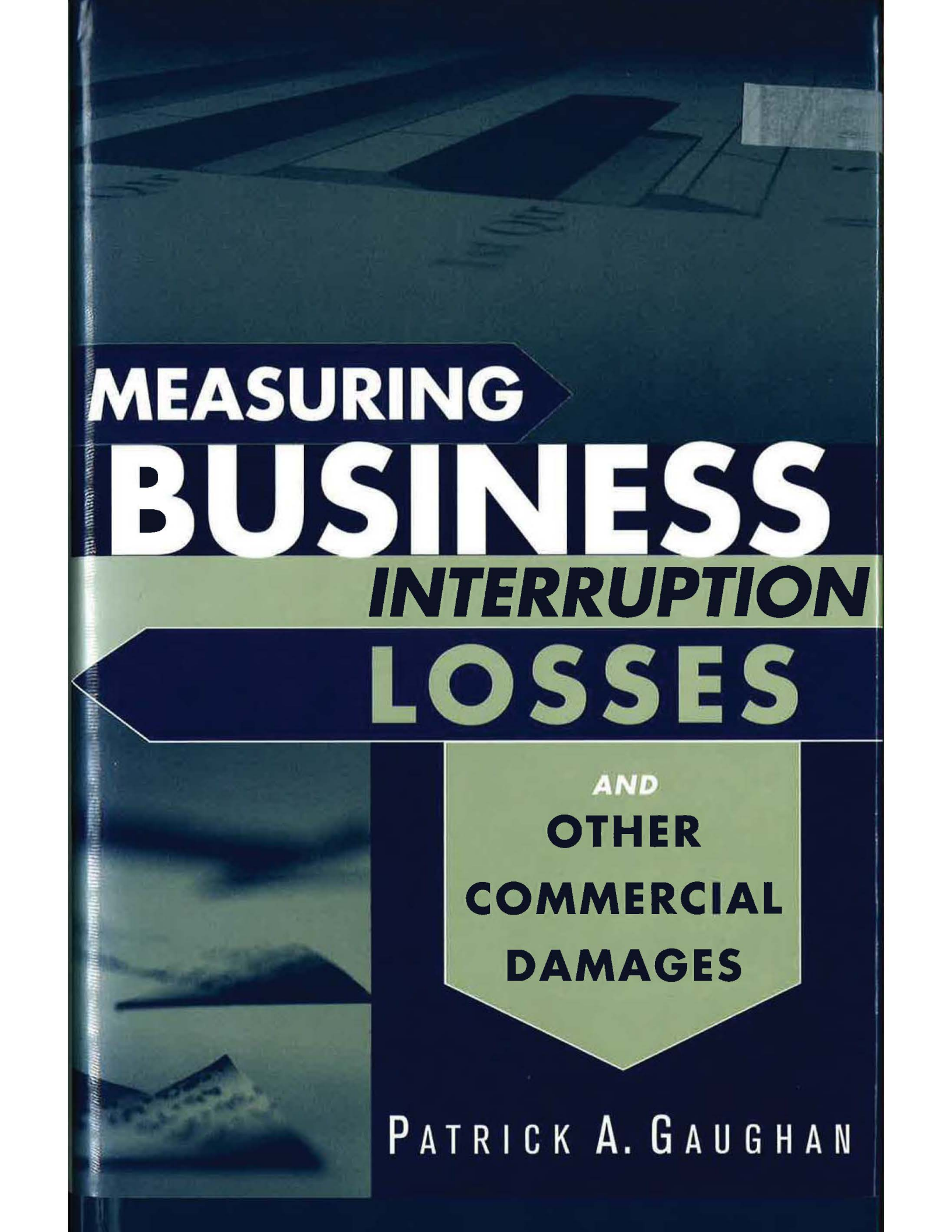

MEASURING BUSINESS INTERRUPTION LOSSES

AND OTHER COMMERCIAL DAMAGES

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Security and Market Returns

The percentage return of security is defined as the combined effects of the income that is received, such as the dividends from a share of stock, and the price changes of the securities (in the form of capital gains or losses). This percentage return has two components, one of which is the dividend yield. It is the component of the return that is attributable to the dividend income.[18] This can be expressed as follows:

$$\text{Dividend Yield} = D_{t+1}/P_t \tag{10.1}$$

The other component of the total return is attributable to the security's price movements; it is called the capital gains return. This is expressed as follows:

$$\text{Capital Gains Yield} = (P_{t+1} - P_t)/P_t \tag{10.2}$$

Both components of a security's return can be combined to form the percentage return of the security. This is shown in Equation 10.3.

$$R_t = \frac{\begin{array}{c}\text{Dividends paid at end of the period} \\ + \text{Change in the market value of the security}\end{array}}{\text{Value of the security at the beginning of the period}} \tag{10.3}$$

The return on the market can be computed in a similar manner using an accepted market proxy such as the Standard & Poor's 500 market index. This index uses the market value of the securities to measure the performance of the market.

COMPARABLE INDEX APPROACH

The comparable index method uses econometric methods to estimate the relationship between a security's return and the return of the market and the industry. The relationship is estimated and used to compute the security's "value." It is then compared to the security's actual price. In order to estimate the relationship, historical return data are gathered for the security, the industry, and the market. This period should be one that excludes the alleged fraud so the estimated relationship is not tainted by the events in question. The decision on the proper period to use

[18]For a discussion of the computation of returns see Stephen Ross, Randolph Westerfield, and Bradford D. Jordan, *Essentials of Corporate Finance,* 4th ed. (Homewood, IL: Irwin/McGraw-Hill, 2004), 290–294.

affects the value of the coefficients $\alpha_0 \ldots \alpha_2$ that are estimated. The estimated function is of the form shown in Equation 10.4.

$$R_{it} = \alpha_0 + \alpha_1 R_{mt} + \alpha_2 R_{It} \tag{10.4}$$

where R_{it} = the return on security i at time t
R_{Mt} = the return on the market at time t
R_{It} = the return on the industry at time t

The difference between the estimated security value and its actual price is sometimes referred to as the damage ribbon or, simply, inflation. This gap reflects the damages incurred by investors. The relationship between a hypothetical price and the value line is depicted graphically in Exhibit 10.1.

Example of the Comparable Index Approach

Assume that historical data have been used to estimate the following equation:

$$R_{it} = .005 + .70R_{mt} + .30R_{It} \tag{10.5}$$

The relationship is applied to the historical market and industry return data to compute the predicted return shown in Table 10.1. It is assumed that the security's value and its price are equal as of the full disclosure date. The value absent the fraud is then computed backwards from the full disclosure date using the predicted return as follows:

$$\text{Security Value}_{t-1} = \frac{\text{Security Value}_t}{(1 + \text{Predicted Return}_{t-1})} \tag{10.6}$$

Once the security value has been computed, the difference between the "but for" value and the actual price can then be computed.

Now assume that the expert is trying to determine a security's value during a ten-day trading period prior to estimating the value line for a nine-day period through day ten. The expert has done some research which shows that the security's return can be explained by a combination of the market return and the industry return. Let us further assume that this research has resulted in the estimation of Equation 10.5.

Using this equation, we can derive the predicted return for each day. The predicted return is then used to retrospectively estimate the value line. For example, the 0.70 percent daily return is "backed out" of the $100 stock price to result in a $99.31 stock value. This value can then be compared to the actual stock price of $103 to result in a daily stock inflation of $103 – $99.31 or $3.69. The stock value