

APPENDIX D

REGRESSION ANALYSES

Section V described two regression models:

(I) Industry Return = $a + b_1$ (Industry Risk) + b_2 (Industry Temporal Variance)

(II) Company Return = $a + b_1$ (Company Risk) + b_2 (Industry Risk).

As indicated the description was quite abbreviated and did not detail the full models nor all the relevant statistic. In order to accomplish this, we shall use the notation introduced in Part II of Appendix A.

Before turning to the specific models studied, let us consider a general four variable step-wise regression model:

$$x_1 = a + b_2x_2 + b_3x_3 + b_4x_4$$

In this model x_1 is the "dependent variable," while variables x_2 , x_3 , and x_4 are the "independent variables." Regressing x_1 on x_2 alone would yield the a and b_2 coefficients of the reduced model $x_1 = a + b_2x_2$; regressing x_1 on both x_2 and x_3 would yield a , $b_{2.3}$, and $b_{3.2}$ of the model $x_1 = a + b_2x_2 + b_3x_3$. (The a 's might, of course, be different.) In the following discussion and tables b_2 refers to the coefficient of variable 2 in a two-variable regression, b_3 refers to the coefficient of variable 3 in a two-variable regression (i.e., $x_1 = a + b_3x_3$), $b_{2.3}$ the coefficient of variable 2 in a three-variable regression involving x_3 (i.e., $x_1 = a + b_2x_2 + b_3x_3$) etc.

Reformulating and expanding the models present in Section V we have:

$$(I) \quad \bar{C}_i = a + b_2[\bar{V}_i(C_{it})] + b_3[V(C_{it})] + b_4[V^*(C_{it})]$$

and

$$(II) \quad \bar{C}_i = a + b_2[V(C_{it})] + b_3[\bar{V}_i(C_{it})] + b_4[V(C_{it})].$$

As will be recalled from Appendix A, $\bar{C}_i$ measures the (15 year) average return for an industry, while $\bar{C}_1$ measures the (15 year) average return for a company.

Model I was fitted with 59 observations (one per industry), while Model II was fitted with 766 observations (one per company). Each model was fitted for each of the four basic rates of return—B, B', B'', and M (see Appendix B for definitions).

Tables D-1 and D-2 summarize almost all of the statistics for the various regression steps. In simple regressions ($y = a + bx$) the F statistic serves as a test of significance of both b and R^2 ; in multiple regressions each coefficient has its own F test reported as does the R^2 .