17
7	175	0.0%	175	7.7%	4.69	$3.71	29.3%	$113	112.95
8	110	0.0%	110	7.7%	4.69	$2.33	29.3%	$71	71.00
9	330	0.0%	330	7.7%	4.69	$6.99	29.3%	$213	213.00
10	250	0.0%	250	7.7%	4.69	$5.30	29.3%	$161	161.36
11	125	0.0%	125	7.7%	4.69	$2.65	29.3%	$81	80.68
12	176	9.0%	160	7.7%	4.69	$3.39	28.4%	$105	120.94

Continued on next page

Figure 5 *(continued)*

ROW	B	C	D	E	F	H	I	J	K
2					**Base Interest Rate**		**19.3%**		
3	**Actual Selling Price**	**% Down**	**Amount Financed**	**Interest Rate**	**Term in Years**	**Monthly Payment**	**Discount Rate**	**Present Value**	**Cash Equivalent Selling Price**
13	165	9.0%	150	8.0%	10.00	$1.82	28.4%	$72	87.26
14	385	12.0%	339	7.5%	10.00	$4.02	28.1%	$161	207.44
15	115	13.0%	100	9.5%	5.00	$2.10	28.0%	$68	82.49
16	155	15.0%	132	0.0%	4.00	$2.74	27.8%	$79	102.31
17	325	15.0%	276	7.0%	3.00	$8.53	27.8%	$207	255.61
18	245	18.0%	201	7.7%	4.69	$4.26	27.5%	$134	178.15
19	595	22.0%	464	7.7%	4.69	$9.84	27.1%	$312	442.89
104	825	75.0%	206	6.0%	5.00	$3.99	21.8%	$145	763.83
105	180	75.0%	45	9.0%	3.00	$1.43	21.8%	$38	172.59
106	285	75.0%	71	7.0%	3.00	$2.20	21.8%	$58	271.54
107	125	75.0%	31	9.0%	5.00	$0.65	21.8%	$24	117.35
108	85	76.0%	20	8.0%	2.00	$0.92	21.7%	$18	82.44
109	85	76.0%	20	0.0%	0.25	$6.80	21.7%	$20	84.29
110	650	77.0%	150	7.7%	4.69	$3.17	21.6%	$112	612.18
111	150	77.0%	35	7.5%	2.00	$1.55	21.6%	$30	145.55
112	228	78.0%	50	7.7%	5.00	$1.01	21.5%	$37	214.79
113	220	78.0%	48	7.7%	4.69	$1.03	21.5%	$36	207.83
114	127	78.0%	28	10.0%	3.00	$0.90	21.5%	$24	122.84
115	415	80.0%	83	8.0%	5.00	$1.68	21.3%	$62	393.87
116	250	80.0%	50	8.0%	3.00	$1.57	21.3%	$41	241.44
117	150	80.0%	30	7.0%	3.00	$0.93	21.3%	$24	144.50
118	50	80.0%	10	7.0%	3.00	$0.31	21.3%	$8	48.17
119	25	80.0%	5	8.0%	2.00	$0.23	21.3%	$4	24.39
120	270	81.0%	51	6.0%	3.00	$1.56	21.2%	$41	260.03
121	140	82.0%	25	12.0%	0.58	$3.75	21.1%	$24	139.27
122	105	82.0%	19	7.0%	3.00	$0.58	21.1%	$15	101.58
123	2,400	83.0%	408	9.3%	10.00	$5.23	21.0%	$262	2,254.16
124	600	83.0%	102	7.7%	4.69	$2.16	21.0%	$77	575.10
125	150	83.0%	26	8.0%	2.00	$1.15	21.0%	$22	146.95
126	575	84.0%	92	7.0%	1.00	$7.96	20.9%	$86	568.55
127	1,300	85.0%	195	6.0%	5.00	$3.77	20.8%	$140	1,245.04
128	380	85.0%	57	7.7%	4.69	$1.21	20.8%	$43	366.26
129	250	86.0%	35	7.7%	4.69	$0.74	20.7%	$27	241.61
130	170	88.0%	20	7.7%	4.69	$0.43	20.5%	$16	165.17
131	650	89.0%	72	10.0%	3.00	$2.31	20.4%	$62	640.27
132	230	89.0%	25	9.3%	5.00	$0.53	20.4%	$20	224.49
133	360	90.0%	36	7.7%	4.69	$0.76	20.3%	$28	351.59
134	457	90.0%	46	8.0%	5.00	$0.93	20.3%	$35	446.08
135	215	90.0%	22	9.0%	3.00	$0.68	20.3%	$18	211.83
136	53	95.0%	3	8.0%	1.00	$0.23	19.8%	$2	52.84
137	30	97.0%	1	7.7%	4.69	$0.02	19.6%	$1	29.80
139	254	Average Selling Price							218
140		Decrease in average selling price							14.2%
141		Use Solver to make cell K141 = the value in cell K142 by changing cell I2							0.85806
142		Ratio of cash to terms for SIC Code as a whole							0.85806

Figure 6

ROW	B	C	D	E	F	H	I	J	K
2					**Base Interest Rate**	**0.192622778419087**			
3	**Actual Selling Price**	**% Down**	**Amount Financed**	**Interest Rate**	**Term in Years**	**Monthly Payment**	**Discount Rate**	**Present Value**	**Cash Equivalent Selling Price**
4	273	0	=+B4*(1-C4)	0.0767	4.69472789115646	=PMT(E4/12,F4*12,-D4,,0)	=$I$2+0.1*(1-C4)	=PV(I4/12,F4*12,-H4,,0)	=+J4+B4-D4
5	100	0	=+B5*(1-C5)	0.0767	4.69472789115646	=PMT(E5/12,F5*12,-D5,,0)	=$I$2+0.1*(1-C5)	=PV(I5/12,F5*12,-H5,,0)	=+J5+B5-D5
6	149	0	=+B6*(1-C6)	0.0767	4.69472789115646	=PMT(E6/12,F6*12,-D6,,0)	=$I$2+0.1*(1-C6)	=PV(I6/12,F6*12,-H6,,0)	=+J6+B6-D6
7	175	0	=+B7*(1-C7)	0.0767	4.69472789115646	=PMT(E7/12,F7*12,-D7,,0)	=$I$2+0.1*(1-C7)	=PV(I7/12,F7*12,-H7,,0)	=+J7+B7-D7
8	110	0	=+B8*(1-C8)	0.0767	4.69472789115646	=PMT(E8/12,F8*12,-D8,,0)	=$I$2+0.1*(1-C8)	=PV(I8/12,F8*12,-H8,,0)	=+J8+B8-D8
9	330	0	=+B9*(1-C9)	0.0767	4.69472789115646	=PMT(E9/12,F9*12,-D9,,0)	=$I$2+0.1*(1-C9)	=PV(I9/12,F9*12,-H9,,0)	=+J9+B9-D9
10	250	0	=+B10*(1-C10)	0.0767	4.69472789115646	=PMT(E10/12,F10*12,-D10,,0)	=$I$2+0.1*(1-C10)	=PV(I10/12,F10*12,-H10,,0)	=+J10+B10-D10
11	125	0	=+B11*(1-C11)	0.0767	4.69472789115646	=PMT(E11/12,F11*12,-D11,,0)	=$I$2+0.1*(1-C11)	=PV(I11/12,F11*12,-H11,,0)	=+J11+B11-D11
12	176	0.09	=+B12*(1-C12)	0.0767	4.69472789115646	=PMT(E12/12,F12*12,-D12,,0)	=$I$2+0.1*(1-C12)	=PV(I12/12,F12*12,-H12,,0)	=+J12+B12-D12
13	165	0.09	=+B13*(1-C13)	0.08	10	=PMT(E13/12,F13*12,-D13,,0)	=$I$2+0.1*(1-C13)	=PV(I13/12,F13*12,-H13,,0)	=+J13+B13-D13
14	385	0.12	=+B14*(1-C14)	0.075	10	=PMT(E14/12,F14*12,-D14,,0)	=$I$2+0.1*(1-C14)	=PV(I14/12,F14*12,-H14,,0)	=+J14+B14-D14
15	115	0.13	=+B15*(1-C15)	0.095	5	=PMT(E15/12,F15*12,-D15,,0)	=$I$2+0.1*(1-C15)	=PV(I15/12,F15*12,-H15,,0)	=+J15+B15-D15
16	155	0.15	=+B16*(1-C16)	0	4	=PMT(E16/12,F16*12,-D16,,0)	=$I$2+0.1*(1-C16)	=PV(I16/12,F16*12,-H16,,0)	=+J16+B16-D16
17	325	0.15	=+B17*(1-C17)	0.07	3	=PMT(E17/12,F17*12,-D17,,0)	=$I$2+0.1*(1-C17)	=PV(I17/12,F17*12,-H17,,0)	=+J17+B17-D17
18	245	0.18	=+B18*(1-C18)	0.0767	4.69472789115646	=PMT(E18/12,F18*12,-D18,,0)	=$I$2+0.1*(1-C18)	=PV(I18/12,F18*12,-H18,,0)	=+J18+B18-D18
19	595	0.22	=+B19*(1-C19)	0.0767	4.69472789115646	=PMT(E19/12,F19*12,-D19,,0)	=$I$2+0.1*(1-C19)	=PV(I19/12,F19*12,-H19,,0)	=+J19+B19-D19
104	825	0.75	=+B104*(1-C104)	0.06	5	=PMT(E104/12,F104*12,-D104,,0)	=$I$2+0.1*(1-C104)	=PV(I104/12,F104*12,-H104,,0)	=+J104+B104-D104
105	180	0.75	=+B105*(1-C105)	0.09	3	=PMT(E105/12,F105*12,-D105,,0)	=$I$2+0.1*(1-C105)	=PV(I105/12,F105*12,-H105,,0)	=+J105+B105-D105
106	285	0.75	=+B106*(1-C106)	0.07	3	=PMT(E106/12,F106*12,-D106,,0)	=$I$2+0.1*(1-C106)	=PV(I106/12,F106*12,-H106,,0)	=+J106+B106-D106
107	125	0.75	=+B107*(1-C107)	0.09	5	=PMT(E107/12,F107*12,-D107,,0)	=$I$2+0.1*(1-C107)	=PV(I107/12,F107*12,-H107,,0)	=+J107+B107-D107
108	85	0.76	=+B108*(1-C108)	0.08	2	=PMT(E108/12,F108*12,-D108,,0)	=$I$2+0.1*(1-C108)	=PV(I108/12,F108*12,-H108,,0)	=+J108+B108-D108
109	85	0.76	=+B109*(1-C109)	0	0.25	=PMT(E109/12,F109*12,-D109,,0)	=$I$2+0.1*(1-C109)	=PV(I109/12,F109*12,-H109,,0)	=+J109+B109-D109
110	650	0.77	=+B110*(1-C110)	0.0767	4.69472789115646	=PMT(E110/12,F110*12,-D110,,0)	=$I$2+0.1*(1-C110)	=PV(I110/12,F110*12,-H110,,0)	=+J110+B110-D110
111	150	0.77	=+B111*(1-C111)	0.075	2	=PMT(E111/12,F111*12,-D111,,0)	=$I$2+0.1*(1-C111)	=PV(I111/12,F111*12,-H111,,0)	=+J111+B111-D111
112	228	0.78	=+B112*(1-C112)	0.0767	5	=PMT(E112/12,F112*12,-D112,,0)	=$I$2+0.1*(1-C112)	=PV(I112/12,F112*12,-H112,,0)	=+J112+B112-D112
113	220	0.78	=+B113*(1-C113)	0.0767	4.69472789115646	=PMT(E113/12,F113*12,-D113,,0)	=$I$2+0.1*(1-C113)	=PV(I113/12,F113*12,-H113,,0)	=+J113+B113-D113
114	127	0.78	=+B114*(1-C114)	0.1	3	=PMT(E114/12,F114*12,-D114,,0)	=$I$2+0.1*(1-C114)	=PV(I114/12,F114*12,-H114,,0)	=+J114+B114-D114

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Figure 6 *(continued)*

ROW	B	C	D	E	F	H	I	J	K
2					**Base Interest Rate**	**0.192622778419087**			
3	**Actual Selling Price**	**% Down**	**Amount Financed**	**Interest Rate**	**Term in Years**	**Monthly Payment**	**Discount Rate**	**Present Value**	**Cash Equivalent Selling Price**
115	415	0.8	=+B115*(1-C115)	0.08	5	=PMT(E115/12,F115*12,-D115,,0)	=$I$2+0.1*(1-C115)	=PV(I115/12,F115*12,-H115,,0)	=+J115+B115-D115
116	250	0.8	=+B116*(1-C116)	0.08	3	=PMT(E116/12,F116*12,-D116,,0)	=$I$2+0.1*(1-C116)	=PV(I116/12,F116*12,-H116,,0)	=+J116+B116-D116
117	150	0.8	=+B117*(1-C117)	0.07	3	=PMT(E117/12,F117*12,-D117,,0)	=$I$2+0.1*(1-C117)	=PV(I117/12,F117*12,-H117,,0)	=+J117+B117-D117
118	50	0.8	=+B118*(1-C118)	0.07	3	=PMT(E118/12,F118*12,-D118,,0)	=$I$2+0.1*(1-C118)	=PV(I118/12,F118*12,-H118,,0)	=+J118+B118-D118
119	25	0.8	=+B119*(1-C119)	0.08	2	=PMT(E119/12,F119*12,-D119,,0)	=$I$2+0.1*(1-C119)	=PV(I119/12,F119*12,-H119,,0)	=+J119+B119-D119
120	270	0.81	=+B120*(1-C120)	0.06	3	=PMT(E120/12,F120*12,-D120,,0)	=$I$2+0.1*(1-C120)	=PV(I120/12,F120*12,-H120,,0)	=+J120+B120-D120
121	140	0.82	=+B121*(1-C121)	0.12	0.583333333333333	=PMT(E121/12,F121*12,-D121,,0)	=$I$2+0.1*(1-C121)	=PV(I121/12,F121*12,-H121,,0)	=+J121+B121-D121
122	105	0.82	=+B122*(1-C122)	0.07	3	=PMT(E122/12,F122*12,-D122,,0)	=$I$2+0.1*(1-C122)	=PV(I122/12,F122*12,-H122,,0)	=+J122+B122-D122
123	2400	0.83	=+B123*(1-C123)	0.093	10	=PMT(E123/12,F123*12,-D123,,0)	=$I$2+0.1*(1-C123)	=PV(I123/12,F123*12,-H123,,0)	=+J123+B123-D123
124	600	0.83	=+B124*(1-C124)	0.0767	4.69472789115646	=PMT(E124/12,F124*12,-D124,,0)	=$I$2+0.1*(1-C124)	=PV(I124/12,F124*12,-H124,,0)	=+J124+B124-D124
125	150	0.83	=+B125*(1-C125)	0.08	2	=PMT(E125/12,F125*12,-D125,,0)	=$I$2+0.1*(1-C125)	=PV(I125/12,F125*12,-H125,,0)	=+J125+B125-D125
126	575	0.84	=+B126*(1-C126)	0.07	1	=PMT(E126/12,F126*12,-D126,,0)	=$I$2+0.1*(1-C126)	=PV(I126/12,F126*12,-H126,,0)	=+J126+B126-D126
127	1300	0.85	=+B127*(1-C127)	0.06	5	=PMT(E127/12,F127*12,-D127,,0)	=$I$2+0.1*(1-C127)	=PV(I127/12,F127*12,-H127,,0)	=+J127+B127-D127
128	380	0.85	=+B128*(1-C128)	0.0767	4.69472789115646	=PMT(E128/12,F128*12,-D128,,0)	=$I$2+0.1*(1-C128)	=PV(I128/12,F128*12,-H128,,0)	=+J128+B128-D128
129	250	0.86	=+B129*(1-C129)	0.0767	4.69472789115646	=PMT(E129/12,F129*12,-D129,,0)	=$I$2+0.1*(1-C129)	=PV(I129/12,F129*12,-H129,,0)	=+J129+B129-D129
130	170	0.88	=+B130*(1-C130)	0.0767	4.69472789115646	=PMT(E130/12,F130*12,-D130,,0)	=$I$2+0.1*(1-C130)	=PV(I130/12,F130*12,-H130,,0)	=+J130+B130-D130
131	650	0.89	=+B131*(1-C131)	0.1	3	=PMT(E131/12,F131*12,-D131,,0)	=$I$2+0.1*(1-C131)	=PV(I131/12,F131*12,-H131,,0)	=+J131+B131-D131
132	230	0.89	=+B132*(1-C132)	0.0925	5	=PMT(E132/12,F132*12,-D132,,0)	=$I$2+0.1*(1-C132)	=PV(I132/12,F132*12,-H132,,0)	=+J132+B132-D132
133	360	0.9	=+B133*(1-C133)	0.0767	4.69472789115646	=PMT(E133/12,F133*12,-D133,,0)	=$I$2+0.1*(1-C133)	=PV(I133/12,F133*12,-H133,,0)	=+J133+B133-D133
134	457	0.9	=+B134*(1-C134)	0.08	5	=PMT(E134/12,F134*12,-D134,,0)	=$I$2+0.1*(1-C134)	=PV(I134/12,F134*12,-H134,,0)	=+J134+B134-D134
135	215	0.9	=+B135*(1-C135)	0.09	3	=PMT(E135/12,F135*12,-D135,,0)	=$I$2+0.1*(1-C135)	=PV(I135/12,F135*12,-H135,,0)	=+J135+B135-D135
136	53	0.95	=+B136*(1-C136)	0.08	1	=PMT(E136/12,F136*12,-D136,,0)	=$I$2+0.1*(1-C136)	=PV(I136/12,F136*12,-H136,,0)	=+J136+B136-D136
137	30	0.97	=+B137*(1-C137)	0.0767	4.69472789115646	=PMT(E137/12,F137*12,-D137,,0)	=$I$2+0.1*(1-C137)	=PV(I137/12,F137*12,-H137,,0)	=+J137+B137-D137
139	=AVERAGE(B4:B137)							=AVERAGE(K4:K137)	
140								=(B139-K139)/B139	
141								=+K139/B139	
142								0.858060526363179	