

# Dividend Discount Models

DDM > OVERVIEW > DDM PREMISE

## How Firms Return Cash to Shareholders

There are two primary ways companies return cash to shareholders after they generate profits:

- **Dividends:** Direct cash payments made to shareholders. Represent a portion of the company's earnings.
- **Stock Buybacks:** When companies repurchase their own shares, reducing the share count and increasing the ownership percentage for remaining shareholders.

Both are optional. But larger/established companies with less growth potential regularly payout and grow their dividends, as well as perform buybacks to increase value for their shareholders.

## DDM Premise

**Dividend discount model (DDM)** estimates the intrinsic value of a company based on its expected future dividends, discounted to present value (PV) using a rate that reflects the time value of money (TVM) and associated risks.

# Dividend Discount Models

DDM > OVERVIEW > TIME VALUE OF MONEY

## Time Value of Money

**Time value of money (TVM)** is a financial concept that states a sum of money is worth more now than the same sum in the future due its potential earning capacity.

### Future Value Formula

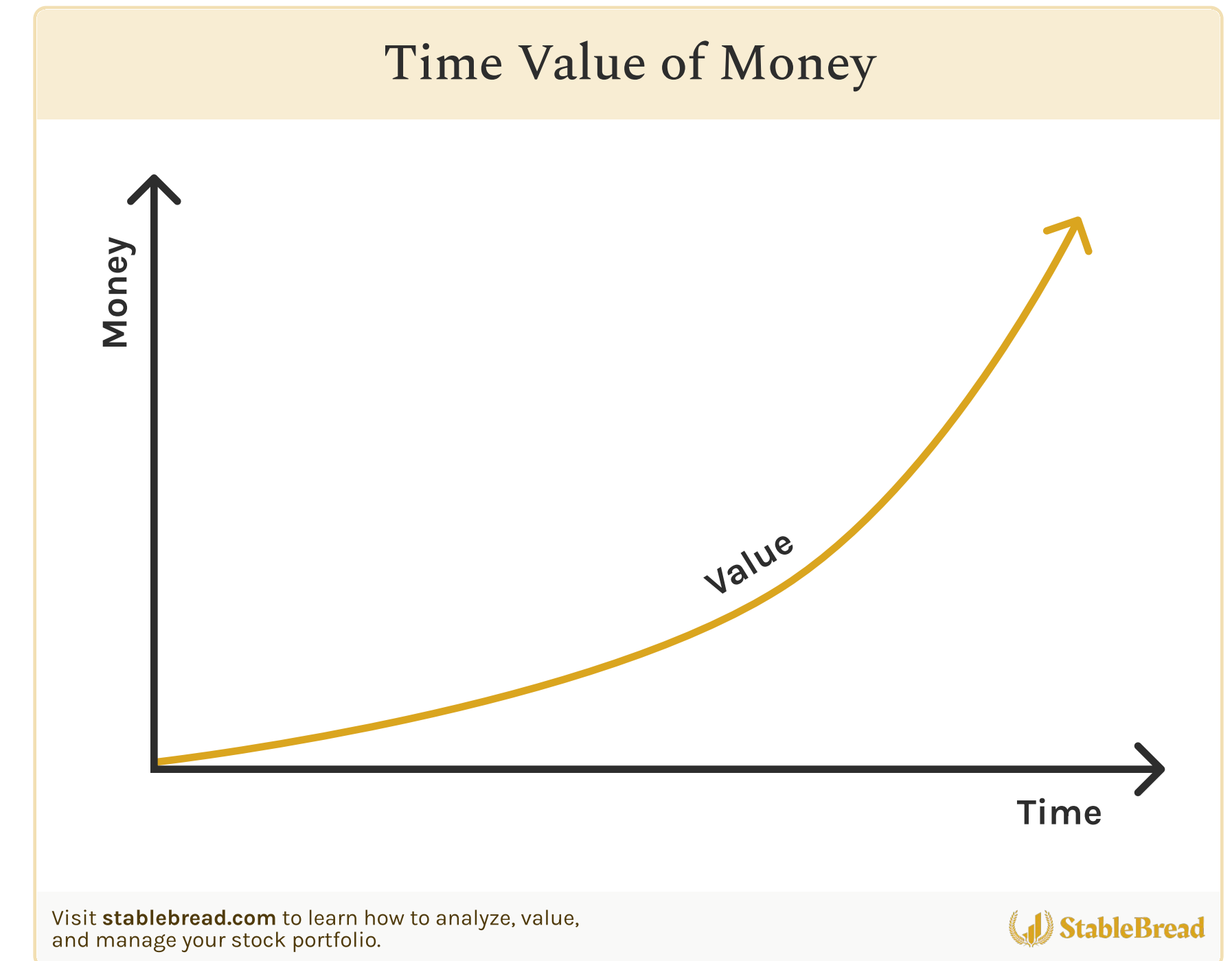
$$FV = PV \times (1 + r)^n$$

where:

- FV = future value
- PV = present value
- r = interest rate (per period)
- n = number of periods

### Present Value Formula

$$PV = \frac{FV}{(1 + r)^n}$$



# Dividend Discount Models

DDM > OVERVIEW > DDM FORMULA

## DDM Formula

$$PV_0 = \sum_{t=1}^{\infty} \frac{E(DPS_t)}{(1 + r_e)^t}$$

where:

- $PV_0$  = present value (at time 0)
- $E(DPS_t)$  = expected dividends per share (at time  $t$ )
- $r_e$  = discount rate (cost of equity)
- $t$  = time period, ranging from 1 to infinity ( $\infty$ )

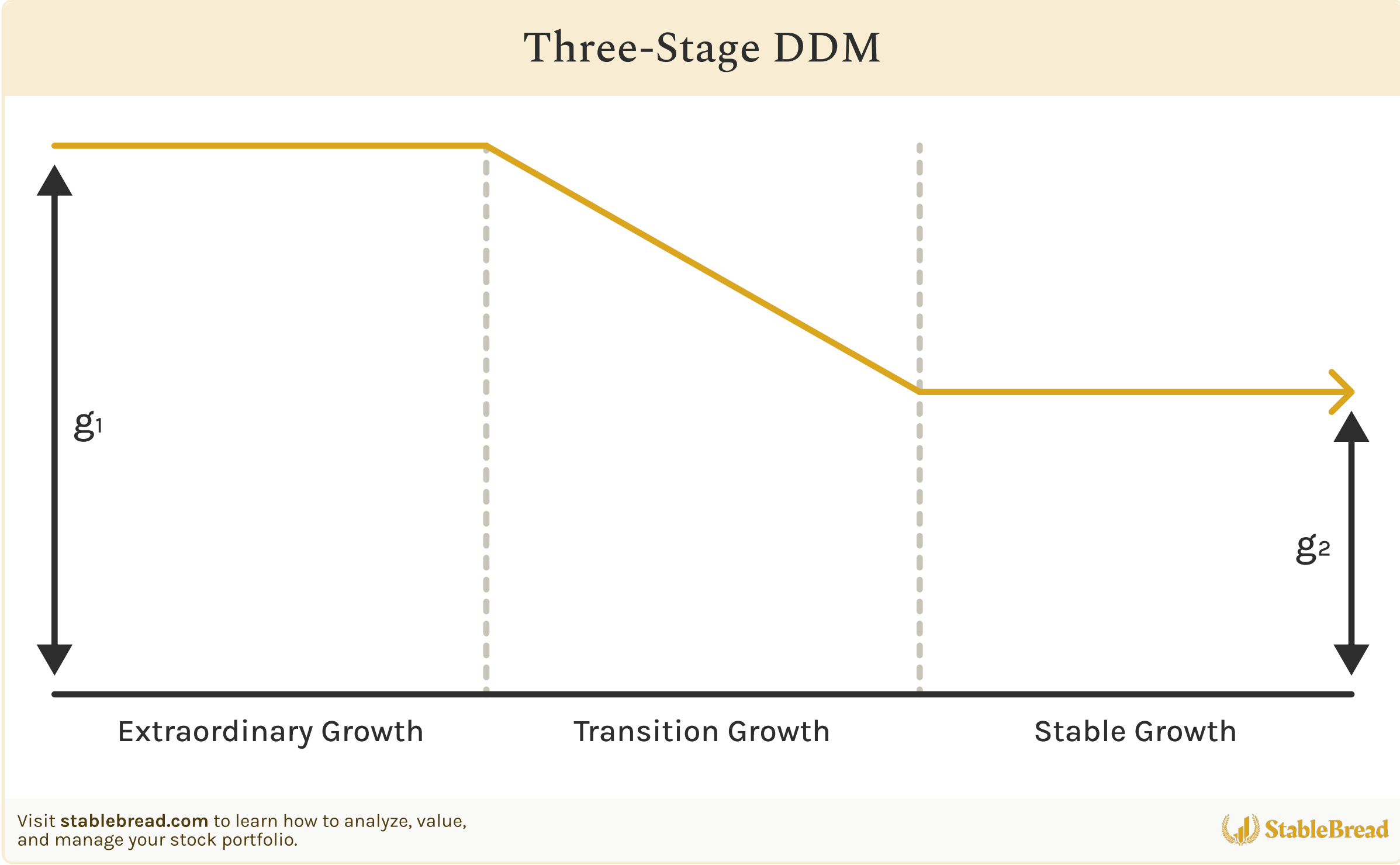
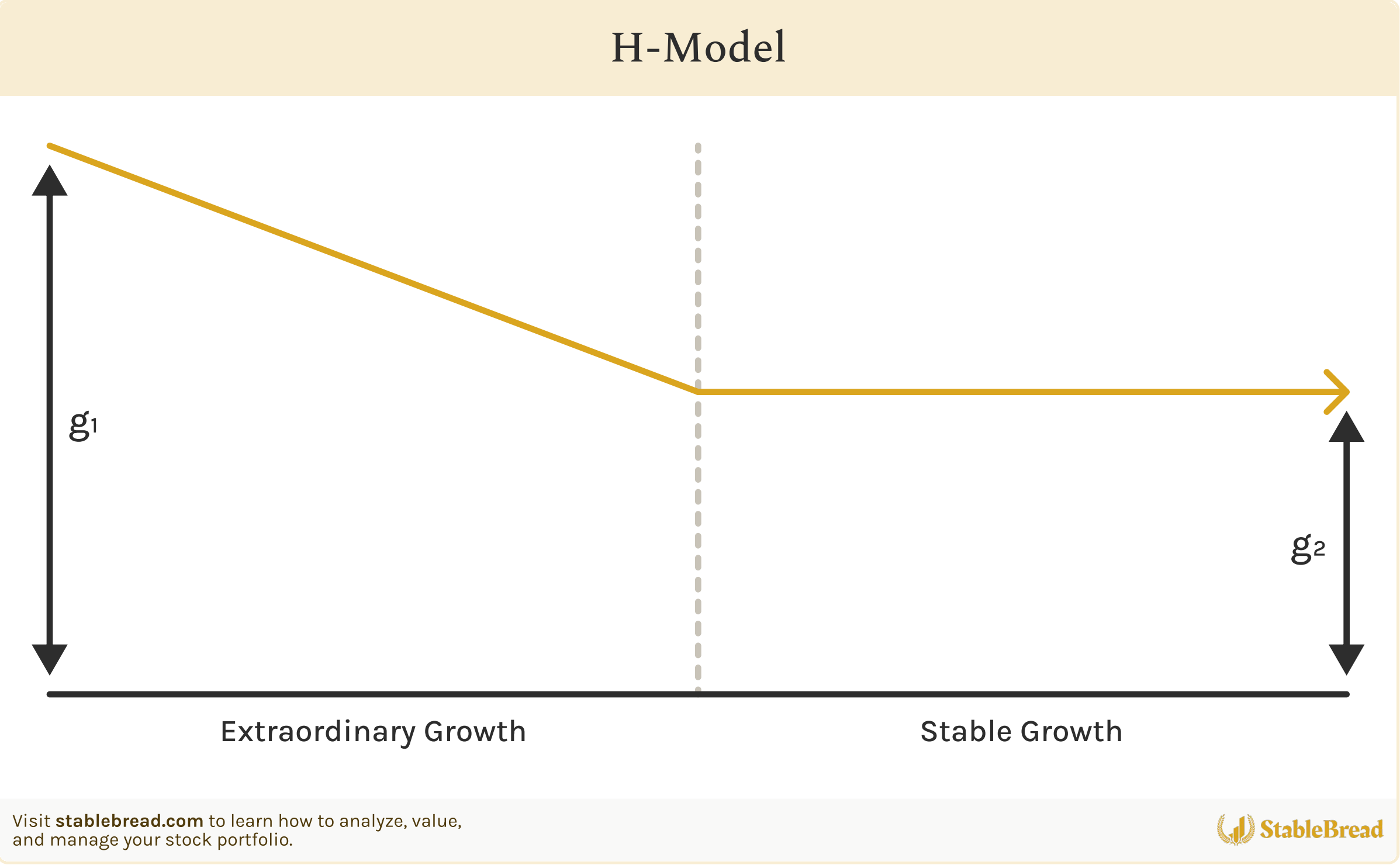
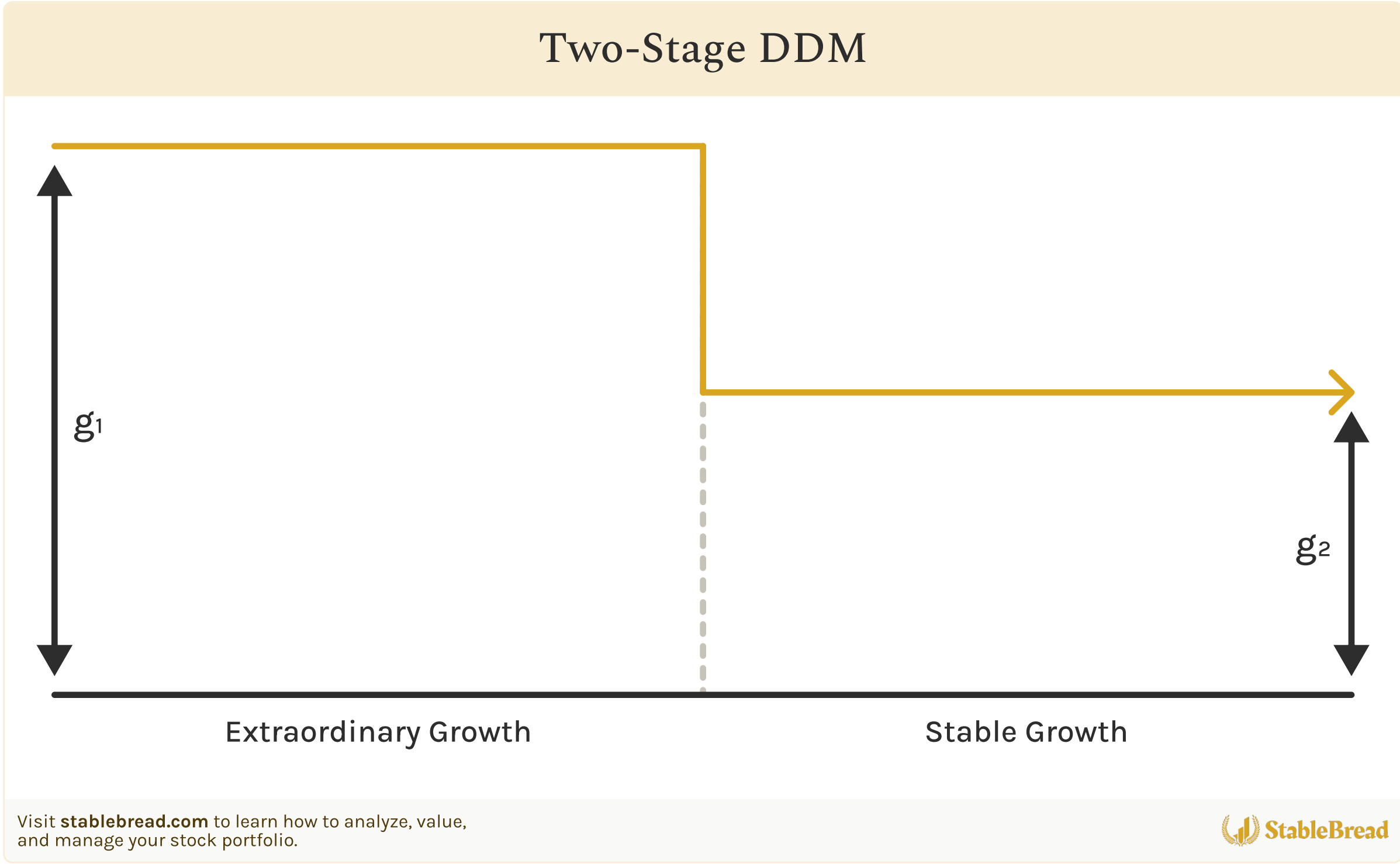
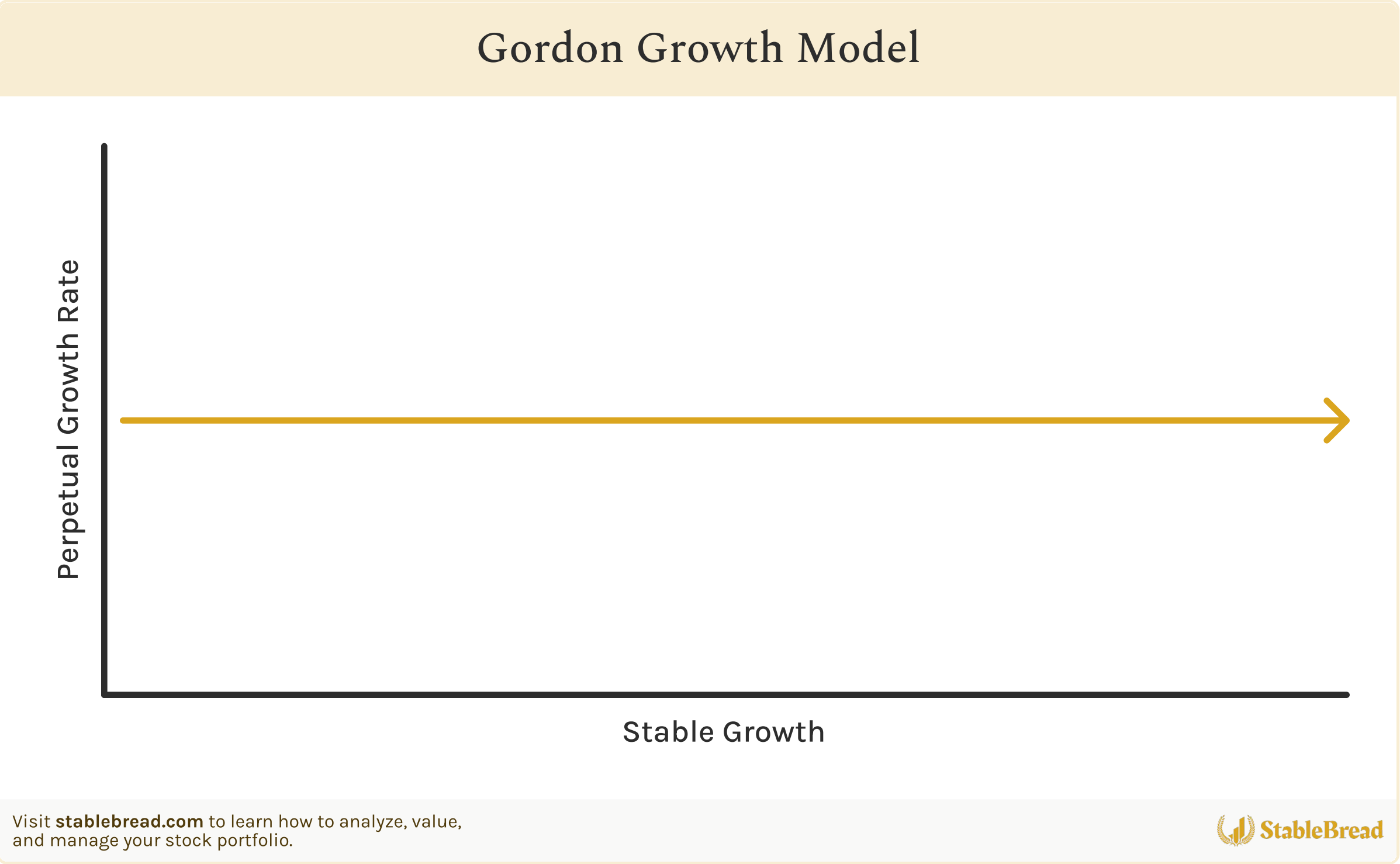


# Dividend Discount Models

## DDM Variations

DDMs come in five variations, each designed for different dividend growth expectations:

- **Zero-Growth DDM:** Assumes no dividend growth into perpetuity.
- **Gordon Growth DDM:** Assumes dividends grow indefinitely at a steady state.
- **Two-Stage DDM:** Initial period of extraordinary dividend growth, followed by steady growth into perpetuity.
- **H-Model:** Gradual change in extraordinary growth during the initial phase, followed by steady growth into perpetuity.
- **Three-Stage DDM:** Initial extraordinary growth, transitional gradual changing growth, and stable growth into perpetuity.



# Dividend Discount Models

DDM > OVERVIEW > FUNDAMENTAL DDM INPUTS

## Fundamental DDM Inputs

All DDM variations require the same two inputs:

- **Perpetual Growth Rate:** Expected rate at which dividends and earnings will grow into perpetuity.
- **Discount Rate:** Expected return required by equity investors (cost of equity).

More complex variations of the DDM also require you to estimate growth rates for extraordinary growth phases (not just perpetual) and different discount rates for each phase.

## Gordon Growth Model

$$PV_0 = \frac{DPS_{n+1}}{r_e - g}$$

where:

- $PV_0$  = present value (at time 0)
- $DPS_{n+1}$  = expected annual dividends per share in year n+1
- $g$  = perpetual dividend growth rate
- $r_e$  = discount rate (cost of equity)