EXHIBIT 7.4 Calculation of Product-Moment Correlation Coefficient

Person	Test Score (X)	Performance Rating (Y)	(X^2)	(Y^2)	(XY)
A	10	2	100	4	20
B	12	1	144	1	12
C	14	2	196	4	28
D	14	1	196	1	14
E	15	3	225	9	45
F	15	4	225	16	60
G	15	3	225	9	45
H	15	4	225	16	60
I	15	4	225	16	60
J	17	3	289	9	51
K	17	4	289	16	68
L	17	3	289	9	51
M	18	2	324	4	36
N	18	4	324	16	72
O	19	3	361	9	57
P	19	3	361	9	57
Q	19	5	361	25	95
R	22	3	484	9	66
S	23	4	529	16	92
T	24	5	576	25	120
	$\Sigma X = 338$	$\Sigma Y = 63$	$\Sigma X^2 = 5948$	$\Sigma Y^2 = 223$	$\Sigma XY = 1109$

$$r = \frac{n\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[n\Sigma X^2 - (\Sigma X)^2]\,[n\Sigma Y^2 - (\Sigma Y)^2]}} = \frac{20\,(1109) - (338)\,(63)}{\sqrt{[20(5948) - (338)^2]\,[20(223) - (63)^2]}} = .58$$

Despite the simplicity of its calculation, there are several notes of caution to sound regarding the correlation.

First, the correlation does not connote a proportion or percentage. An $r = .50$ between variables X and Y does not mean that X is 50% of Y or that Y can be predicted from X with 50% accuracy. However, if the value of r is squared ($r \times r$, or r^2), then that squared value represents the percentage of common variation in the X and Y scores. Thus, one could interpret $r = .50$ as indicating that the two variables share 25% ($.5^2 \times 100$) common variation in their scores. As an example, if X was a test of intelligence and Y was a measure of job performance, then one could say that, of all the reasons why individuals' job performance scores differ, intelligence explains 25% of those differences (hence leaving 75% unexplained and due to other factors).

Second, the value of r is affected by the amount of variation in each set of scores. Other things being equal, the less variation there is in one or both sets of scores, the smaller the calculated value of r will be. At the extreme, if one set of scores has no