# THE UNIVERSITY OF MELBOURNE

*Capital Structure and Payout Policy II*

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# 11. Capital Structure and Payout Policy II

1. Examine Miller and Modigliani with taxes in the real world
2. Examine the effects of financial distress on capital structure
3. Examine whether an optimal capital structure exists
4. Summarize the various payout policies of firms
5. Analyze the circumstances when payout policy is irrelevant
6. Analyze the circumstances when payout policy matters
7. Summarize the main factors affecting dividend policy

# *Required Readings: Weeks 11 – 12*

- ❖ *Week 11*
  - ❖ GRAH, Ch. 13 (Sec 13.4 – 13.6) and Ch. 15
- ❖ *Week 12*
  - ❖ GRAH, Ch. 8 (Sec 8.1 – 8.3)

# 11.1 MM with Corporate and Personal Taxes

❖ *Recall from week 10:* In perfect capital market and with no taxes a firm's capital structure does not affect its market value

❖ With corporate taxes, the value of the leveraged firm, $V_L$ is…

❖ $V_L = V_U + \text{PV(Tax shield)}$

❖ $V_L = V_U + (t_c \times D \times r_D)/r_D$

❖ $V_L = V_U + t_c D$

❖ Key implications…

  ❖ With the introduction of corporate taxes in the MM analysis the existence of debt matters!

  ❖ Firm should *maximize* the level of debt in their capital structure as this will maximize the value of the firm

❖ *What is missing from the analysis?*

# MM with Corporate and Personal Taxes

❖ Miller (1977) extended the MM analysis to include personal taxes on debt and equity income. The *net general gains from leverage* now are…

$$G_L = \left[ 1 - \frac{(1-t_c)(1-t_{ps})}{(1-t_{pd})} \right] D$$

$t_c$ = Corporate tax rate

$t_{ps}$ = Personal tax rate on income from ordinary shares (capital gains and dividends)

$t_{pd}$ = Personal tax rate on income from debt (interest income)

$D$ = Market value of a firm's outstanding debt

❖ What happens when $t_c = t_{ps} = t_{pd}$?

❖ What happens when $t_{ps} = t_{pd} = 0$ or when $t_{ps} = t_{pd}$?

❖ What happens when $t_{ps} = (t_{pd} - t_c)/(1 - t_c)$?

# MM with Corporate and Personal Taxes

| Country | D/(E + D) | Net of Cash D/(E + D) | Interest/EBIT | $\tau_c$ | $\tau^*$ |
|---|---|---|---|---|---|
| United States | 28% | 23% | 41% | 34.0% | 34.0% |
| Japan | 29% | 17% | 41% | 37.5% | 31.5% |
| Germany | 23% | 15% | 31% | 50.0% | 3.3% |
| France | 41% | 28% | 38% | 37.0% | 7.8% |
| Italy | 46% | 36% | 55% | 36.0% | 18.6% |
| United Kingdom | 19% | 11% | 21% | 35.0% | 24.2% |
| Canada | 35% | 32% | 65% | 38.0% | 28.9% |

*Source*: R. Rajan and L. Zingales, "What Do We Know About Capital Structure? Some Evidence from International Data," *Journal of Finance* 50 (1995): 1421–1460. Data is for median firms and top marginal tax rates.

*Source:* Rajan and Zingales (1995), *Journal of Finance*. International leverage and tax rates in 1990. Note that $\tau_c$ is the corporate tax rate and $\tau^*$ measures the effective tax advantage of debt taking personal taxes into account.

# 11.2 Other Market Imperfections

* The main non-tax related factors that can cause a firm's value to depend on its capital structure are financial distress, bankruptcy costs and agency costs
* *Financial distress* is the state where a firm is in breach of its debt obligations, which may not necessarily result in bankruptcy
* *Financial default* occurs when a firm fails to make the required interest or principal payments on its debt
* *Note that the term "bankruptcy" means different things in Australia versus other countries (for example, the US)*
    * *The term "bankruptcy" is used in a generic sense here*
* *Agency costs* arise from the potential for conflicts of interest between parties in contractual relationships in the firm

# Bankruptcy and Capital Structure

- *Direct costs of financial distress* refer to the fees and costs associated with advisors, lawyers, accountants, etc.
- Direct costs of bankruptcy reduce the value of the assets that the firm's investors will ultimately receive
    - Studies in the US show that the average direct costs of bankruptcy are approximately 3 – 4% of the pre-bankruptcy market value of total assets
- In the case of Enron's bankruptcy in 2001 the direct costs were estimated to be around $30 million a month on legal and accounting fees for a total of over $750 million
- In the case of the Lehman Brothers bankruptcy in 2008 the total direct costs were estimated at around $1.6 billion

# Bankruptcy and Capital Structure

- *Indirect costs of financial distress* refer to the costs associated with a range of stakeholders behaving in ways that can disrupt a firm's operations and reduce its market value
  - Loss of customers
  - Loss of suppliers
  - Loss of employees
  - Loss of receivables
  - Fire sale of assets
  - Delayed liquidation
- While the indirect costs are difficult to measure accurately, they are typically much larger than the direct costs of bankruptcy
  - In the case of Enron the indirect costs (in terms of lost market value) exceeded $25 billion!

# *Agency Costs of Capital Structure*

- ❖ Agency costs arise from the potential for conflicts of interest between the parties in contractual relationships in a firm
- ❖ We focus on management decisions that result in a (potential) transfer of wealth from debtholders to shareholders
- ❖ The sources of potential conflict are…
  - ❖ Dilution of claims
  - ❖ Dividend payout
  - ❖ Asset substitution
  - ❖ Underinvestment

# *Agency Costs of Capital Structure*

❖ Dilution of claims
  - ❖ A firm may issue new debt which ranks higher than existing debt
  - ❖ The claim of old debtholders on the firm's assets becomes less secure
  - ❖ New debtholders will earn what they're promised so there is wealth transfer from the (*old*) debtholders to shareholders

❖ Dividend payout
  - ❖ A firm may significantly increase its dividend payout which decreases the firm's assets and increases the riskiness of its debt
  - ❖ This results in a wealth transfer from debtholders to shareholders

# *Agency Costs of Capital Structure*

❖ Excessive risk taking and asset substitution
- ❖ When in financial distress, a firm's incentive to use debt and undertake very risky (and even negative *NPV*) investments increases because there is limited liability for shareholders
- ❖ If the risky investments are successful the benefits go to shareholders. If the risky investments fail the costs are borne by debtholders (as shareholders have limited liability)
- ❖ There is a wealth transfer from debtholders to shareholders
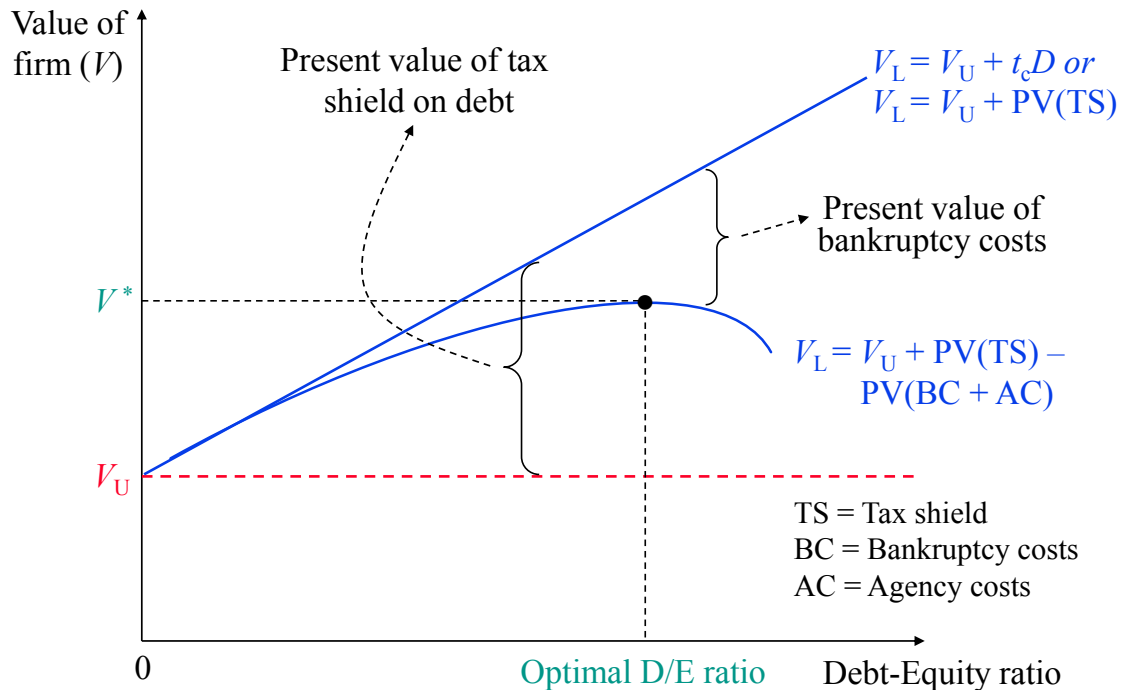
# *Agency Costs of Capital Structure*

- ❖ Debt overhang and underinvestment
  - ❖ A firm in financial distress may potentially reject low risk investments, even if they are positive *NPV* investments, if the benefits go to debtholders
  - ❖ Although the investments are profitable and will otherwise increase firm value, shareholders will lose because the benefits go to debtholders (via lower risk of debt and a higher value of debt)
  - ❖ There is a wealth transfer from debtholders to shareholders
- ❖ *Who bears these agency costs – Bondholders or shareholders?*
- ❖ *What can debtholders do to mitigate the (ex post) agency costs?*
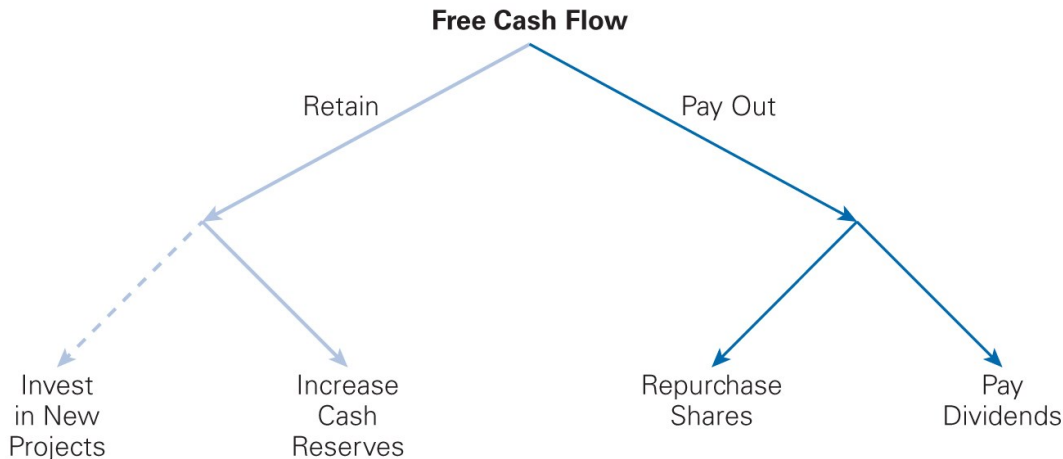
# 11.3 An Optimal Capital Structure

❖ Incorporating the benefits and costs of debt, leads
to the following expression of the value of a leveraged firm…

❖ $V_L = V_U + \text{PV(Tax shield)} - \text{PV(Bankruptcy and agency costs)}$

❖ The present value of expected bankruptcy costs depends on
the probability of bankruptcy and present value of costs incurred if bankruptcy
occurs

❖ The "trade-off" theory of capital structure

    ❖ The possibility of a trade-off between the opposing effects of the benefits of debt finance
and the costs of financial distress may imply that an optimal capital structure exists

    ❖ Management should aim to maintain a target debt-equity ratio

# *An Optimal Capital Structure*



Value of firm ($V$)

Present value of tax shield on debt

$V_L = V_U + t_c D$ *or*
$V_L = V_U + \text{PV(TS)}$

Present value of bankruptcy costs

$V^*$

$V_L = V_U + \text{PV(TS)} -$
$\text{PV(BC} + \text{AC})$

$V_U$

TS = Tax shield
BC = Bankruptcy costs
AC = Agency costs

0          Optimal D/E ratio     Debt-Equity ratio

# 11.4 Summary of Payout Policies

▼ The net after-tax cash flows (free cash flows) of a firm can be put to several uses, dividends being just one of them



**Free Cash Flow**

Retain — Pay Out

Invest in New Projects — Increase Cash Reserves — Repurchase Shares — Pay Dividends

# *Summary of Payout Policies*

- ❖ Special dividend
  - ❖ A one-time dividend payment made by a firm, which is usually much larger than its regular dividend
- ❖ Share split (or share dividend)
  - ❖ A dividend paid in ordinary shares rather than as cash to shareholders
- ❖ Liquidating dividend
  - ❖ A return of capital to shareholders from a business operation that is being terminated
- ❖ Share repurchase (or share buyback)
  - ❖ A return of cash to shareholders via either an on-market or off-market repurchase of shares

# *Institutional Features of Dividends*

- ❖ Dividend declaration (or announcement) date
- ❖ Record date
  - ❖ The date on which shareholders of record receive the announced dividend
- ❖ Ex-dividend date
  - ❖ Typically 1 – 2 business days before the record date
  - ❖ If you purchase the shares before this date you receive the announced dividend
  - ❖ On, or after, this date you do not receive the announced dividend
- ❖ Payment date
  - ❖ Date dividend is mailed or paid electronically
- ❖ Link to dividend information on ASX-listed firms:
  https://www.asx.com.au/asx/markets/dividends.do

# *Case Study 1: CBA's Dividend Announcement*

❖ *Feb 6, 2019:* Commonwealth Bank of Australia (*ASX code:* CBA) announced a fully franked interim dividend of $2.00 per share. The 2019 interim dividend will be paid on 28 March 2019. The ex-dividend date is 12 February 2019 and the record date is 14 February 2019 (5 pm AEDT). The Group's dividend reinvestment plan (DRP) will continue to operate. No discount will be applied to shares issued under the DRP for this dividend
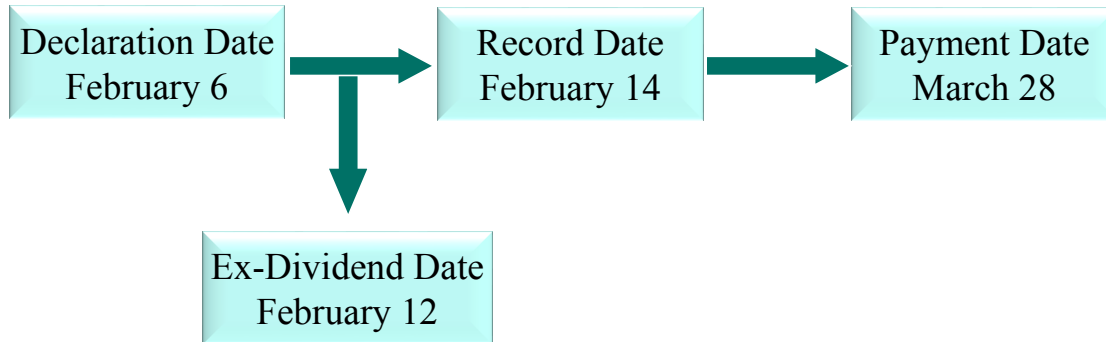
*Source:* www.commbank.com.au/about-us/shareholders/shareholder-information/dividend.html

# Case Study 1: CBA's Dividend Announcement

▼ Summary of interim dividend of $2.00 per share announced by the Commonwealth Bank in 2019

| Announcement date | 6 February 2019 (Wednesday) |
|---|---|
| Ex-dividend date | 12 February 2019 (Tuesday) |
| Record date | 14 February 2019 (Thursday) |
| Final dividend payment date | 28 March 2019 (Thursday) |

# *Case Study 1: CBA's Dividend Announcement*

| Declaration Date February 6 | → | Record Date February 14 | → | Payment Date March 28 |
|---|---|---|---|---|

↓

| Ex-Dividend Date February 12 |
|---|

- ▼ The dividend of $2.00 declared by CBA on February 6 is payable on March 28 to shareholders of record at February 14
- ▼ The ex-dividend date is 2 business days before the record date
- ▼ Shares trade *without* the dividend ("ex dividend") from February 12 onwards
- ▼ Shares trade *with* the dividend ("cum dividend") before February 12
- ▼ What will happen to the price of shares on the ex-dividend date?

# *Dividend Payout Policies*

❖ Pure residual dividend policy
  - ❖ Pay out any earnings that the firm does not need to reinvest
  - ❖ Dividends and dividend payout ratios tend to be unstable

❖ Smoothed (or fixed) dividend policy
  - ❖ Target a proportion of earnings to be paid out as dividends
  - ❖ Objective here is for the dividends to equal the (long run) difference between expected earnings and expected capital expenditures – Stable dividends over time

❖ Constant payout dividend policy
  - ❖ Pay a constant proportion of earnings as dividends
  - ❖ Stable dividend payout ratio but unstable dividend amounts

❖ Low regular dividend and extra dividend policy

# *Examples of Dividend Payout Policies*

| Company | Dividend policy |
|---|---|
| AMP | A **payout ratio** of 70 to 90 per cent of underlying profit |
| BHP Billiton | A **minimum payout ratio** of 50 per cent, introduced in 2016. This replaces a long-standing **progressive dividend policy** that aimed to steadily increase or at least maintain the dividend per share in US dollar terms at each financial half year |
| Brambles | A **progressive dividend policy**, which seeks to maintain or increase dividends per share each year, in Australian cents, subject to its financial performance and cash requirements |
| Commonwealth Bank of Australia | A full-year **payout ratio** of 70 to 80 per cent |
| Insurance Australia Group | A full-year **payout ratio** of 60 to 80 per cent of cash earnings |
| Macquarie Group | A full-year ordinary dividend **payout ratio** of 60 to 80 per cent |
| National Australia Bank | A **payout ratio** of 70 to 75 per cent of cash earnings |
| QBE Insurance Group | A **maximum payout ratio** of annual cash profits of 65 per cent |

# *Examples of Dividend Payout Policies*

| Company | Dividend policy |
|---------|-----------------|
| Rio Tinto | Shifting to a **payout ratio** in the range of 40 to 60 per cent of underlying earnings through the cycle.[a] This replaces a long-standing **progressive dividend policy** that aimed to maintain or increase the US dollar value of ordinary dividends per share |
| Suncorp Group | An ordinary dividend **payout ratio** target of 60 to 80 per cent of cash earnings |
| Telstra Corporation | Within a broader capital management framework, to **increase the dividend over time** |
| Westpac Banking Corporation | Seeks to **consistently lift ordinary dividends** in terms of cents per share each half while maintaining a strong capital position to support growth |
| Wesfarmers | Seeks to deliver **growing dividends over time**, with dividends declared reflective of the Group's current and projected cash position, profit generation and available franking credits |

*Source:* Bergmann (2016) ''The Rise in Dividend Payments'', *RBA Bulletin, Table 2*. Public statements of dividend policies of selected ASX 20 companies.

# *Dividend Payouts in the US*



**FIGURE 15.1    US PAYOUTS 1990–2009: DIVIDENDS, REPURCHASES AND EARNINGS**

Aggregated earnings and payouts, non-financial firms
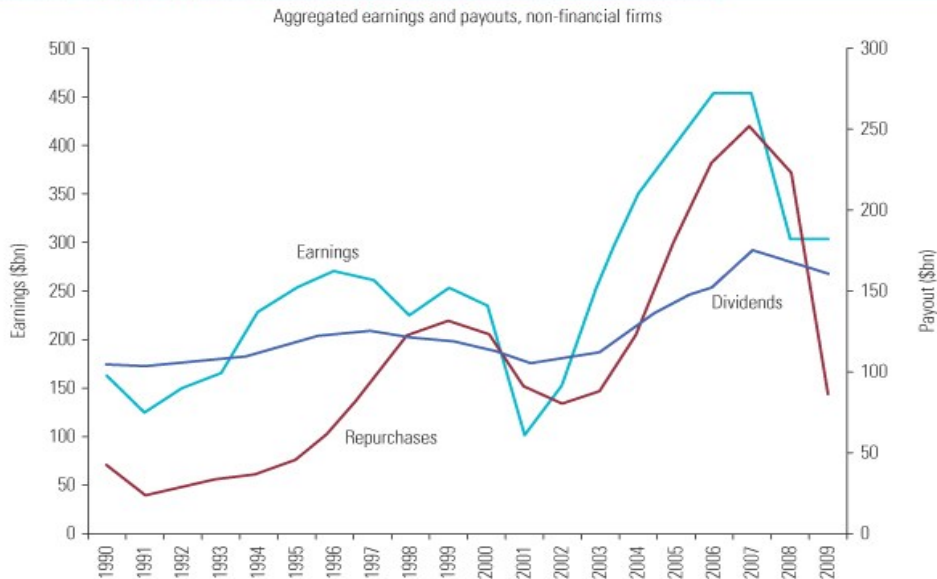
Note: Two scales. Dividends decreased a small amount for nonfinancial companies during the 2008–09 recession, while repurchases decreased much more.

# Dividends versus Share Repurchases



FIGURE 15.3   CFOS' VIEWS ON DIVIDENDS AND REPURCHASES
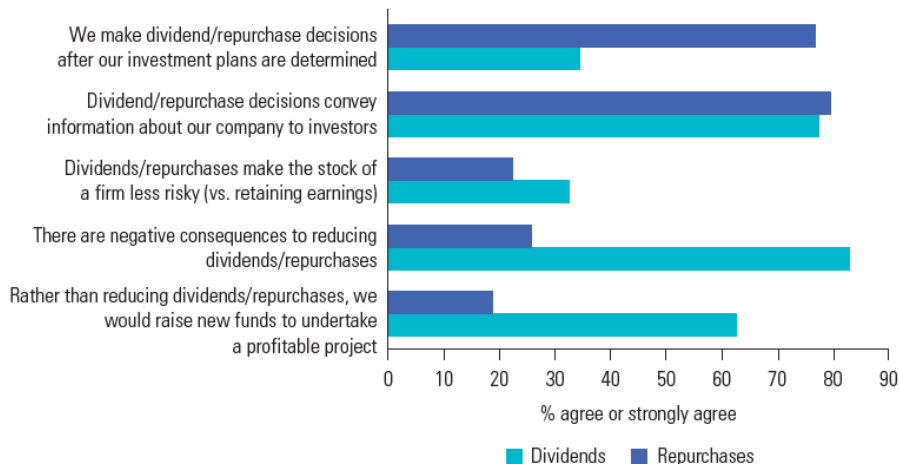
% agree or strongly agree

Dividends   Repurchases

Source: Reprinted from Brav, Graham, Harvey and Michaely, 'Payout Policy in the 21st Century', *Journal of Financial Economics,* vol. 77, pp. 483–527, © 2005, with permission from Elsevier

# Dividends versus Share Repurchases



FIGURE 15.4  CFOS' VIEWS ON WHY COMPANIES REPURCHASE SHARES
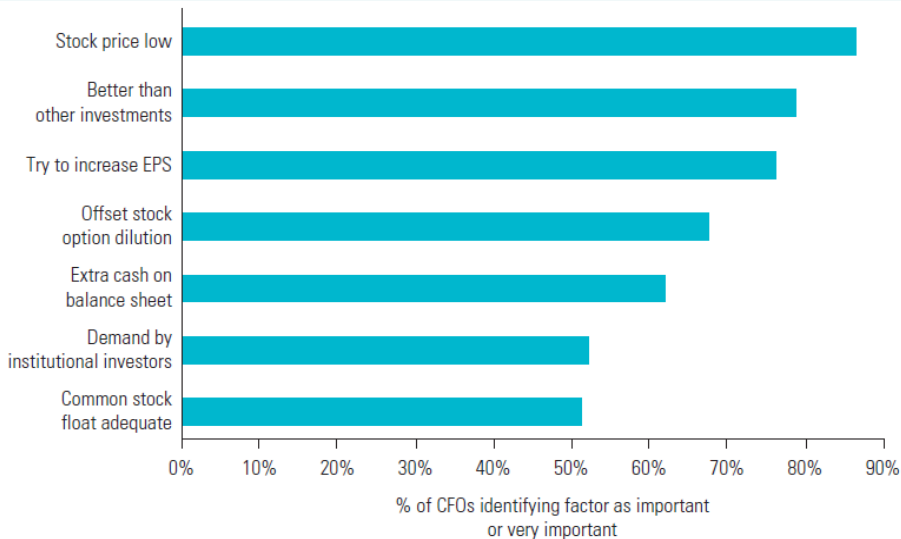
% of CFOs identifying factor as important or very important

Source: Reprinted from Brav, Graham, Harvey and Michaely, 'Payout Policy in the 21st Century,' *Journal of Financial Economics*, 77, pp. 483–527, Copyright © 2005, with permission from Elsevier.

# 11.5 MM and the Dividend Irrelevance Theory

- ❖ In addition to their capital structure theory, Modigliani and Miller (1961) also proposed the dividend irrelevance theory
- ❖ The main assumptions of this theory are…
  - ❖ Capital markets are perfect
  - ❖ The firm can issue and sell new shares as and when needed
  - ❖ There are no personal taxes
  - ❖ The firm is all-equity financed
  - ❖ The firm has a given investment plan which is not affected by changes in its dividends
- ❖ Firm value is determined *only* by the earnings generated by the firm's assets
  - ❖ How the earnings stream is divided between dividends and retained earnings does *not* affect shareholders' wealth

# MM and the Dividend Irrelevance Theory

❖ Recall from Week 4 that the price of ordinary shares is…

  ❖ $P_0 = (D_1 + P_1)/(1 + r_E)$

❖ Since the price at time 1 depends on the dividend in time 2, and so on, we get…

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{\left(1 + r_E\right)^t}$$

▼ The dividend policy puzzle…

  ❖ If the price today depends on the stream of future dividends how can it be that the firm's dividend policy be irrelevant?

  ❖ Investors **should** care about how much of earnings are paid out as dividends!

# *MM and the Dividend Irrelevance Theory*

❖ MM's key insight was that a firm's dividend policy is a trade-off between…
  - ❖ Retaining earnings, versus
  - ❖ Paying out dividends and issuing new share to replace the dividends paid out
❖ The overall effect of paying a dividend and issuing new shares to replace the cash paid out is…
  - ❖ No change in the value of the firm
  - ❖ No change in the wealth of the old shareholders
    - ❖ The market value of the shares will fall by an amount equal to the cash paid out to shareholders

# *MM and the Dividend Irrelevance Theory*

▼ A firm's sources and uses of funds are as follows...

| Sources of funds | |
|---|---|
| Cash from operations | $X$ |
| Cash from *new* shares issued (Number of shares $= m$) | $mP_1$ |
| Uses of funds | |
| Cash for dividends paid (Number of shares $= n$) | $nD_1$ |
| Cash for investments | $I$ |

▼ Since the sources and uses of funds must be equal, we have…

▼ $X + mP_1 = nD_1 + I$

▼ Alternatively, $mP_1 = nD_1 + I - X$

# *MM and the Dividend Irrelevance Theory*

❖ On a per share basis, the price of shares today is…
  ❖ $P_0 = (D_1 + P_1)/(1 + r_E)$
❖ If the firm has n shares outstanding, the value of the firm is…
  ❖ $V_0 = nP_0 = (nD_1 + nP_1)/(1 + r_E)$
❖ To replace the dividend paid out ($nD_1$), the firm sells *m* new shares at a price of $P_1$ each…
  ❖ $V_0 = [nD_1 + (n + m)P_1 - mP_1]/(1 + r_E)$
❖ Substituting for $mP_1 = nD_1 + I - X$ (see previous slide) in the above expression and simplifying, we get…
  ❖ $V_0 = [(n + m)P_1 - I + X]/(1 + r_E)$
❖ Note that $D_1$ does **<u>not</u>** appear in the above equation so dividend policy is irrelevant to firm value!

# MM and the Dividend Irrelevance Theory

❖ *Example:* OLO Ltd has 1,000,000 shares outstanding, and its current market price is $5.00. Assume that the firm operates in a perfect capital market and is considering paying a dividend of $0.50 per share one year from now. The required rate of return on its shares is 10% p.a. and cash from operations is $100,000 while its investment requirement is $500,000

❖ *Given:* $P_0 = \$5.00$, $r_E = 10\%$, $D_1 = \$0.50$, $X = \$100,000$ and $I = \$500,000$

❖ The current total shareholder wealth is…

  ❖ $1000000 \times 5.00 = \$5,000,000$

# *MM and the Dividend Irrelevance Theory*

❖ Recall that…

 ❖ $P_0 = (D_1 + P_1)/(1 + r_E)$

❖ *Case 1:* If the dividend *is* paid, we have…

 ❖ $P_1 = P_0(1 + r_E) - D_1$

 ❖ $P_1 = 5.00(1.10) - 0.50 = \$5.00$

❖ *Case 2:* If the dividend *is not* paid, we have…

 ❖ $D_1 = \$0.00$

 ❖ $P_1 = P_0(1 + r_E)$

 ❖ $P_1 = 5.00(1.10) = \$5.50$

# MM and the Dividend Irrelevance Theory

❖ *Case 1:* If the dividend *is* paid the firm will need to issue new shares in the amount of…
  - ❖ $mP_1 = nD_1 + I - X$
  - ❖ $m(5.00) = 1000000(0.50) + 500000 - 100000$
  - ❖ So, $m = 900000/5.00 = 180,000$ shares
❖ *Case 2:* If the dividend *is not* paid the firm will need to issue new shares in the amount of…
  - ❖ $mP_1 = 0 + I - X$
  - ❖ $m(5.50) = 500000 - 100000$
  - ❖ $m = (500000 - 100000)/5.50 = 72,727$ shares

# MM and the Dividend Irrelevance Theory

- ❖ What happens to shareholder wealth in each case?
- ❖ *Case 1:* If the dividend *is* paid…
  - ❖ Shareholder wealth = [(1180000)(5.00) + 100000 – 500000]/1.10
  - ❖ Shareholder wealth = (5900000 – 400000)/1.10 = $5,000,000
- ❖ *Case 2:* If the dividend *is not* paid…
  - ❖ Shareholder wealth = [(1072727)(5.50) + 100000 – 500000]/1.10
  - ❖ Shareholder wealth = (5900000 – 400000)/1.10 = $5,000,000
- ❖ The decision to pay or not pay a dividend does **not** affect firm value and dividend policy is irrelevant under these assumptions
- ❖ *Does the above hold in a multi-period framework?*
- ❖ *What about dividends versus share repurchases?*

# *MM and the Dividend Irrelevance Theory*

❖ *Illustration:* Genron Corp's board is meeting to decide how to pay out $20 million in excess cash to shareholders. Genron has no debt and its cost of equity equals its (unlevered) cost of capital of 12%. It has 10 million shares outstanding so the firm will be able to pay a $2 per share dividend immediately. The firm expects to generate future net cash flows of $48 million per year and anticipates paying a dividend of $4.80 per share every year thereafter. Which, if any, of the following three payout policies would be preferred by shareholders?

  ❖ *Policy 1:* Pay dividends with excess cash
  ❖ *Policy 2:* Repurchase shares and pay no dividend
  ❖ *Policy 3:* Pay a higher dividend now and issue new equity

# MM and the Dividend Irrelevance Theory

- ❖ The firm's total market value today is…
- ❖ $V_0$ = Cash on hand + PV(Expected cash flows)
- ❖ $V_0$ = 20.0 + 48.0/0.12 = $420 million
- ❖ *Policy 1:* Pay dividends with excess cash
- ❖ Before the dividend is paid, the shares trade with the dividend (or cum-dividend) and when the shares begin to trade ex-dividend the share price drops by the amount of the dividend (see next slide)

# MM and the Dividend Irrelevance Theory

▼ The firm's cum-dividend price is the price *including* the current period's dividend, that is…

❖ $P_{Cum\text{-}Div} = D_0 + \text{PV(Future dividends)}$

$$P_{Cum-Div} = 2.00 + \frac{4.80}{0.12} = 2.00 + 40.00 = \$42.00$$

▼ After the ex-dividend date, the *new* shareholders will not receive the current dividend so the firm's share price will be…

$$P_{Ex-Div} = PV(\text{Future dividends}) = \frac{4.80}{0.12} = \$40.00$$

▼ The original shareholders receive $2.00 dividend and their shares are now worth $40.00 so their wealth does *not* change

# MM and the Dividend Irrelevance Theory

| | Cum-Dividend | Ex-Dividend |
|---|---|---|
| Cash | $20,000,000 | $0 |
| Other assets | $400,000,000 | $400,000,000 |
| Total market value | $420,000,000 | $400,000,000 |
| Total shares | 10,000,000 | 10,000,000 |
| Share price | $42.00 | $40.00 |

▼ *In a perfect capital market, when a dividend is paid with excess cash, shareholders will be indifferent because their pre- and post-dividend wealth remains unchanged*

# *MM and the Dividend Irrelevance Theory*

❖ *Policy 2:* Repurchase shares and pay no dividend

❖ Suppose that instead of paying a dividend now the firm uses the $20 million to repurchase its shares on the open market

❖ The number of shares repurchased is…

    ❖ 20000000/42.00 = 476,190 shares

❖ The number of shares outstanding after the repurchase are…

    ❖ 10000000 – 476190 = 9,523,810 shares

❖ After the repurchase, the firm's expected dividend per share will increase to…

    ❖ 48000000/9523810 = $5.04 per share

    ❖ $P_0$ = 5.04/0.12 = $42.00

# MM and the Dividend Irrelevance Theory

| | Before repurchase | After repurchase |
|---|---|---|
| Cash | $20,000,000 | $0 |
| Other assets | $400,000,000 | $400,000,000 |
| Total market value | $420,000,000 | $400,000,000 |
| Total shares | 10,000,000 | 9,523,810 |
| Share price | $42.00 | $42.00 |

▼ *In perfect capital markets, an open market share repurchase has no effect on the share price, and the share price is the same as the cum-dividend price if a dividend were paid instead*

# MM and the Dividend Irrelevance Theory

❖ What if investors have different preferences for cash versus shares?

❖ *Example:* An investor owns 2,000 shares of Genron. What is this investor's situation after a dividend payment versus the share repurchase if she does *not* sell her shares to the firm?

| | Dividend | Repurchase |
|---|---|---|
| Market value of shares | 40.00(2000) = $80,000 | 42.00(2000) = $84,000 |
| Cash from dividend | 2.00(2000) = $4,000 | |
| Total value | $84,000 | $84,000 |

# *MM and the Dividend Irrelevance Theory*

❖ If the firm repurchases shares but this shareholder wants cash, she can raise cash by selling shares

 ❖ That is, investors can create their own *homemade dividend*

❖ To raise $4,000 in cash, she sells…

 ❖ $4000/42 \approx 95$ shares

 ❖ Value of shares remaining $= 1905 \times 42.00 \approx \$80,000$

❖ If the firm pays a dividend and this shareholder prefers shares, she can use the dividend to purchase additional shares

❖ Number of shares purchased…

 ❖ $4000/40 = 100$ shares

 ❖ Value of total shares $= 2100 \times 40.00 = \$84,000$

# MM and the Dividend Irrelevance Theory

▼ The investor's wealth does not change as a result of the firm's decision to pay dividends versus repurchase shares
  ▼ What the firm does the investor can undo!

| Repurchase and sell shares | Dividend and buy shares |
|---|---|
| $42.00(1905) \approx \$80,000$ | $40.00(2100) = \$84,000$ |
| $42.00(95) \approx \$4,000$ | |
| $\$84,000$ | $\$84,000$ |

▼ *By selling shares or reinvesting dividends investors can replicate either of the firm's payout method on their own*
▼ *In perfect capital markets, investors are indifferent between the firm distributing funds via dividends or share repurchases*

# *MM and the Dividend Irrelevance Theory*

❖ *Policy 3:* Pay a higher dividend and issue new equity

❖ Suppose the firm wants to pay a dividend larger than $2.00 per share right now, but it only has $20 million in cash today

  ❖ Assume the firm wants to pay a $48 million dividend now rather than in one year's time (as planned)

  ❖ The firm would need an additional $28 million to pay the larger dividend now. To do this, the firm decides to raise the cash by selling new shares

❖ Given a current share price of $42.00, the firm could raise $28 million by selling 666,667 shares

  ❖ 28000000/42.00 = 666,667 shares

❖ The total number of shares outstanding after the share issue is 10,666,667 shares

# MM and the Dividend Irrelevance Theory

❖ So, the new dividend per share is…
 ❖ 48000000/10,666,667 = $4.50
❖ The cum-dividend share price is…
 ❖ $P_{Cum\text{-}Div} = D_0 + \text{PV(Future dividends)}$
 ❖ $P_{Cum\text{-}Div} = 4.50 + 4.50/0.12 = \$42.00$
❖ There is a trade-off between current and future dividends
 ❖ A higher dividend now implies lower dividends in the future
 ❖ A lower dividend now implies higher dividends in the future
❖ *In perfect capital markets, holding fixed the investment policy of a firm, the firm's choice of dividend policy is irrelevant and does not affect the share price today*

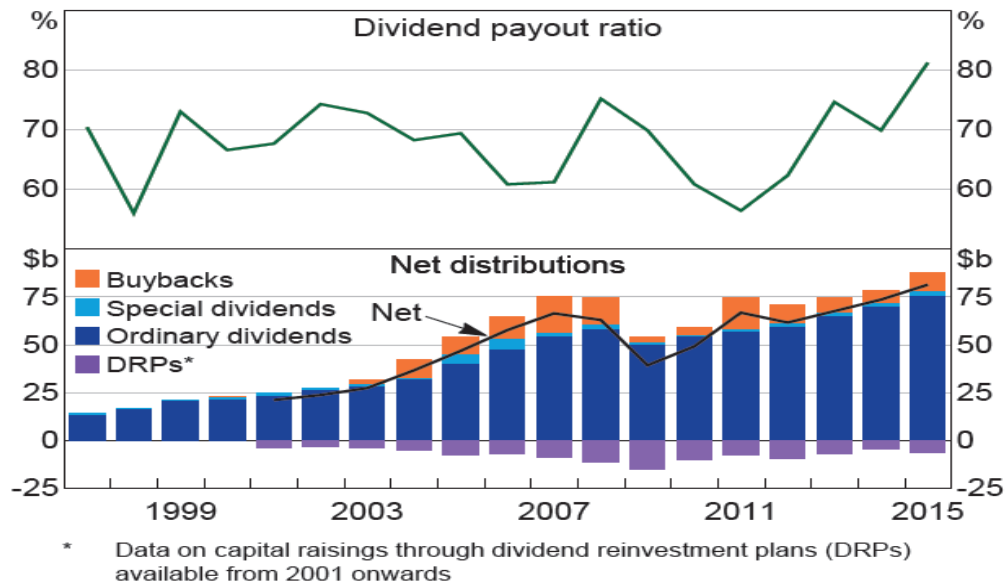# MM and the Dividend Irrelevance Theory

▼ Summary of outcomes from the three payout policies

| | Initial share price | Dividend per share paid | | | |
|---|---|---|---|---|---|
| | | *Year 0* | *Year 1* | *Year 2* | *...* |
| *Policy 1* | $42.00 | $2.00 | $4.80 | $4.80 | ... |
| *Policy 2* | $42.00 | $0.00 | $5.04 | $5.04 | ... |
| *Policy 3* | $42.00 | $4.50 | $4.50 | $4.50 | ... |

▼ *What about the real world?*

▼ *What market imperfections have we not considered?*

# *Shareholder Distributions by ASX-Listed Firms*



*Source:* Bergmann (2016) "The Rise in Dividend Payments", *RBA Bulletin, Graph 1*. Shareholder distributions by companies listed on the ASX.

# *Average Dividend Payout Ratios*

| | |
|---|---|
| Australia | 67 |
| United Kingdom | 60 |
| Japan | 57 |
| Europe | 55 |
| Canada | 52 |
| United States | 48 |

*Source:* Bergmann (2016) "The Rise in Dividend Payments", *RBA Bulletin, Table 1*.
Averages of dividend payout ratios across selected countries. Averages are based on
payout ratios during 2005-15.

# *Trends in Dividends and Profits*
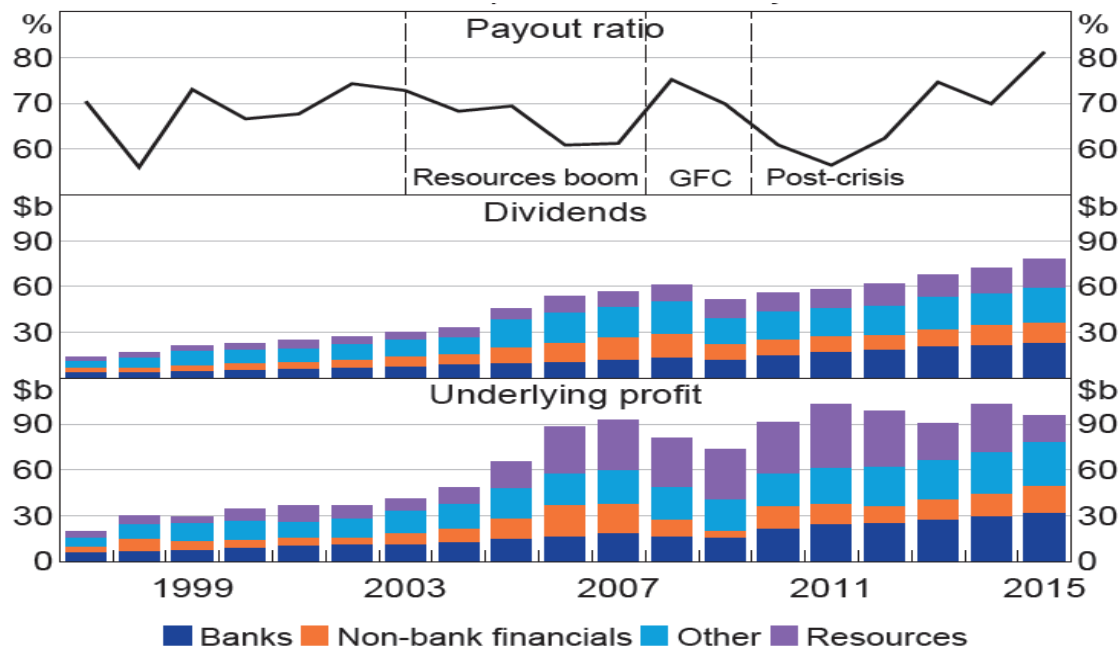


*Source:* Bergmann (2016) "The Rise in Dividend Payments", *RBA Bulletin, Graph 2*.

# 11.6 When Dividend Policy Matters

❖ The differential tax treatment of dividend income versus capital gains can result in shareholders preferring other payout alternatives over dividend payments, or vice versa

❖ We examine this difference in the tax treatment of dividends by comparing a firm's dividend policy under…

  ❖ A classical tax system
  ❖ An imputation tax system (briefly)

# *Dividend Policy in a Classical Tax System*

❖ Under a "classical" tax system…

❖ From one dollar of corporate earnings, the shareholder ends up with $(1 - t_c)(1 - t_p)$ dollars of after-personal-tax dividend

  ❖ $t_p$ = The marginal personal tax rate
  ❖ Dividends are effectively taxed twice

❖ Capital gains are taxed at a lower rate than dividends *and* the effective tax rate on capital gains may even approach *zero* if the sale of shares is postponed well into the future, or forever

  ❖ Shareholders will pay lower taxes if a firm uses share repurchases rather than dividends
  ❖ The optimal dividend policy would be to pay *no* dividends at all!

# *Dividend Policy in a Classical Tax System*

❖ Note that the preference for share repurchases rather than dividends depends on the *difference* between the dividend tax rate and the capital gains tax rate
  ❖ As a result of their different tax rates investors will have varying preferences regarding dividends resulting in shareholder "clienteles"
❖ Shareholder "clienteles" imply…
  ❖ Shareholders who pay high taxes would tend to have a preference for *low* (or no) dividend-paying firms
  ❖ Shareholders who do not pay taxes (or pay low taxes) would tend to have a preference for *high* dividend-paying firms

# *Dividend Policy in an Imputation Tax System*

❖ Under an imputation tax system…
  - ❖ Earnings distributed as "franked" dividends to resident shareholders are effectively taxed only once at the shareholder's (marginal) personal tax rate   *not average but marginal*
  - ❖ Capital gains are taxed at half the rate of ordinary income
❖ If *all* of the firm's shares were held by resident shareholders with marginal tax rates *less than* the corporate tax rate, then the optimal dividend policy would be to pay as much dividends as would exhaust all the available franking credits
❖ *However…*
  - ❖ Not all shareholders are resident shareholders
  - ❖ Individuals whose personal marginal tax rates are higher than the corporate tax rate would prefer the retention of earnings (or share repurchases) over dividends

# Dividend Policy in an Imputation Tax System

▼ Shareholder "imputation clienteles" may exist at the firm level

  ❖ The interaction of capital gains tax and the imputation tax system means that shareholders with low marginal tax rates would prefer earnings to be paid out as fully franked dividends

  ❖ Shareholders in high marginal tax rates may tend to prefer earnings to be retained (or shares repurchased)

❖ *What does this analysis suggest about dividend policy at the company level?*

# *Dividend Policy and Non-Tax Explanations*

❖ The non-tax related explanations of why dividend policy may matter relate to various factors, including…
  ❖ Cash retention to cover potential future cash shortfalls
  ❖ Cash retention to help fund future growth opportunities
  ❖ Cash retention to avoid financial distress
  ❖ Payment of excessive cash to avoid the inefficient use of funds in terms of excessive executive perks, over-paying for acquisitions, etc
  ❖ Paying dividends to provide credible signals to the market

# *Dividend Policy and Non-Tax Explanations*

❖ Research and surveys of managers has found that…
  - ❖ Managers prefer to maintain relatively constant dividends over time
  - ❖ Firms change dividends infrequently and dividends tend to be much less volatile than earnings
  - ❖ Managers believe that investors prefer stable dividends with sustained growth over time
  - ❖ Managers want to maintain a long-term target level of dividends as a fraction of earnings
❖ *Implication:* Firms raise their dividends *only* when they perceive a long-term sustainable increase in the expected level of future earnings, and cut dividends only as a last resort

# *Dividend Policy and Non-Tax Explanations*

❖ The *dividend signaling hypothesis* captures the notion that dividend changes reflect managers' views about a firm's future earning prospects
  ❖ If firms smooth dividends, the firm's dividend choice may contain information regarding management's expectations of future earnings
❖ When a firm *increases* its dividend, it typically sends a *positive* signal to investors that management expects to be able to afford the higher dividend for the foreseeable future
  ❖ Can an increase in dividends be viewed as a *negative* signal as well?
❖ When a firm *decreases* its dividend, it may signal that management has given up hope that earnings will rebound in the near term and so need to reduce the dividend to save cash

# 11.7 Does Dividend Policy Matter?

- ❖ Markets are not perfect and market imperfections drive managers to pay attention to do "what the market wants"
- ❖ Taxes are the obvious market imperfection but in some cases the irrelevance of dividend policy may still hold
  - ❖ The classical tax system versus the imputation tax system
- ❖ Dividends do contain information and possess strong "signaling" elements as well. Increase in dividends may signal positive future earnings
- ❖ Dividends also impose managerial discipline and may result in lowering the agency costs between management and shareholders

# *Key Concepts*

- ❖ The trade off theory of capital structure implies an optimal capital structure where the firm's value is maximized
- ❖ Dividend policy relates to the trade-off between retaining profit and paying out dividends
- ❖ In perfect capital markets, dividend policy will not affect firm value and shareholder wealth
- ❖ Dividend policy becomes important when we consider personal taxes and other market imperfections
- ❖ The imputation tax system does eliminate double taxing of dividend income and encourages higher dividend payout ratios
- ❖ Dividends contain information and possess strong "signaling" elements as well. An increase in dividends may signal positive future earnings

# *Formula Sheet*

▼ Value of the leveraged firm with financial distress

  ▼ $V_L = V_U + \text{PV(TS)} - \text{PV(BC + AC)}$

▼ Sources and uses of funds: $X + mP_1 = nD_1 + I$

▼ Dividend irrelevance: $V_0 = [(n + m)P_1 - I + X]/(1 + r_E)$

(*Note:* The formula sheet on the final exam will contain all the formulas covered in lectures but *without* the descriptions)