

1 **Appendix B**

2 **Projected EPS and GDP Growth and the Market Risk Premium**

3

4 **Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT MS. BULKLEY'S**
 5 **MARKET RISK PREMIUM OF 12.49% COMPUTED USING S&P 500 EPS**
 6 **GROWTH RATE IS EXCESSIVE?**

7 A. Beyond my previous discussion of the upwardly biased nature of analysts' projected
 8 earnings per share (EPS) growth rates, the fact is that a long-term EPS growth rate of
 9 11.60% is inconsistent with both historic and projected economic and earnings growth in
 10 the U.S for several reasons: (1) long-term EPS and economic growth is about one-half of
 11 Ms. Bulkley's projected EPS growth rate of 11.60%; (2) as discussed below, long-term
 12 EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as
 13 well as projections of GDP growth, suggest slower economic and earnings growth in the
 14 near future, during the period when the rates from this case will be effective.

15 Long-Term Historic EPS and GDP Growth have been in the 6%-7% Range - I performed
 16 a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500
 17 EPS and dividends per share (DPS) growth since 1960. The results are provided on page
 18 1 of Exhibit JRW-10, and a summary is shown in Table B-1, below.

19 **Table B-1**
 20 **GDP, S&P 500 Stock Price, EPS, and DPS Growth %**
 21 **1960-Present**

Nominal GDP	6.43
S&P 500 Stock Price	7.05
S&P 500 EPS	6.87
<u>S&P 500 DPS</u>	<u>5.91</u>
Average	6.43

23 The results show that the historical long-run growth rates for GDP, S&P EPS, and
24 S&P DPS are in the 6% to 7% range. By comparison, Ms. Bulkley's long-run growth rate
25 projections of 11.60% is at best overstated. Her estimates suggest that companies in the
26 U.S. would be expected to: (1) increase their growth rate of EPS by more than 50% in the
27 future, and (2) maintain that growth indefinitely in an economy that is currently expected
28 to grow at about one-third of Ms. Bulkley's projected growth rates.

29 There is a Direct Link Between Long-Term EPS and GDP Growth - The results in Exhibit
30 JRW-10 and Table 6 show that historically there has been a close link between long-term
31 EPS and GDP growth rates. Brad Cornell of the California Institute of Technology
32 published a study on GDP growth, earnings growth, and equity returns. He finds that long-
33 term EPS growth in the U.S. is directly related to GDP growth, with GDP growth providing
34 an upward limit on EPS growth. In addition, he finds that long-term stock returns are
35 determined by long-term earnings growth. He concludes with the following observations:¹

36 The long-run performance of equity investments is fundamentally
37 linked to growth in earnings. Earnings growth, in turn, depends on
38 growth in real GDP. This article demonstrates that both theoretical
39 research and empirical research in development economics suggest
40 relatively strict limits on future growth. In particular, real GDP
41 growth in excess of 3 percent in the long run is highly unlikely in
42 the developed world. In light of ongoing dilution in earnings per
43 share, this finding implies that investors should anticipate real
44 returns on U.S. common stocks to average no more than about 4–5
45 percent in real terms.

46 The Trend and Projections Indicate Slower GDP Growth in the Future - The components
47 of nominal GDP growth are real GDP growth and inflation. Page 3 of Exhibit JRW-10

¹ Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February 2010), p. 63.

48 shows annual real GDP growth rate over the 1961 to 2019 time period. Real GDP growth
49 has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range
50 during the most recent five-year period. The second component of nominal GDP growth
51 is inflation. Page 4 of Exhibit JRW-10 shows inflation as measured by the annual growth
52 rate in the Consumer Price Index (CPI) over the 1961 to 2019 time period. The large
53 increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident
54 is the rapid decline in inflation during the 1980s as inflation declined from above 10% to
55 about 4%. Since that time, inflation has gradually declined and has been in the 2.0% range
56 or below over the past five years.

57 The graphs on pages 2, 3, and 4 of Exhibit JRW-10 provide clear evidence of the
58 decline, in recent decades, in nominal GDP as well as its components, real GDP and
59 inflation. To gauge the magnitude of the decline in nominal GDP growth, Table B-2,
60 below, provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years.
61 Whereas the 50-year compounded GDP growth rate is 6.28%, there has been a monotonic and
62 significant decline in nominal GDP growth over subsequent 10-year intervals. These figures
63 strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in
64 the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

65 **Table B-2**
66 **Historical Nominal GDP Growth Rates**

10-Year Average	4.02%
20-Year Average	4.08%
30-Year Average	4.55%
40-Year Average	5.39%
50-Year Average	6.28%

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73 Long-Term GDP Projections also Indicate Slower GDP Growth in the Future - A lower
74 range is also consistent with long-term GDP forecasts. There are several forecasts of
75 annual GDP growth that are available from economists and government agencies. These
76 are listed in Panel B of on page 5 of Exhibit JRW-10. The mean 10-year nominal GDP
77 growth forecast (as of March 2020) by economists in the recent *Survey of Financial*
78 *Forecasters* is 4.30%.² The Energy Information Administration (“EIA”), in its projections
79 used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.2% for
80 the period 2019-2050.³ The Congressional Budget Office (“CBO”), in its forecasts for the
81 period 2019 to 2029, projects a nominal GDP growth rate of 3.8%.⁴ Finally, the Social
82 Security Administration (“SSA”), in its Annual OASDI Report, provides a projection of
83 nominal GDP from 2020-2095.⁵ SSA’s projected growth GDP growth rate over this period
84 is 4.1%. Overall, these forecasts suggest long-term GDP growth rate in the 4.0% - 4.3%
85 range. The trends and projections indicating slower GDP growth make Ms. Bulkley’s
86 market risk premium of 12.49%, which is computed by using a growth rate of 11.60% from
87 analysts’ EPS growth projections, look even more unrealistic. Simply stated, Ms.
88 Bulkley’s projected EPS growth rate of 11.60% is almost three times projected GDP
89 growth.

² <https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/>

³ U.S. Energy Information Administration, *Annual Energy Outlook 2020*, Table: Macroeconomic Indicators..

⁴ Congressional Budget Office, *The 2020 Long-Term Budget Outlook*, June 25, 2020.

⁵ Social Security Administration, *2020 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, (July 1, 2020), The 4.1% growth rate is the growth in projected GDP from \$22,341 trillion in 2020 to \$450,425 trillion in 2095.

90 **Q. WHAT ARE THE FUNDAMENTAL FACTORS THAT HAVE LED TO THE**
91 **DECLINE IN PROSPECTIVE GDP GROWTH?**

92 A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real
93 GDP growth over time: (a) the number of workers in the economy (employment); and (2)
94 the productivity of those workers (usually defined as output per hour).⁶ According to
95 McKinsey, real GDP growth over the past 50 years was driven by population and
96 productivity growth which grew at compound annual rates of 1.7% and 1.8%, respectively.

97 However, global economic growth is projected to slow significantly in the years to
98 come. The primary factor leading to the decline is slow growth in employment (working-
99 age population), which results from slower population growth and longer life expectancy.
100 McKinsey estimates that employment growth will slow to 0.3% over the next fifty years.
101 They conclude that even if productivity remains at the rapid rate of the past fifty years of
102 1.8%, real GDP growth will fall by 40 percent to 2.1%.

103 **Q. PLEASE PROVIDE MORE INSIGHTS INTO THE RELATIONSHIP BETWEEN**
104 **S&P 500 EPS AND GDP GROWTH.**

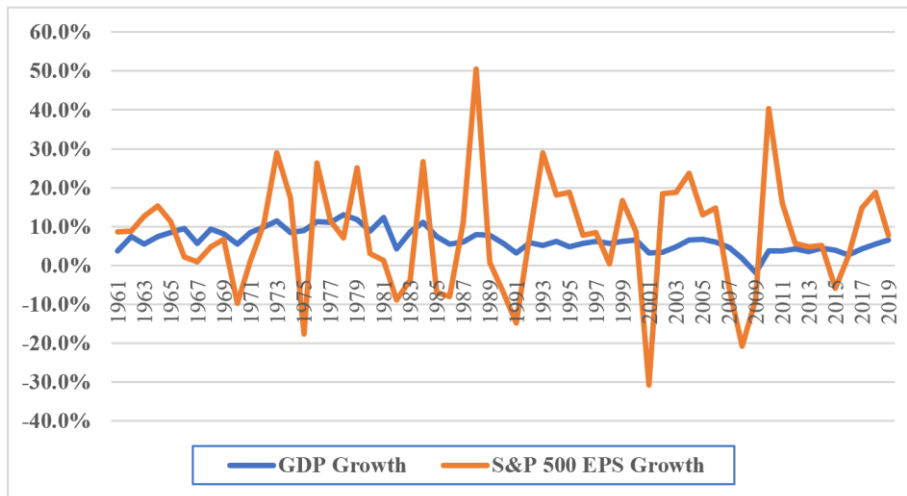
105 A. Figure B-1 shows the average annual growth rates for GDP and the S&P 500 EPS since
106 1960. The one very apparent difference between the two is that the S&P 500 EPS growth
107 rates are much more volatile than the GDP growth rates, when compared using the
108 relatively short, and somewhat arbitrary, annual conventions used in these data.⁷ Volatility

⁶ McKinsey & Co., “Can Long-Term Growth be Saved?”, McKinsey Global Institute, (Jan. 2015).

⁷ Timing conventions such as years and quarters are needed for measurement and benchmarking but are somewhat arbitrary. In reality, economic growth and profit accrual occur on continuous bases. A 2014 study evaluated the timing relationship between corporate profits and nominal GDP growth. The authors found that aggregate accounting earnings growth is a leading indicator of the GDP growth with a quarter-ahead forecast horizon. See Yaniv Konchitchki and Panos N. Patatoukas, “Accounting Earnings and Gross Domestic Product,” *Journal of Accounting and Economics* 57 (2014), pp. 76–88.

109 aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not
110 outpace GDP growth.

111 **Figure B-1**
112 **Average Annual Growth Rates**
113 **GDP and S&P 500 EPS**
114 **1960-2019**



115
116 Data Sources: GDPA - <http://research.stlouisfed.org/fred2/series/GDPA/downloaddata>.
117 S&P EPS - <http://pages.stern.nyu.edu/~adamodar/>

118 A fuller understanding of the relationship between GDP and S&P 500 EPS growth
119 requires consideration of several other factors.

120 Corporate Profits are Constrained by GDP – Milton Friedman, the noted economist,
121 warned investors and others not to expect corporate profit growth to sustainably exceed
122 GDP growth, stating, “Beware of predictions that earnings can grow faster than the
123 economy for long periods. When earnings are exceptionally high, they don’t just keep
124 booming.”⁸ Friedman also noted in the same *Fortune* interview that profits must move
125 back down to their traditional share of GDP. In Table B-3 below, I show that currently the

⁸ Shaun Tully, “Corporate Profits Are Soaring. Here’s Why It Can’t Last,” *Fortune*, (Dec. 7, 2017), <http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/>.

126 aggregate net income levels for the S&P 500 companies, using 2019 figures, represent
 127 6.53% of nominal GDP.

128 **Table B-3**
 129 **S&P 500 Aggregate Net Income as a Percent of GDP**

	\$ Billion
Aggregate Net Income for S&P 500	\$1,399.46
2019 Nominal U.S. GDP	\$21,427.10
Net Income/GDP (%)	6.53%

130
 131 Data Sources: 2019 Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
 132 2019 Nominal GDP – Moody’s - <https://www.economy.com/united-states/nominal-gross-domestic-product>.

133 Short-Term Factors Impact S&P 500 EPS – The growth rates in the S&P 500 EPS and
 134 GDP can diverge on a year-to-year basis due to short-term factors that impact S&P 500
 135 EPS in a much greater way than GDP. As shown above in Figure B-1, S&P EPS growth
 136 rates are much more volatile than GDP growth rates. The EPS growth for the S&P 500
 137 companies has been influenced by low labor costs and interest rates, commodity prices, the
 138 recovery of different sectors such as the energy and financial sectors, the cut in corporate
 139 tax rates, etc. These short-term factors can make it appear that there is a disconnect
 140 between the economy and corporate profits.

141 The Differences Between the S&P 500 EPS and GDP – In the last two years, as the EPS
 142 for the S&P 500 has grown at a faster rate than U.S. nominal GDP, some have pointed to
 143 the differences between the S&P 500 and GDP.⁹ These differences include: (a) corporate
 144 profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer
 145 discretionary spending accounts for a smaller share of S&P 500 profits (15%) than of GDP

⁹ See the following studies: Burt White and Jeff Buchbinder, “The S&P and GDP are not the Same Thing,” LPL Financial, (Nov. 4, 2014), <https://www.businessinsider.com/sp-is-not-gdp-2014-11>; Matt Comer, “How Do We Have 18.4% Earnings Growth In A 2.58% GDP Economy?,” Seeking Alpha, (Apr. 2018), https://seekingalpha.com/article/4164052-18_4-percent-earnings-growth-2_58-percent-gdp-economy; Shaun Tully, “How on Earth Can Profits Grow at 10% in a 2% Economy?,” Fortune, (July 27, 2017), <http://fortune.com/2017/07/27/profits-economic-growth/>.

146 (23%); (c) corporate profits are more international-trade driven, while exports minus
147 imports tend to drag on GDP; and (d) S&P 500 EPS is impacted not just by corporate
148 profits but also by share buybacks on the positive side (fewer shares boost EPS) and by
149 share dilution on the negative side (new shares dilute EPS). While these differences may
150 seem significant, it must be remembered that the Income Approach to measure GDP
151 includes corporate profits (in addition to employee compensation and taxes on production
152 and imports) and therefore effectively accounts for the first three factors.¹⁰

153 The bottom line is that despite the intertemporal short-term differences between
154 S&P 500 EPS and nominal GDP growth, the long-term link between corporate profits and
155 GDP is inevitable.

156 **Q. PLEASE PROVIDE ADDITIONAL EVIDENCE ON HOW UNREALISTIC THE**
157 **S&P 500 EPS GROWTH RATE IS THAT MS. BULKLEY USES TO COMPUTE**
158 **HER MARKET RISK PREMIUM.**

159 A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS
160 and GDP growth in Table 8 below. Specifically, I started with the 2019 aggregate net
161 income for the S&P 500 companies and 2019 nominal GDP for the U.S. As shown in
162 Table 8, the aggregate profit for the S&P 500 companies represented 6.53% of nominal
163 GDP in 2019. In Table B-4, I then projected the aggregate net income level for the S&P
164 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500
165 companies, I used Ms. Bulkley's projected S&P 500 EPS growth rate of 11.60%. As a

¹⁰ The Income Approach to measuring GDP includes wages, salaries, and supplementary labor income, corporate profits, interest and miscellaneous investment income, farmers' incomes, and income from non-farm unincorporated businesses

166 growth rate for nominal GDP, I used the average of the long-term projected GDP growth
 167 rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.1%, and 4.0%), which is 4.09%. The
 168 projected 2050 level for the aggregate net income level for the S&P 500 companies is \$42.0
 169 trillion. However, over the same period GDP grows to \$78.7 trillion. As such, if the
 170 aggregate net income for the S&P 500 grows in accordance with the growth rate used by
 171 Ms. Bulkley, and if nominal GDP grows at rates projected by major government agencies,
 172 the net income of the S&P 500 companies will represent growth from 6.53% of GDP in
 173 2019 to 56.61% of GDP in 2050. Obviously, it is implausible for the net income of the
 174 S&P 500 to become almost 50% of GDP.

175 **Table B-4**
 176 **Projected S&P 500 Earnings and Nominal GDP**
 177 **2019-2050**
 178 **S&P 500 Aggregate Net Income as a Percent of GDP**

	2019	Growth	No. of	2050
	\$ Billion	Rate	Years	Value
Aggregate Net Income for S&P 500	\$1,399.46	11.60%	31	\$42,029.14
Nominal U.S. GDP	\$21,427.10	4.09%	31	\$74,240.80
Net Income/GDP (%)	6.53%			56.61%

179
 180 Data Sources: 2019 Aggregate Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
 181 2019 Nominal GDP – Moody’s - <https://www.economy.com/united-states/nominal-gross-domestic-product>.
 182 S&P 500 EPS Growth Rate - Ms. Bulkley’s projected S&P 500 growth rate of 11.60%;
 183 Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from SFF, CBO, SSA, and
 184 EIA (4.3%, 3.8%, 4.0%, and 4.1%).

185
 186 **Q. PLEASE PROVIDE A SUMMARY ANALYSIS ON GDP AND S&P 500 EPS**
 187 **GROWTH RATES.**

188 A. As noted above, the long-term link between corporate profits and GDP is inevitable. The
 189 short-term differences in growth between the two has been highlighted by some notable
 190 market observers, including Warren Buffet, who indicated that corporate profits as a share

191 of GDP tend to go far higher after periods where they are depressed, and then drop sharply
192 after they have been hovering at historically high levels. In a famous 1999 *Fortune* article,
193 Mr. Buffet made the following observation:¹¹

194 You know, someone once told me that New York has more lawyers
195 than people. I think that's the same fellow who thinks profits will
196 become larger than GDP. When you begin to expect the growth of a
197 component factor to forever outpace that of the aggregate, you get
198 into certain mathematical problems. In my opinion, you have to be
199 wildly optimistic to believe that corporate profits as a percent of
200 GDP can, for any sustained period, hold much above 6%. One thing
201 keeping the percentage down will be competition, which is alive and
202 well. In addition, there's a public-policy point: If corporate
203 investors, in aggregate, are going to eat an ever-growing portion of
204 the American economic pie, some other group will have to settle for
205 a smaller portion. That would justifiably raise political problems –
206 and in my view a major reslicing of the pie just isn't going to happen.

207 In sum, Ms. Bulkley's long-term S&P 500 EPS growth rate of 11.60% is grossly
208 overstated and has no basis in economic reality. In the end, the big question remains as to
209 whether corporate profits can grow faster than GDP. Jeremy Siegel, the renowned finance
210 professor at the Wharton School of the University of Pennsylvania, believes that going
211 forward, earnings per share can grow about half a point faster than nominal GDP, or about
212 5.0%, due to the big gains in the technology sector. But he also believes that sustained
213 EPS growth matching analysts' near-term projections is absurd: "The idea of 8% or 10%
214 or 12% growth is ridiculous. It will not happen."¹²

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¹¹ Carol Loomis, "Mr. Buffet on the Stock Market," *Fortune*, (Nov. 22, 1999), https://money.cnn.com/magazines/fortune/fortune_archive/1999/11/22/269071/.

¹² Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," *Fortune*, (Dec. 7, 2017), <http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/>.