Q. Vander Weide Evidence (page 39) – Regarding the CAPM analysis of Dr. Vander Weide, he states (line 24, page 39) that he uses the Ibbotson SBBI 6.6 percent risk premium on the market portfolio which is measured from the difference between the arithmetic mean return on the S&P 500 and the income return on twenty-year Treasury bonds. Please a copy of the Ibbotson SBBI source document to which Dr. Vander Weide refers.

A. As noted in Dr. Vander Weide's evidence, the source of his data is the book, I*bbotson® SBBI 2011® Valuation Edition Yearbook*. This book is copyright protected and may be purchased from Morningstar, or it is typically available in university libraries. As described in Dr. Vander Weide's written evidence, the risk premium value he uses is the Ibbotson® SBBI® 6.6 percent risk premium on the market portfolio, which is measured from the difference between the arithmetic mean return on the S&P 500 (large company stocks) and the income return on long-term (twenty-year) Treasury bonds. A copy of a relevant page from the Ibbotson book, which shows the large company stock total return equal to 11.8 percent and the long-term Government bond income return equal to 5.2 percent, is attached.

Long-term Government Bond Income Return

Table 2-1: Total Returns, Income Returns, and Capital Appreciation of the Basic Asset Classes: Summary Statistics of Annual Returns

Series	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Serial Correlation
Large Company Stocks				
Total Returns	9.8	11.8	20.3	0.02
Income	4.1	4.1	1.6	0.90
Capital Appreciation	5.5	7.4	19.6	0.01
Ibbotson Small Company Stocks				
Total Returns	11.9	16.5	32.5	0.06
Mid-Cap Stocks*				
Total Returns	10.9	13.7	24.8	-0.04
Income	3.9	3.9	1.8	0.90
Capital Appreciation	6.8	9.6	24.1	-0.04
Low-Cap Stocks*				
Total Returns	11.3	15.2	29.2	0.02
Income	3.5	3.6	2.0	0.90
Capital Appreciation	7.6	11.4	28.5	0.01
Micro-Cap Stocks*				
Total Returns	12.0	18.0	38.9	0.07
Income	2.5	2.5	1.7	0.91
Capital Appreciation	9.5	15.4	38.3	0.06
Long-Term Corporate Bonds				
Total Returns	6.1	6.4	8.4	0.08
Long-Term Government Bonds				
Total Returns	5.7	6.1	9.8	-0.11
Income	5.1	5.2	2.6	0.96
Capital Appreciation	0.4	0.8	8.7	-0.23
Intermediate-Term Government Bonds				
Total Returns	5.4	5.5	5.7	0.13
Income	4.6	4.6	2.9	0.96
Capital Appreciation	0.6	0.7	4.6	-0.17
Treasury Bills				
Total Returns	3.6	3.6	3.1	0.91
Inflation	3.0	3.1	4.2	0.64

Data from 1926–2011. Total return is equal to the sum of three component returns: income return, capital appreciation return, and reinvestment return.

*Source: Morningstar and CRSP. Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2012 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

Annual Total Returns

Annual and monthly total returns for large company stocks, small company stocks, long-term corporate bonds, long-term government bonds, intermediate-term government bonds, Treasury bills, and inflation rates are for the full 86-year time period presented in Appendix B. Those tables can be used to compare the performance of each asset class on both a monthly and an annual basis.

Real Rates versus Nominal Rates

The cost of capital embodies a number of different concepts or elements of risk. Two of the most basic concepts in finance are real and nominal returns. The nominal return includes both the real return and the impact of inflation.

The real rate of interest represents the exchange rate between current and future purchasing power. An increase in the real rate indicates that the cost of current consumption has risen in terms of future goods. It is the real rate of interest that measures the opportunity cost of foregoing consumption.

The relationship between real rates and nominal rates can be expressed in the following equation:

$$\text{Real} = \left[\frac{1+\text{Nominal}}{1+\text{Inflation}}\right] - 1$$

$$\text{Nominal} = \left[(1+\text{Real}) \times (1+\text{Inflation})\right] - 1$$

It is important to note that the conversion of nominal and real rates is not an additive process; rather, it is a geometric calculation. The arithmetic sum or difference is calculated by adding or subtracting one number from the other. As illustrated in the above equation, the real rate of return involves taking the geometric difference of the nominal rate of return and the rate of inflation. Conversely, the nominal rate of return can be determined by taking the geometric sum of the real rate of return and the rate of inflation. For example, if the real rate is 2.5 percent and the inflation rate is 5.0 percent, the nominal rate of interest is not 7.5 percent (2.5+5.0) but 7.625 percent, or $[(1.025) \times (1.05) - 1]$. Similarly, if the nominal rate is 7.625 percent and the inflation rate is 2.5 percent, the real rate is not 5.125 percent (7.625−2.5) but 5.0 percent, $[(1.07625/1.025) - 1]$.

Discount rates are most often expressed in nominal terms. That is, they usually have an inflation estimate included in them. Unless stated otherwise, the cost of capital data presented in this book are expressed in nominal terms.