Morgan Stanley

October 2018

Portfolio Strategy

MORGAN STANLEY RESEARCH
North America

P/E Premiums & Franchise Structures

The Q-Group

October 15, 2018

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Outline

- Dividend Discount Model (DDM)
- Core Value and Franchise Value
- Franchise Structure
- Investment-Constrained Franchise
- Opportunity-Constrained Franchise
- Franchise Value and g*
- Implications

Source: Morgan Stanley Research

Many Have Studied Equity Valuation

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References		
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Phillips	Fairfield	Statman
	& etc	

Source: Morgan Stanley Research

The "Standard" Dividend Discount Model (DDM)

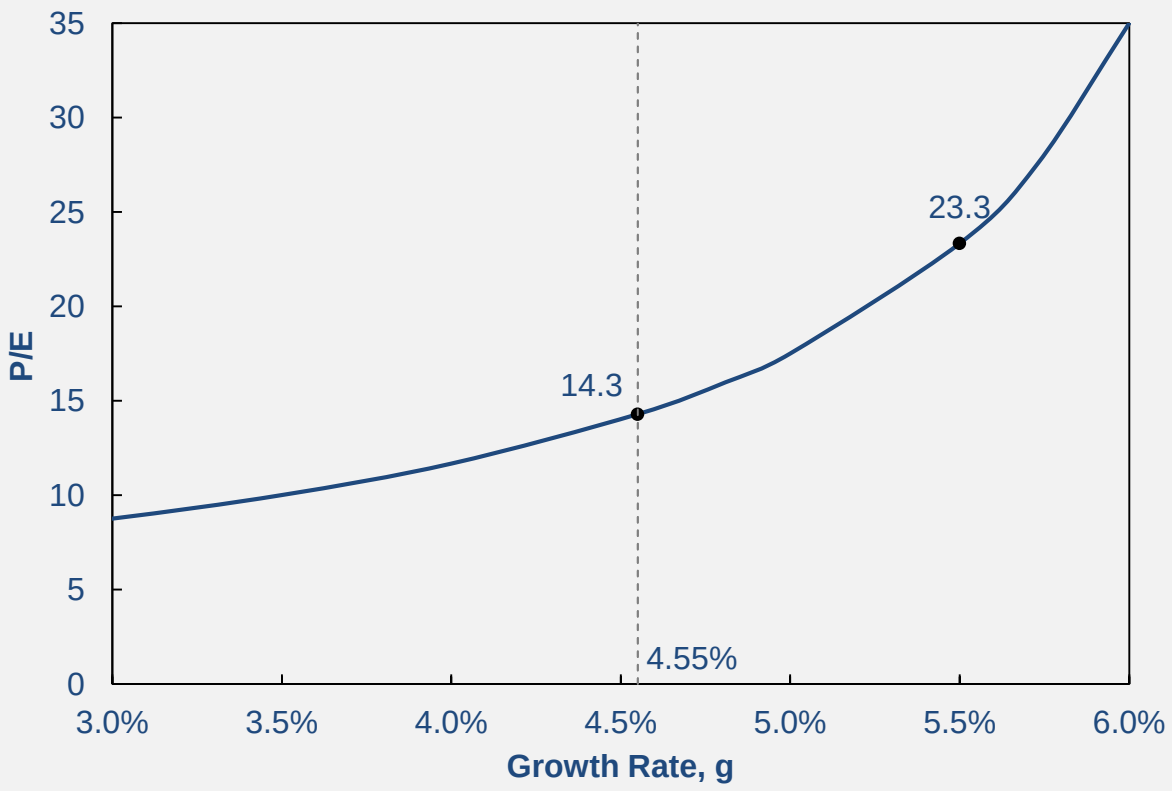
$$\mathbf{P} = \frac{D}{k - g}$$

$$P/E = \frac{1 - b}{k - g}$$

- b = Earnings retention rate
- r = Return on equity (ROE)
- k = Market capitalization rate

Source: Morgan Stanley Research

P/E vs Growth with DDM



- b = 0.65
- k = = 7.0%

g = 4.55% ⇒ P/E = 14.3

g = 5.50% ⇒ P/E = 23.3

Source: Morgan Stanley Research

Spread-Driven Earnings Growth & g*

$$\mathbf{g} = \boldsymbol{br} = \boldsymbol{b}(\boldsymbol{k} + \boldsymbol{s})$$

$$\boldsymbol{P/E} = \frac{\mathbf{1} - \boldsymbol{b}}{\boldsymbol{k} - \boldsymbol{br}}$$

$$\boldsymbol{P/E} = \frac{\mathbf{1} - \boldsymbol{b}}{(\mathbf{1} - \boldsymbol{b})\boldsymbol{k} - \boldsymbol{bs}}$$

$$\boldsymbol{P/E} = \frac{\mathbf{1}}{\boldsymbol{k} - \boldsymbol{bs}/(\mathbf{1} - \boldsymbol{b})}$$

$$\boldsymbol{P/E} = \frac{\mathbf{1}}{\boldsymbol{k} - \boldsymbol{g}^*}$$

Retained earnings = bE

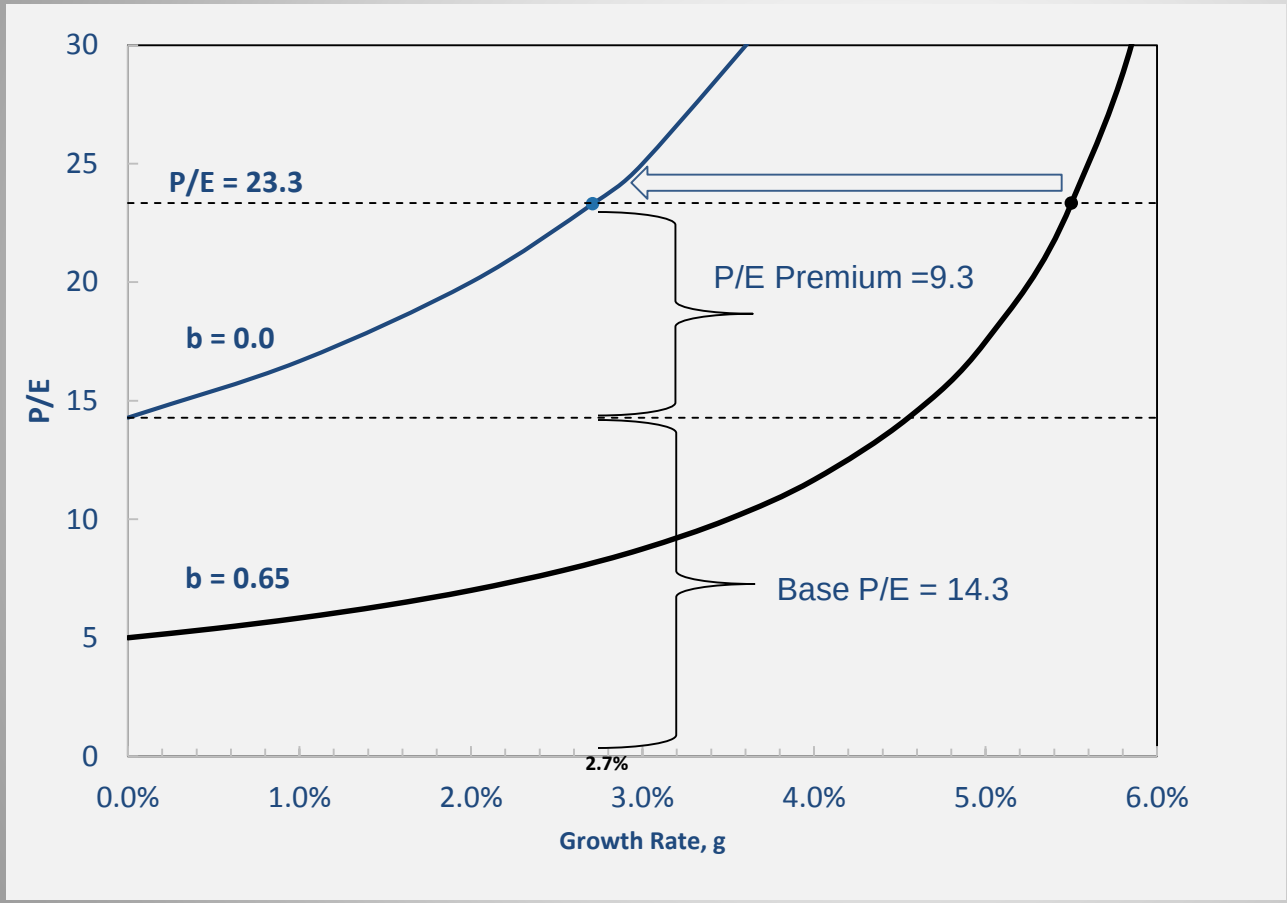
Incremental earnings = r(bE)

Annual growth rate, g = br

g* = bs/(1 – b)

Source: Morgan Stanley Research

P/E vs Growth with Retentions of 65% and 0%



- k = = 7.0%
- b = 0.65, g = 5.5%
  ⇨ P/E = 23.3

Source: Morgan Stanley Research

Earnings Yield + g* = Return

$$P/E = \frac{1-b}{k-g}$$

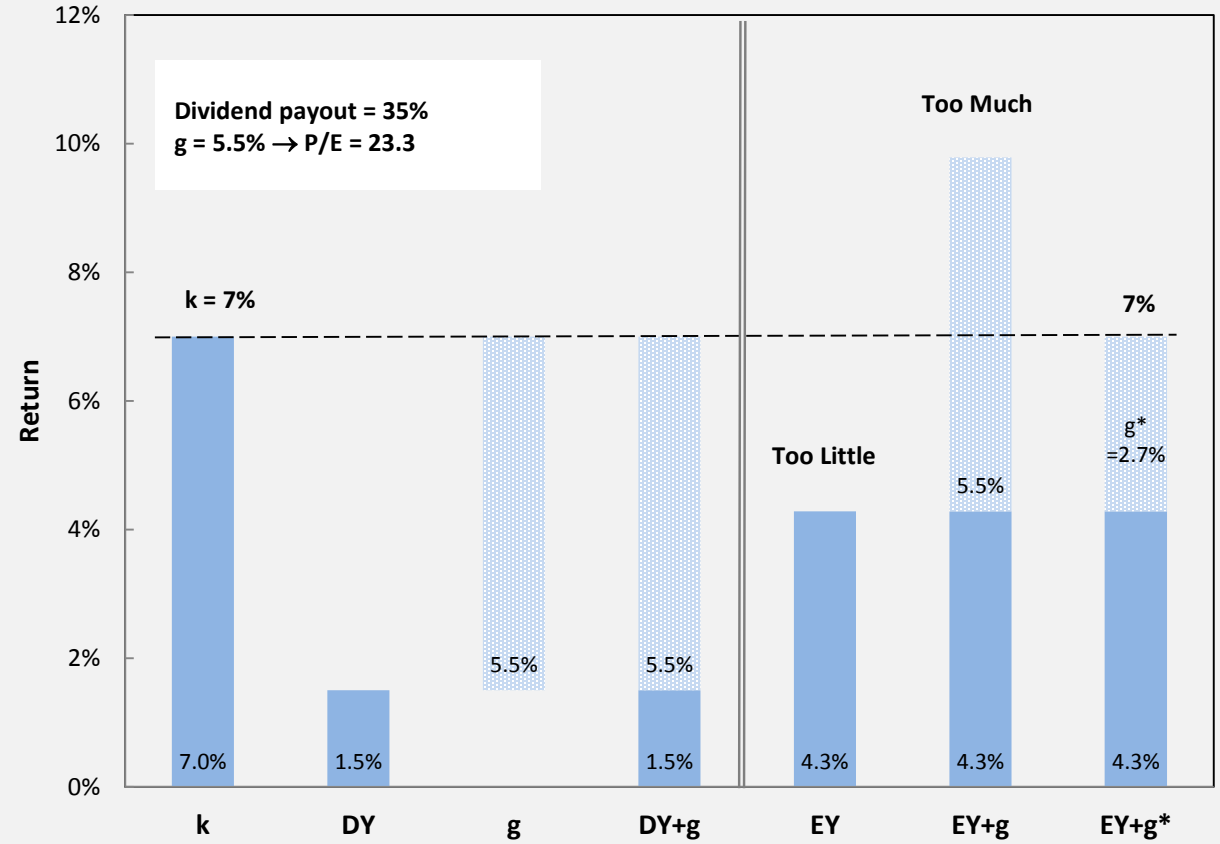
$$k = (1-b)E/P + g$$

$$= E/P + \{g - b(E/P)\}$$

$$= E/P + \quad g^*$$

Source: Morgan Stanley Research

Return = Dividend Yield + Growth = Earnings Yield + g*



Source: Morgan Stanley Research

g* Provides An Equity Risk Premium "Correction"

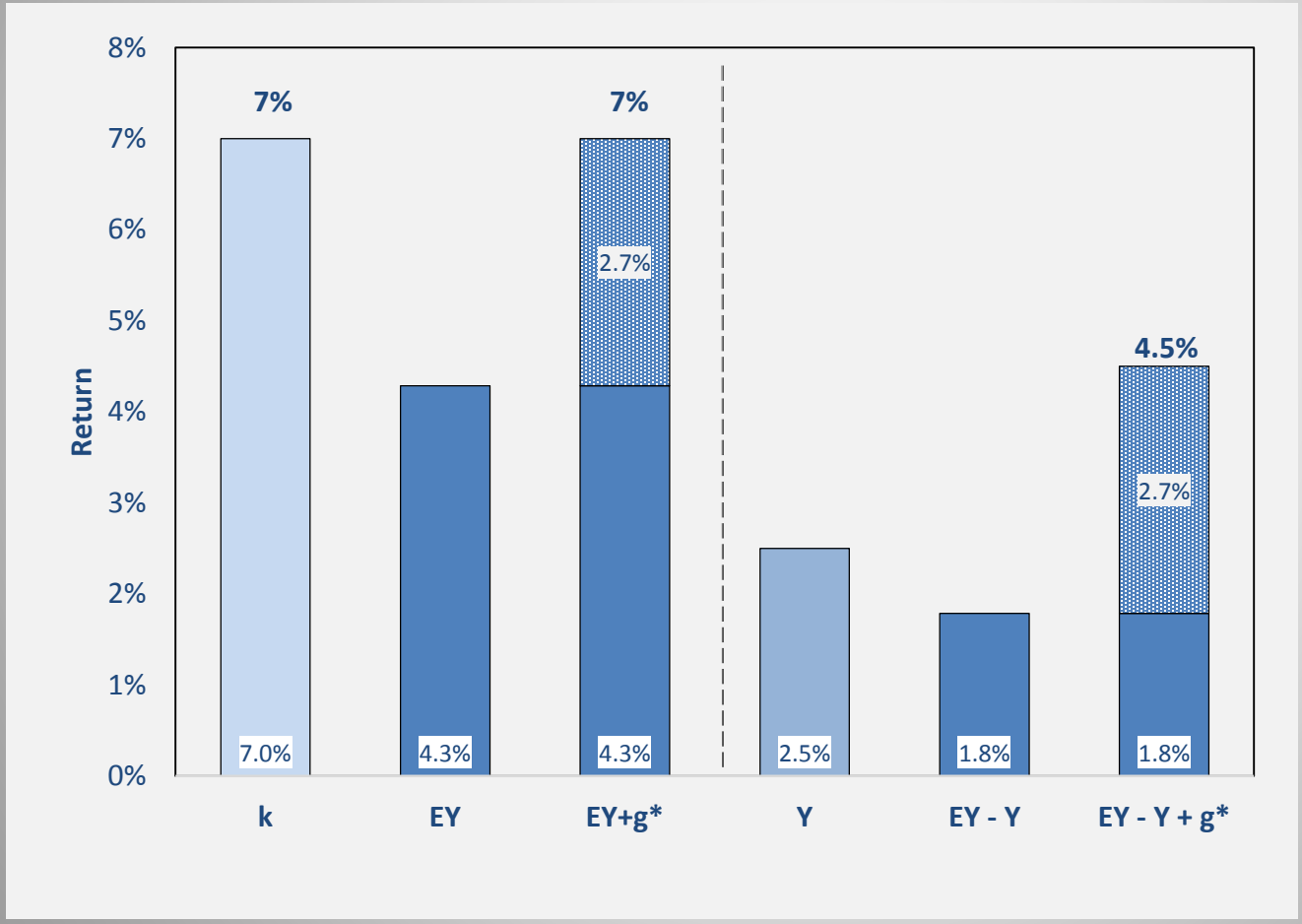
$$r_p = k - y$$

$$r_p = (E/P + g^*) - y$$

$$r_p = (E/P - y) + g^*$$

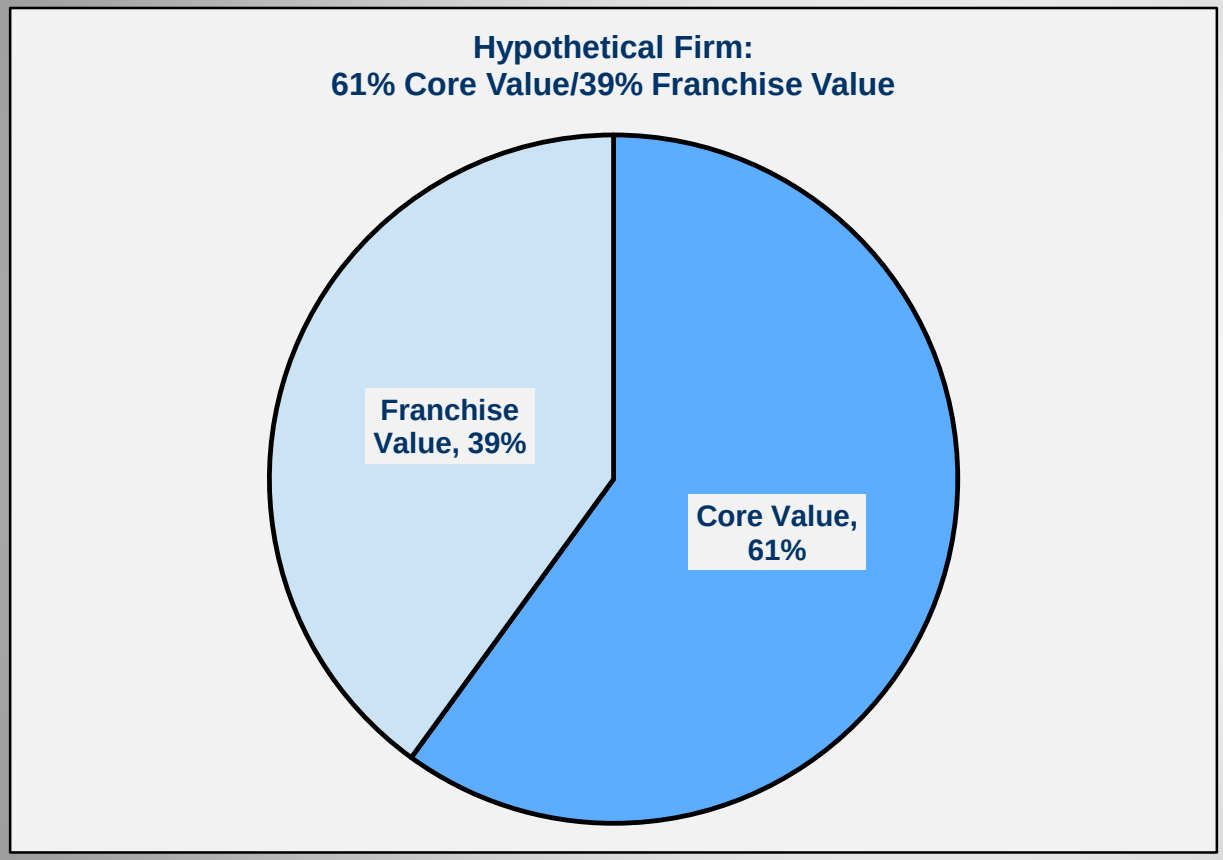
Source: Morgan Stanley Research

g* as Risk Premium "Premium"



Source: Morgan Stanley Research

Two Components of Theoretical Firm Value



- "Core Value (CV)" is based on earnings E from existing businesses & cost of capital k

$$CV = \frac{E}{k}$$

- "Franchise Value (FV)" is based on the present value (PV) of future net earnings from new investments with return R > k

$$FV = \left(\frac{R-k}{k}\right) x\ PV(New\ Inv.\$)$$

$$Total\ Value = CV + FV$$

Source: Morgan Stanley Research

Franchise Value, FV

- **FV flows from the firm's patents, licenses, branding, market penetration**
- **These competitive advantages are reflected in a firm's ability to make premium (r > k) investments at times *t* > 0**

Source: Morgan Stanley Research

P/E = Base P/E + P/E Premium

Total Value, P = Core Value + Franchise Value

Core Value = PV of perpetual earnings E

= E/k

P = E/k + FV

P/E = 1/k + FV/E

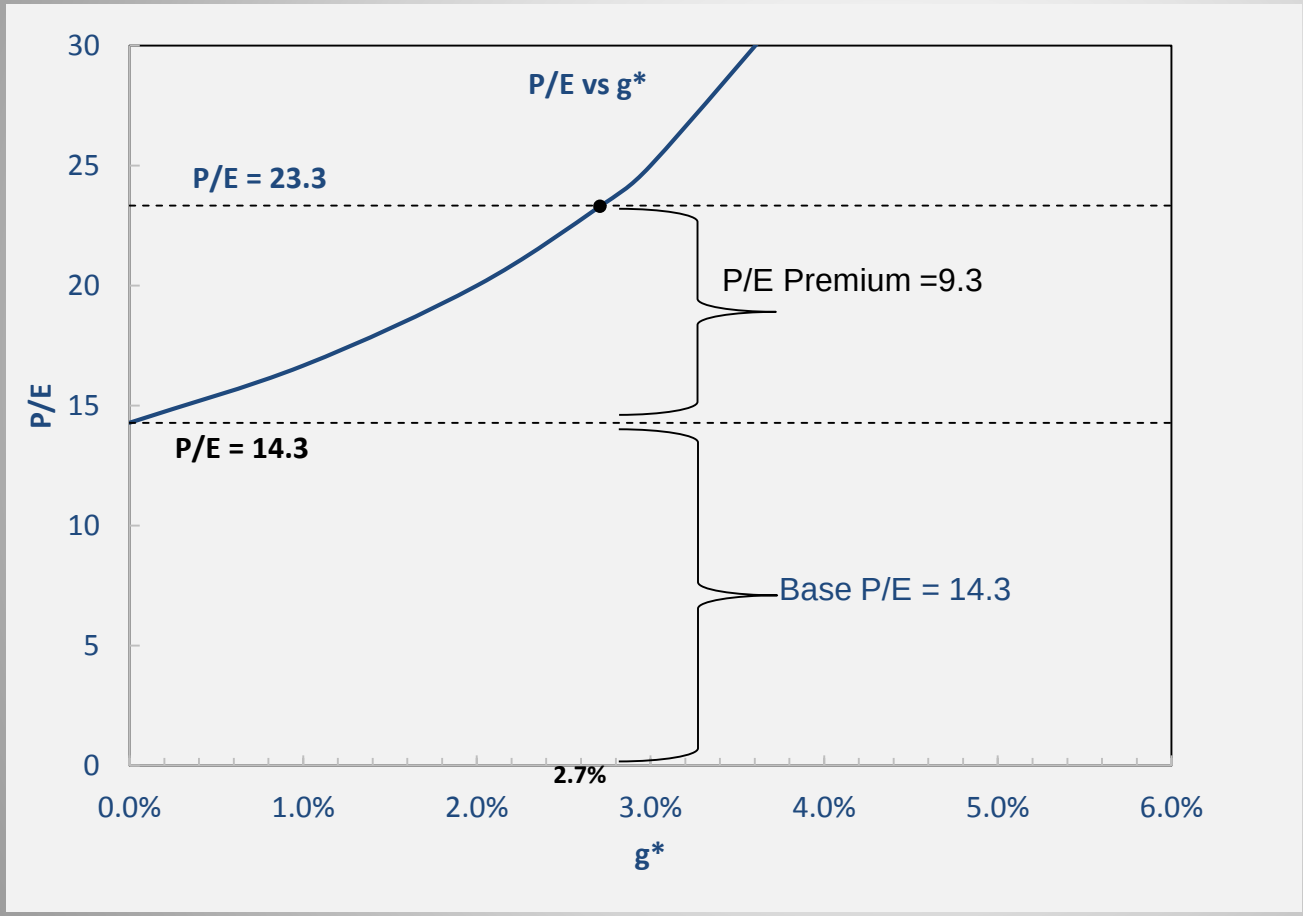
{Base P/E = 1/k}

P/E Premium = P/E – 1/k

P/E Premium = FV/E

Source: Morgan Stanley Research

P/E vs g* and the P/E Premium

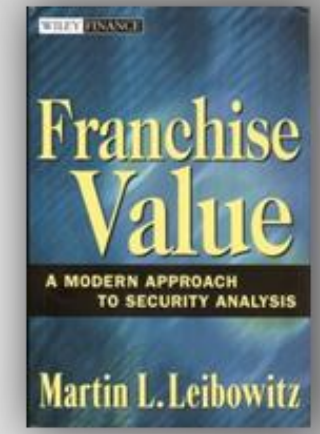


- P/E Premium
  = FV/E = 9.3
- Base P/E
  = 1/k = 14.3

Source: Morgan Stanley Research

Topics Covered in *FRANCHISE VALUE* (2004)

- **Spread-Based Franchises**
- **The Growth Illusion**
- **Equity Duration**
- **Leveraged Firms**
- **Inflation Effects**
- **Impact of Q-Type Competition**
- **Franchise Consumption and Erosion**
- **Myth of Stable P/Es**
- **P/E "Orbits"**
- **Franchise Labor**
- **Anti-Franchise Situations**



Source: Morgan Stanley Research

Discounting Franchise Flows

- **At time T > 0, an Investment ,** I(T, r)**, provides a "notional" return r > k**
- **For t > T and r > k,** I(T, r) **leads to a flow of payments p**[t,σ|I(T, r)]
- **Payment discount factor is** d[t |σ]
- **Value =** $\sum_{r>k} \sum_{T>0} \sum_{t>T}$ p[t,σ|I(T, r)] d[t |σ]

  - $\sum_{r>k} \sum_{T>0}$ I(T, r)d(T)

- **This complex formula simplifies to:**

V(r) = $\frac{r-k}{k} \times A(r)$ {where $A(r) = \text{I(T, r)d(T)}$}

Source: Morgan Stanley Research

FV and g*

P/E = Base P/E + P/E Premium

P/E = 1/k + FV/E

P = E/k + kFV

k = E/P + kFV/P

Earlier, we showed that

k = E/P + g*

So,

g* $= k\frac{FV}{P}$

Source: Morgan Stanley Research

Generalized Core Value (CV)

- CV = $\sum_{t\geq 0, T=0}$ p[t,σ|N(T)=0, r≠k]d[t|σ]

  → E/k

- FV ≡ P – CV → P – E/k

- P/E = 1/k + FV/E
  = 1/k + (g*/k)P/E

- kP = E + g*P

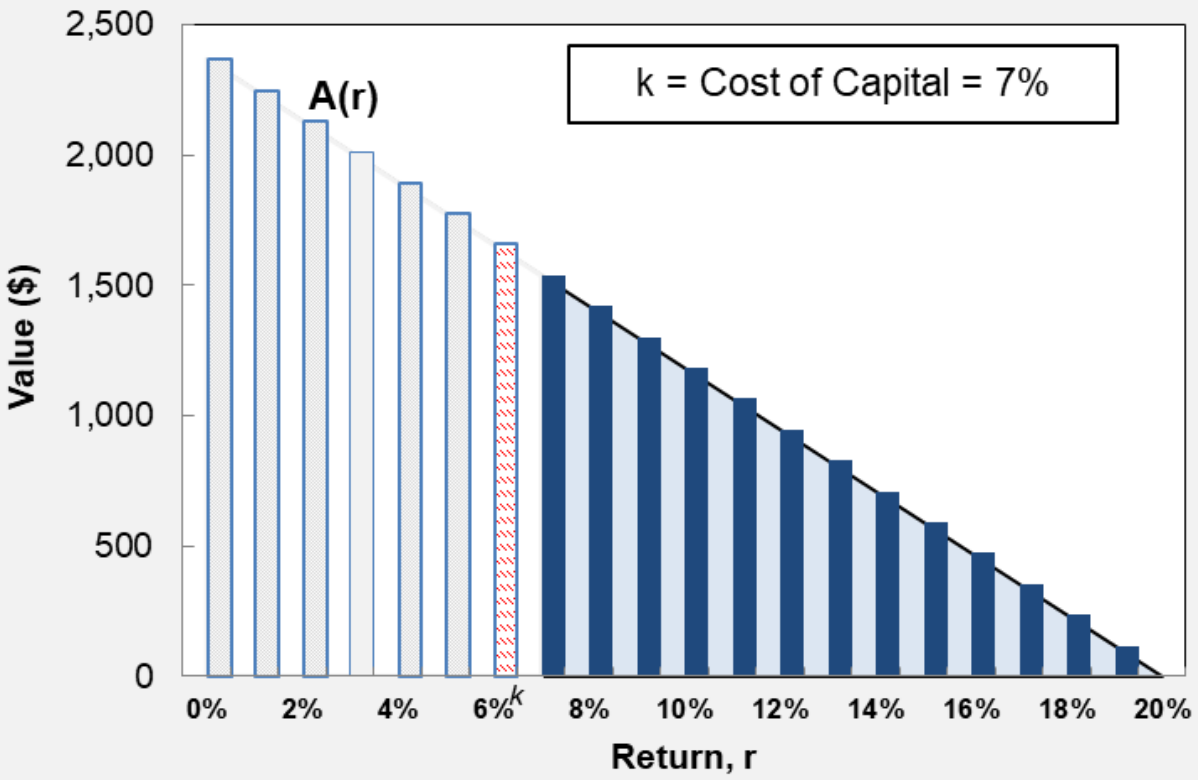
Source: Morgan Stanley Research

Franchise Structure Model

- $FV = \sum_i A(r_i)(r_i - k) / k$

Source: Morgan Stanley Research

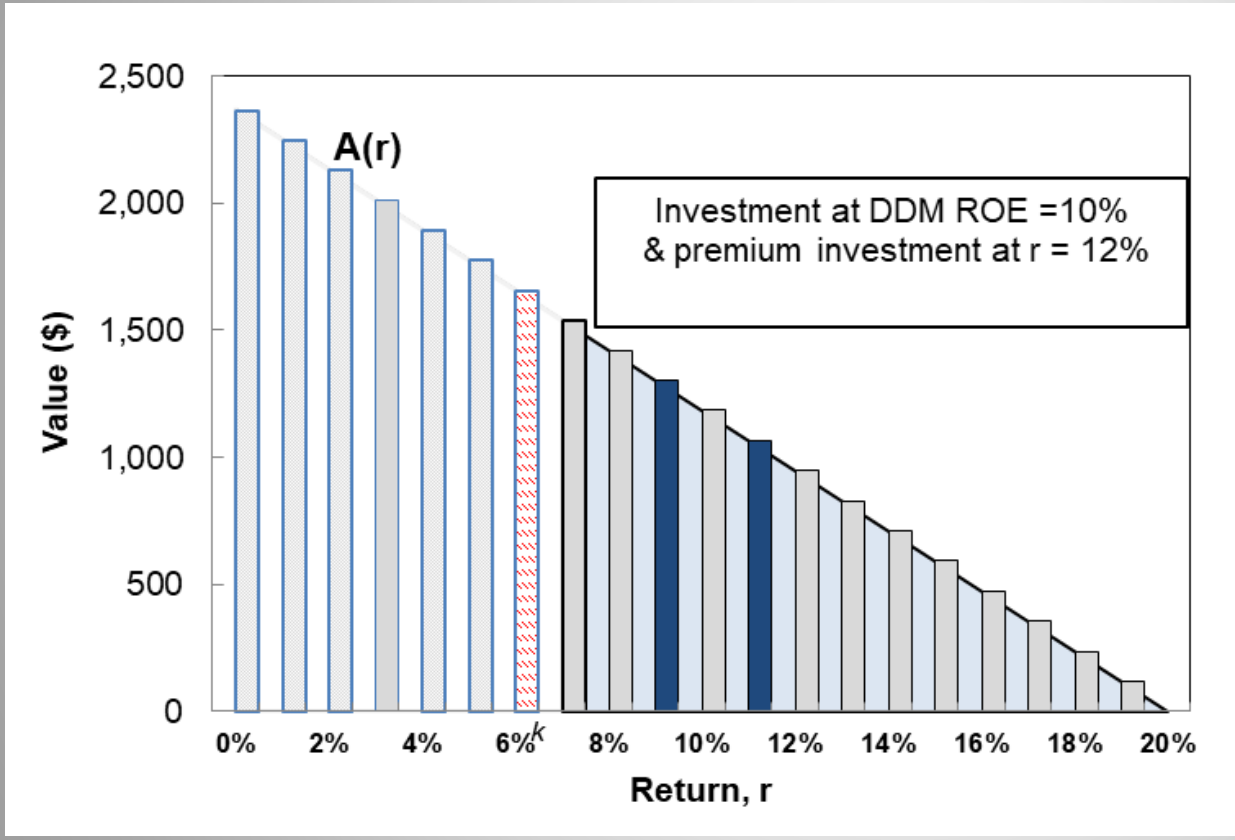
Only Investments with r > k Add to FV



- Total investment is sum of $A(r_i)\Delta r_i$
- Investments occur at 1% return intervals so $\Delta r_i = 1\%$
- Investment opportunities at low returns are more plentiful than at high returns

Source: Morgan Stanley Research

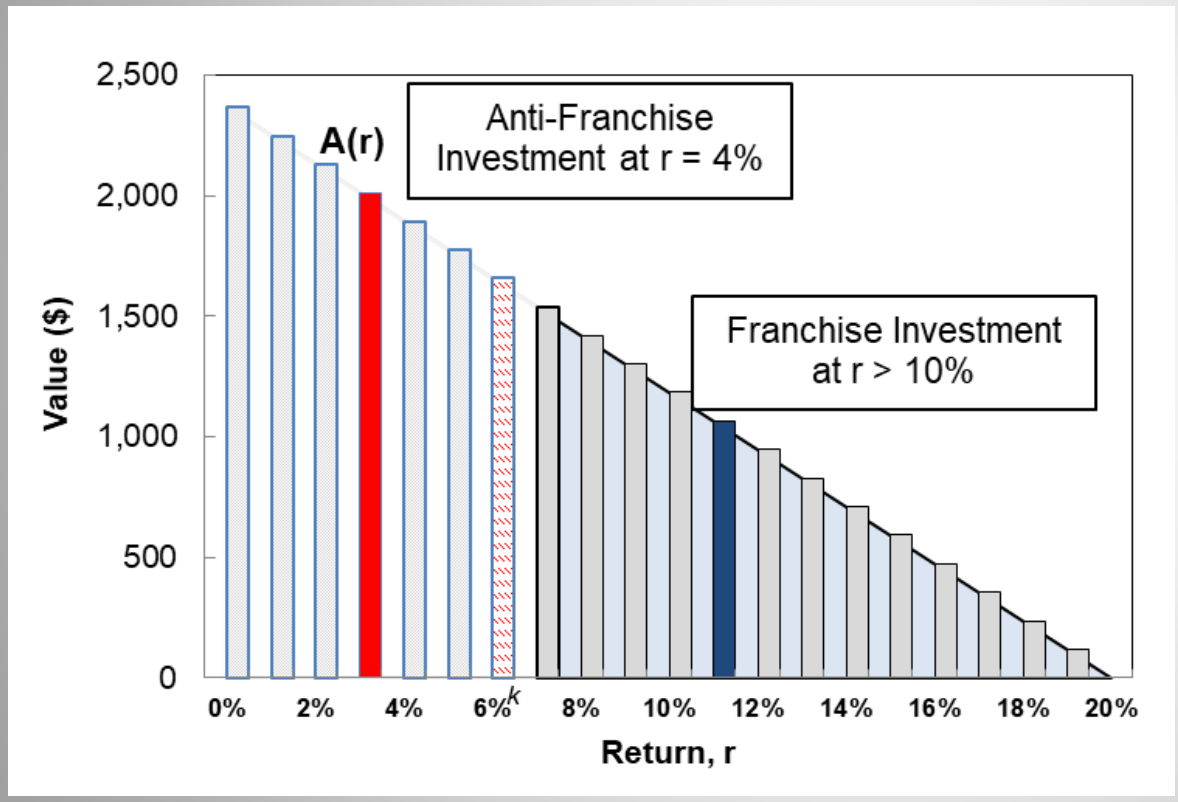
Investments Implicit in DDM Retention & Franchise Premium



- k = 7%
- ROE = r = 10%
- Premium R = 12% > 10%

Source: Morgan Stanley Research

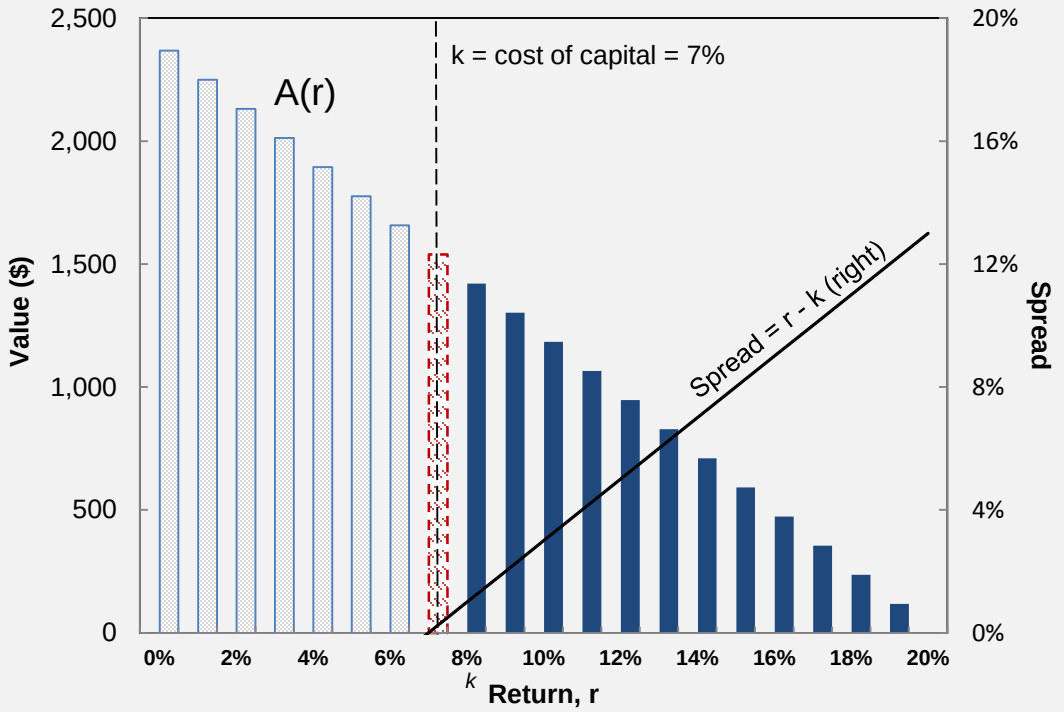
The Anti-Franchise: Investments at r < kReduce Value



- Total investment is sum of $A(r_i)\Delta r_i$
- Investments occur at 1% return intervals so $\Delta r_i = 1\%$
- Investment opportunities at low returns are more plentiful than at high returns

Source: Morgan Stanley Research

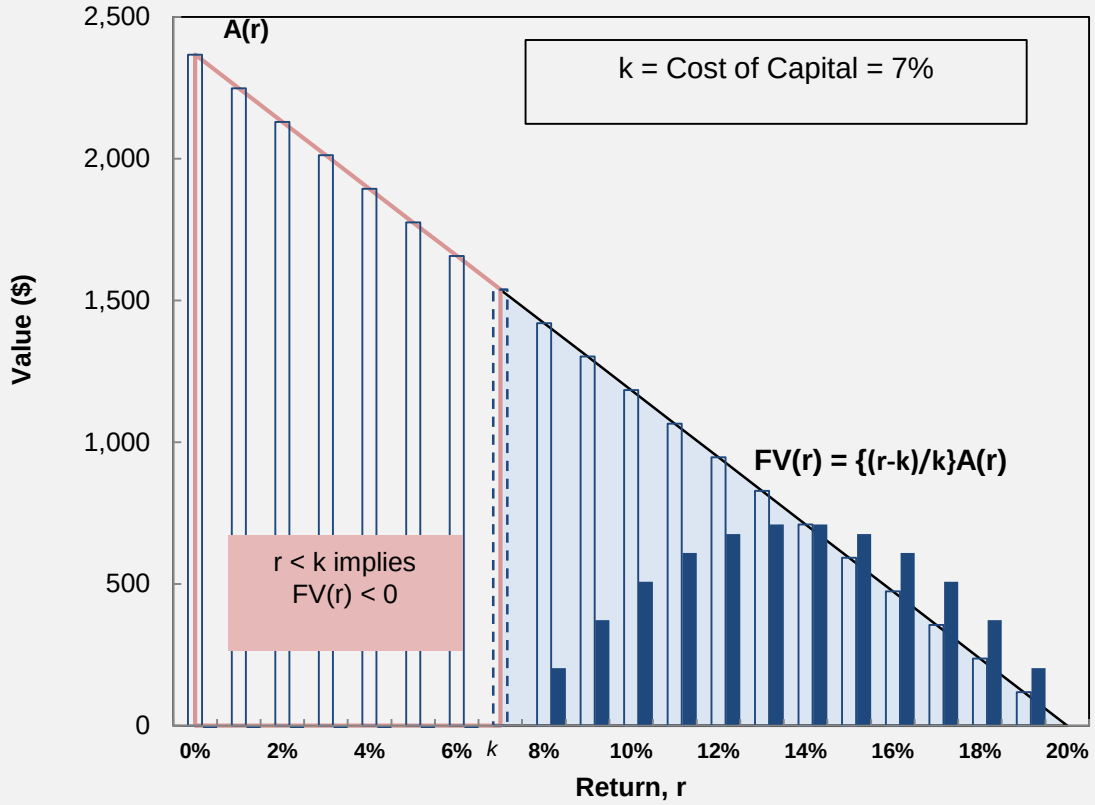
A(r) and Spread vs Return



- All returns are assumed risk-equivalent
- For each return r, the investment opportunity represents the PV of all future investments that are expected to return r in perpetuity
- Investment opportunities at low returns are more plentiful than at high returns

Source: Morgan Stanley Research

Franchise Value Structure, FV(r)



- FV = 0 if spread (r – k) = zero or A(r) = 0
- If spread < 0, investments decrease value
- If only one or two investments can be made, choose opportunities with highest (i.e., peak) FV.

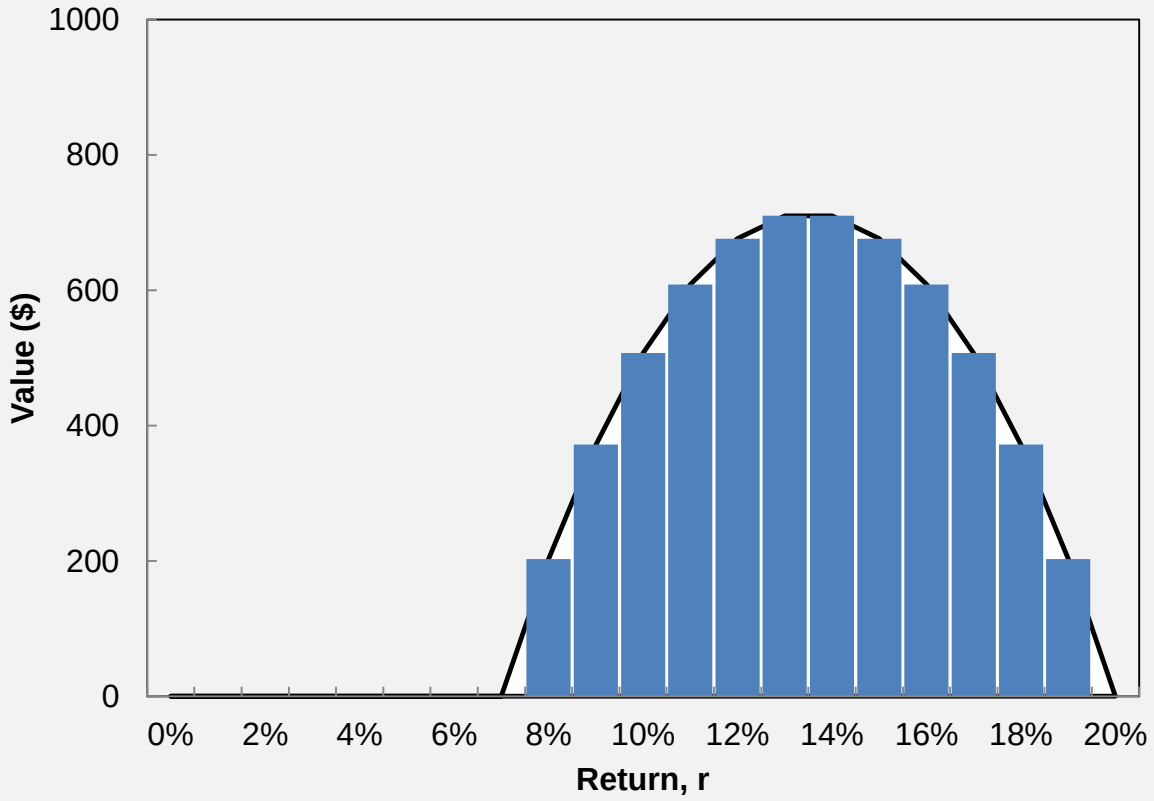
Source: Morgan Stanley Research

Franchise Value with Exponential Investment Model

- $A(R) = \frac{\lambda}{1-e^{-\alpha R_M}}(e^{-\alpha R} - e^{-\alpha R_M})$
- $FV(R_M) = \frac{1}{k}\left(\frac{\lambda}{1-e^{-\alpha R_M}}\right)\int_k^{R_M}(R-k)(e^{-\alpha R} - e^{-\alpha R_M})\,dR$
- $FV(R) = \frac{1}{k\alpha^2}\left(\frac{\lambda}{1-e^{-\alpha R_M}}\right)\left\{\left(e^{-\alpha k} - [1+\alpha(R_M-k)]\right)e^{-\alpha R_M} - \frac{1}{2}\alpha^2 e^{-\alpha R_M}(R_M-k)^2\right\}$

Source: Morgan Stanley Research

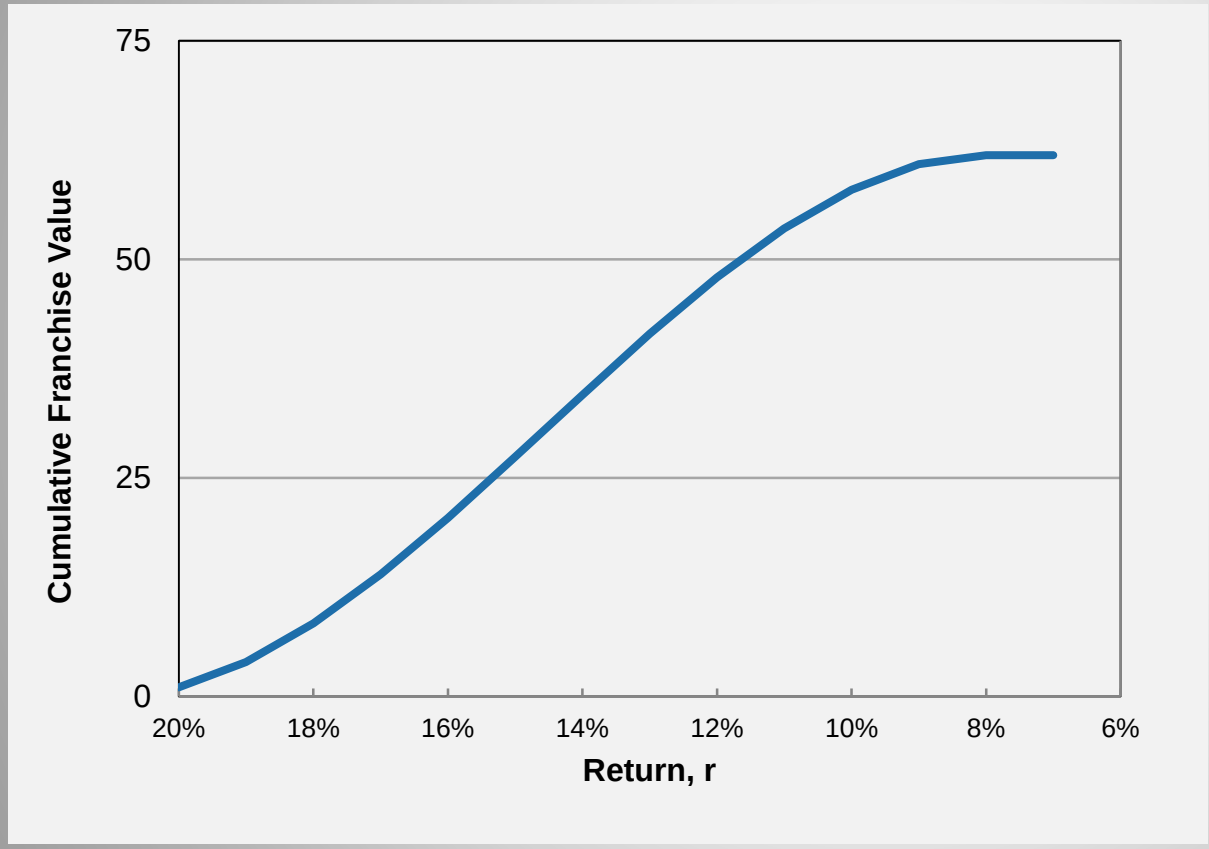
Franchise Value With Full Funding ("Goldilocks")



- $Total\ Franchise\ Value$
  $= \text{Area Under FV Curve}$
  $= \frac{1}{k}\int_{k}^{R_M} A(r)(r-k)dr$

Source: Morgan Stanley Research

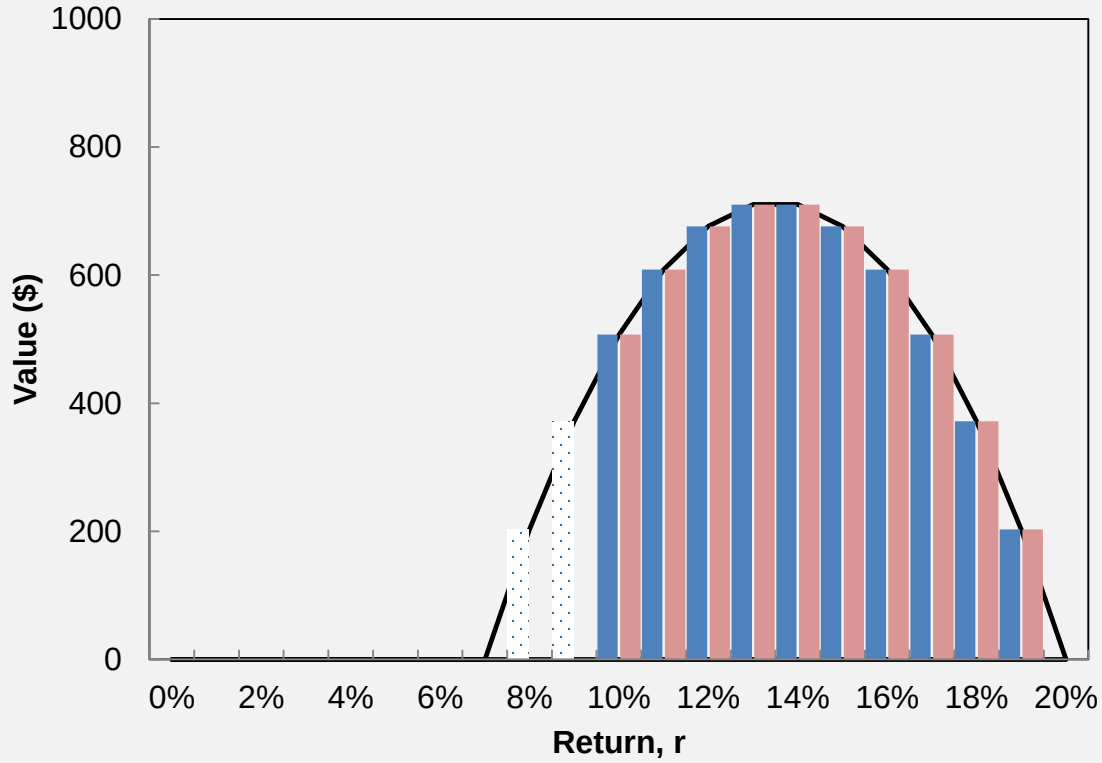
Balanced Funding of Opportunities ("Goldilocks")



- **Cumulative FV builds fastest for High Return-Spread Opportunities**
- **Investments below a 10% return add little to total FV**

Source: Morgan Stanley Research

Capital-Constrained Franchise Investment

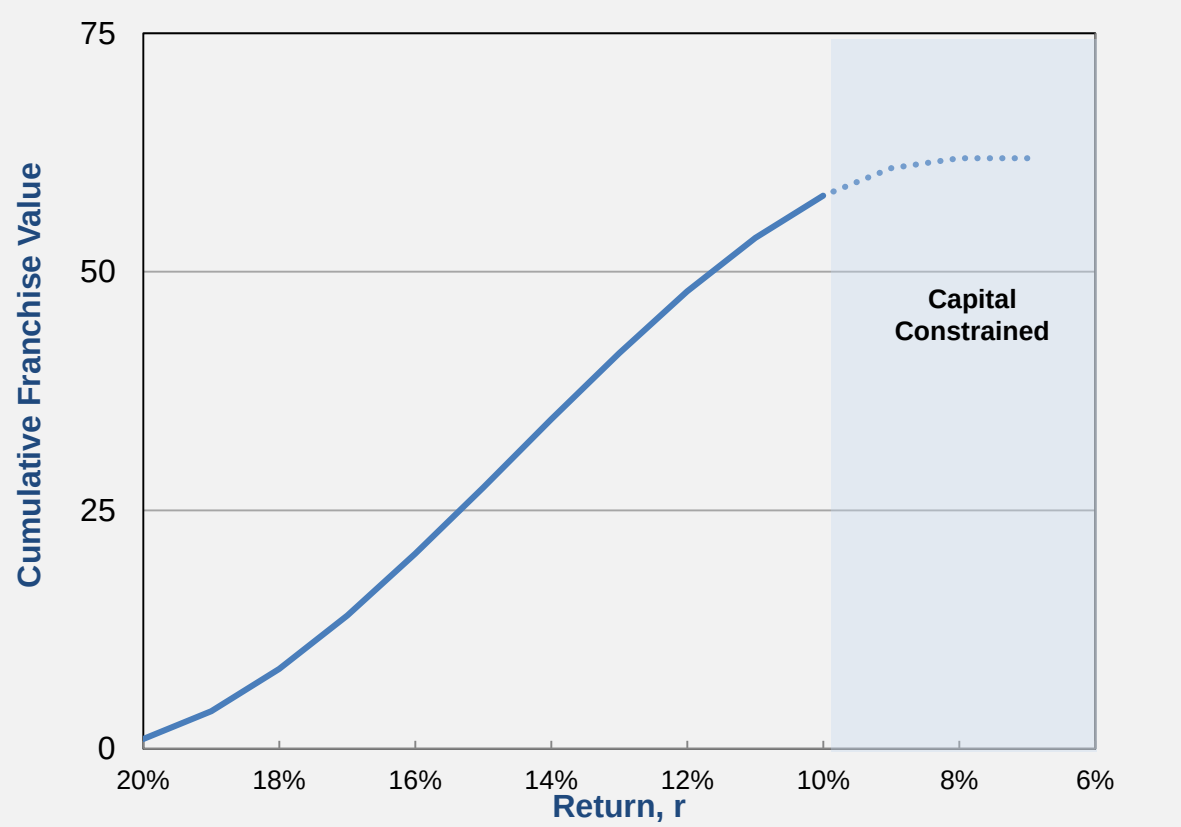


- **Capital deployment extends from highest to lowest return**
- **Total Investment**
  = Area Under FV Curve

$$= \frac{1}{k}\int_{10\%}^{20\%} A(r)(r-k)dr$$

Source: Morgan Stanley Research

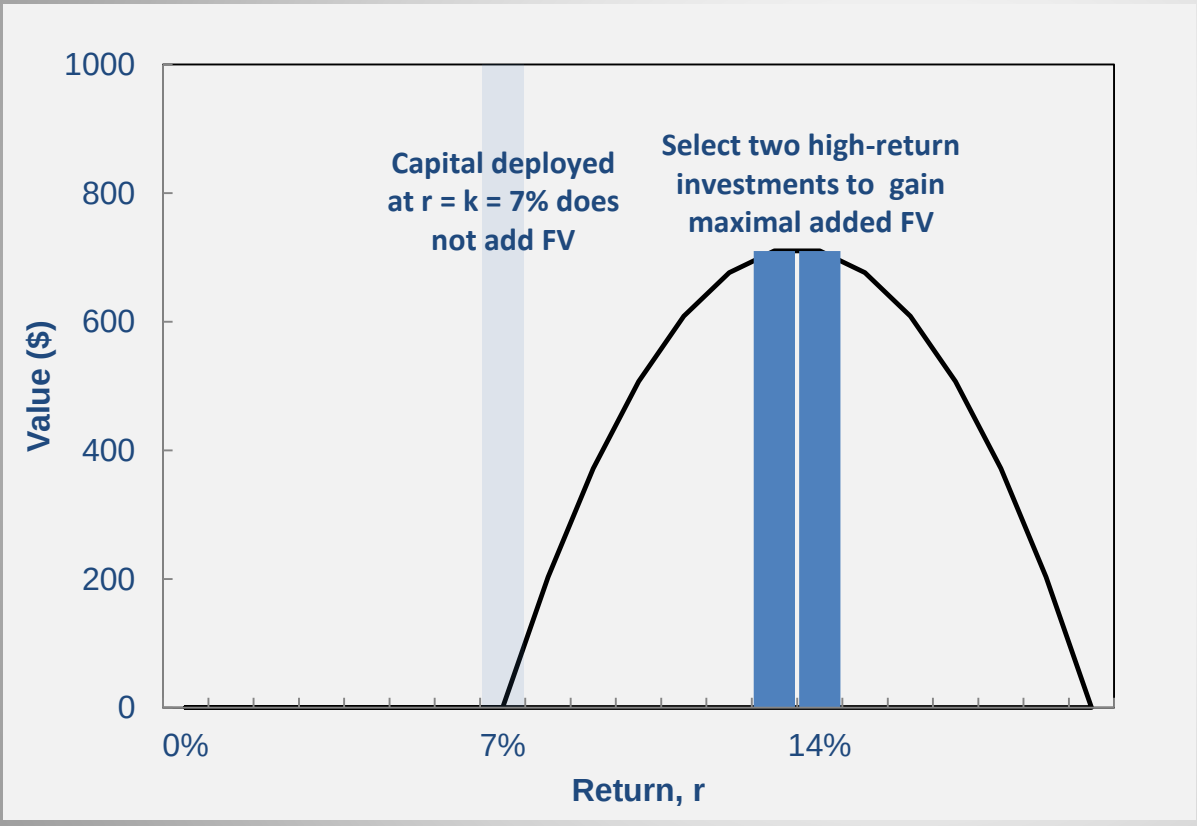
Capital-Constrained: Pursue High Return Investments First



- **Low-Spread investments make a modest contribution to Total FV**
- **Reasonable capital constraints do not significantly reduce FV**

Source: Morgan Stanley Research

Pursuit-Limited: Only Pursue "Best" Two Investments



- **Choose investments offering the greatest FV, i.e. the highest product of investible $ and spread (r – k)**
- **Excess capital invested at market return k, does not add to FV**

Source: Morgan Stanley Research

Capital-Light, Sales-Driven Firm

$$P = \frac{mS - cS}{k - g}$$

$$= \frac{E\left(1 - \frac{c}{m}\right)}{k - g}$$

$$\Rightarrow \frac{E}{k - g} \quad \text{if } c \to 0$$

$$\Rightarrow g^* = g \quad \text{for such firms}$$

- S – Sales
- m – Margin
- c – Capital received

Source: Morgan Stanley Research

Investment & Opportunity-Driven g*

$$g^* = \frac{k}{P} \times FV \begin{cases} \text{Funding} - \text{Constrained} \\ \text{Opportunity} - \text{Constrained} \\ \text{Pursuit} - \text{Limited} \end{cases}$$

Source: Morgan Stanley Research

Multiple Interpretations of g*

- **Earnings Yield "Plug"** $k = EY + g^*$
- **Risk Premium "Premium"** $r_P = (EY - y) + g^*$
- **Premium Fraction** $g^* = \frac{1}{k} \times \frac{Premium\ P/E}{P/E}$
- **Organic (Retention-Free) Earnings Growth** $P = \frac{E}{k - g^*}$
- **Net Yield** $g^* = g_E - bEY$
- **Annualized flow of FV** $g^* = k\ FV/P$

Source: Morgan Stanley Research

Summary and Conclusions

- EY misleading as estimate of equity risk premium
- "Adjustment" needed for value from future investments
- Excess "franchise" based on competitive advantages
- FV approach separates current from future investments
- FV structure allows for limits on funding, pursuits, etc
- FV framework helpful in analyzing issues like equity duration, inflation, fixed vs spread-based returns
- The annualized FV flow g* is the needed adjustment to the EY for estimating the theoretical equity risk premium

Source: Morgan Stanley Research

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