Valuation Strategies

NOVEMBER/DECEMBER 2008

MERGERS AND ACQUISITIONS

COMMERCIAL DAMAGES

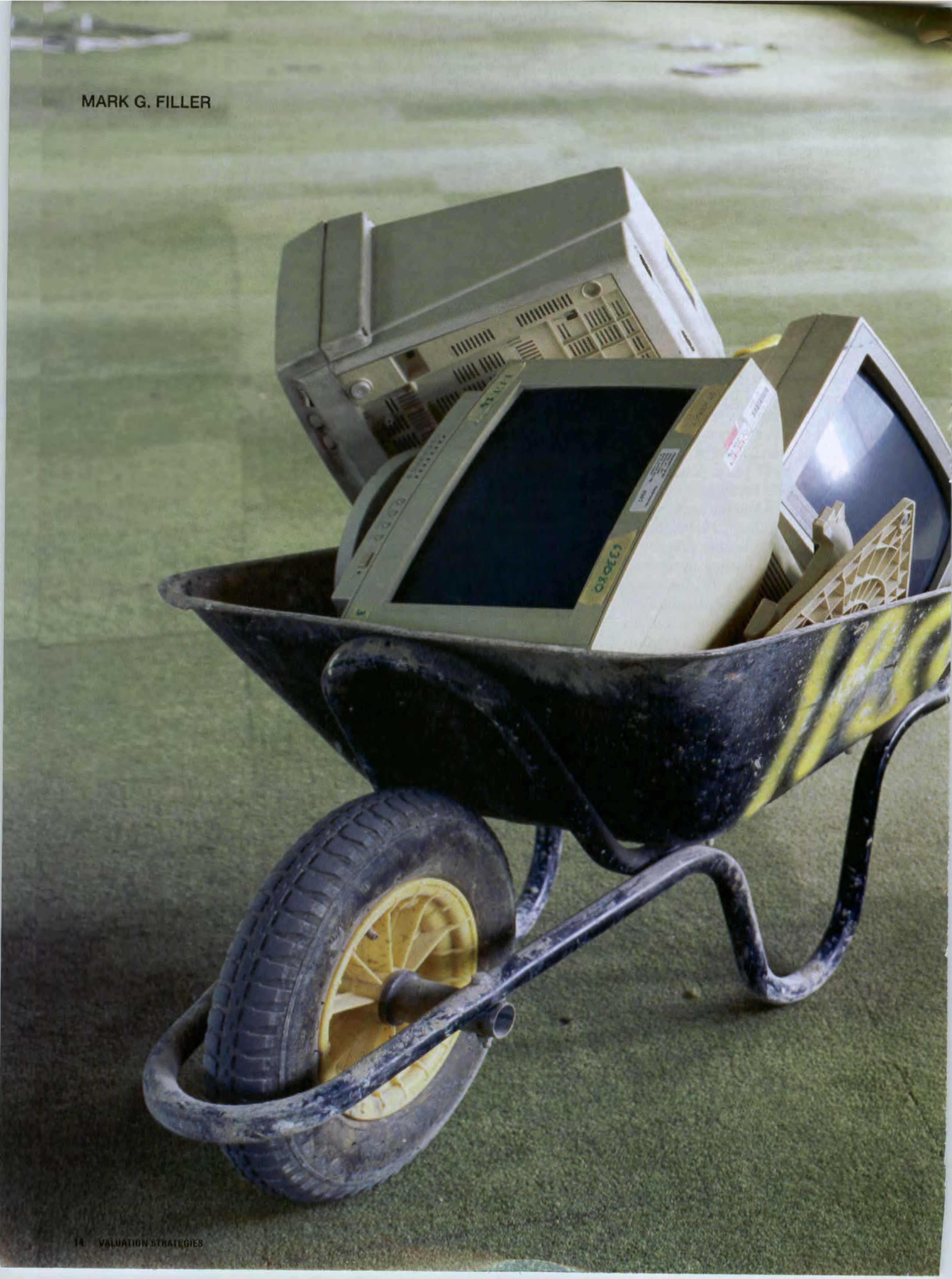
INTELLECTUAL PROPERTY

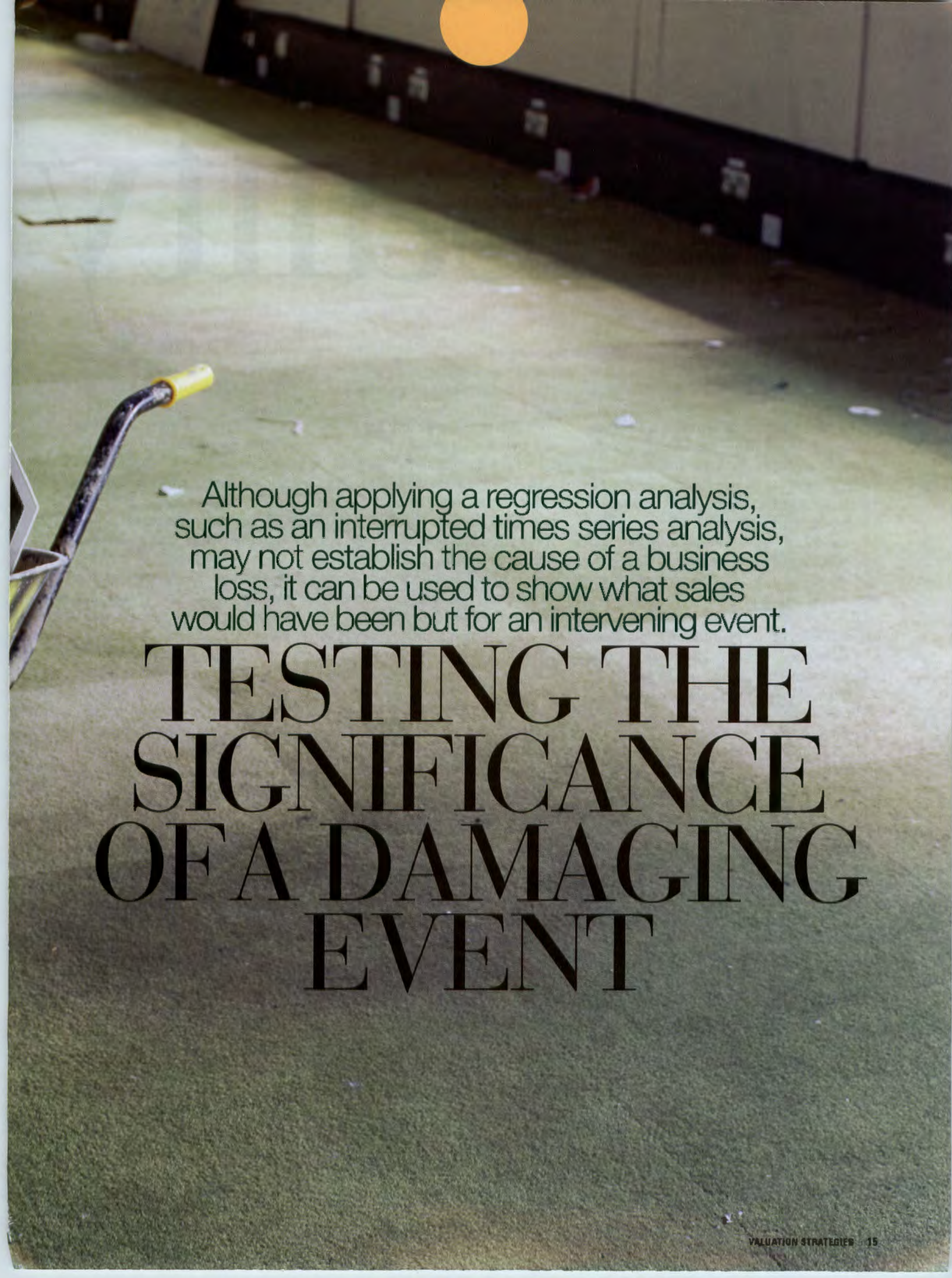
Valuation Strategies

NOVEMBER/DECEMBER 2008
VOLUME 12, NUMBER 2

WG&L

MARK G. FILLER





Although applying a regression analysis, such as an interrupted times series analysis, may not establish the cause of a business loss, it can be used to show what sales would have been but for an intervening event.

TESTING THE SIGNIFICANCE OF A DAMAGING EVENT

The issue of causality

is one of the most critical aspects of a lost profits lawsuit. If the losses of the plaintiff are substantial but it is not conclusive that the actions of the defendant caused those losses, the litigation may be pointless. Statistical techniques can be valuable in demonstrating causation with a reasonable degree of certainty. For example, on the simplest level, statistics can be employed to bolster financial and economic theory used to establish what the sales of the plaintiff would have been had it not been for a specific event, such as the actions of the defendant. This can be done by use of either an explanatory model to establish the closeness of association between sales of the plaintiff and various economic indicators, or by use of time series analysis to discover the pattern or trend in the historical data series and extrapolate that pattern or trend into the future.

In this article, the author demonstrates the application of a particular type of regression analysis known as interrupted time series analysis, which identifies and accounts for a substantive change in the plaintiff's sales volume and relates it to the actions of the defendant. While this might not establish causality, it is, at a minimum, useful to show that the plaintiff's sales varied in a certain way in the past, and that now something has ended that pattern or trend.

The Case

The author's firm was contacted by the attorney for the buyer of a supermarket to measure damages in a lost profits case allegedly caused by the seller's failure to disclose that six months after the closing a competitor would be opening a new market, the Seaside Supermarket, on 3/1/07, just ten miles down the road on State Highway 1. In these types of cases, the first task is to establish that the damaging event actually had a statistically significant impact on the buyer's monthly revenues, and that the decrease in revenue was not the result of mere chance. The process is begun by scheduling actual monthly sales for the Shop 'N Save Supermarket (the purchased supermarket) for the four-year period 2004—2007 on Exhibit 1, and the accompanying line chart on Exhibit 2.

Exhibit 2 shows that sales seem to be level from January 2004 through February 2007, indicating that inflationary increases in selling prices were hiding an actual decrease in volume. To uncover this downward sales trend, the annual sales were inflation-adjusted for the years 2004 through 2006 after monthly sales were inflation adjusted. This is shown on Exhibit 3 and the accompanying line chart on Exhibit 4, The downward trend is presented in tabular form on Exhibit 5, in which both twelve-month periods and ten-month periods are compared to coincide with the period March-December 2007. From examining Exhibits 4 and 5, it is obvious that whatever downward trend existed through 2006 had been greatly accelerated in 2007. While this quickened downward trend appears to be of practical significance (2007 sales are off $222,155, or 4.78%, from 2006), there remains a need to determine if it was also of statistical significance.

To that end a numder of statistical tests were applied. They included the two-sample t-test for means to determine whether a significant difference exists between pre- and post-Seaside-Supermarket-opening sales, and the Chow test (and a variation of the Chow test), which examined the time series of data to see if it contained a structural break due to a change in policy or sudden shock, for example, a stock market crash.[1] All these tests work best when applied to a stream of annual data, but because there was an insufficient number of years' data, the tests were applied to the monthly data that did exist. The results obtained from all three tests did not allow a rejection of the null hypothesis that average monthly sales, both pre- and post-Seaside-Supermarket-opening were equal. As this result belied the information conveyed in Exhibits 4 and 5, the tests' formulae and operations were reviewed, which led to the conclusion that the highly seasonal variation in the data was masking the post-February 2007 variation caused by sales drop-off, and the tests were not robust enough to handle this difference. This would require another test that would be more robust to seasonal variability,[2] which would segregate the different causes of variation and then account for them in a statistical model.

Interrupted Time Series Analysis

This new test, or methodology, is known as interrupted time series analysis (ITSA), which is a specific application of multiple regression analysis. The first element of this multiple regression ITSA model is seasonality, and that element is accounted for with a seasonal index, or factor, rather than as a monthly dummy, or indicator, variable in order to preserve as many degrees of freedom[3] as possible so that the standard error of the estimate[4] will be minimized.

Seasonal indices reflect the average percentage by which observations in

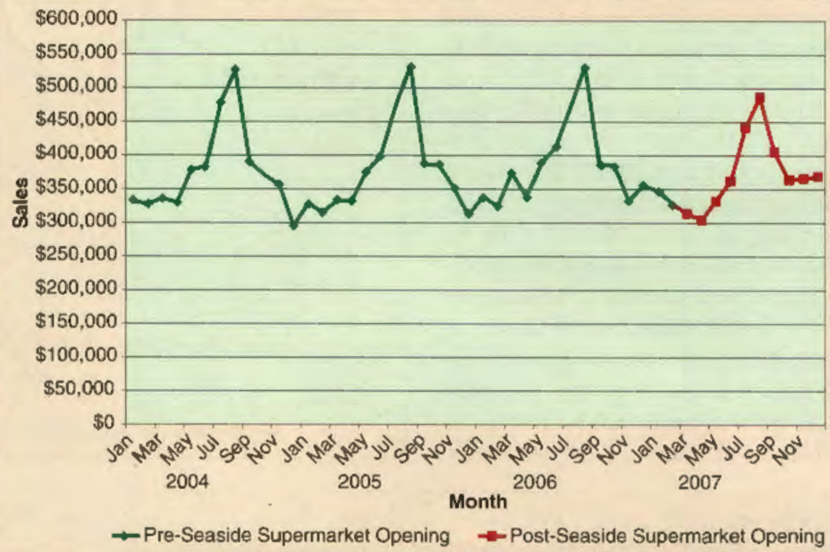
MARK G. FILLER, CPA/ABV, CBA, AM, CVA, is the founder and president of Filler & Associates, P.A., a CPA firm in Portland, Maine. His personal practice focuses on business valuations, measurement of damages for lost profits, and assistance in adjusting business interruption losses.

EXHIBIT 1
Shop 'N Save Supermarket—Schedule of Monthly Sales

	2004	2005	2006	2007
January	$331,907	$329,125	$339,568	$348,258
February	328,219	315,520	324,803	328,217
March	336,306	333,046	374,563*	314,016
April	330,282	333,256	338,934	304,149
May	379,373	376,551	388,314	332,120
June	383,177	398,637	413,383	362,224
July	479,873	472,006	472,006	441,669
August	526,116	533,199	533,199	487,030
September	390,017	387,184	387,184	405,740
October	371,480	385,097	385,097	364,339
November	357,040	353,212	332,903	366,213
December	295,235	312,431	355,482	369,308
Annual Totals	$4,509,026	$4,529,264	$4,645,436	$4,423,281

* Seaside Supermarket opened

EXHIBIT 2
Shop 'N Save Supermarket—Chart of Monthly Sales



Interrupted time series analysis is a specific application of multiple regression analysis.

each "season" (month) differ from their projected trend values. For example, Shop 'n Save's sales in August are above the value predicted using a trend model, while December's sales fall below the value predicted using a trend model. Thus, if seasonal indices are determined that represent the average amount by which observations in a given month fall above or below the trend line, the trend projections can be multiplied by these amounts, which will increase forecast accuracy. In so doing, the procedures set forth in the present author's earlier article in *Valuation Strategies*[5] were followed. That article demonstrates how to refine the seasonal adjustment factors using Excel's Solver add-in to determine simultaneously the optimal values of the seasonal indices and the parameters of the base-line trend model. In developing the seasonal indices for this case, only the 38 months through February 2007 were used, because sales after that date were compromised and would detract from the model's predictive power if included.

The second element to be accounted for in the model is the degree of trend, if any, over the 48-month period, January 2004-December 2007. Variance was analyzed, and the results are shown on Exhibit 6. While seasonali-

EXHIBIT 3
Shop 'N Save Supermarket—Inflation-Adjusted Sales

Year	Actual Sales	CPI	Sales in 2007 $	Growth Rate
2003		184.0		
2004	$4,509,026	188.9	$4,949,235	2.66%
2005	4,529,264	195.3	4,806,534	3.39%
2006	4,645,436	201.6	4,777,748	3.23%
2007	4,423,281	207.3	4,423,281	2.85%

EXHIBIT 4
Shop 'N Save Supermarket—Chart of Inflation-Adjusted Sales

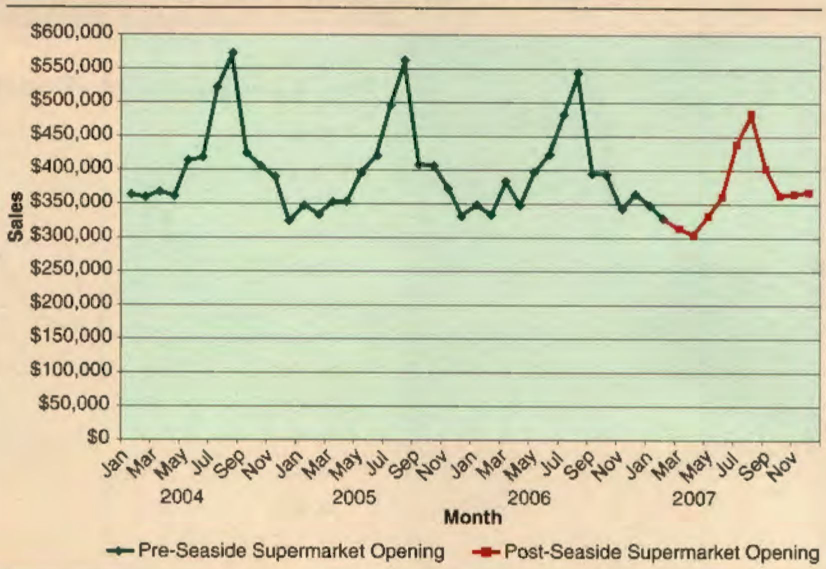


EXHIBIT 5
Shop 'N Save Supermarket—Schedule of Comparative Monthly Sales

	12 Month to 12 Month Comparison			
	Non-Inflation Adjusted		Inflation Adjusted	
	$	% Change	$	% Change
2004	$4,509,026		$4,949,235	
2005	4,529,264	0.45%	4,806,534	-2.84%
2006	4,645,436	2.56%	4,777,748	-0.64%
2007	4,423,281	-4.78%	4,423,281	-7.42%

	10 Month to 10 Month Comparison			
	Non-Inflation Adjusted		Inflation Adjusted	
	$	% Change	$	% Change
2004	$3,848,900		$4,224,662	
2005	3,884,618	0.93%	4,124,140	-2.38%
2006	3,981,065	2.48%	4,094,454	-0.72%
2007	3,746,806	-5.88%	3,746,806	-8.49%

EXHIBIT 6
Shop 'N Save Supermarket—Analysis of Variance—Monthly Sales

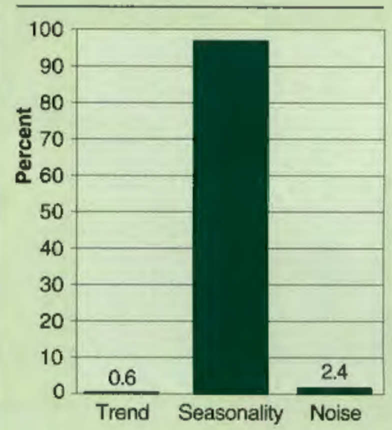


EXHIBIT 7
Shop 'N Save Supermarket—Regression Model for Structural Change—Input Values for All Variables

Month	Actual Sales	TREND	SHIFT	TREND CHANGE	MONTHLY SEASONAL INDEX
January-04	$331,907	1	0	0	88.67%
February-04	328,219	2	0	0	85.13%
March-04	336,306	3	0	0	91.95%
April-04	330,282	4	0	0	88.17%
May-04	379,373	5	0	0	100.52%
June-04	383,177	6	0	0	104.90%
July-04	479,873	7	0	0	124.77%
August-04	526,116	8	0	0	139.41%
September-04	390,017	9	0	0	101.80%
October-04	371,480	10	0	0	99.72%
November-04	357,040	11	0	0	90.97%
December-04	295,235	12	0	0	83.99%
January-05	329,125	13	0	0	88.67%
February-05	315,520	14	0	0	85.13%
March-05	333,046	15	0	0	91.95%
April-05	333,256	16	0	0	88.17%
May-05	376,551	17	0	0	100.52%
June-05	398,637	18	0	0	104.90%
July-05	472,006	19	0	0	124.77%
August-05	533,199	20	0	0	139.41%
September-05	387,184	21	0	0	101.80%
October-05	385,097	22	0	0	99.72%
November-05	353,212	23	0	0	90.97%
December-05	312,431	24	0	0	83.99%
January-06	339,568	25	0	0	88.67%
February-06	324,803	26	0	0	85.13%
March-06	374,563	27	0	0	91.95%
April-06	338,934	28	0	0	88.17%
May-06	388,314	29	0	0	100.52%
June-06	413,383	30	0	0	104.90%
July-06	472,006	31	0	0	124.77%
August-06	533,199	32	0	0	139.41%
September-06	387,184	33	0	0	101.80%
October-06	385,097	34	0	0	99.72%
November-06	332,903	35	0	0	90.97%
December-06	355,482	36	0	0	83.99%
January-07	348,258	37	0	0	88.67%
February-07	328,217	38	0	0	85.13%
March-07	314,016	39	1	1	91.95%
April-07	304,149	40	1	2	88.17%
May-07	332,120	41	1	3	100.52%
June-07	362,224	42	1	4	104.90%
July-07	441,669	43	1	5	124.77%
August-07	487,030	44	1	6	139.41%
September-07	405,740	45	1	7	101.80%
October-07	364,339	46	1	8	99.72%
November-07	366,213	47	1	9	90.97%
December-07	369,308	48	1	10	83.99%

GLOSSARY

***MSE (Mean Squared Error)*—The sum of the squared difference between actual sales and predicted sales divided by the error degrees of freedom. Measures the degree of dispersion in the data set.**

***Degrees of freedom*—Number of data points less the number of regression parameters, including the constant.**

***SEE (Standard Error of the Estimate)*—The square root of the MSE. States the degree of dispersion in terms of the original response, or data set.**

***t statistic*—The x coefficient value divided by its standard error. Indicates how many standard deviations the x coefficient is from zero.**

***p value*—Indicates if the x coefficient is statistically significant at a particular level, i.e., if it is significantly different from zero.**

***COV (Coefficient of Variation)*—The SEE divided by the average of the dependent variables. Allows for comparability of the degree of dispersion among differing data sets, models, etc.**

r^2—The degree of explanatory power of the model. Takes a value between 0 and 1.

***F statistic*—Indicates if the model as a whole is statistically significant.**

***RMSE (Root Mean Square Error)*—A measure of forecast accuracy that has the same advantage as the MSE in that a penalty is assessed to large forecast errors, but, the value of RMSE is comparable in magnitude to other commonly used statistics for forecast accuracy.**

ty is an overwhelming factor, there is still some small amount of trend that needs to be accounted for by assigning the number 1 to the first month in the time series, January 2004, the number 2 to February 2004 and so on, up to the number 48 for the month of December 2007 (TREND column in Exhibit 7).

The next two elements to be accounted for in the model are two possible interventions that occurred starting in March 2007. An intervention occurs when an outside influence at a particular time affects the dependent, or forecast, variable. One of those interventions could have caused a new trend in sales, so starting with March 2007, it was assigned number 1, April 2007 was assigned number 2, and so on up to number 10 for December 2007, with 0 assigned to all other months prior to March 2007 (TREND CHANGE column in Exhibit 7). The second intervention could have caused a shift in sales, either upward or downward, and can be accounted for by the use of a dummy variable consisting of a 0 before March 2007 and a 1 after February 2007 (SHIFT column in Exhibit 7). The resulting regression coefficient will measure the effect of the opening of the Seaside Supermarket if that effect occurred instantly. Otherwise, TREND CHANGE will account for any gradual change in sales, if there was one. The complete regression input model for ITSA is shown on Exhibit 7.

The regression output is shown in Exhibit 8, in which all the metrics indicate a high degree of goodness of fit.[6] Ancillary tests were also run on the residuals (not shown) for normality, homoscedasticty, and lack of serial correlation, all of which the model passed. All of the t-statistics[7] for the variable coefficients are greater than two, and all of their p-values[8] are significant at the 5% level, and TREND CHANGE, SHIFT, AND MONTHLY SEASONAL INDEX are significant at the .000001 level. (There is only one chance in a million that the sample overstates the case.) This means that all of the independent variables are

EXHIBIT 8
Shop 'N Save Supermarket—Regression Model for Structural Change—Summary Output

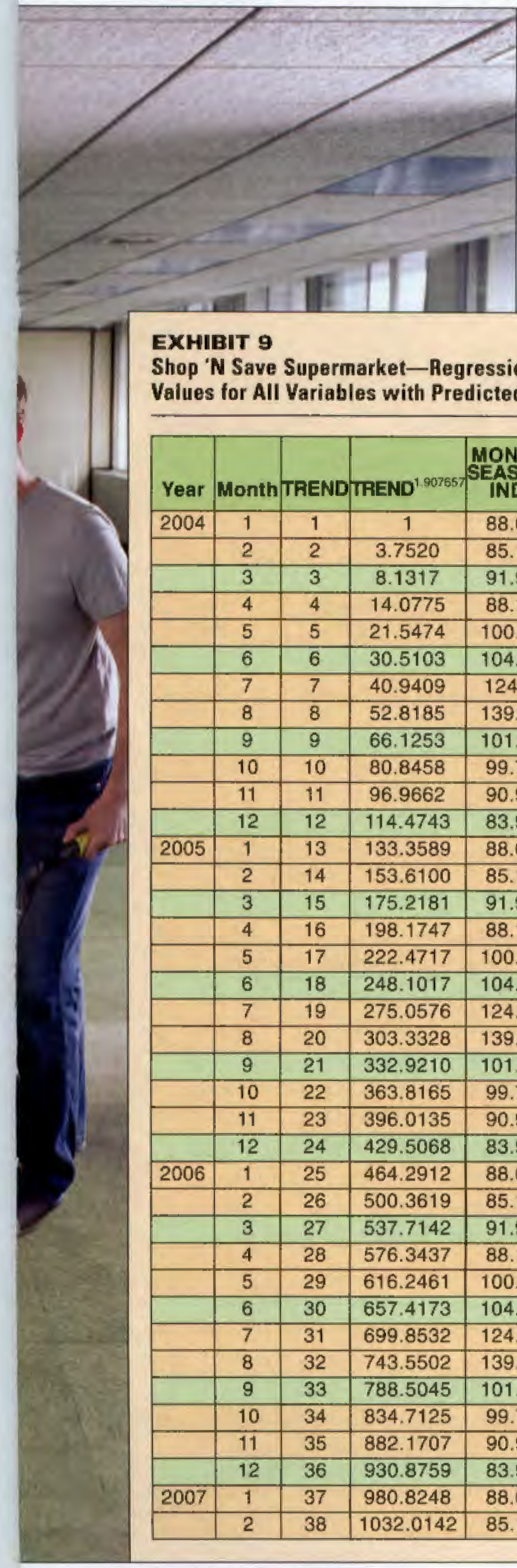
Regression Statistics	
Multiple R	0.9804
R Square	0.9612
Adjusted R Square	0.9576
Standard Error	12,462
Coefficient of Variation	3.30%
Observations	48

ANOVA

	df	SS	MS	F	Significance F
Regression	4	1.65627E+11	41,406,820,611	267	9.6773E-30
Residual	43	6,678,359,721	155,310,691		
Total	47	1.72306E+11			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	10,117	11,957	0.846	0.40214	(13,995)	34,230
Trend	456	184	2.473	0.01743	84	828
Shift	(72,018)	9,411	-7.653	1.478E-09	(90,996)	(53,040)
Trend Change	8,345	1,385	6.026	3.351E-07	5,552	11,137
Monthly Seasonal Index	361,384	11,260	32.094	1.130E-31	338,675	384,092

The effects of a business interruption can be clearest when there is a dramatic change in the revenues of the plaintiff.



statistically significant and bring something to the model, including the two variables that are being specifically tested for, TREND CHANGE and SHIFT.

Interpretation of the regression results is straightforward. The TREND coefficient indicates that the trend line was almost flat up through February 2007. (Sales were increasing at the rate of only $456 per month.) At the time Seaside opened in March 2007, the flat trend line was interrupted, or became discontinuous with an immediate shift downward, with sales dropping off by $72,018 per month. Simultaneously with this downward shift in sales, the trend line changed direction again. Because it immediately began lowering its selling prices, Shop 'n Save was able to begin inducing customers to return to the store, such that the monthly sales trend increased by $8,345 in March 2007, by $16,690 in April 2007, and so on. These increases in the monthly trend served only to offset the monthly downward shift of $72,018 until November 2007, when sales returned to a pre-Seaside level of normality. The full regression equation follows, where y, the dependent variable, is monthly sales:

y = 10,117 + 456 * TREND - 72,018 * SHIFT + 8,345 * TREND CHANGE + 361,384 * MONTHLY SEASONAL INDEX

Having demonstrated that the sales differential that began in March 2007 was not caused by mere chance, next up was predicting what sales should have been during the ten-month period beginning March 2007, absent the opening of Seaside Supermarket. To do this, another regression model was created, this time using 38 months of past data (January 2004-February 2007) so that the ten months beginning March 2007 through December 2007 can be forecasted. This model consists of two independent, or predictor, variables—TREND and SEASONAL INDEX. There is no further need for the SHIFT and TREND CHANGE variables because the occurrences they were controlling for must be ignored in order to predict what sales would have been without them. In other words, including those two variables in the model would only produce what sales were from March-December 2007, which is already known. The model can also be optimized by transforming by exponentiation the dependent variable, sales, and the independent variable, TREND.

EXHIBIT 9

Shop 'N Save Supermarket—Regression Model for Prediction—Input Values for All Variables with Predicted Values Thrown

Year	Month	TREND	$TREND^{1.907657}$	MONTHLY SEASONAL INDEX	Actual Sales	$Actual\ Sales^{1.112839}$	Predicted Sales
2004	1	1	1	88.67%	$331,907	$1,393,172	$330,923
	2	2	3.7520	85.13%	328,219	1,375,955	317,039
	3	3	8.1317	91.95%	336,306	1,413,733	343,878
	4	4	14.0775	88.17%	330,282	1,385,582	329,159
	5	5	21.5474	100.52%	379,373	1,616,608	377,352
	6	6	30.5103	104.90%	383,177	1,634,659	394,380
	7	7	40.9409	124.77%	479,873	2,099,817	470,160
	8	8	52.8185	139.41%	526,116	2,326,188	525,148
	9	9	66.1253	101.80%	390,017	1,667,161	383,049
	10	10	80.8458	99.72%	371,480	1,579,224	375,261
	11	11	96.9662	90.97%	357,040	1,511,062	341,517
	12	12	114.4743	83.99%	295,235	1,222,979	314,441
2005	1	13	133.3589	88.67%	329,125	1,380,184	333,145
	2	14	153.6100	85.13%	315,520	1,316,843	319,567
	3	15	175.2181	91.95%	333,046	1,398,493	346,671
	4	16	198.1747	88.17%	333,256	1,399,473	332,252
	5	17	222.4717	100.52%	376,551	1,603,232	380,676
	6	18	248.1017	104.90%	398,637	1,708,218	397,962
	7	19	275.0576	124.77%	472,006	2,061,540	473,938
	8	20	303.3328	139.41%	533,199	2,361,064	529,140
	9	21	332.9210	101.80%	387,184	1,653,690	387,455
	10	22	363.8165	99.72%	385,097	1,643,775	379,944
	11	23	396.0135	90.97%	353,212	1,493,042	346,519
	12	24	429.5068	83.99%	312,431	1,302,502	319,759
2006	1	25	464.2912	88.67%	339,568	1,429,003	338,695
	2	26	500.3619	85.13%	324,803	1,360,028	325,409
	3	27	537.7142	91.95%	374,563	1,593,816	352,722
	4	28	576.3437	88.17%	338,934	1,426,034	338,594
	5	29	616.2461	100.52%	388,314	1,659,064	387,181
	6	30	657.4173	104.90%	413,383	1,778,681	404,689
	7	31	699.8532	124.77%	472,006	2,061,540	480,785
	8	32	743.5502	139.41%	533,199	2,361,064	536,148
	9	33	788.5045	101.80%	387,184	1,653,690	394,964
	10	34	834.7125	99.72%	385,097	1,643,775	387,723
	11	35	882.1707	90.97%	332,903	1,397,825	354,632
	12	36	930.8759	83.99%	355,482	1,503,726	328,201
2007	1	37	980.8248	88.67%	348,258	1,469,758	347,336
	2	38	1032.0142	85.13%	328,217	1,375,946	334,343

Time series data are rarely linear, infrequently homogeneous as to variance, and not often distributed normally, or even, symmetrically.

This is done because time series data are (1) rarely linear, (2) infrequently homogeneous as to variance, and (3) not often distributed normally, or even, symmetrically. Fortunately, these three problems can be fixed with one procedure, by transforming either or both the independent and dependent variables. This procedure is necessary because data that is not normally distributed is also often neither linear nor homogeneous. Thus, transformation provides a simple way both to fix statistical problems (nonsymmetrical, non-normal, and heterogeneous distributions) and to provide a better fit for curves to data (linear regression). To accomplish this transformation, Excel's Solver function was used to create the two exponents that minimize the mean squared error[9] of the differences between actual sales and predicted sales. The complete regression input model is shown on Exhibit 9.

The regression output is shown in Exhibit 10, in which all the metrics indicate a high degree of goodness of fit. Some ancillary tests were also run on the residuals (not shown) for normality, homoscedasticty, and lack of serial correlation, all of which the model passed. For this model as well, the t-statistics for the variable coefficients are greater than two, and their p-values are significant at the 1% level. All this indicates that the model's predictive powers should be highly accurate.

To test this assumption, Exhibit 11 shows that for the 38-month period, January 2004-February 2007, the lines and data points for actual, forecasted, and predicted sales lie almost on top of each other, demonstrating the goodness of fit for the two regression models for that period. Post-February 2007, the forecasted sales line continues to lie on top of the actual sales line, indicating that the forecast model that controlled for SHIFT and TREND CHANGE continues to have an excellent goodness of fit. The predicted sales line, which is offset from both the actu-

EXHIBIT 10
Shop 'N Save Supermarket—Regression Model for Prediction—Summary Output

Regression Statistics

	Transformed	Back-Transformed
Multiple R	0.9884	0.9880
R Square	0.9769	0.9761
Adjusted R Square	0.9756	0.9747
Standard Error	46,537	9,895
Coefficient of Variation	2.89%	2.62%
Observations	38	38

ANOVA

	df	SS	MS	F	Significance F
Regression	2	3.21077E+12	1.60539E+12	741.2797831	2.24461E-29
Residual	35	75799305573	2165694445		
Total	37	3.28657E+12			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	(234,786)	49,068.91	(4.78)	3.06779E-05	-334401.5316	-135170.9342
$Trend^{1.907657}$	78	23.96	3.27	0.002389765	29.8070898	127.0711506
Seasonal Factor	1,830,656	47,576.69	38.48	3.11014E-30	1734069.788	1927241.637

PREDICTION

Regression Equation:

Forecasted Monthly Sales = $(-234{,}786 + Trend^{1.907657} \times 78 + \text{Seasonal Factor} \times 1{,}830{,}656)^{(1/1.112839)}$

Month	Intercept	Trend	$Trend^{1.907657}$	Seasonal Factor	Transformed Prediction	Back-Transformed $Prediction^{(1/1.112839)}$
Mar-07	(234,786)	39	1084.44	91.95%	1,533,624	$361,827
Apr-07	(234,786)	40	1138.10	88.17%	1,468,508	347,992
May-07	(234,786)	41	1193.00	100.52%	1,698,916	396,686
Jun-07	(234,786)	42	1249.12	104.90%	1,783,516	414,392
Jul-07	(234,786)	43	1306.47	124.77%	2,151,837	490,543
Aug-07	(234,786)	44	1365.04	139.41%	2,424,353	546,025
Sep-07	(234,786)	45	1424.83	101.80%	1,740,627	405,427
Oct-07	(234,786)	46	1485.84	99.72%	1,707,327	398,450
Nov-07	(234,786)	47	1548.07	90.97%	1,551,957	365,711
Dec-07	(234,786)	48	1611.51	83.99%	1,429,258	339,622

1 The two-sample t-test for means compares the averages from two independent samples (pre-Seaside-opening sales and post-Seaside-opening sales) to determine whether a significant difference exists between the two samples. It can be located in Excel's Analysis Toolpak add-in. After loading the add-in, click on Tools, Data Analysis, then scroll down to and select t-Test: Two-Sample Assuming Equal (or Unequal) Variances. The Chow test and its variants are used to determine if the structural break in a data series, which divides the data into two periods, each with distinct characteristics, is statistically significant. Its design and application can be found in any forecasting textbook or on the internet.

2 This means that a particular procedure, model, or test can better sense and account for the variation in the data caused by the opening of Seaside without being thrown off track by the variation in the data caused by seasonality.

EXHIBIT 11
Shop 'N Save Supermarket—Regression Model for Prediction—Chart of Summary Output

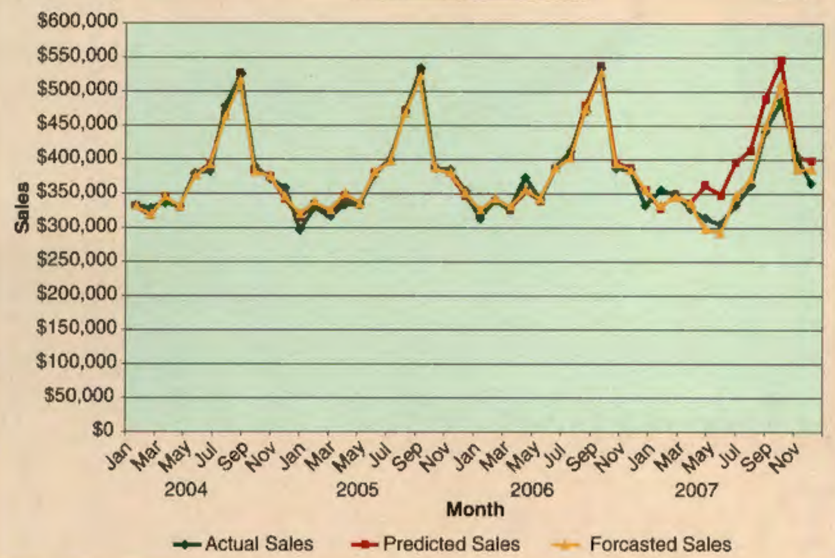


EXHIBIT 12
Shop 'N Save Supermarket—Regression Model for Prediction—Schedule of Lost Profits for 2007

Predicted Month	Sales	Actual Sales	Lost Sales
Mar-07	$361,827	$314,016	$47,811
Apr-07	347,992	304,149	43,843
May-07	396,686	332,120	64,566
Jun-07	414,392	362,224	52,169
Jul-07	490,543	441,669	48,874
Aug-07	546,025	487,030	58,995
Sep-07	405,427	405,740	(313)
Oct-07	398,450	364,339	34,112
Nov-07	365,711	366,213	
Dec-07	339,622	369,308	
Totals	3,746,806	350,056	
Less Saved Cost of Merchandise @ 75.42%			264,012
Lost Gross Profit			86,044
Add Lost Gross Margin on Actual Sales of $3,746,806 @ 2.5%			93,670
Total Lost Profits in 2007			$179,714

al and forecasted sales lines, fills out the eight-month period so that its shape now conforms to that of the prior three years. The chart ends with October 2007, because after that date predicted and actual sales achieve equality. See Exhibit 12 for a table that lays out the actual and predicted sales for the eight-months March 2007—October 2007.

From the lost sales ($350,056), the cost of the merchandise that did not have to be purchased ($264,012) was subtracted, leaving lost gross profit of $86,044. An additional loss for 2007 is the amount of lost gross profit sustained due to the customer-inducing loss leaders. The lowered prices during the last ten months of the year amounted to $93,670, and total lost profits for 2007 amounted to $179,714. Future losses remain to be computed, but will consist of lost gross profit on future sales at the rate of 2.5% due to the continuing need to offer prices lower than the competition.

Conclusion

In its basic form, the effects of a business interruption can be clearest when there is a dramatic change in the revenues of the plaintiff. If the plaintiff's revenues fell dramatically after certain actions by the defendant, plaintiff's counsel may find it easier to convince the trier of fact of the plaintiff's loss and the defendant's culpability though the use of statistical techniques and eye-popping charts created, demonstrated, and explained by the plaintiff's financial expert. ●

3 See glossary in sidebar.

4 *Id.*

5 Filler and DiGabriele, "Short-Term Sales Forecasting Using a Seasonal Adjustment Model," 11 Val. Strat. 6 (May/June 2008).

6 This refers to how good the "fit" of the predicted data is when compared to actual data; i.e., are the differences between fitted and actual data larger or smaller than expected? It is primarily measured by r^2 and the coefficient of variation (SEE/average of the dependent variable).

7 See glossary in sidebar.

8 *Id.*

9 *Id.*