

**BEFORE THE WASHINGTON
UTILITIES & TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,

Complainant,

v.

CASCADIA WATER, LLC.

Respondent.

DOCKET UW-240151

**DAVID J. GARRETT
ON BEHALF OF THE
WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL
PUBLIC COUNSEL UNIT**

EXHIBIT DJG-1T

APPENDIX A

November 20, 2024

APPENDIX A:

DISCOUNTED CASH FLOW MODEL THEORY

The Discounted Cash Flow (“DCF”) Model is based on a fundamental financial model called the “dividend discount model,” which maintains that the value of a security is equal to the present value of the future cash flows it generates. Cash flows from common stock are paid to investors in the form of dividends. There are several variations of the DCF Model. In its most general form, the DCF Model is expressed as follows:¹

**Equation 1:
General Discounted Cash Flow Model**

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

where: P_0 = current stock price
 $D_1 \dots D_n$ = expected future dividends
 k = discount rate / required return

The General DCF Model would require an estimation of an infinite stream of dividends. Since this would be impractical, analysts use more feasible variations of the General DCF Model, which are discussed further below.

The DCF Models rely on the following four assumptions:

1. Investors evaluate common stocks in the classical valuation framework; that is, they trade securities rationally at prices reflecting their perceptions of value;
2. Investors discount the expected cash flows at the same rate (K) in every future period;

¹ See Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 410 (9th ed., McGraw-Hill/Irwin 2013).

3. The K obtained from the DCF equation corresponds to that specific stream of future cash flows alone; and
4. Dividends, rather than earnings, constitute the source of value.

The General DCF can be rearranged to make it more practical for estimating the cost of equity. Regulators typically rely on some variation of the Constant Growth DCF Model, which is expressed as follows:

**Equation 2:
Constant Growth Discounted Cash Flow Model**

$$K = \frac{D_1}{P_0} + g$$

where:

<i>K</i>	=	<i>discount rate / required return on equity</i>
<i>D₁</i>	=	<i>expected dividend per share one year from now</i>
<i>P₀</i>	=	<i>current stock price</i>
<i>g</i>	=	<i>expected growth rate of future dividends</i>

Unlike the General DCF Model, the Constant Growth DCF Model solves directly for the required return (K). In addition, by assuming that dividends grow at a constant rate, the dividend stream from the General DCF Model may be essentially substituted with a term representing the expected constant growth rate of future dividends (g). The Constant Growth DCF Model may be considered in two parts. The first part is the dividend yield (D_1/P_0), and the second part is the growth rate (g). In other words, the required return in the DCF Model is equivalent to the dividend yield plus the growth rate.

In addition to the four assumptions listed above, the Constant Growth DCF Model relies on four additional assumptions as follows:²

² *Id.* at 254-56.

1. The discount rate (K) must exceed the growth rate (g);
2. The dividend growth rate (g) is constant in every year to infinity;
3. Investors require the same return (K) in every year; and
4. There is no external financing; that is, growth is provided only by the retention of earnings.

Because the growth rate in this model is assumed to be constant, it is important not to use growth rates that are unreasonably high. In fact, the constant growth rate estimate for a regulated utility with a defined service territory should not exceed the growth rate for the economy in which it operates.