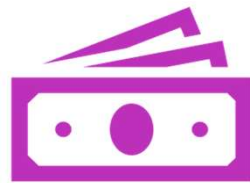# FINANCIAL DISTRESS AND DIVIDEND POLICY

MOT111A Financial Management: Lecture 6
Dr.ir. Zenlin Roosenboom-Kwee
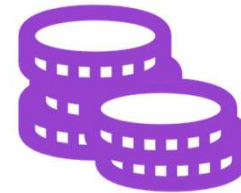Z.Roosenboom-Kwee@tudelft.nl

Structure of Lecture 6

—◇—

Financial Distress

Default and bankruptcy

Bankruptcy and capital structure

Direct and indirect costs of bankruptcy

Tradeoff theory

Payout Policy

Types of dividends

Timing of cash dividends

Share repurchases

Dividend policy

Default and Bankruptcy

Financial Distress

- When a firm has difficulty meeting its debt obligations

Default

- When a firm fails to make the required interest or principal payments on its debt, or violates a debt covenant
- An important consequence of leverage is the risk of bankruptcy

Does every firm that gets into trouble go bankrupt?

How to circumvent bankruptcy?

Circumventing Bankruptcy (1 of 2)

- Workout: a firm in financial distress negotiates directly with its creditors to reorganize

- Prepack: a firm first develops a reorganization plan with the agreement of its main creditors and then implements the plan

Circumventing Bankruptcy (2 of 2)

In the U.S., firms can file for two forms of bankruptcy protection: Chapter 7 or Chapter 11.

- Chapter 7: liquidation of a firm's assets through an auction (under a trustee), pay creditors with the proceeds, the firm ceases to exist

- Chapter 11: mostly for large corporations, the firm's management develops a reorganization plan (treatment of each creditor), the firm continues operating its business

In the Netherlands, firms can:

- First enter into a private (compulsory) agreement with creditors and shareholders.

- When approves by the majority, the agreement can be further approved by a judge in the court: Court Approval of a Private Composition (Prevention of Insolvency) Act (*Wet homologatie onderhands akkoord in faillissement*, WHOA).

- Link: https://business.gov.nl/regulation/bankruptcy/

Bankruptcy and Capital Structure

With perfect capital markets, Modigliani–Miller (MM) Proposition I applies: The total value to all investors does not depend on the firm's capital structure.

There is no disadvantage to debt financing:

• A firm will have the same total value and

• The firm will be able to raise the same amount initially from investors with either choice of capital structure

Illustrative Example: Moon Industries

- Consider the following outcomes next year both for the following scenarios with and without leverage for Moon Industries' new venture:

(in millions)	Without Leverage		With Leverage	
	Success	*Failure*	*Success*	*Failure*
Debt value	---	---	$150	$90
Equity value	$250	$90	$100	$0
Total to all investors	$250	$90	$250	$90

- Assume:
  Moon's new venture is equally likely to succeed or to fail.
  The risk-free rate is 4%.
  The venture has a beta of 0 and the cost of capital is equal to the risk-free rate.

- ***Compute the current value of Moon's securities with and without leverage.***

Solution: Moon Industries

Without leverage:

$$\text{Equity (unlevered)} = V^U = \frac{.5(\$250) + .5(\$90)}{1.04} = \$163.46 \text{ million}$$

With leverage:

$$\text{Debt} = \frac{.5(\$150) + .5(\$90)}{1.04} = \$115.38 \text{ million}$$

$$\text{Equity (Levered)} = \frac{.5(\$100) + .5(\$0)}{1.04} = \$48.08 \text{ million}$$

$V^L = \$48.08 + \$115.38 = \$163.46$

As stated by MM Proposition I, the total value of the firm is unaffected by leverage.

Direct Costs of Bankruptcy

With perfect capital markets, the risk of bankruptcy is not a disadvantage of debt

- Bankruptcy shifts the ownership of the firm from equity holders to debt holders (the similar total value available to all investors)

However, direct costs reduce the value of the assets to investors (3%–4% of the pre-bankruptcy MV of total assets)

A study of Chapter 7 liquidations of small businesses found that the average direct costs of bankruptcy were 12% of the value of the firm's assets.

Indirect Costs of Bankruptcy

The indirect costs of financial distress may be substantial (10% – 20% of firm value)

- Loss of Customers

- Loss of Suppliers

- Loss of Employees

- Loss of Receivables

- Fire Sale of Assets

- Delayed Liquidation

- Costs to Creditors

Moon Industries with financial distress costs

Extending the previous example, assume now that the costs of financial distress are $15 million. Hence, in case of failure, the debtholders will receive less than $90 million, i.e. $75 million (=$90M-$15M) :

(in millions)	Without Leverage		With Leverage	
	Success	*Failure*	*Success*	*Failure*
Debt value	---	---	$150	$75
Equity value	$250	$90	$100	$0
Total to all investors	$250	$90	$250	$75

- *Given the financial distress costs, compute the current value of Moon's securities with and without leverage.*

Solution: Moon Industries with financial distress costs

Without leverage:

Equity (unlevered) $= V^U = \dfrac{0.5(\$250) + 0.5(\$90)}{1.04} = \$163.46$ million

With leverage:

Equity (Levered) $= \dfrac{.5(\$100) + .5(\$0)}{1.04} = \$48.08$ million

Debt $= \dfrac{0.5(\$150) + 0.5(\$75)}{1.04} = \$108.17$ million

$V^L = \$48.08 + \$108.17 = \$156.25$

Hence: $V^L \neq V^U$

- The difference, ($\$163.46 - \$156.25 = \$7.21$), is the present value of the \$15 million in financial distress costs:

$$PV(\text{Financial Distress Costs}) = \dfrac{0.5(\$0) + 0.5(\$15)}{1.04} = \$7.21 \text{ million}$$

The Tradeoff Theory

The total value of a levered firm equals the value of the firm without leverage plus the present value of the tax savings from debt, less the present value of financial distress costs.

$$V^L = V^U + PV(\text{Interest Tax Shield}) - PV(\text{Financial Distress Costs})$$
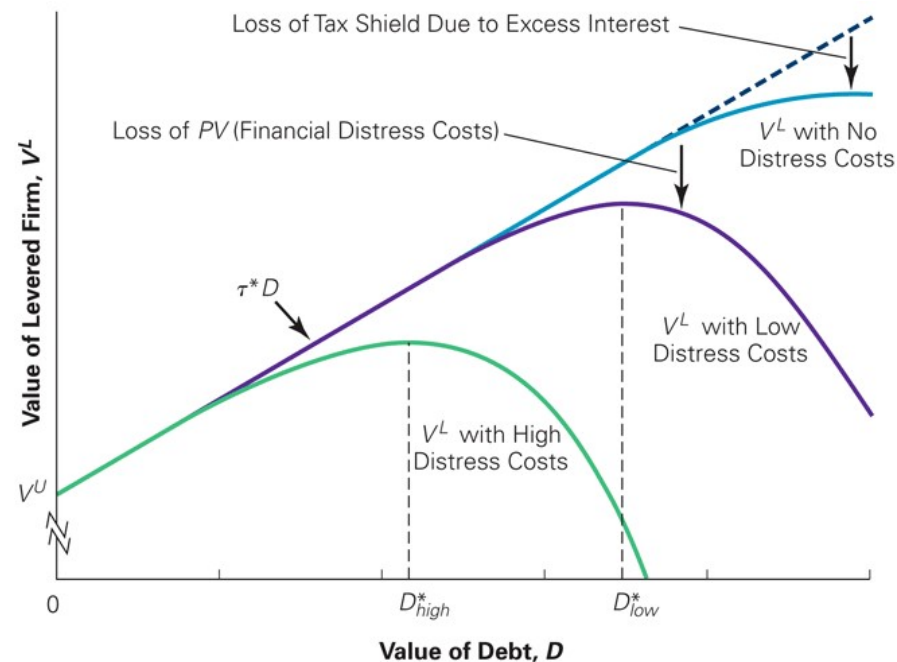
The PV of financial distress costs

1. The probability of financial distress

   - Increases with the amount of liabilities (relative to its assets)
   - Increases with the volatility of a firm's cash flows and asset values

2. The magnitude of the costs after a firm is in distress

   - Financial distress costs vary by industry

3. The appropriate discount rate for the distress costs

   - Depends on the firm's market risk
   - The PV of distress costs will be higher for high beta firms

Optimal Leverage

The tradeoff theory states that firms should increase their leverage until it reaches the level for which the firm value is maximized

• At this point, the tax savings that result from increasing leverage are offset by the increased probability of incurring the costs of financial distress

Hence, the tradeoff theory can explain:

• The low leverage puzzle
• Variation of leverage level across industries

Example: Optimal Leverage

Holland, Inc. is considering adding leverage to its capital structure. Holland's managers believe they can add as much as $50 million in debt and exploit the benefits of the tax shield (τ_c=39%). Based on simulations of the firm's future cash flows, the CFO has made the following estimates (in millions of euros):

Debt	0	10	20	30	40	50
PV(Interest tax shield)	0	3.9	7.8	11.7	15.6	19.5
PV(Financial distress costs)	0	0	0	3.38	19.23	23.47

What is the optimal debt choice for Holland?

Optimal Leverage

Solution

| Debt	0	10	20	30	40	50
PV(Interest tax shield)	0	3.9	7.8	11.7	15.6	19.5
PV(Financial distress costs)	0	0	0	3.38	19.23	23.47
Net Benefit	0	3.9	7.8	8.32	-3.63	-3.97

- The level of debt that leads to the highest net benefit is $30 million. Holland will gain $11.7 million due to tax shields, and lose $3.38 million due to the present value of financial distress costs, for a net gain of $8.32 million.

What determines capital structure in practice?

- Survey evidence: 392 US CFOs from Graham and Harvey (2001, JFE) and 313 European CFOs from Brounen et al. (2004, FM)
- Percentage of respondents that claims that the following factors determine the appropriate amount of debt

	US	UK	NL	GER	FR
Financial flexibility	59%	50%	51%	48%	37%
Our credit rating	57%	27%	34%	39%	30%
Earnings volatility	48%	35%	43%	31%	35%
Tax advantage of interest	45%	30%	38%	21%	30%
The cost of bankruptcy	21%	30%	27%	7%	24%

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Do firms formulate a target debt ratio?
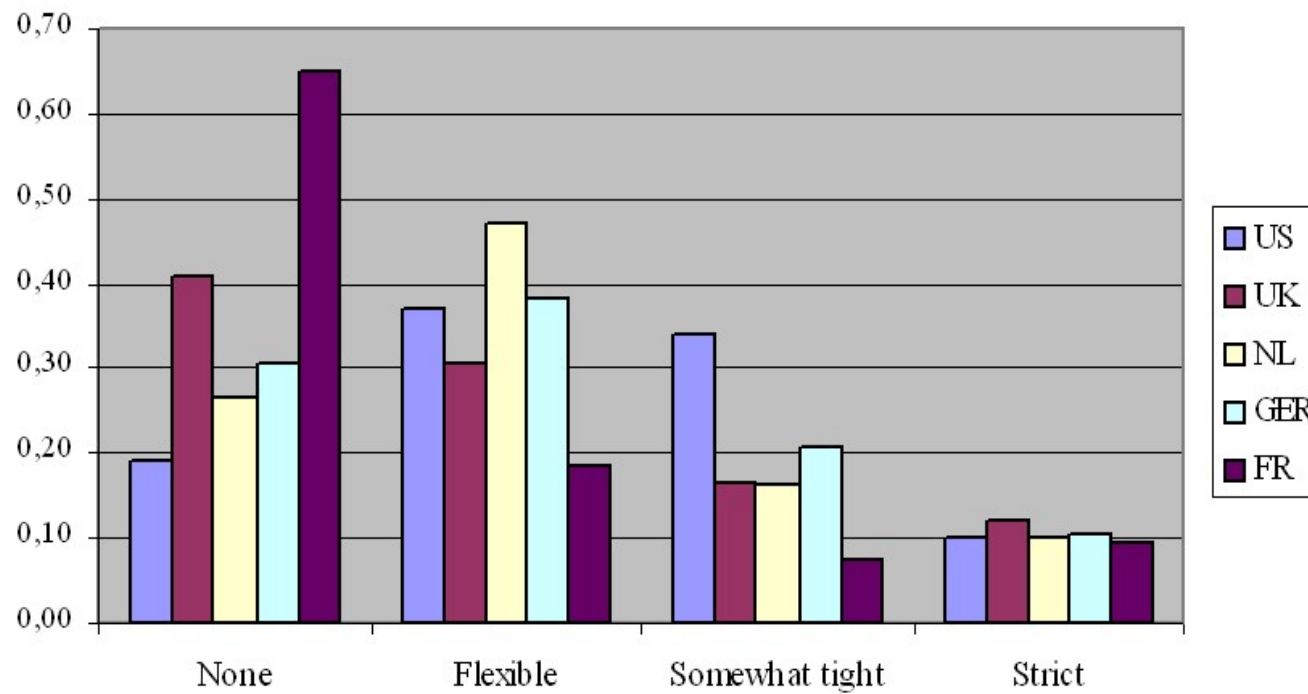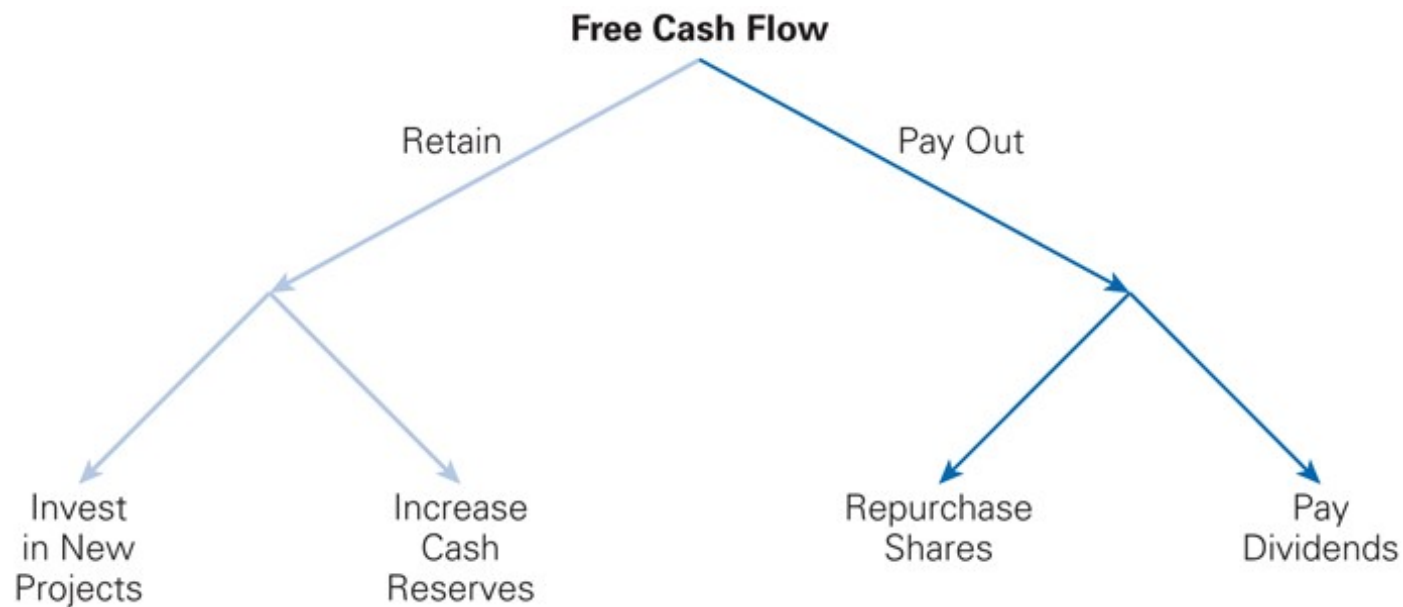
Implications for Capital Structure

Managers who perceive the firm's equity is underpriced will have a preference to fund investment using retained earnings, or debt, rather than equity.

- The converse is also true: Managers who perceive the firm's equity to be overpriced will prefer to issue equity, as opposed to issuing debt or using retained earnings, to fund investment.
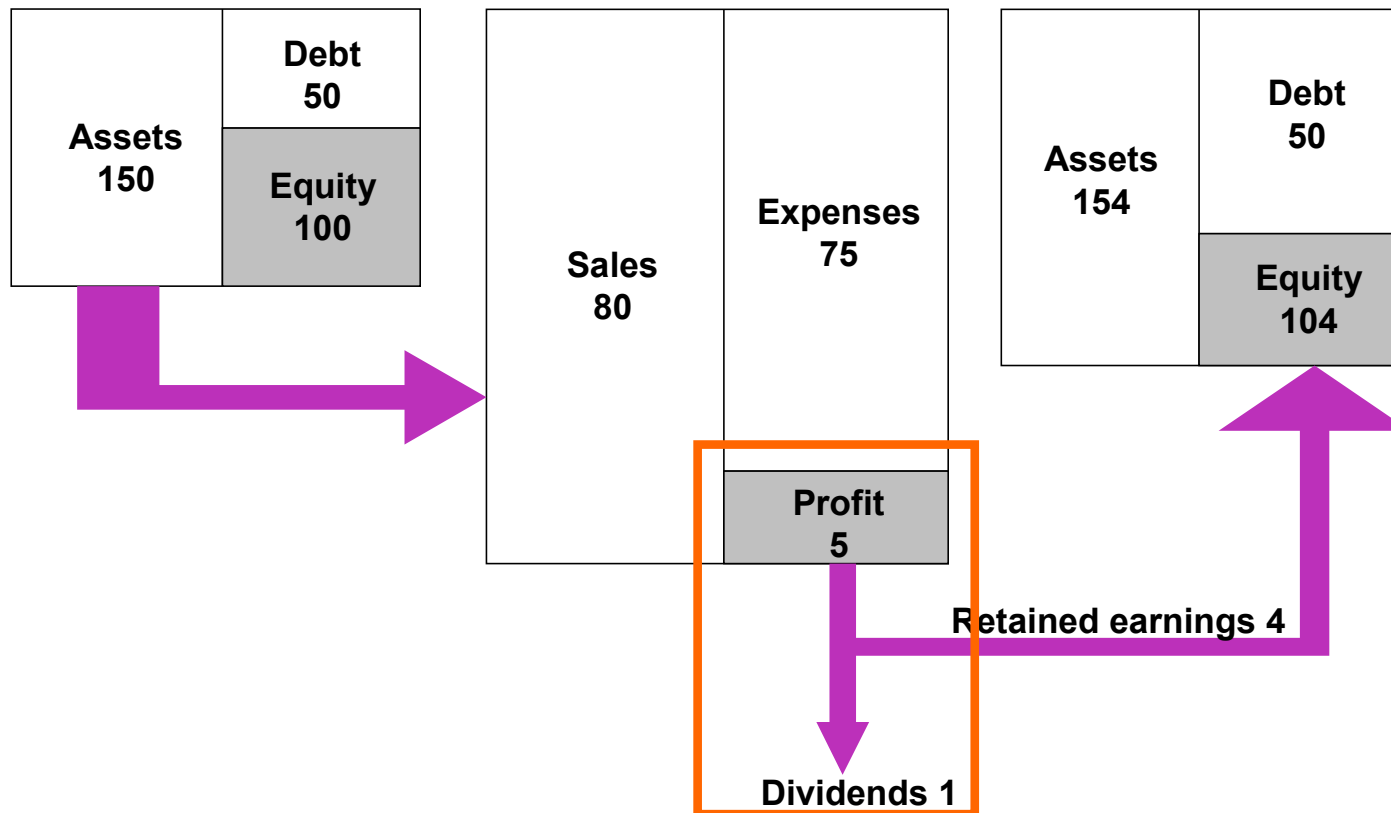
The optimal capital structure depends on market imperfections, such as taxes, financial distress costs, agency costs, and asymmetric information

Payout Policy

- Definition: The way a firm chooses between the alternative ways to distribute free cash flow to equity holders

Free Cash Flow

Retain — Pay Out

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

Can we create value using dividend policy?

| Assets 150 | Debt 50 |
| | Equity 100 |

| Sales 80 | Expenses 75 |
| | Profit 5 |

| Assets 154 | Debt 50 |
| | Equity 104 |

Retained earnings 4

Dividends 1

Type of Dividends

Regular cash dividend.
- Public companies often pay quarterly
- Sometimes firms will pay an extra cash dividend
- The extreme case would be a liquidating dividend
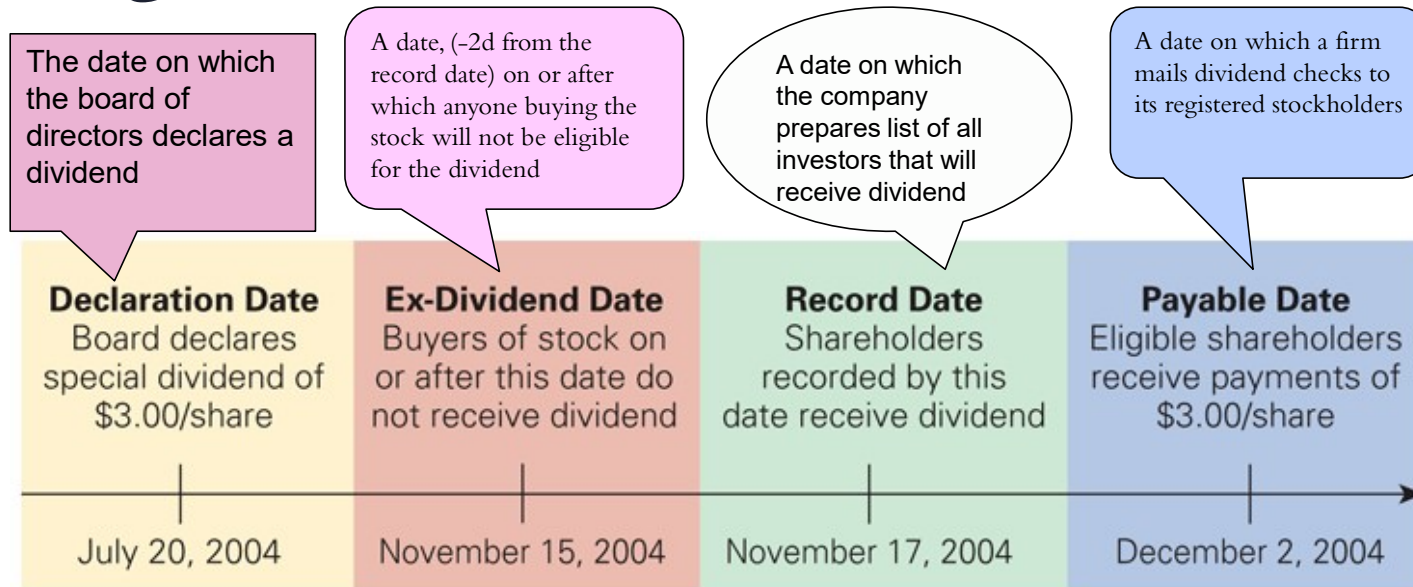
Stock dividends.
- No cash leaves the firm
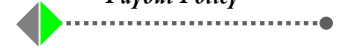- The firm increases the number of shares outstanding

Dividend in kind
- Very uncommon
- Wrigley's Gum sends a box of chewing gum
- Dundee Crematoria offers shareholders discounted cremations

3 Pack

Timing of Cash Dividends

The date on which the board of directors declares a dividend

A date, (-2d from the record date) on or after which anyone buying the stock will not be eligible for the dividend

A date on which the company prepares list of all investors that will receive dividend

A date on which a firm mails dividend checks to its registered stockholders

Declaration Date
Board declares special dividend of $3.00/share

Ex-Dividend Date
Buyers of stock on or after this date do not receive dividend

Record Date
Shareholders recorded by this date receive dividend

Payable Date
Eligible shareholders receive payments of $3.00/share

July 20, 2004   November 15, 2004   November 17, 2004   December 2, 2004

Cum-dividend date: the last day a buyer of the stock can still receive dividend

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Cum-Dividend vs. Ex-Dividend: An illustration (1 of 3)

Consider Genron Corporation:

- Genron has $20 million in cash and $400 million of other assets

- The firm's board is meeting to decide how to pay out $20 million in excess cash to shareholders.

- Genron has no debt, its equity cost of capital equals its unlevered cost of capital of 12%.

- With 10 million shares outstanding, Genron will be able to pay a $2 dividend immediately.

- The firm anticipates paying a dividend of $4.80 per share each year *thereafter*.

Cum-Dividend vs. Ex-Dividend: An illustration (2 of 3)

Recall that cum-dividend is when a stock trades before the ex-dividend date, entitling anyone who buys the stock to the dividend

The cum-dividend price of Genron will be:

$$P_{cum} = \text{Current Dividend} + PV(\text{Future Dividends}) = 2 + \frac{4.80}{0.12} = 2 + 40 = \$42$$

After the ex-dividend date, new buyers will not receive the current dividend and the share price and the price of Genron will be:

$$P_{ex} = PV(\text{Future Dividends}) = \frac{4.80}{0.12} = \$40.$$

Cum-Dividend vs. Ex-Dividend: An illustration (3 of 3)

	Cum–Dividend Date	*Ex-Dividend Date*
Cash	20	0
Other assets	400	400
Total market value	420	400
Shares (millions)	10	10
Share price	*$42*	*$40*

Share Repurchase

Instead of declaring cash dividends, firms can pay cash to investors through buying shares of their own stock

Recently, share repurchase has become an important way of distributing earnings to shareholders.

Why?

- Personal tax savings for shareholders
- Dividend tax rate is higher than capital gains tax rate
- Capital gains tax can be deferred

Managers would prefer share repurchases

Fig. 2C: What would your first payout be if you were hypothetically deciding to pay out capital for the first time? (Current non-payers only). For each response we report the percentage of respondents that answer 1 or 2 on a scale from -2 to +2.
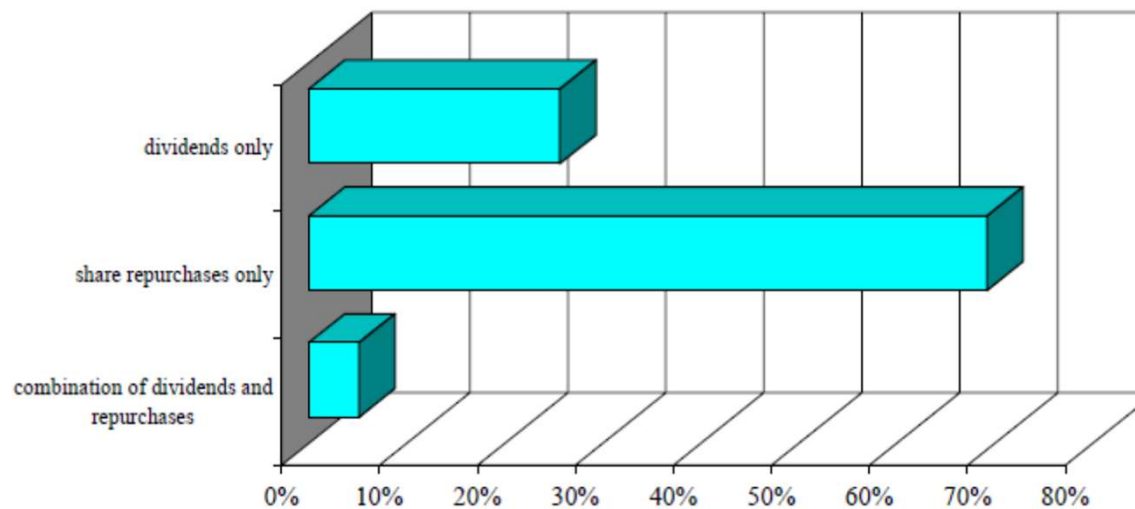
Reference: Graham et al. (2005, JFE)

Share Repurchase Techniques

Open market repurchases

- 95% of all programs
- Require board approval (US) or shareholder approval (Europe)
- Firm takes several years to complete

Fixed price tender offer

- Firm indicates # shares repurchased at given date at given price

Dutch auction

- Firm indicates # shares repurchased at range of prices
- Shareholders indicate minimum price at which to tender
- Firm pays lowest price to all shareholders that will secure # shares sought

Private negotiation

- Firm buys back shares from one shareholder (greenmail)

No dividend but share repurchase: An illustration from Genron (1 of 2)

Suppose that instead of paying a dividend this year, Genron uses the $20 million to repurchase its shares on the open market.

With an initial share price of $42, Genron will repurchase: $\frac{\$20\ million}{\$42/share} = 0.476$ million $= 476,000$ shares.

Recall that the initial number of shares outstanding is 10 million. Hence, after the repurchase, this will leave only: 10 million $-$ 0.476 million $=$ 9.524 million shares outstanding.

The net effect is that the share price remains unchanged.

	Before Repurchase	*After Repurchase*
Cash	20	0
Other assets	400	400
Total market value of assets	420	400
Shares (millions)	10	9.524
Share price	*$42*	*$42*

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No dividend but share repurchase: An illustration from Genron (2 of 2)

Genron's Future Dividends

- It should not be surprising that the repurchase had no effect on the stock price.

- After the repurchase, the future dividend would rise to $5.04 per share

$$\frac{48 \text{ million}}{9.524 \text{ million shares}} = \$5.04 \text{ per share.}$$

Genron's share price is: $P_{rep} = \dfrac{5.04}{0.12} = \$42.$

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

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Does dividend policy matter?

Modigliani and Miller (1961, JoB) argue that dividend policy is irrelevant to firm value

- Investors will not pay higher prices for firms with higher dividends
- Therefore, dividend policy should have no impact on the value of the firm → investors can create whatever income stream they prefer by using homemade dividends

Textbook Example 17.1

Homemade Dividends

Problem

Suppose Genron pays a $2 dividend per share today. Show how an investor holding 2,000 shares could create a homemade dividend of $4.50 per share × 2,000 shares = $9,000 per year on her own.

Solution

- (Reference: See slides #25-27): Since Genron pays a $2 dividend, the investor receives $4,000 in cash and holds the rest in stock.
- To receive $9,000 in total today, she can raise an additional $5,000 by selling 125 shares at $40 per share just after the dividend is paid.
- In future years, Genron will pay a dividend of $4.80 per share. Because she will own 2,000 − 125 = 1,875 shares, the investor will receive dividends of 1,875 × $4.80 = $9,000 per year from then on.

Homemade Dividends: Another example

- Telco trades at €42 stock about to pay a €2 cash dividend
- You own 80 shares and prefer a €3 dividend instead
- How can you achieve that?

	homemade dividends	€3 dividend
Cash from dividend	€ 160	€ 240
Cash from selling stock	€ 80	€ 0
Total cash	€ 240	€ 240
Value of stock holdings	€ 40 × 78 =	€ 39 × 80 =
	€ 3,120	€ 3,120

Sell 2 shares ex-dividend

- Total wealth remains at €3,120 + €240 = €3,360 (same as before dividend was paid out (42 × 80 shares = €3,360)

Dividend policy in reality: Imperfection due to taxes

Taxes on Dividends and Capital Gains

- Shareholders must pay taxes on the dividends they receive, and they must also pay capital gains taxes when they sell their shares.

- Dividends are typically taxed at a higher rate than capital gains. In fact, long-term investors can defer the capital gains tax forever by not selling.

- When dividends are taxed at a higher rate than capital gains, shareholders are hurt because they will receive less than their initial investment.
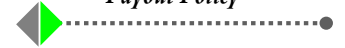
Taxes on Dividends and Capital Gains

Problem

Suppose a firm raises $25 million from shareholders and uses this cash to pay them $25 million in dividends. If the dividend is taxed at a 39% rate, and if capital gains are taxed at a 20% rate, how much will shareholders receive after taxes?

Solution
- On dividends, shareholders will owe = 39% × $25 million = $9.75 million in dividends taxes.
- Because the value of the firm will fall when the dividend is paid, shareholders' capital gain on the stock will be $25 million less when they sell for capital gains. Hence, shareholders will lower their capital gain taxes by: 20% of $25 million = $5 million.
- Thus, in total, shareholders will pay $9.75 million−$5 million = $4.75 million in taxes, and they will receive back only $25 million–$4.75 million = **$20.25 million** of their $25 million investment.

Optimal Dividend Policy with Taxes

The optimal dividend policy when the dividend tax rate exceeds the capital gain tax rate is to pay no dividends at all.

- When the tax rate on dividends is greater than the tax rate on capital gains, shareholders will pay lower taxes if a firm uses share repurchases rather than dividends.

- This tax savings will increase the value of a firm that uses share repurchases rather than dividends.

The preference for share repurchases rather than dividends depends on the difference between the dividend tax rate and the capital gains tax rate

- Tax rates vary by income, by jurisdiction, and by whether the stock is held in a retirement account.

The Effective Dividend Tax Rate

Consider buying a stock just before it goes ex-dividend and selling the stock just after.

- The equilibrium condition must be:

$$(P_{cum} - P_{ex})(1 - \tau_g) = Div(1 - \tau_d)$$

Which can be stated as:

$$P_{cum} - P_{ex} = Div \times \left(\frac{1 - \tau_d}{1 - \tau_g}\right) = Div \times \left(1 - \frac{\tau_d - \tau_g}{1 - \tau_g}\right) = Div \times \left(1 - \tau_d^*\right)$$

- Where P_{cum} is the cum-dividend price, P_{ex} is the ex-dividend price, τ_g is the capital gains tax rate, τ_d is the dividend tax rate.

The Effective Dividend Tax Rate (cont'd)

Thus, the ***effective dividend tax rate*** is:

$$\tau_d^* = \left(\frac{\tau_d - \tau_g}{1 - \tau_g} \right)$$

- This measures the additional tax paid by the investor per dollar of after-tax capital gains income that is instead received as a dividend.

Changes in the Effective Dividend Tax Rate

Problem

Consider an individual investor in the highest U.S. tax bracket who plans to hold a stock for more than one year. What was the effective dividend tax rate for this investor in 2002? How did the effective dividend tax rate change in 2003? (Ignore state taxes.)

Solution

From Table 17.2 , in 2002 we have $\tau_d = 39\%$ and $\tau_g = 20\%$. Thus,

$$\tau_d^* = \frac{0.39 - 0.20}{1 - 0.20} = 23.75\%$$

This indicates a significant tax disadvantage of dividends; each \$1 of dividends is worth only \$0.7625 in capital gains. However, after the 2003 tax cut, $\tau_d = 15\%$, $\tau_g = 15\%$, and

$$\tau_d^* = \frac{0.15 - 0.15}{1 - 0.15} = 0\%$$

Therefore, the 2003 tax cut eliminated the tax disadvantage of dividends for a one-year investor.

Exercise

KKI pays a regular dividend of $2.50 per share. Typically the stock price drops by $2.00 per share when the stock goes ex–dividend. Suppose the capital gains tax rate is 20%, but investors pay different tax rates on dividends. Absent transactions cost, what is the highest dividend tax rate of an investor who could gain from trading to capture the dividend?

$$(P_{cum} - P_{ex})(1 - T_g) = DIV(1 - T_d) \rightarrow \$2.00\,(1 - .20) = \$2.50\,(1 - T_d)$$

$$\frac{\$1.60}{\$2.50} = 1 - T_d \rightarrow T_d = 1 - \frac{\$1.60}{\$2.50} \rightarrow T_d = .36 \text{ or } 36\%$$

At 36% there would be no benefit to capturing the dividend, the tax rate must be slightly below this amount.

Stock Dividend: Does it matter?

In case of stock dividends, firms give additional stock to shareholders

Does that increase shareholder wealth?

- Stock dividends and stock splits are economically the same (both increase the number of shares outstanding and share price drops)
- You will simply cut the pie in more pieces but not create wealth
- No dilution because existing shareholders receive stock dividend

Stock Dividend: Does it matter?

You own 120 shares in Telco

Shares outstanding: 1,000,000
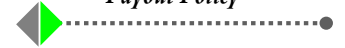Net income = € 6,000,000

P/E ratio = 10

25% stock dividend

- **What is the stock value before and after the 25% stock dividend?**

The Great Dividend Puzzle

In many countries many shareholders are taxed more heavily on dividend income than on capital gains.

This raises a dividend puzzle (Black, 1976, JPM):

Why do companies pay out a dividend when dividend income is taxed at a higher rate than capital gains and in theory it should not affect shareholder wealth?

Why do firms pay dividends?

Clientele theory

- Different investor clienteles prefer different payout levels

Expectations theory

- Investors form expectations concerning the amount of a firm's upcoming dividend

Residual dividend theory

- A firm pays a dividend only if it has retained earnings left after financing all profitable investment opportunities

Signaling theory

- Firms pay dividends is that this way they signal future profitability

Agency theory

- Dividend policy addresses an agency problems between managers and outside investors

Dividend Policy: Summary

Dividends are sticky: firms are careful not to lower dividends or to initiate them when they cannot sustain them

Dividends provide information on long-term earnings view to the market but fewer companies are paying dividends

Firms should follow a sensible policy:

- Do not forgo positive NPV projects just to pay a dividend
- Consider share repurchase when there are few better uses for the cash and the shock to earnings is transitory