The Macroeconomic Data

127

Date	Change in T.Bond rate	% Chg in GDP	% Change in CPI	% Change in US $
2013	1.07%	1.83%	1.18%	4.89%
2012	-0.11%	2.20%	-1.03%	2.75%
2011	-1.37%	1.81%	1.48%	-4.59%
2010	-0.53%	2.39%	1.97%	-3.64%
2009	1.29%	-3.07%	-3.98%	5.79%
2008	-1.44%	-1.18%	-4.26%	10.88%
2007	-0.65%	2.93%	2.19%	-11.30%
2006	0.30%	3.40%	-1.84%	-2.28%
2005	0.16%	3.68%	0.66%	3.98%
2004	0.13%	3.72%	1.34%	-3.92%
2003	0.05%	4.32%	-0.65%	-14.59%
2002	-0.97%	2.80%	1.44%	-11.17%
2001	-0.18%	-0.04%	-2.50%	7.45%
2000	-0.98%	2.24%	0.96%	7.73%
1999	1.56%	4.70%	1.04%	1.68%
1998	-1.03%	4.51%	0.11%	-4.08%
1997	-0.63%	4.33%	-1.43%	9.40%
1996	0.80%	4.43%	0.31%	4.14%
1995	-2.09%	2.01%	-0.08%	-0.71%
1994	1.92%	4.12%	0.27%	-5.37%
1993	-0.83%	2.50%	-0.72%	0.56%
1992	-0.02%	4.15%	0.64%	6.89%
1991	-1.26%	1.09%	-2.89%	0.69%
1990	0.12%	0.65%	0.43%	-8.00%
1989	-1.11%	2.66%	0.51%	2.04%
1988	0.26%	3.66%	0.60%	1.05%
1987	1.53%	4.49%	2.54%	-12.01%
1986	-1.61%	2.83%	-2.33%	-15.26%
1985	-2.27%	4.19%	3.89%	-13.51%

I. Sensitivity to Interest Rate Changes

- How sensitive is the firm's value and operating income to changes in the level of interest rates?
- The answer to this question is important because it
  - it provides a measure of the duration of the firm's projects
  - it provides insight into whether the firm should be using fixed or floating rate debt.

Firm Value versus Interest Rate Changes

- Regressing changes in firm value against changes in interest rates over this period yields the following regression –

  Change in Firm Value = 0.1790 – 2.3251 (Change in Interest Rates)

  (2.74) (0.39)

  - T statistics are in brackets.

- The coefficient on the regression (-2.33) measures how much the value of Disney as a firm changes for a unit change in interest rates.

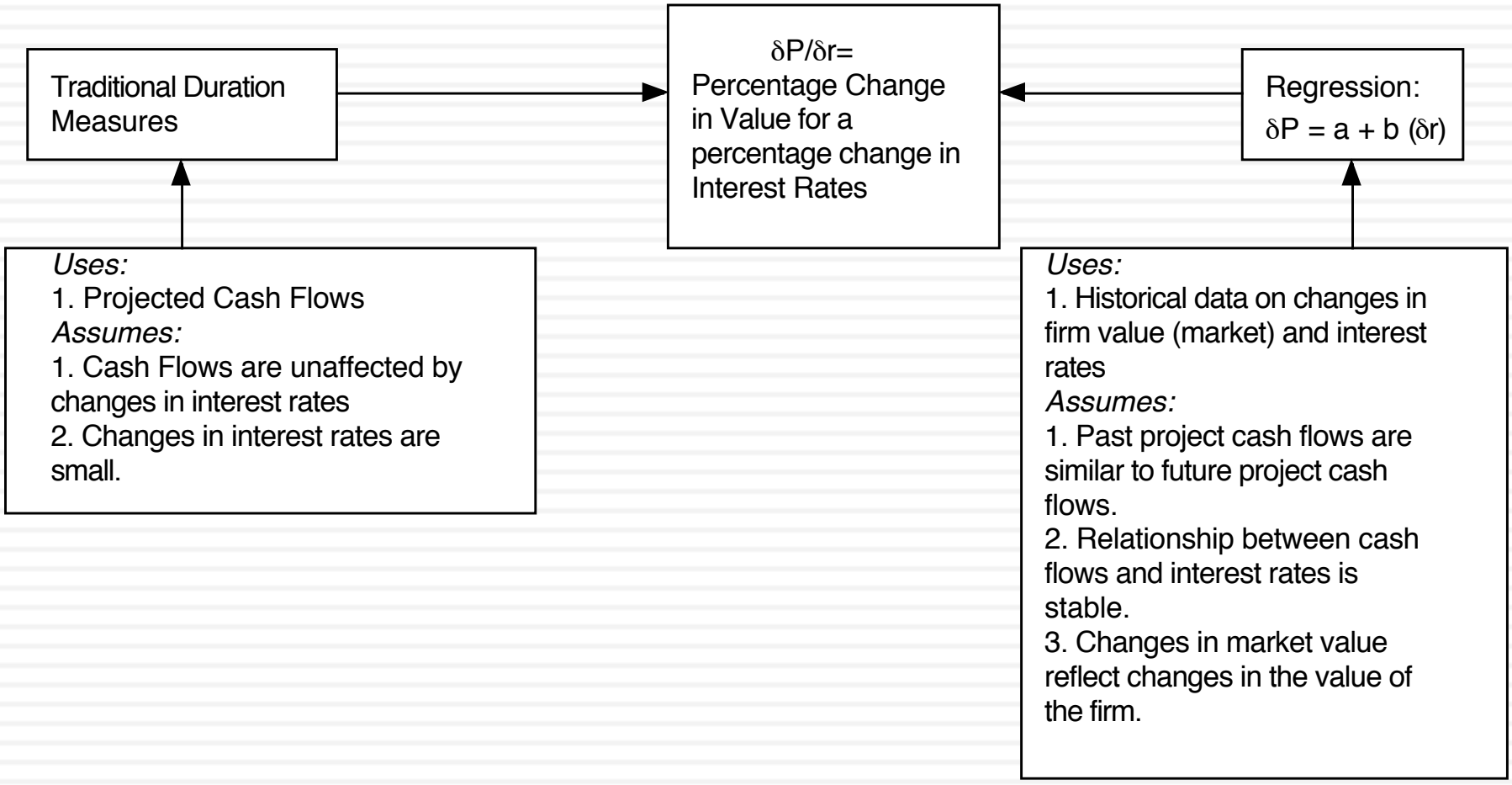
Why the coefficient on the regression is duration..

- The duration of a straight bond or loan issued by a company can be written in terms of the coupons (interest payments) on the bond (loan) and the face value of the bond to be –

$$\text{Duration of Bond} = \frac{dP/P}{dr/r} = \frac{\left[\sum_{t=1}^{t=N} \frac{t*\text{Coupon}_t}{(1+r)^t} + \frac{N*\text{Face Value}}{(1+r)^N}\right]}{\left[\sum_{t=1}^{t=N} \frac{\text{Coupon}_t}{(1+r)^t} + \frac{\text{Face Value}}{(1+r)^N}\right]}$$

- The duration of a bond measures how much the price of the bond changes for a unit change in interest rates.
- Holding other factors constant, the duration of a bond will increase with the maturity of the bond, and decrease with the coupon rate on the bond.

Duration: Comparing Approaches



Operating Income versus Interest Rates

- Regressing changes in operating cash flow against changes in interest rates over this period yields the following regression –

Change in Operating Income = 0.1698 – 7.9339 (Change in Interest Rates)
(2.69[a]) (1.40)

Conclusion: Disney's operating income has been affected a lot more than its firm value has by changes in interest rates.

II. Sensitivity to Changes in GDP/ GNP

- How sensitive is the firm's value and operating income to changes in the GNP/GDP?
- The answer to this question is important because
  - it provides insight into whether the firm's cash flows are cyclical and
  - whether the cash flows on the firm's debt should be designed to protect against cyclical factors.
- If the cash flows and firm value are sensitive to movements in the economy, the firm will either have to issue less debt overall, or add special features to the debt to tie cash flows on the debt to the firm's cash flows.

Regression Results

- Regressing changes in firm value against changes in the GDP over this period yields the following regression –

Change in Firm Value = 0.0067 + 6.7000 (GDP Growth)

(0.06) (2.03[a])

Conclusion: Disney is sensitive to economic growth

- Regressing changes in operating cash flow against changes in GDP over this period yields the following regression –

Change in Operating Income = 0.0142 + 6.6443 (GDP Growth)

(0.13) (2.05[a])

Conclusion: Disney's operating income is sensitive to economic growth as well.

III. Sensitivity to Currency Changes

- How sensitive is the firm's value and operating income to changes in exchange rates?
- The answer to this question is important, because
  - it provides a measure of how sensitive cash flows and firm value are to changes in the currency
  - it provides guidance on whether the firm should issue debt in another currency that it may be exposed to.
- If cash flows and firm value are sensitive to changes in the dollar, the firm should
  - figure out which currency its cash flows are in;
  - and issued some debt in that currency

Regression Results

- Regressing changes in firm value against changes in the dollar over this period yields the following regression –

Change in Firm Value = 0.1774– 0.5705 (Change in Dollar)

(2.76) (0.67)

Conclusion: Disney's value is sensitive to exchange rate changes, decreasing as the dollar strengthens. However, the effect is statistically insignificant.

- Regressing changes in operating cash flow against changes in the dollar over this period yields the following regression –

Change in Operating Income = 0.1680 – 1.6773 (Change in Dollar)

(2.82[a]) (2.13[a])

Conclusion: Disney's operating income is more strongly impacted by the dollar than its value is. A stronger dollar seems to hurt operating income.

IV. Sensitivity to Inflation

- How sensitive is the firm's value and operating income to changes in the inflation rate?
- The answer to this question is important, because
  - it provides a measure of whether cash flows are positively or negatively impacted by inflation.
  - it then helps in the design of debt; whether the debt should be fixed or floating rate debt.
- If cash flows move with inflation, increasing (decreasing) as inflation increases (decreases), the debt should have a larger floating rate component.

Regression Results

- Regressing changes in firm value against changes in inflation over this period yields the following regression –

Change in Firm Value = 0.1855 + 2.9966 (Change in Inflation Rate)

(2.96) (0.90)

Conclusion: Disney's firm value does seem to increase with inflation, but not by much (statistical significance is low)

- Regressing changes in operating cash flow against changes in inflation over this period yields the following regression –

Change in Operating Income = 0.1919 + 8.1867 (Change in Inflation Rate)

(3.43[a]) (2.76[a])

Conclusion: Disney's operating income increases in periods when inflation increases, suggesting that Disney does have pricing power.

Summarizing…

- Looking at the four macroeconomic regressions, we would conclude that
  - Disney's assets collectively have a duration of about 2.33 years
  - Disney is increasingly affected by economic cycles
  - Disney is hurt by a stronger dollar
  - Disney's operating income tends to move with inflation
- All of the regression coefficients have substantial standard errors associated with them. One way to reduce the error (a la bottom up betas) is to use sector-wide averages for each of the coefficients.

Bottom-up Estimates

These weights reflect the estimated values of the businesses

Business	*Interest rates*	*GDP Growth*	*Inflation*	*Currency*	*Weights*
Media Networks	-3.70	0.56	1.41	-1.23	49.27%
Parks & Resorts	-4.50	0.70	-3.05	-1.58	33.81%
Studio Entertainment	-6.47	0.22	-1.45	-3.21	13.49%
Consumer Products	-4.88	0.13	-5.51	-3.01	2.18%
Interactive	*-1.01*	*0.25*	*-3.55*	*-2.86*	1.25%
Disney Operations	-4.34	0.55	-0.70	-1.67	100.00%

Recommendations for Disney

- The debt issued should be long term and should have duration of about 4.3 years.
- A significant portion of the debt should be floating rate debt, reflecting Disney's capacity to pass inflation through to its customers and the fact that operating income tends to increase as interest rates go up.
- Given Disney's sensitivity to a stronger dollar, a portion of the debt should be in foreign currencies. The specific currency used and the magnitude of the foreign currency debt should reflect where Disney makes its revenues. Based upon 2013 numbers at least, this would indicate that about 18% of its debt should be in foreign currencies (and perhaps more, since even their US dollar income can be affected by currency movements).

Analyzing Disney's Current Debt

- Disney has $14.3 billion in interest-bearing debt with a face-value weighted average maturity of 7.92 years. Allowing for the fact that the maturity of debt is higher than the duration, this would indicate that Disney's debt may be a little longer than would be optimal, but not by much.
- Of the debt, about 5.49% of the debt is in non-US dollar currencies (Indian rupees and Hong Kong dollars), but the rest is in US dollars and the company has no Euro debt. Based on our analysis, we would suggest that Disney increase its proportion of Euro debt to about 12% and tie the choice of currency on future debt issues to its expansion plans.
- Disney has no convertible debt and about 5.67% of its debt is floating rate debt, which looks low, given the company's pricing power. While the mix of debt in 2013 may be reflective of a desire to lock in low long-term interest rates on debt, as rates rise, the company should consider expanding its use of foreign currency debt.

Adjusting Debt at Disney

- It can swap some of its existing fixed rate, dollar debt for floating rate, foreign currency debt. Given Disney's standing in financial markets and its large market capitalization, this should not be difficult to do.
- If Disney is planning new debt issues, either to get to a higher debt ratio or to fund new investments, it can use primarily floating rate, foreign currency debt to fund these new investments. Although it may be mismatching the funding on these investments, its debt matching will become better at the company level.

Debt Design for Bookscape & Vale

- *Bookscape:* Given Bookscape's dependence on revenues at its New York bookstore, we would design the debt to be

  Recommendation: Long-term, dollar denominated, fixed rate debt

  Actual: Long term operating lease on the store

- *Vale:* Vale's mines are spread around the world, and it generates a large portion of its revenues in China (37%). Its mines typically have very long lives and require large up-front investments, and the costs are usually in the local currencies but its revenues are in US dollars.
  - Recommendation: Long term, dollar-denominated debt (with hedging of local currency risk exposure) and if possible, tied to commodity prices.
  - Actual: The existing debt at Vale is primarily US dollar debt (65.48%), with an average maturity of 14.70 years. All of the debt, as far as we can assess, is fixed rate and there is no commodity-linked debt.

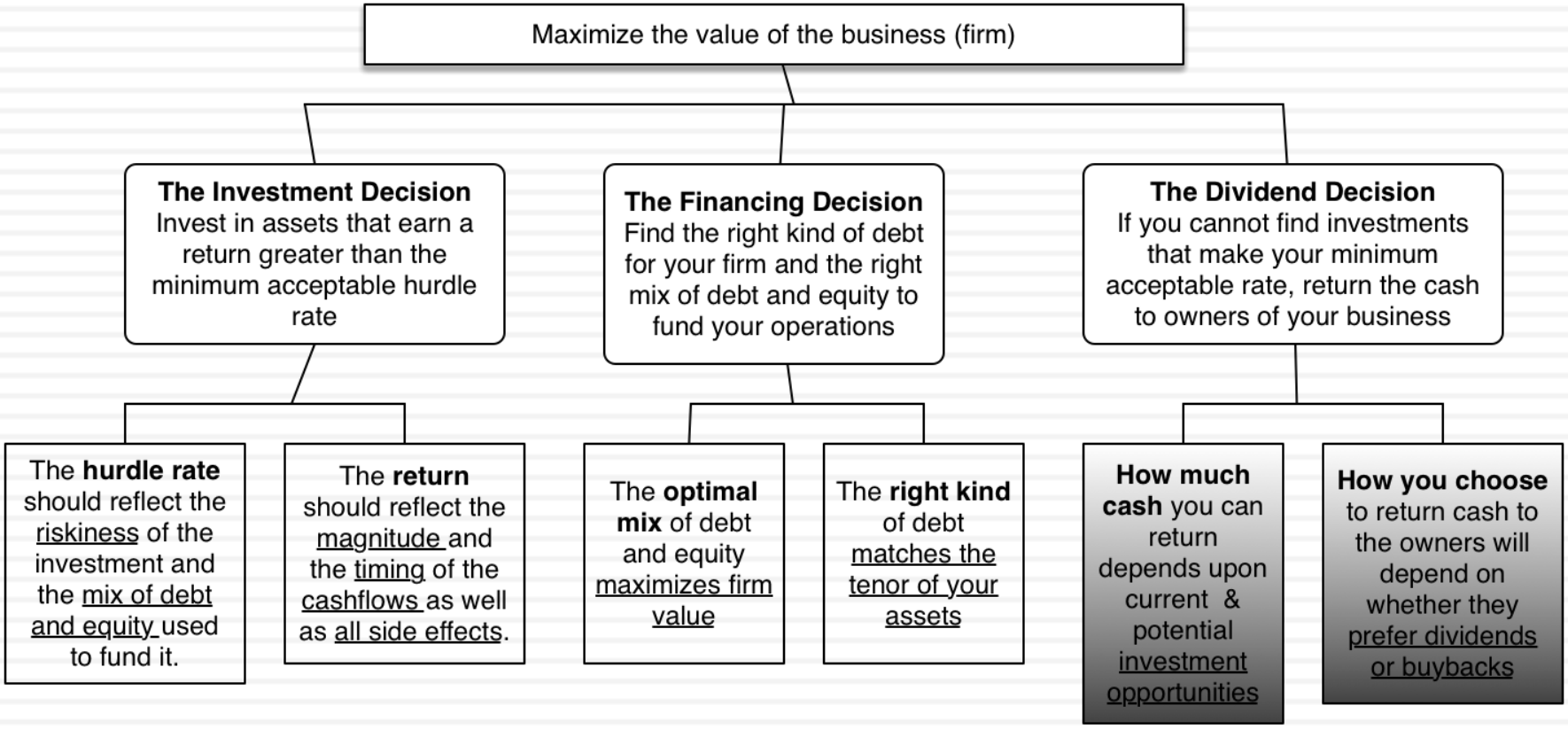
And for Tata Motors and Baidu

- *Tata Motors*: As an manufacturing firm, with big chunks of its of its revenues coming from India and China (about 24% apiece) and the rest spread across developed markets.
  - Recommendation: Medium to long term, fixed rate debt in a mix of currencies reflecting operations.
  - Actual: The existing debt at Tata Motors is a mix of Indian rupee debt (about 71%) and Euro debt (about 29%), with an average maturity of 5.33 years and it is almost entirely fixed rate debt.
- *Baidu:* Baidu has relatively little debt at the moment, reflecting its status as a young, technology company.
  - Recommendation: Convertible, Chinese Yuan debt.
  - Actual: About 82% of Baidu's debt is in US dollars and Euros currently, with an average maturity of 5.80 years. A small portion is floating rate debt, but very little of the debt is convertible.

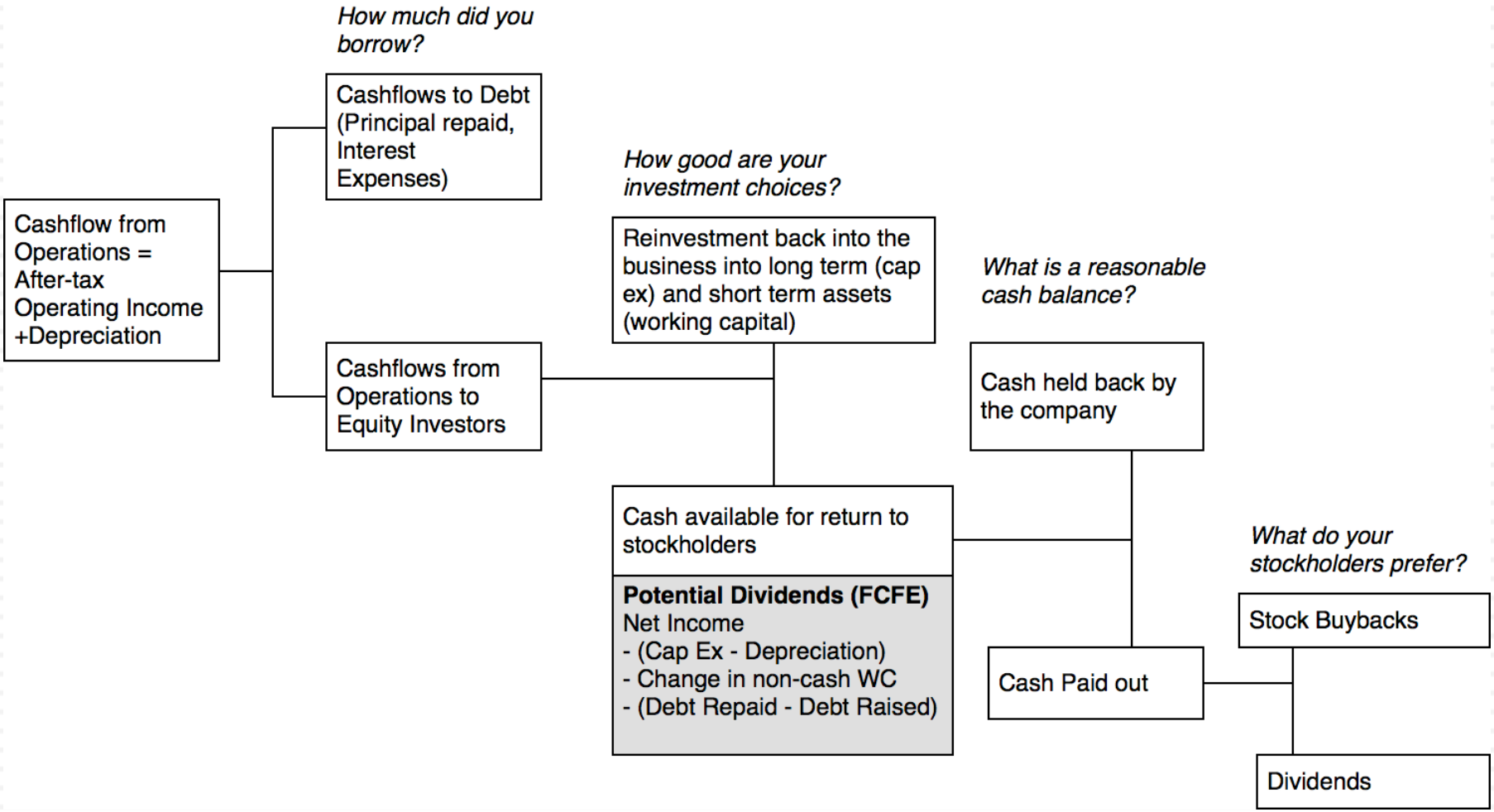
RETURNING CASH TO THE OWNERS: DIVIDEND POLICY

"Companies don't have cash. They hold cash for their stockholders."

First Principles



Steps to the Dividend Decision… if equity is treated as a residual claim

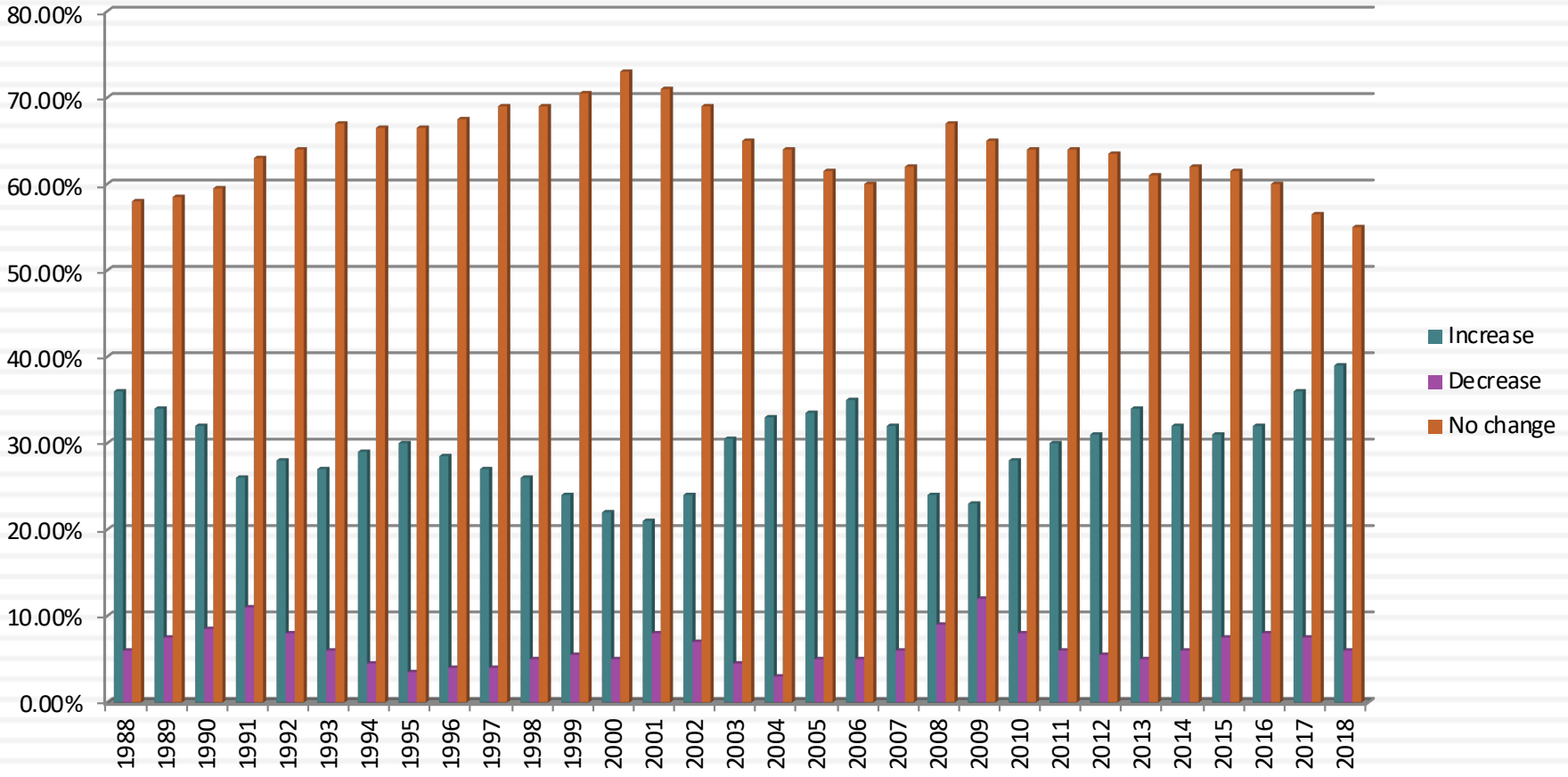


The Roots of Dividend Dysfunction

- In practice, dividend policy is dysfunctional and does not follow the logical process of starting with your investment opportunities and working your way down to residual cash.
- The two dominant factors driving dividend policy around the world are:
  - Inertia: Companies seem to hate to let of their past, when it comes to dividend policy.
  - Me-too-ism: Companies want to behave like their peer group.

I. Dividends are sticky

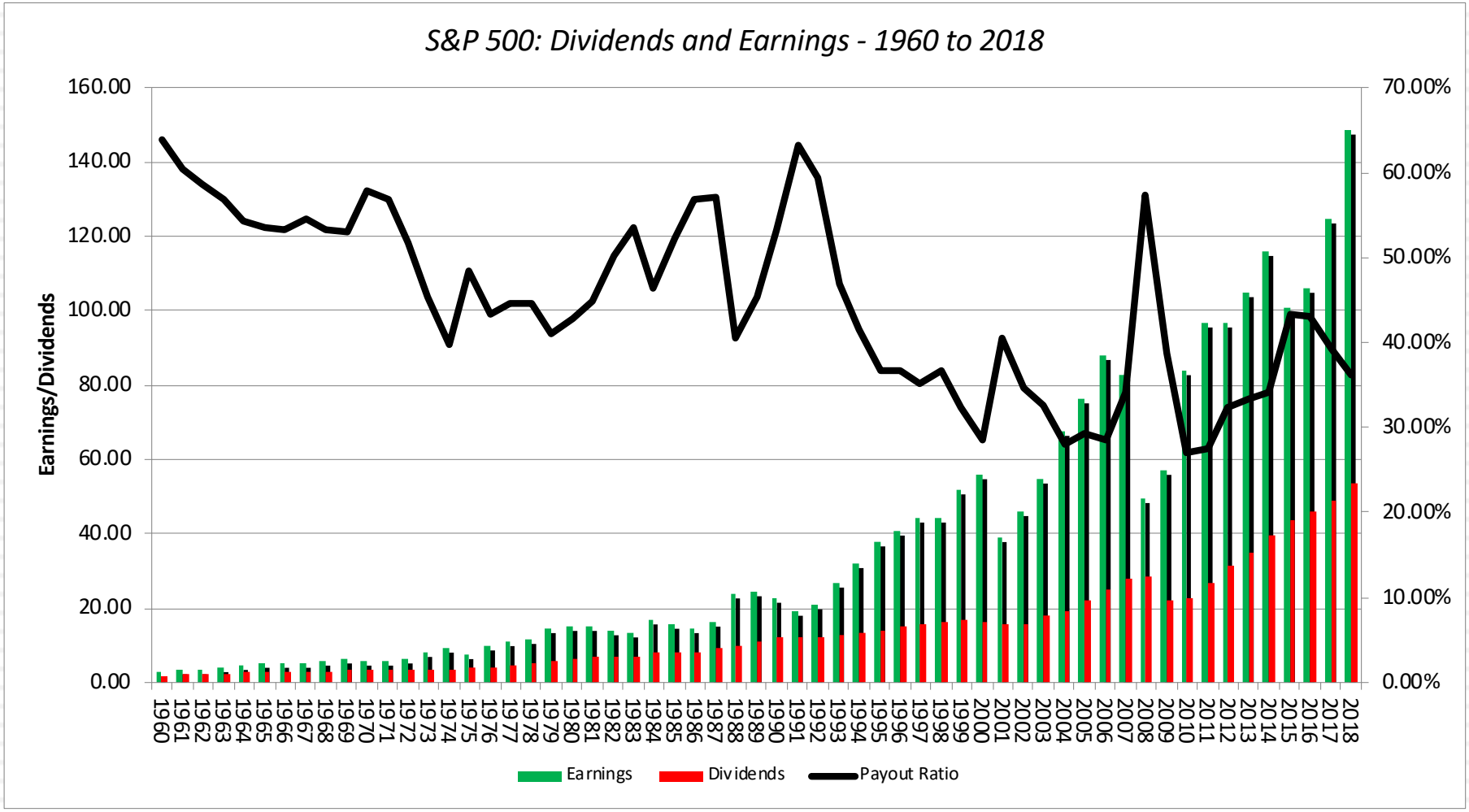
Figure 10.6: Dividend Changes at US companies



The last quarter of 2008 put stickiness to the test.. Number of S&P 500 companies that…

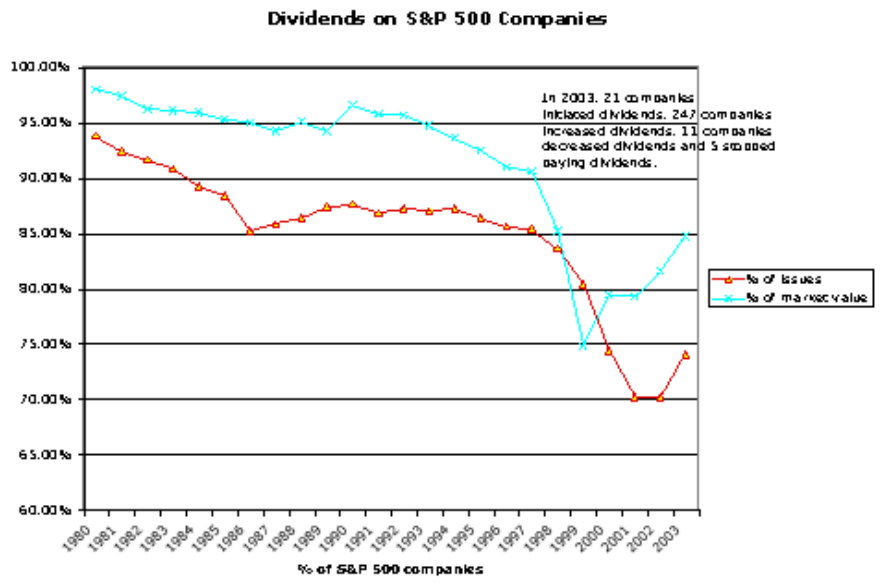
Quarter	Dividend Increase	Dividend initiated	Dividend decrease	Dividend suspensions
Q1 2007	102	1	1	1
Q2 2007	63	1	1	5
Q3 2007	59	2	2	0
Q4 2007	63	7	4	2
Q1 2008	93	3	7	4
Q2 2008	65	0	9	0
Q3 2008	45	2	6	8
Q4 2008	32	0	17	10

II. Dividends tend to follow earnings



III. Are affected by tax laws…

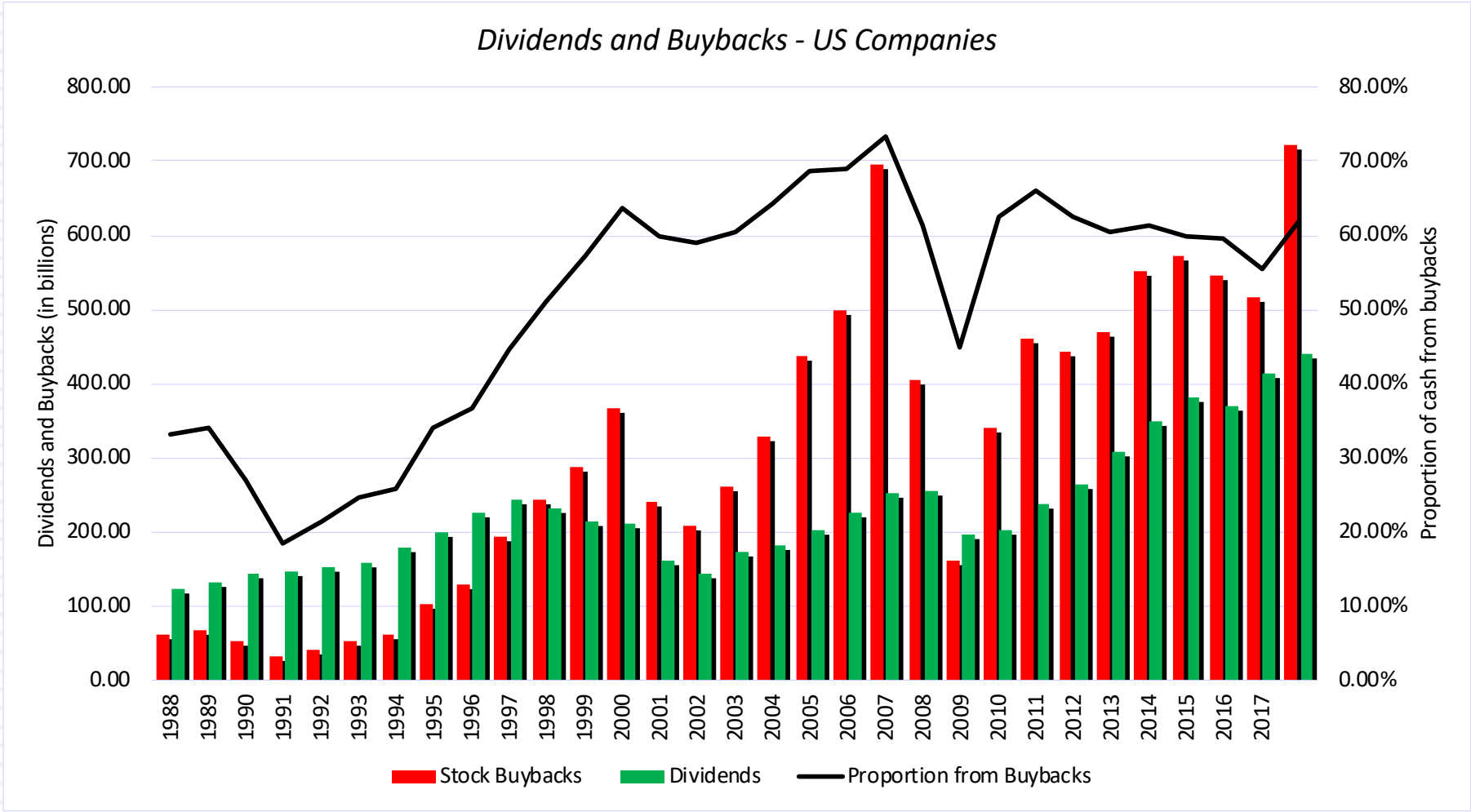
In 2003



In the last quarter of 2012

- As the possibility of tax rates reverting back to pre-2003 levels rose, 233 companies paid out $31 billion in dividends.
- Of these companies, 101 had insider holdings in excess of 20% of the outstanding stock.

IV. More and more US firms are buying back stock, rather than pay dividends...

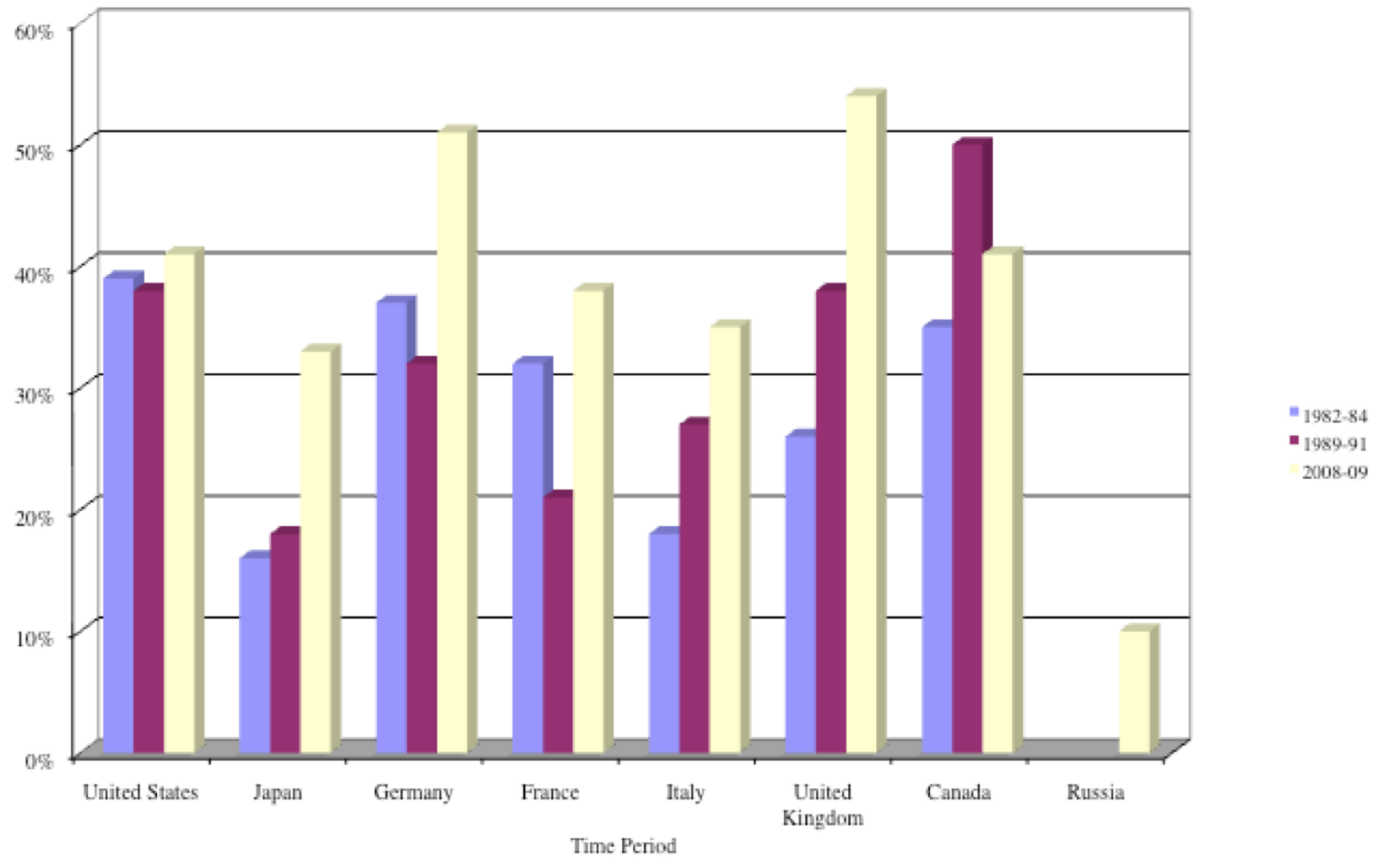


And its going global..

Sub Region	Number of firms	Market Cap	Net Income	Dividends	Buybacks	% Cash Returned in Buybacks	Payout Ratio	Cash Return Ratio
Africa and Middle East	2209	$ 1,850,574.35	$ 138,284.58	$ 71,927.05	$ 5,436.62	7.03%	52.01%	55.95%
Australia & NZ	1681	$ 1,314,426.61	$ 74,254.22	$ 54,751.40	$ 9,215.72	14.41%	73.74%	86.15%
Canada	2745	$ 1,834,045.97	$ 106,978.16	$ 54,622.26	$ 38,118.06	41.10%	51.06%	86.69%
China	5891	$ 10,213,167.44	$ 809,286.96	$ 359,242.67	$ 27,278.55	7.06%	44.39%	47.76%
Eastern Europe & Russia	546	$ 410,764.31	$ 79,210.26	$ 24,350.90	$ 1,899.96	7.24%	30.74%	33.14%
EU & Environs	5309	$ 10,890,170.58	$ 737,522.02	$ 358,473.92	$ 113,304.65	24.02%	48.61%	63.97%
India	3570	$ 2,073,039.57	$ 57,377.14	$ 20,002.95	$ 6,958.13	25.81%	34.86%	46.99%
Japan	3839	$ 5,298,919.76	$ 445,543.74	$ 118,429.96	$ 41,082.10	25.75%	26.58%	35.80%
Latin America & Caribbe	864	$ 2,124,223.58	$ 121,292.99	$ 45,793.92	$ 7,414.54	13.93%	37.75%	43.87%
Small Asia	8697	$ 4,692,158.10	$ 355,365.07	$ 139,662.15	$ 15,843.60	10.19%	39.30%	43.76%
UK	1288	$ 2,949,507.08	$ 211,673.17	$ 109,494.10	$ 37,608.93	25.57%	51.73%	69.50%
United States	7209	$ 26,902,976.41	$ 1,375,411.91	$ 536,039.09	$ 815,970.11	60.35%	38.97%	98.30%
Global	43848	$ 70,553,973.76	$ 4,512,200.23	$1,892,790.37	$1,120,130.97	37.18%	41.95%	66.77%

V. And there are differences across countries…

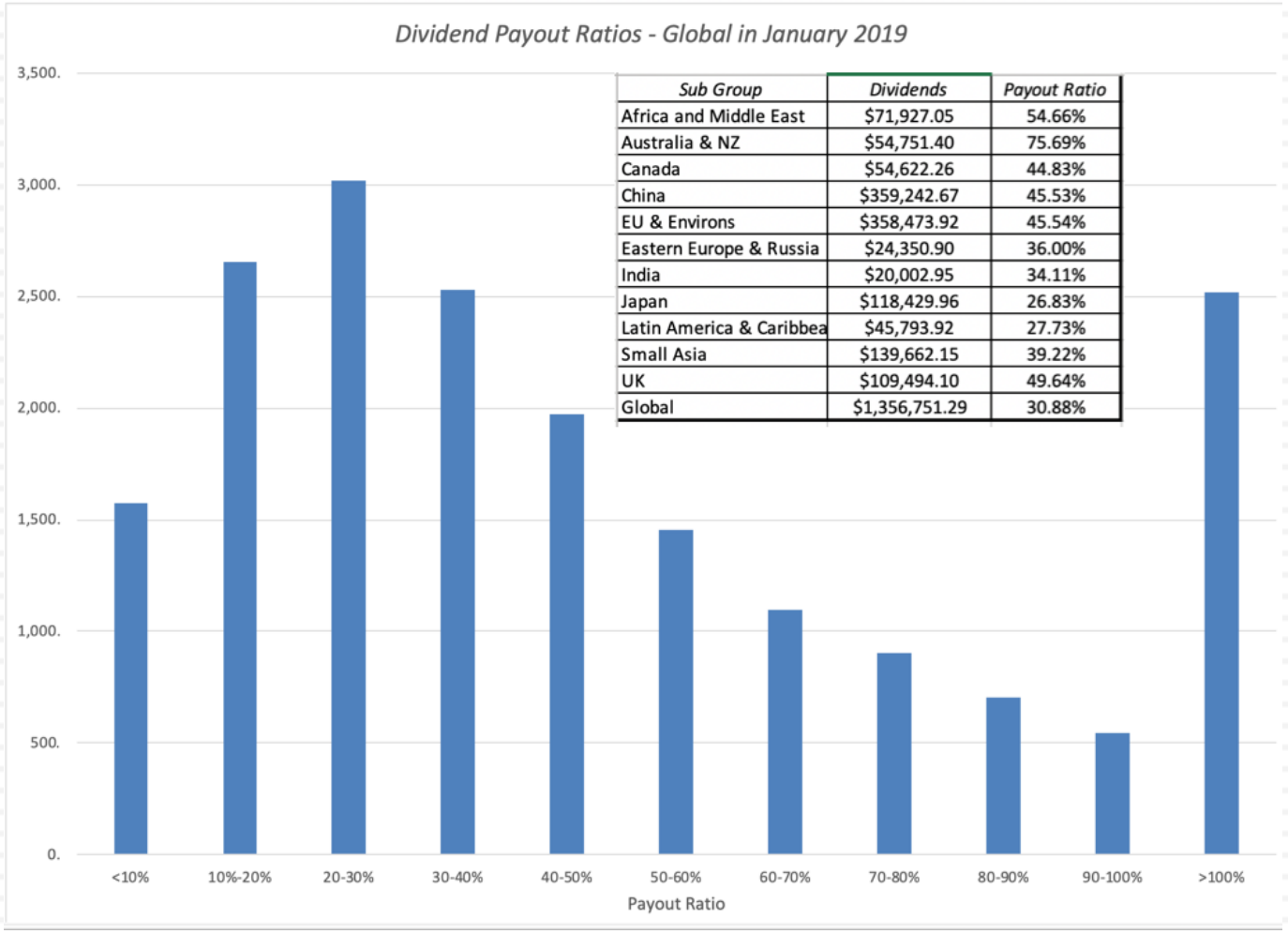
Figure 10.9: Dividend Payout Ratios - G7 Countries



Measures of Dividend Policy

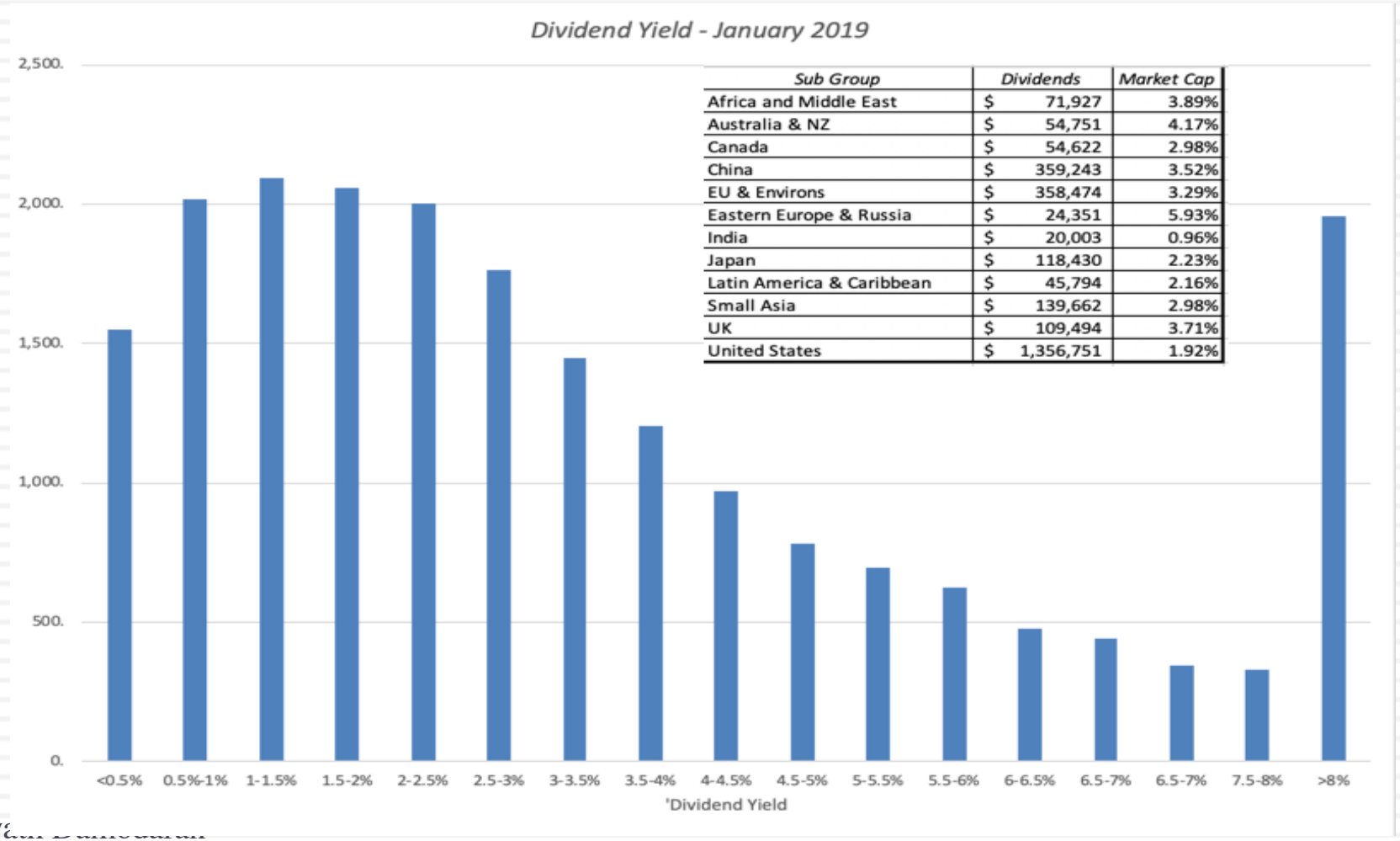
- Dividend Payout = Dividends/ Net Income
  - Measures the percentage of earnings that the company pays in dividends
  - If the net income is negative, the payout ratio cannot be computed.
- Dividend Yield = Dividends per share/ Stock price
  - Measures the return that an investor can make from dividends alone
  - Becomes part of the expected return on the investment.

Dividend Payout Ratio: January 2019



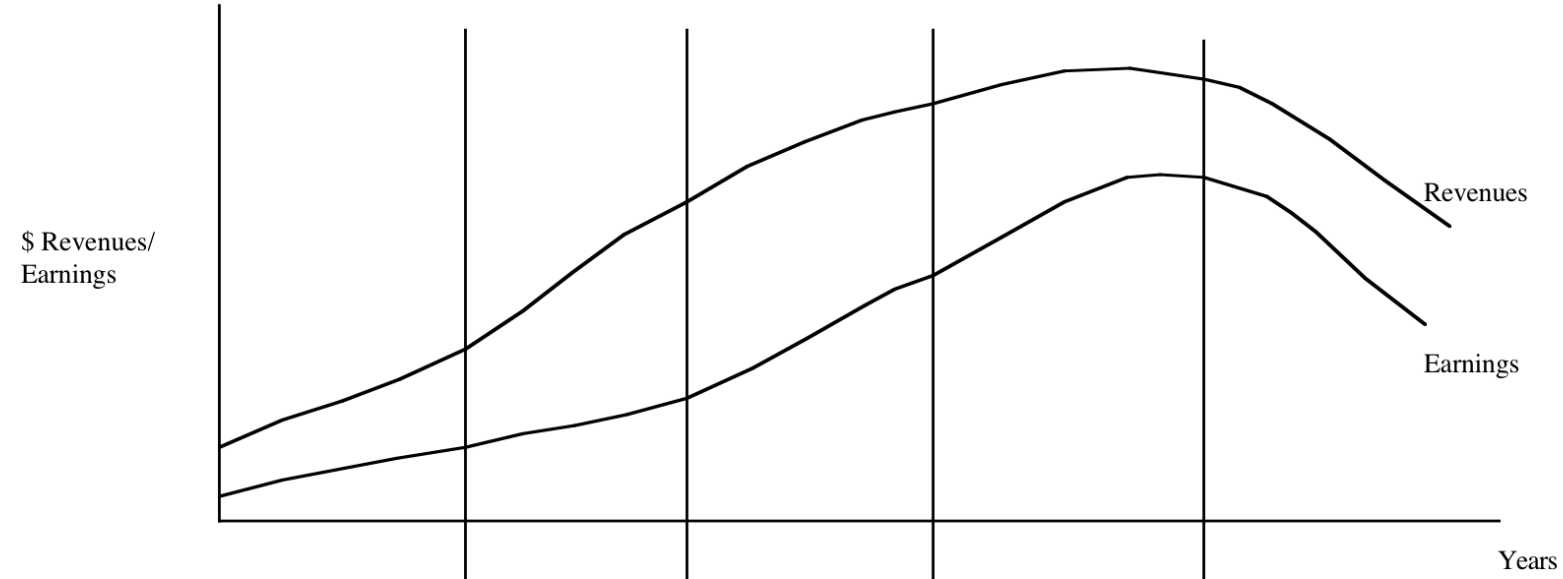
Sub Group	Dividends	Payout Ratio
Africa and Middle East	$71,927.05	54.66%
Australia & NZ	$54,751.40	75.69%
Canada	$54,622.26	44.83%
China	$359,242.67	45.53%
EU & Environs	$358,473.92	45.54%
Eastern Europe & Russia	$24,350.90	36.00%
India	$20,002.95	34.11%
Japan	$118,429.96	26.83%
Latin America & Caribbea	$45,793.92	27.73%
Small Asia	$139,662.15	39.22%
UK	$109,494.10	49.64%
Global	$1,356,751.29	30.88%

Dividend Yields: January 2019



Sub Group	Dividends	Market Cap
Africa and Middle East	$ 71,927	3.89%
Australia & NZ	$ 54,751	4.17%
Canada	$ 54,622	2.98%
China	$ 359,243	3.52%
EU & Environs	$ 358,474	3.29%
Eastern Europe & Russia	$ 24,351	5.93%
India	$ 20,003	0.96%
Japan	$ 118,430	2.23%
Latin America & Caribbean	$ 45,794	2.16%
Small Asia	$ 139,662	2.98%
UK	$ 109,494	3.71%
United States	$ 1,356,751	1.92%

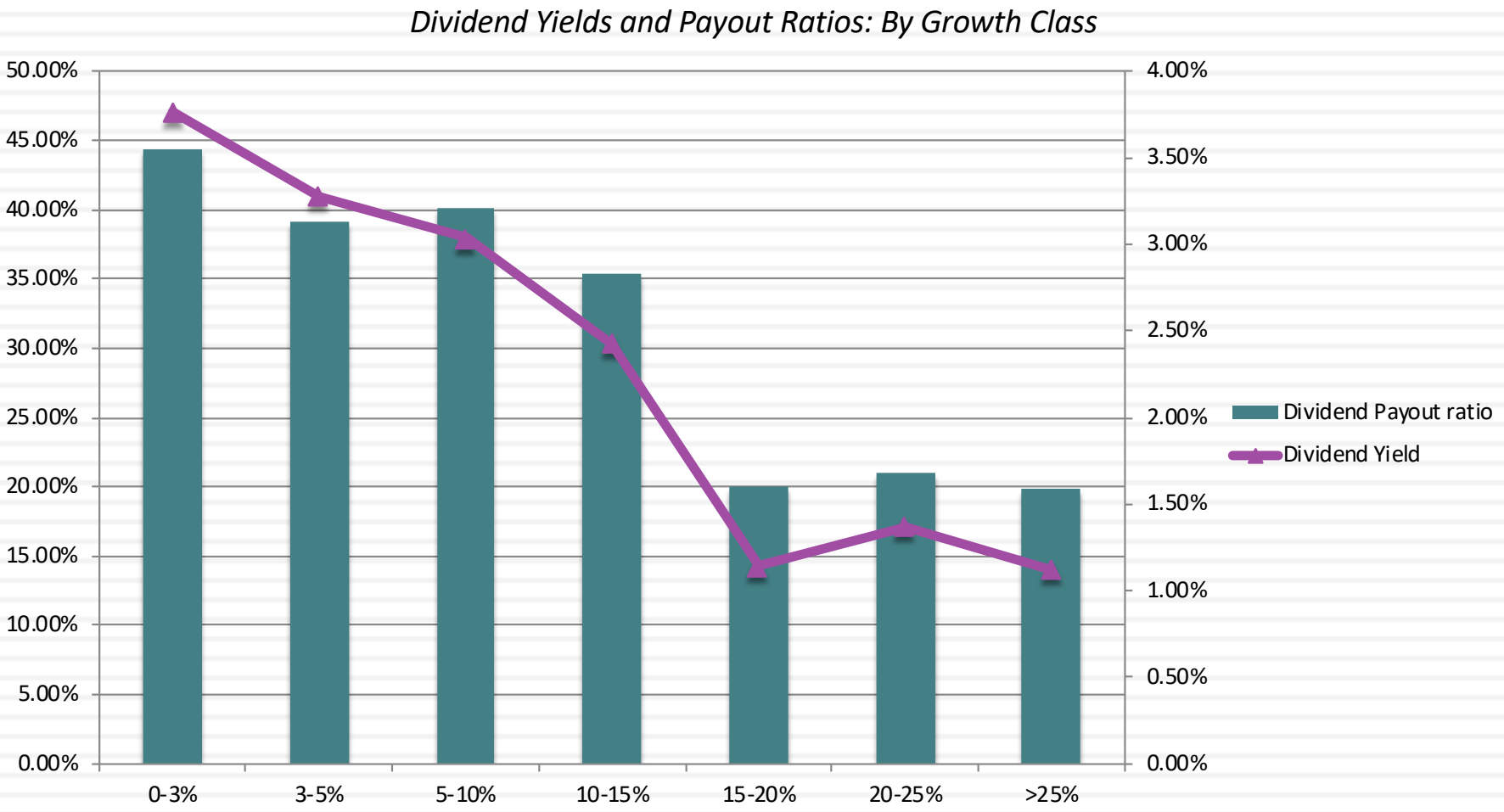
Figure 10.7: Life Cycle Analysis of Dividend Policy



External funding needs	High, but constrained by infrastructure	High, relative to firm value.	Moderates, relative to firm value.	Low, as projects dry up.	Low, as projects dry up.
Internal financing	Negative or low	Negative or low	Low, relative to funding needs	High, relative to funding needs	More than funding needs
Capacity to pay dividends	None	None	Very low	Increasing	High
Growth stage	Stage 1 Start-up	Stage 2 Rapid Expansion	Stage 3 High Growth	Stage 4 Mature Growth	Stage 5 Decline

Years

Dividend Yields and Payout Ratios: Growth Classes



Dividend Policy: Disney, Vale, Tata Motors, Baidu and Deutsche Bank

	Disney	Vale	Tata Motors	Baidu	Deutsche Bank
Dividend Yield - Last 12 months	1.09%	6.56%	1.31%	0.00%	1.96%
Dividend Payout ratio - Last 12 months	21.58%	113.45%	16.09%	0.00%	362.63%
Dividend Yield - 2008-2012	1.17%	4.01%	1.82%	0.00%	3.14%
Dividend Payout - 2008-2012	17.11%	37.69%	15.53%	0.00%	37.39%

Three Schools Of Thought On Dividends

1. If there are no tax disadvantages associated with dividends & companies can issue stock, at no issuance cost, to raise equity, whenever needed

Dividends do not matter, and dividend policy does not affect value.

2. If dividends create a tax disadvantage for investors (relative to capital gains)

Dividends are bad, and increasing dividends will reduce value

3. If dividends create a tax advantage for investors (relative to capital gains) and/or stockholders like dividends

Dividends are good, and increasing dividends will increase value

The balanced viewpoint

- If a company has excess cash, and few good investment opportunities (NPV>0), returning money to stockholders (dividends or stock repurchases) is good.
- If a company does not have excess cash, and/or has several good investment opportunities (NPV>0), returning money to stockholders (dividends or stock repurchases) is bad.

The Dividends don't matter school
The Miller Modigliani Hypothesis

- The Miller-Modigliani Hypothesis: Dividends do not affect value
- Basis:
  - If a firm's investment policies (and hence cash flows) don't change, the value of the firm cannot change as it changes dividends.
  - If a firm pays more in dividends, it will have to issue new equity to fund the same projects. By doing so, it will reduce expected price appreciation on the stock but it will be offset by a higher dividend yield.
  - If we ignore personal taxes, investors have to be indifferent to receiving either dividends or capital gains.
- Underlying Assumptions:

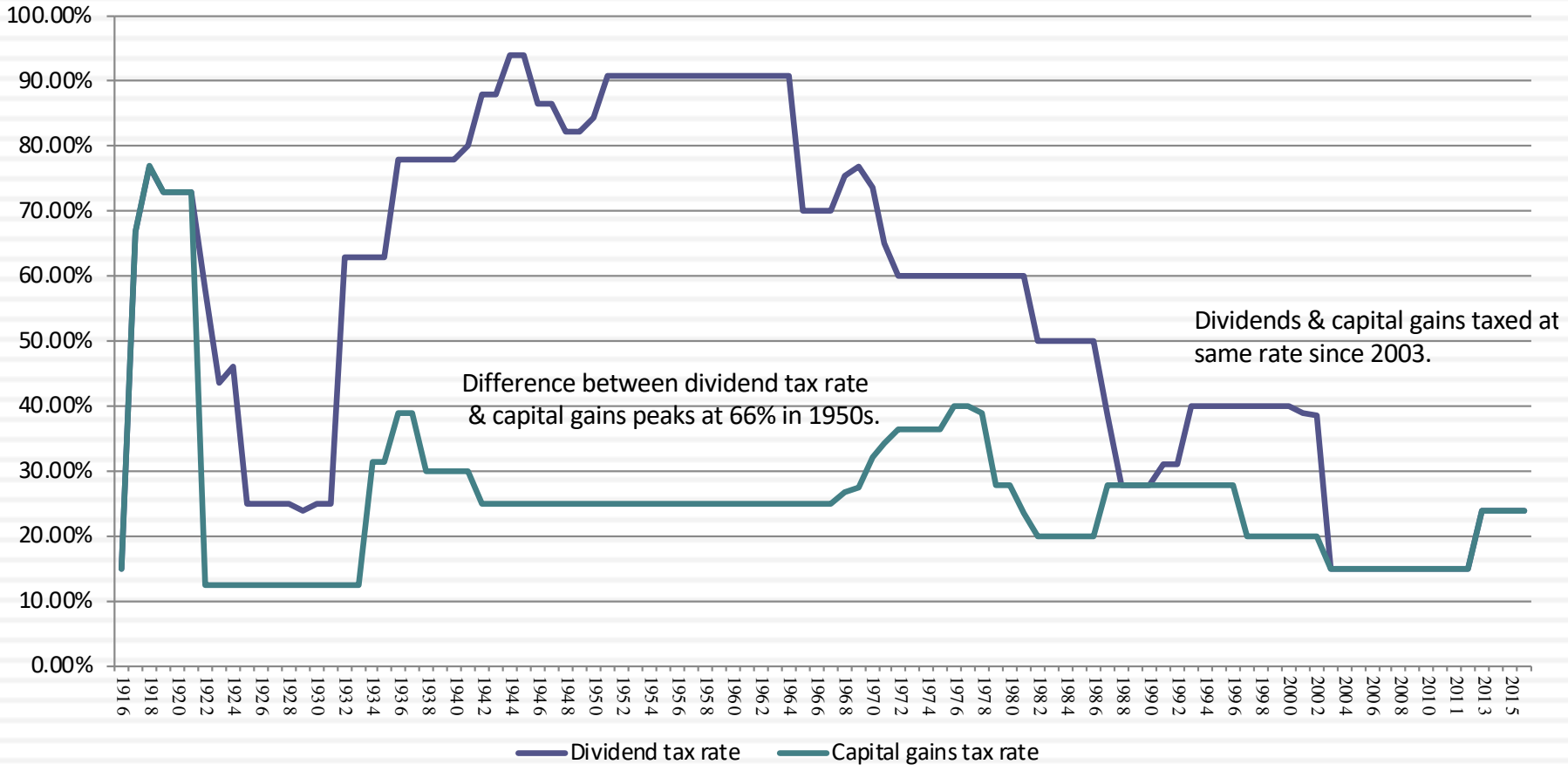
(a) There are no tax differences to investors between dividends and capital gains.

(b) If companies pay too much in cash, they can issue new stock, with no flotation costs or signaling consequences, to replace this cash.

(c) If companies pay too little in dividends, they do not use the excess cash for bad projects or acquisitions.

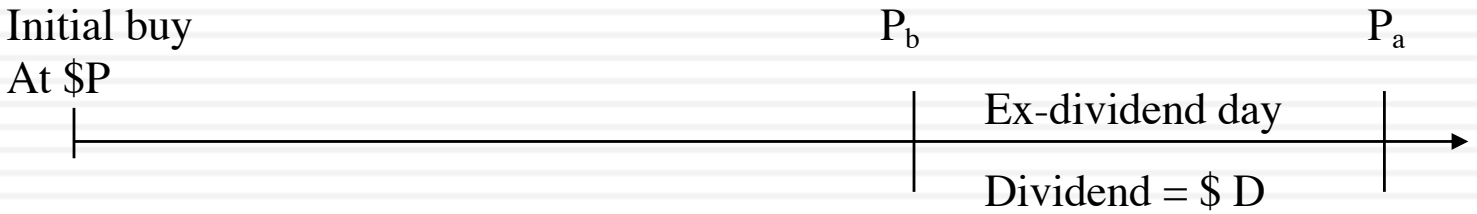
II. The Dividends are "bad" school: And the evidence to back them up…

Figure 10.10: Tax rates on Dividends and Capital Gains- US



What do investors in your stock think about dividends? Clues on the ex-dividend day!

- Assume that you are the owner of a stock that is approaching an ex-dividend day and you know that dollar dividend with certainty. In addition, assume that you have owned the stock for several years.



P = Price at which you bought the stock a "while" back

P_b= Price before the stock goes ex-dividend

P_a=Price after the stock goes ex-dividend

D = Dividends declared on stock

t_o, t_{cg} = Taxes paid on ordinary income and capital gains respectively

Cashflows from Selling around Ex-Dividend Day

- The cash flows from selling before ex-dividend day are:

  $P_b - (P_b - P)\, t_{cg}$

- The cash flows from selling after ex-dividend day are:

  $P_a - (P_a - P)\, t_{cg} + D(1-t_o)$

- Since the average investor should be indifferent between selling before the ex-dividend day and selling after the ex-dividend day -

  $P_b - (P_b - P)\, t_{cg} = P_a - (P_a - P)\, t_{cg} + D(1-t_o)$

- Some basic algebra leads us to the following:

$$\frac{P_b - P_a}{D} = \frac{1 - t_o}{1 - t_{cg}}$$

Intuitive Implications

- The relationship between the price change on the ex-dividend day and the dollar dividend will be determined by the difference between the tax rate on dividends and the tax rate on capital gains for the typical investor in the stock.

Tax Rates	*Ex-dividend day behavior*
If dividends and capital gains are taxed equally	Price change = Dividend
If dividends are taxed at a higher rate than capital gains	Price change < Dividend
If dividends are taxed at a lower rate than capital gains	Price change > Dividend

The empirical evidence…

1966-1969

- Ordinary tax rate = 70%
- Capital gains rate = 28%
- Price change as % of Dividend = 78%

1981-1985

- Ordinary tax rate = 50%
- Capital gains rate = 20%
- Price change as % of Dividend = 85%

1986-1990

- Ordinary tax rate = 28%
- Capital gains rate = 28%
- Price change as % of Dividend = 90%

Dividend Arbitrage

- Assume that you are a tax exempt investor, and that you know that the price drop on the ex-dividend day is only 90% of the dividend. How would you exploit this differential?
  a. Invest in the stock for the long term
  b. Sell short the day before the ex-dividend day, buy on the ex-dividend day
  c. Buy just before the ex-dividend day, and sell after.
  d. _____

Example of dividend capture strategy with tax factors

- XYZ company is selling for $50 at close of trading May 3. On May 4, XYZ goes ex-dividend; the dividend amount is $1. The price drop (from past examination of the data) is only 90% of the dividend amount.
- The transactions needed by a tax-exempt U.S. pension fund for the arbitrage are as follows:
  - 1. Buy 1 million shares of XYZ stock cum-dividend at $50/share.
  - 2. Wait till stock goes ex-dividend; Sell stock for $49.10/share (50 - 1* 0.90)
  - 3. Collect dividend on stock.
- Net profit = - 50 million + 49.10 million + 1 million = $0.10 million