

Total shares are 50,000,000,000

These shares need to be divided until the 50th year

The initial shares were 20,000,000 which gains dividends per month

Now the total shares to be distributed in the remaining 50 years is

$$50,000,000,000 - 20,000,000 = 49,980,000,000$$

Total months in 50 years = 600 months

Let's assume that the dividends are growing at a constant rate for the 600 months until 49980,000,000 gets exhausted. Let's determine the rate

Let  $c$  be the rate of the growth, and  $d$  be the dividend to be issued

Let's use the following formula;

$$D(1 + c)^{600} = 4.998 \times 10^{10}$$

$$10,000,000(1 + c)^{600} = 49980,000,000$$

$$(1 + c)^{600} = 4998$$

$$= 600 \log(1 + c) = \log 4998$$

$$= 600 \log(1 + c) = 3.698796254 \quad // \text{ Divide both sides by 600}$$

$$= \log(1 + c) = 0.00616466042 \quad // \text{ Find antilogarithm of both sides}$$

$$= 1 + c = 1.014296$$

$$C = 0.014296 \quad // \text{ convert into percentage}$$

$$C = 1.43\%$$

Our  $c$  should be greater or equal to 1.5%

Therefore, dividend need to change in order to achieve this

$$\text{From, our formula } D(1 + c)^{600} = 4.998 \times 10^{10}$$

Letting  $c$  be 1.5% let's find  $D$

$$D(1 + 0.015)^{600} = 4.998 \times 10^{10}$$

$$D(1.015)^{600} = 4.998 \times 10^{10}$$

$$D(7579.2346) = 4.998 \times 10^{10} \quad // \text{ Divide both sides by 7579.2346}$$

$$D = 6594333$$

The initial dividend should be 6594333 which is to increase by 1.5% monthly for 50 years.