Appendix C
Building Blocks Equity Risk Premium

A.   THE BUILDING BLOCKS MODEL

Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[1] They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings ("P/E") ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment ("INT").[2] This is shown on page 1 of Exhibit JRW-C1. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return components demanded by investors: the historical U.S. Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%), real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small interaction term (0.2%).

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[1] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January 2003).

[2] Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003), p. 11.

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1   The third column in the graph on page 1 of Exhibit JRW-C1 shows current

2   inputs to estimate an ex ante expected market return. These inputs include the

3   following:

4   CPI – To assess expected inflation, I have employed expectations of the short-

5   term and long-term inflation rate.   Long term inflation forecasts are available in the

6   Federal Reserve Bank of Philadelphia's publication entitled *Survey of*

7   *Professional Forecasters*. While this survey is published quarterly, only the first

8   quarter survey includes long-term forecasts of gross domestic product ("GDP")

9   growth, inflation, and market returns. In the first quarter 2013 survey, published

10   on February 15, 2013, the median long-term (10-year) expected inflation rate as

11   measured by the CPI was 2.30% (see Panel A of page 2 of Exhibit JRW-C1).

12   The University of Michigan's Survey Research Center surveys consumers

13   on their short-term (one-year) inflation expectations on a monthly basis.   As

14   shown on page 3 of Exhibit JRW-C1, the current short-term expected inflation

15   rate is 3.1%.

16   As a measure of expected inflation, I will use the average of the long-term

17   (2.3%) and short-term (3.3%) inflation rate measures, or 2.75%.

18

19   D/P – As shown on page 4 of Exhibit JRW-C1, the dividend yield on the S&P

20   500 has fluctuated from 1.0% to almost 3.5% over the past decade. Ibbotson and

21   Chen (2003) report that the long-term average dividend yield of the S&P 500 is

22   4.3%. As of March, 2013, the indicated S&P 500 dividend yield was 2.1%. I will

23   use this figure in my ex ante risk premium analysis.

1   <u>RG</u> – To measure expected real growth in earnings, I use the historical real

2   earnings growth rate S&P 500 and the expected real GDP growth rate. The S&P

3   500 was created in 1960 and includes 500 companies which come from ten

4   different sectors of the economy. On page 5 of Exhibit JRW-C1, real EPS growth

5   is computed using the CPI as a measure of inflation. The real growth figure over

6   1960-2011 period for the S&P 500 is 2.8%.

7   The second input for expected real earnings growth is expected real GDP

8   growth. The rationale is that over the long-term, corporate profits have averaged

9   5.50% of U.S. GDP.[3] Expected GDP growth, according to the Federal Reserve

10   Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.5% (see Panel B

11   of page 2 of Exhibit JRW-C1).

12   Given these results, I will use 2.65%, for real earnings growth.

13   <u>PEGAIN</u> – PEGAIN is the repricing gain associated with an increase in the P/E

14   ratio.   It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000

15   period.   In estimating an ex ante expected stock market return, one issue is

16   whether investors expect P/E ratios to increase from their current levels. The P/E

17   ratios for the S&P 500 over the past 25 years are shown on page 4 of Exhibit

18   JRW-C1. The run-up and eventual peak in P/Es in the year 2000 is very evident

19   in the chart. The average P/E declined until late 2006, and then increased to

20   higher high levels, primarily due to the decline in EPS as a result of the financial

21   crisis and the recession. As of March, 2013, the average P/E for the S&P 500 was

22   14X, which is in line with the historic average. Since the current figure is near the

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[3]Marc. H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14.

1   historic average, a PEGAIN would not be appropriate in estimating an ex ante

2   expected stock market return.

3   Expected Return form Building Blocks Approach - The current expected

4   market return is represented by the last column on the right in the graph entitled

5   "Decomposing Equity Market Returns: The Building Blocks Methodology" set

6   forth on page 1 of Exhibit JRW-C1. As shown, the expected market return of

7   7.50% is composed of 2.75% expected inflation, 2.10% dividend yield, and

8   2.65% real earnings growth rate.

9   This expected return of 7.50% is consistent other expected return

10   forecasts.

11   1. In the first quarter 2013 *Survey of Financial Forecasters*, published on

12   February 15, 2013 by the Federal Reserve Bank of Philadelphia, the

13   median long-term expected return on the S&P 500 was 6.13% (see

14   Panel D of page 2 of Exhibit JRW-C1).

15   2. John Graham and Campbell Harvey of Duke University conduct a

16   quarterly survey of corporate CFOs. The survey is a joint project of

17   Duke University and *CFO Magazine*. In the March 2013 survey, the

18   mean expected return on the S&P 500 over the next ten years was

19   6.13%.[4]

20   **B.   THE BUILDING BLOCKS EQUITY RISK PREMIUM**

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[4] The survey results are available at www.cfosurvey.org.

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Building Blocks Equity Risk Premium

1   The current 30-year U.S. Treasury yield is 3.10%. This ex ante equity risk

2   premium is simply the expected market return from the Building Blocks

3   methodology minus this risk-free rate:

4

5   Ex Ante Equity Risk Premium   =   7.5%   -   3.10%   = 4.40%

6

7   This is only one estimate of the equity risk premium. As shown on page 6

8   of Exhibit JRW-11, I am also using the results of other studies and surveys to

9   determine an equity risk premium for my CAPM.