

MERGERS, ACQUISITIONS & TAKEOVERS

M&A market is highly active

- Around 4% of public firms taken over each year
- Around \$1 trillion in transactions per year
 - Compare to total U.S. equity markets of around \$20 trillion

Types of Acquisitions

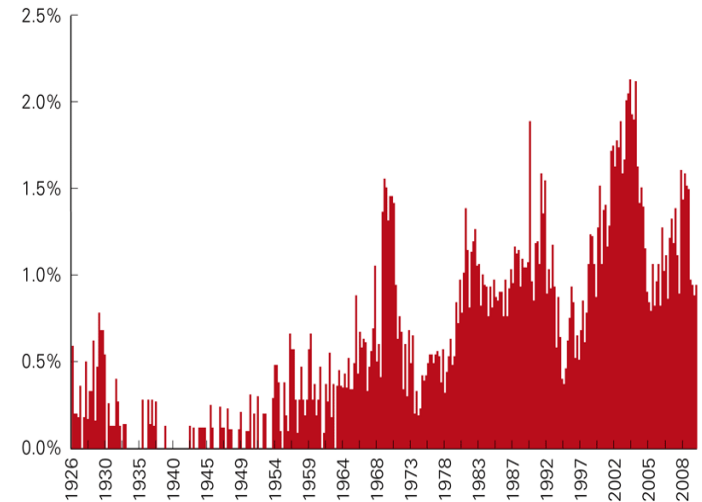
- Acquisitions by another firm
 - Horizontal merger
 - Target and acquirer are in the same industry
 - Vertical merger
 - Target's industry buys from or sells to acquirer's industry
 - Conglomerate merger
 - Target and acquirer operate in unrelated industries
- Acquisitions by someone else
 - Private equity fund – in a “leveraged buyout”
 - The firm's own management – in a “management buyout”, often partly financed with a private equity fund

FAQ: Is there a difference between a “merger”, an “acquisition”, and a “takeover”?

- Not really... but...
- “Merger” we tend to think of as a fusion of two companies
 - Tend to involve companies of roughly similar size
 - But there will still be an “acquirer” and a “target”...
 - *Who* is the acquirer and who is the target?
 - Sometimes not easy to determine...
 - One of the companies may survive, which would make that company legally the “acquirer”.
 - Useful to think of the target as the firm whose shareholders is paid a premium, which is not necessarily the firm that doesn’t survive
 - Sometimes a new third company is formed in merger; a “consolidation”
- “Acquisition” we tend to think of as a larger company buying a smaller company
 - Or if the buyer is not an operating company, e.g. if a private equity fund or group of investors buy a target firm
- “Takeover” we tend to think of as having a “hostile” connotation, *i.e.* the acquisition is not supported by the target’s management

Historical Trends

- Waves of acquisitions in the 1960s, 1980s, 1990s, and 2000s happened for different reasons
- 1960s
 - Known as the “conglomerate wave”
- 1980s
 - Known for “hostile” takeovers
- 1990s
 - Known for the “strategic” or “global” deals
- 2000s
 - Consolidation in many industries and the larger role played by private equity
- 2010s
 - Private equity playing even larger role, “activists” shaping market



Percentage of Public Companies Taken Over Each Quarter

How pay for target?

- Target shareholders can be paid with almost any combination of:
 - Cash
 - Securities in the acquiring (and now combined) firm:
 - Stock
 - “Exchange Ratio”: The number of new shares the target shareholders receive in exchange for each target share they hold
 - Preferred stock
 - Debt securities
- Cash or Stock most common ways to pay for the target

ACQUISITIONS BY ANOTHER FIRM

Why do a merger? Synergies!

- The main reason to do a merger is if the merged company has a greater value than the sum of the individual companies:

$$V_{merged\ firm} > V_{acquirer} + V_{target}$$

- How can this happen? Usually, the systematic risk of the companies don't change, so this requires:

$$CashFlow_M > CashFlow_A + CashFlow_T,$$

- We often call any difference “synergies”, *i.e.*:

$$V_M = V_A + V_T + V_S, \text{ and}$$

$$CashFlow_M = CashFlow_A + CashFlow_T + CashFlow_S$$

- Any merger for which synergies are positive increases value for the market as a whole
 - But that doesn't mean it's necessarily a good deal for the acquirer...

NPV of mergers

- NPV to acquirer is:

$$NPV = Synergies - Premium\ paid\ to\ target$$

- *i.e.*, a merger is positive-NPV for the acquirer only if:

$$synergies > premium$$

- Specifically, NPV to the acquirer of a merger can be calculated as follows:

- Price paid for target: $V_T + Premium$

- Value of acquirer after merger: $V_A + V_T + V_{Synergies} - Price\ paid$

- The change in value of the acquirer (*i.e.*, the acquirer's NPV) is then:

$$V_T + V_{Synergies} - Price = V_T + V_{Synergies} - (V_T + Premium) = V_{Synergies} - Premium$$

- Estimating the value of these synergies is the key to making good M&A decisions!

Valuing synergies

- How do we value synergies?
- Two ingredients:
 - Cash flows (saved)
 - Systematic risk of the cash flows saved
- Note: the systematic risk of cash flows saved (e.g., from eliminating duplicate IT services), can often be lower than systematic risk of company's total cash flows

Example: Stock-swap merger's exchange ratio

- Let's start with a zero-synergy, zero-premium stock swap merger...
- Two corporations, OldWorld and NewWorld are merging
 - OldWorld has 1 million shares, $P=\$60$ per share
 - NewWorld has 1 million shares, $P=\$100$ per share
- Suppose NewWorld acquires OldWorld in a stock-swap (OldWorld shareholders get shares in NewWorld)
- What is the value of the merged company after the acquisition?
- How many shares must NewWorld offer to OldWorld's shareholders in exchange for their shares? What's the exchange ratio?

Solution: Stock-swap merger's exchange ratio

- The market cap of the merged company is:

$$V_{Merged} = V_{NewWorld} + V_{OldWorld} = 100 + 60 = \$160 \text{ million}$$

- NewWorld shares (before the merger) are worth \$100, so to pay for OldWorld, the OldWorld shareholders get \$60 million/\$100=600,000 newly issued shares in NewWorld
 - So, OldWorld shareholders get 600,000 new shares in exchange for 1 million old shares → the exchange ratio is 0.6
 - In general, in a stock-swap, the zero-premium exchange ratio is: $ExchangeRatio = P_T/P_A$
- There are now a total of 1 million+600,000=1.6 million shares in NewWorld, with a post-merger price of \$160 million/1.6million=\$100
 - i.e., NewWorld's share price stays constant at \$100 (which makes sense since this is a zero-NPV transaction where the premium and synergies both are zero)
- **Bonus Exercise:**
 - What would happen if OldWorld was the acquirer in the stock-swap?

NPV in Stock-swap Mergers

- A stock-swap merger is positive-NPV for the acquiring shareholders if the share price of the merged firm exceeds the pre-merger price of the acquiring firm
- Let A be the pre-merger value of the acquirer, T be the pre-merger value of the target and S be the value of the synergies created by the merger.
 - The value of the merged firm is $A+T+S$
 - If the acquirer has N_A shares before the merger, and issues x new shares to pay for the target, then the acquirer's share price increases if:

$$\frac{A + T + S}{N_A + x} > \frac{A}{N_A}$$

NPV in Stock-swap Mergers (cont.)

- A zero-NPV merger is: $\frac{A+T+S}{N_A+x} = \frac{A}{N_A}$
- x gives the maximum number of new shares the acquirer can offer for the NPV to be non-negative:

$$x = \frac{T+S}{A} * N_A$$

The fewer shares that are given, the higher NPV

- This can be expressed as an exchange ratio:

$$\text{Exchange ratio} = \frac{x}{N_T} = \frac{T+S}{A} \frac{N_A}{N_T}$$

- Or, alternatively, because $P_T = \frac{T}{N_T}$ and $P_A = \frac{A}{N_A}$:

$$\text{Exchange ratio} = \frac{P_T}{P_A} \left(1 + \frac{S}{T}\right)$$

Example: Maximum Exchange Ratio in a Stock Swap

- At the time Sprint announced plans to acquire Nextel in December 2004, Sprint stock was trading for \$25 per share and Nextel stock was trading for \$30 per share.
 - The projected synergies were \$12 billion, and Nextel had 1.033 billion shares outstanding.
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- What is the **maximum cash offer** Sprint could make?
 - What is the **maximum exchange ratio** Sprint could offer in a stock swap and still generate a positive NPV?

Solution: Maximum Exchange Ratio in a Stock Swap

- For a cash offer, since there are synergies of \$12 billion/1.033 billion shares = \$11.62 per share, Sprint could offer up to \$30 + 11.62 = \$41.62 per share
- We can compute the maximum shares Sprint could offer and still have a positive NPV:

$$\text{Exchange Ratio} < \frac{P_T}{P_A} \left(1 + \frac{S}{T} \right) = \frac{30}{25} \left(1 + \frac{12}{31} \right) = 1.665$$

- That is, Sprint could offer up to 1.665 shares of Sprint stock for each share of Nextel stock
- Notice: Both the cash amount and the exchange offer have the same value, assuming the price of Sprint doesn't change... (\$25 × 1.665 = \$41.62)

How large are the synergies and NPV?

- On average, acquirers pay a premium of 43% over the pre-merger price (usually measured around a month before the announcement) of the target
 - On the day when a bid is announced, the target has an abnormal return of 15%; *i.e.*, there is a run-up in the target's price also before the announcement
- Average acquirer abnormal return are only 1%; around half of acquirers see a price decrease on deal announcement

Premium Paid over Pre-Merger Price	Announcement Price Reaction	
	Target	Acquirer
43%	15%	1%

Source: Data based on all U.S. deals from 1980 to 2005, as reported in *Handbook of Corporate Finance: Empirical Corporate Finance*, Vol. 2, Chapter 15, pp. 291–430, B. E. Eckbo, ed., Elsevier/North-Holland Handbook of Finance Series, 2008.

Why do acquirers pay so much?

- The fact that acquirers gain almost nothing and targets gain a lot, suggests that the premium the acquirer pays is approximately equal to the synergies in the merger
 - In other words, target shareholders capture almost all the value from the merger!
- Why? The most likely explanation is competition for the target
 - Once an acquirer starts bidding on a target company, other potential acquirers also submit their own bids
 - The result is effectively an auction in which the target is sold to the highest bidder
 - Result: Winner's curse?

Common motivations for mergers

- Economic Reasons
 - Cost savings
 - Revenue enhancements
 - Acquiring expertise
 - Monopoly gains / Market power
 - Replacing inefficient management
 - Taxes
- Dubious Reasons
 - Diversification
 - Boosting EPS
 - Empire-building (and other managerial motives...)

Cost savings

- Cost savings are by far the most common stated reason behind mergers; a large part of any synergies
- Result from layoffs of overlapping employees and divisions
 - Relatively easy to predict
- But, merging two operations and managing a larger firm can also result in some extra costs

Revenue enhancements

- Improving product/service
 - Offer customers a “one-stop shop”
 - A bundle may be preferred by customers over the sum of the parts
- Cross-selling
 - For example, suppose insurance company merges with brokerage firm
 - Now insurance salesmen can start referring their clients to the new partner’s brokerage service, and vice versa
- Revenue enhancements usually harder to predict than cost savings
 - And firms could often offer these integrated product offerings even without going through the step of merging

Expertise

- Firms often need new expertise in particular areas
 - E.g., suppose oil-change company wanted to offer body shop services
- But, hiring and integrating new employees can be difficult
 - Especially if these employees have very specialized skills
- If so, can be more efficient to “purchase” a group of employees as an already functioning entity

Monopoly Gains

- Merging with a rival may enable a firm to reduce competition within the industry and thereby increase prices and profits
- Most countries have **antitrust** laws that try to limit these types of mergers
- Example: Staples and Office Depot merger
 - <https://www.wsj.com/articles/federal-judge-blocks-staples-office-depot-merger-1462920789>
- But, other mergers that could appear to increase market power have been approved, e.g. Sirius and XM, American Airlines and U.S. Airways, etc

Replacing Inefficient Management

- Acquirers often think that they can run the target organization more efficiently than the existing management
- Particularly in the 1980s, many takeovers were motivated by a desire to replace inefficient managers
 - These takeovers were “hostile”, i.e. resisted by the management
 - Often initiated by Private Equity funds

Tax Savings

- A conglomerate may have a tax advantage over a single-product firm because losses in one division can **offset** profits in another division

Diversification: Should firms diversify?

- Imagine you have two specialized but unrelated firms
 - e.g., a car company and a shoe factory
- Would these firms be more valuable if they merged and became a single (diversified) firm?
 - The idea is appealing: Large, diversified firms have cash flows with less (idiosyncratic) risk
 - So merging would make the combined cash flow less risky!

Diversification and M&M

- In the MM world: $V[A+B] = V[A] + V[B]$
 - “Value additivity”
 - Diversification may reduce each individual firm’s idiosyncratic risk, but so what!
 - If diversification creates value, it must follow from a failure of an MM assumption...
 - e.g., cost of distress, taxes...
- Investors can achieve the same benefits of diversification themselves by purchasing shares in the two separate firms

Why could diversification add value?

1. Reduce financial distress costs
 - All else being equal, diversification leads to a lower probability of bankruptcy and financial distress costs
 - Lower financial distress costs → Higher optimal leverage (remember?)
 - So a diversified firm can increase leverage and thereby lower its costs of capital more than an undiversified firm
2. Shareholders of private companies (e.g., families) often have a large share of their wealth invested in the company, and can't sell off pieces and diversify by themselves
 - If so, the firm doing the diversification for them can be valuable

Boosting EPS

- It is possible to combine two companies with the result that the **EPS of the merged company exceed the pre-merger EPS share of either company**, even when the merger itself creates no economic value
- When firm acquires another firm with a lower P/E, then EPS increases, and vice versa
 - **Accretive** deals increase EPS
 - **Dilutive** deals reduce EPS

Example: Mergers and EPS

- Consider the example of NewWorld and OldWorld
- Suppose both corporations have EPS of \$5 per share
- OldWorld Enterprises has 1 million shares outstanding, priced at \$60 per share
- NewWorld Corporation has more lucrative growth opportunities than OldWorld. It also has 1 million shares outstanding, but priced at \$100 per share
- Assume NewWorld acquires OldWorld using its own stock, with no synergies and no premium paid
- What is NewWorld's EPS after the acquisition?

Solution: Mergers and EPS (1)

- Because the merger adds no value, the post-merger value of NewWorld is just the sum of the values of the two separate companies:
$$100 \times 1 \text{ million} + 60 \times 1 \text{ million} = \$160 \text{ million}$$
- To acquire OldWorld, NewWorld must pay \$60 million
 - At its pre-merger stock price of \$100 per share, the deal requires issuing 600,000 shares ($\$60 \text{ million} / \$100 = 600,000$)
 - So OldWorld's shareholders will exchange 1 million shares in OldWorld for 600,000 shares in NewWorld
- The price per share of NewWorld stock is the same after the merger: The new value of NewWorld is \$160 million and there are 1.6 million shares outstanding, giving it a stock price of \$100 per share

Solution: Mergers and EPS (2)

- However, NewWorld's EPS has changed!
- Prior to the merger, both companies each earned \$5/share \times 1 million shares = \$5 million.
 - The combined corporation will earn \$10 million
- There are 1.6 million shares outstanding after the merger, so NewWorld's post-merger EPS is:
 - $\text{EPS} = \$10 \text{ million} / 1.6 \text{ million shares} = \$6.25/\text{share}$
- Thus, by taking over OldWorld, NewWorld has raised its EPS by \$1.25!
- Why is EPS higher but P the same?
 - Although the combined company has higher EPS, it also has lower growth because we have combined the low-growth OldWorld with the high-growth NewWorld!

Should we care about EPS in mergers?

- Some practitioners assign great importance to EPS accretion in mergers
 - Firms prefer EPS-increasing deals, and avoid EPS-reducing deals
- But many (including most academics) think this concern is misguided
- However, if investors blindly slap P/E multiple on combined firm, dilution/accretion could be important
 - But then, in a world with stupid investors, almost anything is possible...

Managerial Motives to Merge

1. Conflicts of interest

- CEOs prefer to run a larger company due to additional pay and prestige
- “Empire-building”

2. Overconfidence

- Overconfident CEOs pursue value-destroying mergers because they wrongly believe they will succeed in creating value in the merger

- Main difference between these two motives:

- In the conflict of interest explanation (1), managers know they are destroying value for shareholders, but personally gain from doing so (i.e., an agency problem!)
- In the overconfidence explanation (2), managers really believe they are doing the right thing for shareholders!

Friendly vs. Hostile mergers

- For a merger to proceed, both the target's and acquirer's board of directors must approve the deal, as well as the shareholders of the target
- Friendly merger:
 - If a target's board supports a merger, the board negotiates with the acquirer, and both parties agree on a price that is ultimately put to a (target) shareholder vote
- Hostile takeover:
 - Sometimes, the target's management and board resists a takeover bid
 - The acquirer must “go around” the target's board and appeal directly to the target's shareholders by making a *tender offer* for their shares

Takeover Defenses (1)

- Corporations can employ “takeover defenses” to make hostile takeovers more difficult for the acquirer or raider

Examples of takeover defenses:

- *Poison pill*
 - New shares are issued at a discount if an acquirer purchase a large amount of shares above some threshold (e.g., above >25% of shares outstanding)
 - Example: Time-Warner had a provision such that if 5 of 8 board members are voted out, then preferred shareholders have option to convert shares to common shares (preferred was \$45/share, common was \$110/share)
- *Supermajority Rules*
 - The corporate charter can require that 2/3 (or more) of shareholders approve any acquisition

Takeover Defenses (2)

More examples of takeover defenses:

- *Staggered Boards*
 - Board members are elected for staggered three-year terms, so no more than (1/3) of the board can be changed in any given year
 - An acquirer's board candidates would have to win a proxy fight at least two years in a row to get a majority on the board
- *Financial restructuring* to make the target less attractive
 - Pay a large dividend or repurchase stock
 - Increase leverage
 - Make random acquisitions to burn cash
- *Buy assets* that can create antitrust problems or that the acquirer does not want

Why defend against mergers at all?

- Target firms usually get a substantial premium, so why would target shareholders make it more difficult themselves to make money?
- Arguments against takeover defenses:
 - Missed opportunities for target's shareholders to get paid a premium
 - Protects underperforming managers
- Arguments for takeover defenses :
 - Can force acquirer pay a higher takeover premium
 - Can prevent low-premium takeovers and provide shareholders an option to wait for a higher premium

Golden Parachutes

- A **golden parachute** is an extremely lucrative severance package that is guaranteed to a firm's senior management in the event that the firm is taken over and the managers are let go
- Golden parachutes have the potential to both:
 - Hinder takeovers: By committing a large part of the target firm's value to the firm's managers
 - Promote takeovers: By making managers more receptive to a deal

Merger “Arbitrage”

- After a merger is announced, there will still be uncertainty about whether the deal will go through
 - This uncertainty creates an opportunity for investors—“risk-arbitrageurs”—to speculate on the outcome of the deal
- Definition: Merger-Arbitrage Spread
 - The difference between a target stock’s price and the implied offer price
 - Note: It is not a “true” arbitrage opportunity because there is a risk that the deal will not go through

Example: Merger “Arbitrage”

- In September 2001, HP announced that it would purchase Compaq by swapping 0.6325 share of HP stock for each share of Compaq stock
 - After the announcement, HP traded for \$18.87 per share, and Compaq traded for \$11.08 per share
 - Compaq’s share price after the announcement was around \$0.86 below the implied value of HP’s offer: $\$18.87 \times 0.6325 = \11.94
- Can we make money here?
- Is it “arbitrage” (*i.e.*, risk-free)?

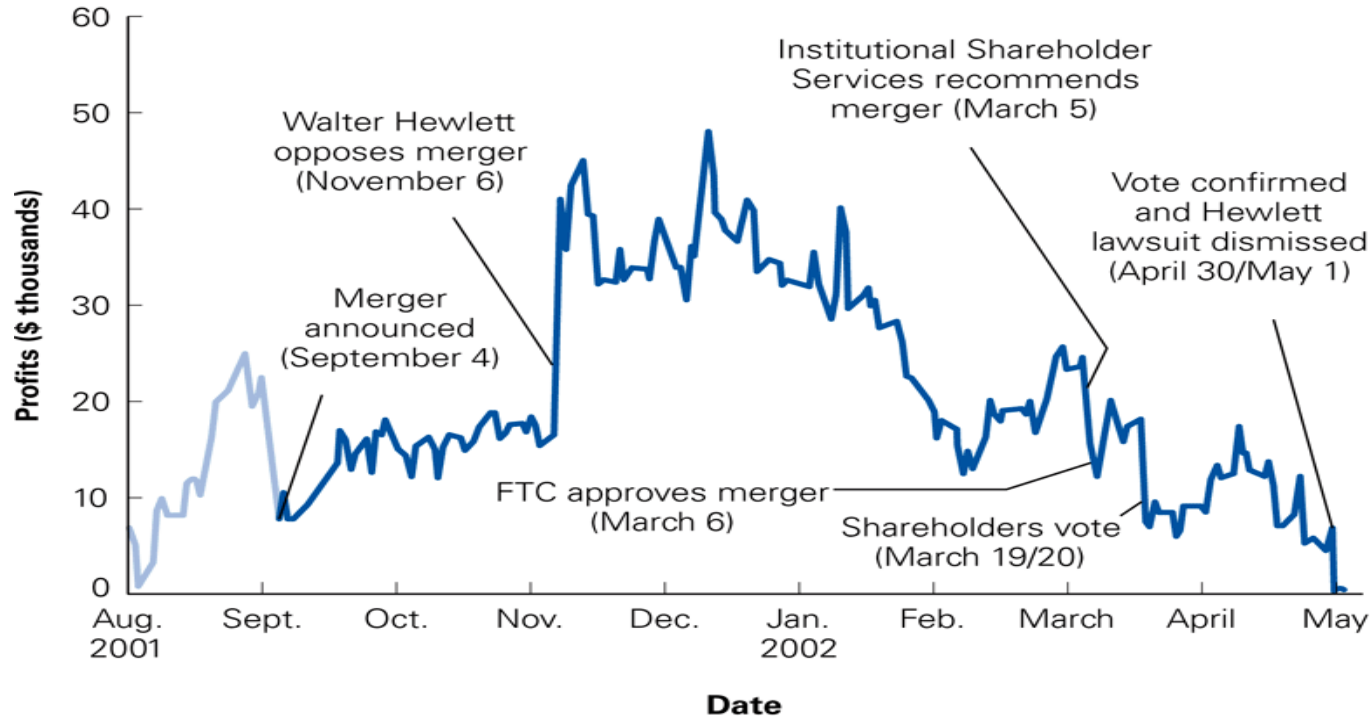
Solution: Merger “Arbitrage”

- If just after the announcement, a trader simultaneously purchased 10,000 Compaq shares and short sold 6325 HP shares, he would net \$8,553 upfront:

$$6325 \times \$18.87 - 10,000 \times \$11.08 = \$8553$$

- Now if the takeover is successfully completed on the original terms, the risk-arbitrageur pockets the \$8553 as a profit
- What about risk?

Figure Merger-Arbitrage Spread for the Merger of HP and Compaq



PRIVATE EQUITY AND LBOS

Private Equity

- Private Equity (PE) funds usually buy established companies (private or public)
 - The goal is to improve the companies, raise their value, and subsequently sell the companies at a profit
- PE funds are organized like VC (venture capital) funds:
 - PE firms raise money for a fund from investors and the fund invest in several companies
 - The funds have a limited life span, typically around 10 years, which necessitates having a shorter horizon for making investments and then realizing/selling these investments (usually within 3-7 years)
 - Successful PE firms tend to regularly raise money for new funds (e.g. every couple of years)
- Shareholders in target paid out with cash; debt often also refinanced
- Finance deals with equity supplied by the partners, and (mainly), by putting a lot of new debt on the company (called “leveraged buyout” (LBO))
- Deal volume typically hundreds of billions per year, but highly cyclical
 - Deals depend on availability of debt financing which tends to dry up in recessions
- Examples of PE firms: Bain Capital, Blackstone, Kohlberg Kravis Roberts (KKR), Texas Pacific Group (TPG)

Example of a Private Equity deal

- Leveraged buyout of Hertz
 - Took place in September 2005
 - Second-largest buyout by that date
 - Marked the start of a huge buyout boom during 2006-2007
- Total deal value: \$15.2 Billion (equity+debt+fees)
 - \$5.6 Billion equity value
 - \$9.1 Billion debt
 - \$0.5 Billion fees & expenses
- Financing: \$15.2 Billion
 - \$11.1 Billion in new debt
 - \$1.8 Billion in Hertz' cash & short-term securities
 - \$2.3 Billion in private equity
- How did leverage change?

Example of a Private Equity deal (cont.)

The Hertz buyout involved \$11.1 Billion of debt

Type of Debt	Amount (\$ million)
Public Debt	
Senior dollar-denominated	1,800.0
Senior Euro-denominated (€225 million)	268.9
Subordinated dollar-denominated	600.0
Private Debt	
Term loan	1,707.0
Asset-backed revolving line of credit	400.0
Asset-backed “fleet debt”*	6,348.0
Total	\$11,123.9

* The collateral for this debt was Hertz’s fleet of rental cars.

The LBO model: How to value a private equity transaction?

Example

- You want to buy a company
- Current revenues are \$50m, and you expect them to grow by 5% every year
- EBITDA is expected to continue at 20% of sales, asset turnover at 0.5 and working capital turnover at 0.2
- Depreciation is 10% of assets, the tax rate is 30%
- A bank will lend you 5x EBITDA at a cost of debt of 5%
 - You will pay down the debt using all available cash flows, until it's paid off or until you sell the company. Any free cash flows after you pay the debt off will go to pay a dividend.
- You hope to buy the company for 9x EBITDA and then sell it for 10x EBITDA
- What IRR could you make on the investment?
- See spreadsheet on Compass. This is called an “LBO model”

APPENDIX

Goodwill

- The merged firm must mark up the value assigned to the target's assets on the financial statements by allocating the purchase price to target assets according to their fair market value
 - If the purchase price exceeds the fair market value of the target's identifiable assets, then the remainder is recorded as **goodwill**
 - Any goodwill created can be amortized for tax purposes over 15 years

Taxes and merger payment

- How the acquirer pays for the target affects the target shareholders
 - Any cash received in full or partial exchange for shares triggers an immediate tax liability for target shareholders → Will need to pay capital gains taxes on any gain
 - If the acquirer pays for the merger entirely by exchanging acquirer stock for target stock, then the tax liability is **deferred** until the target shareholders actually sell their new shares of acquirer stock

Free Rider Problem

- Suppose a target firm is poorly managed, resulting in a low value, but the value could increase if an acquirer takes over and replaces the target's management
- Due to a “free-rider” problem the acquirer may have to pay shareholders the full increase in value to induce them to sell
- But if the potential new owner can't capture any value for himself, why would he go through the trouble of taking over the firm?
- This is best illustrated in an example...

Example: The Free Rider Problem

- Assume the current price of the target firm is \$45 per share and the potential value if the firm is taken over would be \$75 per share
 - If the potential acquirer makes a tender offer of \$60 per share, target shareholders who sell gain \$15 per share: $\$60 - \$45 = \$15$
- But shareholders who don't sell can "free ride"!
 - By not selling, these shareholders will receive the \$75 per share or a gain of \$30 per share
 - However, if all the shareholders feel that the potential price is \$75, no-one will tender their shares and the deal will not go through, which prevents everyone from getting \$75
- The only way to persuade shareholders to tender their shares is to offer them at least \$75 per share, which removes any profit opportunity for the acquirer
 - So any acquirer may not bother doing the transaction if there's nothing to gain

Solving The Free Rider Problem

- A common way for an acquirer to be able to capture some of the value from a takeover is to first buy a “toehold” stake in the firm
 - A toehold is an initial ownership stake that an acquirer buys before announcing the takeover
 - Acquirer can capture the full value on at least this slice of the company
 - An investor has to report ownership stakes over 5% within ten days to the SEC (in a “13D” filing where the investor must state their intentions for the stake)