

This statistic, $V(C_{.j})$, is the variance of the industry average over the years and must be carefully differentiated from $V[C_{.j}(t)]$. The variance of the companies about the industry average in any one year is given by:

$$V[C_{.j}(t)] = \frac{n \sum_{i=1}^n [C_{ij}(t)]^2 - \left[\sum_{i=1}^n C_{ij}(t) \right]^2}{n(n-1)}$$

in the equal weight case, and by:

$$V[C_{.j}(t)] = \frac{\frac{\sum_{i=1}^n W_{ij}(t) [C_{ij}(t)]^2}{\sum_{i=1}^n W_{ij}(t)} - [C_{.j}(t)]^2}{\left\{ 1 - \sum_{i=1}^n \left[\frac{W_{ij}(t)}{\sum_{i=1}^n W_{ij}(t)} \right]^2 \right\}}$$

in the case of unequal weights.

The difference between $V(C_{.j})$ and $V[C_{.j}(t)]$ is quite significant for our analysis of interindustry riskiness. Year to year profitability for an entire industry may be quite stable. Yet in any one of those years, the individual companies whose profitabilities are averaged to yield the industry's figure, may be widely distributed about that mean. (That is, $V[C_{.j}(t)]$ may be very much larger than $V(C_{.j})$.) Using the year to year industry variance tends to hide the important company to company variance. The risk of a change in market share facing individual companies is not at all reflected in the time series variance of industry sales of the detergent or automotive industries. Our primary concern in this analysis is the risk as it appears to an individual company. Most scholars, on the other hand, have concentrated on the year to year industry variance.

The $V[C_{.j}(t)]$ calculations will yield a T-element vector, $V_{.j}$, each of whose elements is one year's value of $V[C_{.j}(t)]$. The question then arises how best to summarize this vector (for graphic presentation and interindustry comparisons). One method is to indicate the range of the elements. It would be preferable if some scalar could be used rather than two numbers. Should the elements of $V_{.j}$ prove to be serially uncorrelated, we could construct an estimate of the variance of the underlying process by taking a (weighted) average of the elements.

PART II—SPECIFIC NOTATION

DEFINITIONS AND CALCULATIONS OF RATES OF RETURNS AND VARIANCES FOR COMPANIES AND INDUSTRIES

The specific quantities used in our analyses are outlined below. It should be noted that all measures are derived from the single datum point C_{it} , which is defined in Part I, above, as $C_{ij}(t)$ —the value in year t of any variable for company i (in industry j).

COMPANY

Company value in t :

$$C_{it}$$

Company's average value over time:¹

$$\bar{C}_i = \frac{1}{T} \sum_{t=1}^T C_{it}$$

Company's temporal dispersion:²

$$V(C_{.i}) = \frac{1}{T} \sum_{t=1}^T (C_{it} - \bar{C}_i)^2$$

¹ In Section V this statistic is called Company Return.

² In Section V this statistic is called Company Risk.