## Strategic Financial management

## Lecture 1: Introduction to M\&A's

## Learning Objectives

- Describe trends in the global takeover market since the 1960s.
- Identify the sources of synergies that are most commonly cited in the justification given for acquiring a firm.
- Define the term "tender offer," and discuss the premium typically paid over current share price.
- Identify the gains to both acquiring and target firms upon announcement of a takeover; provide reasons for those gains to accrue.
- Calculate the maximum premium that should be paid in a stock acquisition, as well as the earnings per share before and after a merger, the new price of the combined firm, and the change in percentage ownership that will happen as a result of the merger.
- Identify two methods commonly used to pay for a target, and the tax and accounting consequences of each.
- Discuss the role of the board of directors and shareholders of the target and the board of directors of the acquirer in the merger.
- Distinguish between a friendly and a hostile takeover.
- List and define several defense strategies against takeovers.
- Define the free rider problem, and describe how it can be alleviated by a toehold, a leveraged buyout, or a freeze out merger.


## Background and Historical Trends

Market for corporate control:

- Acquirer (or bidder) - the buyer of the firm
- Target - the seller of the firm

The global takeover market is highly active, averaging more than \$1 trillion per year in transaction value.

Corporations have separation between control and ownership; if you have a stock of a firm, you have ownership, but you do not directly control the firm. So, there is a separation. The shareholders elect the board of directors who in turn elect the CEO of the firm. So, the board of director control and manage the firm on a daily basis.

Because there is this separation, we can talk about market corporate control: for example, if there is a news released about Apple and this news is bad and not expected. If this corporation, Apple, is publicly traded meaning the shares are traded on top exchanges. The investors that hold a share, many of them will want to sell their stock in Apple. Because it released bad news. If more investors start selling their stock, the price of stock is going down. This is a problem for the manager, CEO, board of directors. Because their main job is that the value of the stock is high. If this value is going down, it's a signal the managers aren't doing their job right.
The second thing is that the salary of the managers is tied to the stock of the company.
As the stock is going down, the performance is low, it is possible that it is linked to low performance of manager. As the stock gets cheaper it's easier to buy the stock.

Well, it's possible that another firm decides to buy as much stock of Apple as possible to become the full owner. If you secure let's say $50 \%$ stocks you will be possible to control the management of Apple.
So, another company will try to buy this cheap shares and replace the management with a better management that will improve the performance of Apple $=$ acquisitions .

This is why M\&A can be viewed as part of corporate control. I know if I don' $\dagger$ do my job well my stock prices will plummet, and another company can buy many shares and take over control. So, I as a CEO will be replaced.

Merger $=$ company A and company B merge together and make company C.
Company A will typically be the bigger company who wants to acquire the smaller company
B. And once company A acquires company B; B seizes to exist and becomes part of company A.
Distinction between merger and acquisition:

- when it comes to mergers, 2 companies want to merge together and want to become one item.
- When it comes to acquisition there is typically a company that want to buy another company. And that other company might or might not want to be acquired. And typically, If it wants to be acquired we call it an acquisition or a takeover. If it doesn't want to be acquired, then we call it hostile takeover. Another word for the acquired company is target.

Largest merger transactions 1998-2018

| Date <br> Announced | Date <br> Completed | Target Name | Acquirer Name | Equity Value <br> (in \$ billion) |
| :--- | :--- | :--- | :--- | :---: |
| Nov. 1999 | June 2000 | Mannesmann AG | Vodafone AirTouch PLC | 203 |
| Oct. 2004 | Aug. 2005 | Shell Transport \& Trading Co. | Royal Dutch Petroleum Co. | 185 |
| Jan. 2000 | Jan. 2001 | Time Warner | America Online Inc. | 182 |
| Sep. 2015 | Oct. 2015 | SABMiller PLC | Anheuser-Busch Inbev SA/NV | 102 |
| Apr. 2007 | Nov. 2007 | ABN-AMRO Holding NV | RFS Holdings BV | 98 |
| Mar. 2006 | Dec. 2006 | BellSouth Corp. | AT\&T Inc. | 89 |
| Nov. 1999 | June 2000 | Warner-Lambert Co. | Pfizer Inc. | 89 |
| Dec. 1998 | Nov. 1999 | Mobil Corp. | Exxon Corp. | 85 |
| Jan. 2000 | Dec. 2000 | SmithKline Beecham PLC | Glaxo Wellcome PLC | 79 |
| Oct. 2016 | June 2018 | Time Warner Inc. | AT\&T Inc. | 79 |
| Feb. 2006 | July 2008 | Suez SA | Gaz de France SA | 75 |


| Date <br> Announced | Date Completed | Target Name | Acquirer Name | Equity Value (in \$ billion) |
| :---: | :---: | :---: | :---: | :---: |
| Apr. 1998 | Oct. 1998 | Citicorp | Travelers Group Inc. | 73 |
| July 1998 | June 2000 | GTE Corp. | Bell Atlantic Corp. | 71 |
| May 1998 | Oct. 1999 | Ameritech Corp. | SBC Communications Inc. | 70 |
| June 1998 | Mar. 1999 | Tele-Communications Inc. (TC1) | AT\&T Corp. | 70 |
| Apr. 2015 | Feb. 2016 | BG Group PLC | Royal Dutch Shell PLC | 69 |
| Nov. 2014 | Mar. 2015 | Allergan Inc. | Actavis PLC | 68 |
| Jan. 2009 | Oct. 2009 | Wyeth | Pfizer Inc. | 67 |
| Jan. 1999 | June 1999 | AirTouch Communications Inc. | Vodafone Group PLC | 66 |
| Jan. 2004 | Aug. 2004 | Aventis SA | Sanofi-Synthelabo SA | 66 |
| Oct. 2015 | Sep. 2016 | EMC Corp. | Dell Inc. | 66 |

Example of relatively large merger transaction
The date of announcement and completion are always different.
Merger waves: Peaks of heavy activity followed by quiet troughs of few transactions in the takeover market
Merger activity is greater during economic expansions than during contractions and correlates with bull markets. Many of the same technological and economic conditions that lead to bull markets also motivate managers to reshuffle assets through mergers and acquisitions. Thus, the same economic activities that drive expansions most likely also drive peaks in merger activity

The greatest takeover activity occurred in the 1960s, 1980s, 1990s, and 2000s.

- 1960s: Known as the conglomerate wave: a kind of M\&A where firms of unrelated industries merge together or acquire each other.
- 1980s: Known for the hostile takeovers: when the target company doesn't want to be acquired. The CEO and the board of directors reject the offer to be sold.
- 1990s: Known for the "strategic" or "global" deals
- 2000s: Marked by consolidation in many industries and



## Types of mergers: by organizational structure

## Horizontal merger

- Target and acquirer are in the same industry


## Vertical merger

- Target's industry buys from or sells to acquirer's industry
- suppose there is company B which is supplier of company A. Suppose there is also company C at which you distribute the goods. Suppose A wants to acquire B or C, you bring in the supplier or distributor in house. You make it part of the company.


## Conglomerate merger

- Target and acquirer operate in unrelated industries
- Massive corporation with different companies that are unrelated, think about unilever.

Types of mergers: by method of payment
A = acquirer
B = target
How does $A$ buys $B$ ? the management of $A$ approaches the management of company $B$ with an offer to purchase $51 \%$ of the shares given that it would yield the full control. How does company A pay?

## Cash

- Target shareholders receive a cash payment for their stock from the acquirer


## Stock (Stock Swap)

- Target shareholders are swapping old stock for new stock in either the acquirer or a newly created merged firm.
- What if we issue new equity in our own stock, and we will give you our stock. This would be a stock deal.


## Debt

- Target shareholders exchange old stock for debt instruments issued by either the acquirer or a newly created merge firm
- Can offer shareholders of company B debt instruments.

Cash deals

- Cash is the most common and simplest form of payment for acquiring shares and assets of another company
- Cash used in M\&A transaction may be arranged by the acquiring company from internal sources, SEOs, or through additional debt (Leveraged Buy Outs (LBOs))
- The main advantage of cash payment method is a corporate identity and ownership structure of the acquirer remains unchanged (as opposed to stock payment)
- Typical when the acquiring company is much larger than the target company and it has substantial cash reserves: Because if the target is too expensive then the acquiring company may have not enough cash.
- However the drawback of this method is that there the acquirer must compensate the target shareholders the tax that those have to pay on their capital gains
- Let's clarify this: A pays the share of B with cash. Let's say you bought it for 1 dollar in the past, and today you sell it to $A$ for the price of 5 . Your capital gain is 4 dollars. According to tax code you have to pay taxes on capital gains. If shareholder of $B$ have to pay tax on that capital gain that you generate, is exactly the amount of money you don't get. When it comes to cash deals the price at which the acquirer will acquire will be much higher than when stock is used.

The main advantage of cash payments: this is different from stock swaps.
Example: A acquires B. there is only 1 shareholder in A AND 1 in B. If I want to acquire your company, I need to buy your shares. If I approach you, I hand you the cash and I take from you the share. Now you no longer have the share of B but you have money, now I merge A
en B AND I am the sole owner of the newly created company. The corporate structure did not change as I acquired your company.
If we did stock swaps: A wants to pay for B share with my share. After the issuance of the second share the value of the stock goes from 10 to 5 . But let's say it's enough, I give you one of my shares and in exchange you give me one of your shares. You no longer hold a share of $B$, company $B$ belongs to $A$. And I still hold $50 \%$ of shares of $A$. The value of company $A$ increases, but I only own $50 \%$ of company A now. Because the $50 \%$ of company $A$ is now owned by B. Because $A$ holds a share of $A$ and $B$ now also holds a share of $A$ but does not hold shares of $B$ anymore.

## Stock deals

- In the late 80 s , most of the large $M \& A$ deals were paid entirely in cash, but after a decade, the trend changed and more than $50 \%$ of the value of all large deals were paid for entirely in stock
- $\quad$ Stock payment method is a non-cash payment method in which acquiring companies issue its own equity share to target company as purchase consideration of the deal
- Thus, both acquirer and target company share post M\&A deal outcome (if the stock of a new company goes up (down) after the deal then this benefits (harms) both parties)
- The important part of this method is to determine what the "right" exchange ratio is
- This significantly affect the actual benefits to the shareholders of acquiring company (easy to make a mistake in valuation)

If I pay with cash, I get your stock, you don't own stock and don't own the company anymore. If for example a year after I realize this M\&A was a failure, it's going to affect me as the owner but you don't because you aren't the owner anymore. But if I gave you stock of company A and you hold on to this stock, whatever happens to this company will affect your wealth because you still have a share.

- This is an ideal method of financing an M\&A deal when the price- earnings ratio of the acquiring company is comparatively higher than the one of the target company: If the acquiring company is overvalued, then I can use fewer of my shares to purchase your shares. If my shares are undervalued, then I will have to use more of my shares to buy your shares.
- Also, it is handy for the target if its shareholders do not want to recognize taxable gains in the near future
- The main disadvantage of stock payment method is that it takes more time to complete the deal, higher transaction costs, potential misvaluation at determining the "right" stock exchange rate, and lots of legal procedures
- Note, however, that stock payments relate to cash payments since it is possible that the cash used for an acquisition is raised through SEOs
- It allows companies to easier acquire other companies. If you can pay with your own stock, it facilitates M\&A.

Debt deals

- The acquirer may include debt in the structure of its deal to buy the target (i.e., the acquirer borrows from the target)
- This can be beneficial to the seller's shareholders, since they do not pay income taxes until they receive the debt payments.
- The seller should not accept this form of payment unless it is very certain of the financial condition of the acquirer
- If the acquirer were to enter bankruptcy, the seller's shareholders would simply be categorized among other creditors to be paid out of any remaining assets
- The acquirer could sell off the assets and use the proceeds, or simply let the equipment run down over time without proper maintenance, leaving little for the seller's shareholders to recover
- If the merger is not successful there is a chance that the new company will not be able to service their debts and that the shareholders will not get their cash flows.


## Market reaction to a takeover

In most U.S. states, the law requires that when existing shareholders of a target firm are forced to sell their shares, they receive a fair value (= market value) for their shares. This concept is interpreted as the value exclusive of any value that arises because of the merger itself.

- As a consequence, a bidder is unlikely to acquire a target company for less than its current market value.
- In practice, most acquirers pay a premium on the current market value.

When the decision is made there will be a public announcement. How does the market reac $\dagger$ to the announcement if A want to acquire company B? This announcement will move the market, the share prices of both companies.
If the market thinks that it is a good idea, then the shares of the company will go up = market reaction (omgekeerde ook mogelijk)

## Acquisition Premium

- Paid by an acquirer in a takeover, it is the percentage difference between the acquisition price and the pre- merger price of a target firm
- Research has found, as shown on the next slide, that acquirers pay an average premium of $43 \%$ over the pre-merger price of the target.
- Pre-merger = refers to the day before the announcement. Because the prices of the shares will change after the announcement.
- If before the announcement the price of the target is 10 dollars per share, then the actual price that A will pay for the share will be 14,3 dollars per share.
- When a bid is announced, target shareholders enjoy a gain of $15 \%$ on average in their stock price.
- Acquirer shareholders see an average gain of $1 \%$, but half receive a price decrease. For acquires shareholders the price could even drop the day of the announcement.
Table 28.2 Average Acquisition Premium and Stock Price Reactions to Mergers

Premium Paid over
Premerger Price
$43 \%$

Announcement Price Reaction
Target Acquirer $15 \% \quad 1 \%$

So, if $A$ announces that it will acquire $B$, the shares of $B$ on average will increase. While the prices of the acquirer increase on average by only $1 \%=$ effect of announcement, no purchasing is taking place yet.
At the same time, how much does an acquirer actually pay for the target, before the announcement and pays he actually? What is the percentage increase in the price of the target shares from before the announcement to when it actually pays for it? That is the $43 \%$ which is higher than the $15 \%$.

## Important questions that we must answer:

- Why do acquirers pay a premium over the market value for a target company?
- Although the price of the target company rises on average upon the announcement of the takeover, why does it rise less than the premium offered by the acquirer?
- Why does the acquirer not consistently experience a price increase?

We will answer these questions during the course.

## Reasons to Acquire

Large synergies (the idea is that the sum of 2 equal parts creates a value larger than those 2 together) are by far the most common justification that bidders give for the premium they pay for a target.

- Such synergies usually fall into two categories: cost reductions and revenue


## enhancements

- Cost-reduction synergies are more common and easier to achieve because they generally translate into layoffs of overlapping employees and elimination of redundant resources.
- A simple example: lets say you have 2 companies, horizontal merger. If you merge this firms together, you can save up on some fixed costs. For example: A and B and they have both accountants, if you merge these two companies together you don't need as many accountants as these two separates. Imagine A has 10 and B also 10 , you don't need 20 accountants. This is the reason why combining two firms can lead to some synergies, in the category of cost reduction.
- Revenue-enhancement synergies, however, are much harder to predict and achieve: If the merger will create possibilities to expand into new markets or gain more customers


## Commonly listed reasons to acquire

## Economies of scale and scope

## Economies of Scale

- The savings a large company can enjoy from producing goods in high volume that are not available to a small company
- As you get bigger your fixed cost relative to your output decreases.


## Economies of Scope

- Savings large companies can realize that come from combining the marketing and distribution of different types of related products
- As you get bigger you can differentiate your product better: example milk, as you get bigger you can get additional lines of production e.g., milk with alodium, strawberry milk, ... once you have a big company it's easy for you to increase the variety of your product within the same industry you operate.

But a cost associated with an increase in size is that larger firms are more difficult to manage

## Vertical integration

- Refers to the merger of two companies in the same industry that make products required at different stages of the production cycle
- A major benefit of vertical integration is coordination.
- By putting two companies under central control, management can ensure that both companies work toward a common goal.
- For example, Apple Computers makes both the operating system and the hardware
- However, not all successful corporations are vertically integrated
- For example, Microsoft makes the operating system but not the computers

For example, you are a milk firm who pasteurizes milk, you are dependent of your suppliers of milk so you may want to acquire the milk farmers. When you don't acquire them, you have to look at prices. Those farmers compete with each other, and you make a deal with the one who has the lowest price. Once you acquire these, the competitive market forces no longer affect the internal prices of producing this milk.

## Expertise

Firms often need expertise in particular areas to compete more efficiently.

- Particularly with new technologies, hiring experienced workers directly may be difficult.
- It may be more efficient to purchase the talent as an already functioning unit by acquiring an existing firm.

Apple: a small company came up with a new vocal recognition technology, once apple found out, apple went and acquired this company. This is how we have Siri on apple today. Often this expertise is created by new firms, and sometimes a large company rather than invest large amount in R\&D and innovation they acquire the company who is already specialized in this.

## Monopoly Gains

- It is often argued that merging with or acquiring a major rival enables a firm to substantially reduce competition within the industry and thereby increase profits.
- Most countries have antitrust laws that limit such activity
- While all companies in an industry benefit when competition is reduced, only the merging company pays the associated costs (from, for instance, managing a larger corporation).
- This may be why, along with existing antitrust regulation, that there is a lack of convincing evidence that monopoly gains result from the reduction of competition following takeovers.

Example: if you are focused in one industry and company A acquires companies in the industry and it reduces the number of companies in the industry and every firm in the same industry gains additional monopoly. However, this sound very logical, from an empirical point of view they don't find support in these theory; if you have 5 companies in the industry if a company buys other companies then sure the acquirer will gain monopoly but so does the monopoly power of others that were not acquired because the number of firms in the industry decreases. But there is no evidence that stock prices in the other companies within the industry will be affected even after a large acquisition.

## Efficiency Gains

Another justification acquirers cite for paying a premium for a target is efficiency gains, which are often achieved through an elimination of duplication.

- Acquirers often argue that they can run the target organization more efficiently than existing management could.
- When the management is performing poorly, typically the shareholders will sell their stock, the stock price will become cheaper, and then an acquirer could purchase shares at a discounted price and take control of the corporation and replace management.
- Although identifying poorly performing corporations is relatively easy, fixing them is another matter entirely.
- Takeovers relying on the improvement of target management are difficult to complete, and post-takeover resistance to change can be great.
- Thus, not all inefficiently run organizations necessarily become more efficient following a takeover.

Example: if you see that a company is mismanaged and you have a great idea to make it work, this is the world of business, these people that mismanaged the firm are also professionals so it's easy to say they are not good at what they do but it's also a little bit too easy because there are serious constraints them to effectively manage their firm but maybe not. So, let's say it's not obvious.

## Tax Savings from Operating Losses

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

- To justify a takeover based on operating losses, management would have to argue that the tax savings are over and above what the firm would save using carry back and carry forward provisions.
- Carry back and carry forward: are accounting tools that allow firms to shift in their temporary losses. When firms do well when they generate profits, the firms have to generate taxes. When firms generate losses, then they can be used to offset profit. These are accounting rules, in a certain number of firms where you can do this. But you cannot constantly do this.


## Example Textbook

## Taxes for Merged Corporation Problem

Consider two firms, Ying Corporation and Yang Corporation. Both corporations will either make $\$ 50$ million or lose $\$ 20$ million every year with equal probability. The only difference is that firms' profits are perfectly negatively correlated. That is, any year Yang Corporation earns $\$ 50$ million, Ying Corporation loses $\$ 20$ million, and vice versa. Assume that the corporate tax rate is $34 \%$. What are the total expected after-tax profits if the two firms' when they are two separate firms? What are the expected after-tax profits if the two firms are combined into one corporation called Ying-Yang Corporation, but are run as two independent divisions? (Assume it is not possible to carry back or forward any loses.)

When you cannot offset profits in time then there is a possibility to generate additional cash flow.

## Solution

Let's start with Ying Corporation. In the profitable state, the firm must pay corporate taxes, so after-tax profits are $\$ 50 \times(1-0.34)=\$ 33$ million. No taxes are owned when the firm reports loses, so the expected after-tax profits of Ying Corporation are 33(0.5) - $20(0.5)=\$ 6.5$ million. Because Yang Corporation has identical expected profits, its expected profits are also $\$ 6.5$ million. Thus, the expected profit of both companies operated separately is $\$ 13$ million.

The merged corporation, Ying-Yang Corporation, always makes a pretax profit equal to 50 $20=\$ 30$ million. After taxes, expected profits are therefore $\$ 30 \times(1-0.34)=\$ 19.8$ million. So Ying-Yang Corporation has significantly higher after-tax profits than the total stand-alone after-tax profits of Ying Corporation and Yang Corporation.

## Diversification

## Risk Reduction

- Like a large portfolio, large firms bear less unsystematic risk, so often mergers are justified on the basis that the combined firm is less risky
- A problem with this argument is that it ignores the fact that investors can achieve the benefits of diversification themselves by purchasing shares in the two separate firms


## Debt Capacity and Borrowing Costs

- All else being equal, larger firms are more diversified and, therefore, have a lower probability of bankruptcy.
- The argument is that with a merger, the firm can increase leverage and thereby lower its costs of capital.
- Due to market imperfections like bankruptcy, a firm may be able to increase its debt and enjoy greater tax savings without incurring significant costs of financial distress by merging and diversifying.
- Gains must be large enough to offset any disadvantages of running a larger, less focused firm.


## Asset Allocation

- A diversified conglomerate may benefit by being able to quickly reallocate assets across industries
- For example, the firm may redeploy managerial talent to where it is most needed to exploit emerging opportunities
- On the other hand, agency costs may lead to the opposite result: profitable divisions may subsidize money-losing ones for longer than is optimal

For example: if one division within a company requires certain machines and if you as a corporation are large you can divert machines from one division to another.

## Liquidity

- Shareholders of private companies often have a disproportionate share of their wealth invested in the private company
- Consequently, when an acquirer buys a private target, it provides the target's owners with a way to reduce their risk exposure by cashing out their investment in the private target and reinvesting in a diversified portfolio.
- The liquidity that the bidder provides to the owners of a private firm can be valuable and often is an important incentive for the target shareholders to agree to the takeover

The problem is that often companies, while they do well and while they have high profits, there occasionally can be problems with cash. You have debt, you cannot skip debt payments. When you are a more diversified corporation you can diversify assets and therefore your liquidity, and then decrease the risk of bankruptcy.

## Earnings growth

It is possible to combine two companies with the result that the earnings per share of the merged company exceed the pre-merger earnings per share of either company, even when
the merger itself creates no economic value.

## Textbook example 28.2: Mergers and Earnings per Share Problem

Consider two corporations that both having earnings of \$5 per share. The first firm, OldWorld Enterprises, is a mature company with few growth opportunities. It has 1 million shares that are currently outstanding, priced at $\$ 60$ per share. The second company, NewWorld Corporation, is a Young company with much more lucrative growth opportunities. Consequently, it has a higher value: Although it has the same number of shares outstanding, its stock price is $\$ 100$ per share. Assume NewWorld acquires OldWorld using its own stock, and the takeover adds no value. In a perfect market, what is the value of NewWorld after the acquisition? At current market prices, how many shares must NewWorld offer to OldWorld's shareholders in exchange for their shares? Finally, what are NewWorld's earnings per share after the acquisition?

## Solution

Because the takeover adds no value, the post-takeover value of NewWorld is just the sum of the values of the two separate companies: $100 \times 1$ million $+\$ 160$ million. To acquire OldWorld, NewWorld must pay $\$ 60$ million. At its pre-takeover stock price of $\$ 100$ per share, the deal requires issuing 600,000 shares. As group, OldWorld's shareholders will then exchange 1 million shares in OldWorld for 600,000 shares in NewWorld, or each shareholders will get 0.6 million
share in NewWorld for each 1 share in OldWorld. Notice that the price per share of NewWorld stock is the same after the takeover: 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.

However, NewWorld's earnings per share have changed. Prior to the takeover, both companies earned $\$ 5 /$ share * 1 million shares $=\$ 5$ million. The combined corporation thus earns $\$ 10$ million. There are 1.6 million shares outstanding after the takeover, so NewWorld's post-takeover earnings per share are

$$
E P S=\frac{\$ 10 \text { million }}{1.6 \text { million shares }}=\$ 6.25 / \text { share }
$$

By taking over OldWorld, NewWorld has raised its earning per share by \$1.25.
Merging a company with little growth potential and a company with high growth potential can raise earnings per share.

- However, the merger may add no economic value.
- The price-earnings ratio reflects this.


## Textbook example 28.3: Mergers and the Price-Earnings Ratio <br> Problem

Calculate NewWorld's price-earnings ratio before and after the takeover described in Example 28.2.

The Price-earnings ratio has dropped to reflect the fact that taking over OldWorld, more of the value of NewWorld comes from earnings from current projects than from its future growth potential.

Before the takeover, NewWorld's price-earnings ratio is

$$
\mathrm{P} / \mathrm{E}=\frac{\$ 100 / \text { share }}{\$ 5 / \text { share }}=20
$$

After the takeover, NewWorld's price-earnings ratio is

$$
\mathrm{P} / \mathrm{E}=\frac{\$ 100 / \text { share }}{\$ 6.25 / \text { share }}=16
$$

## Managerial Motives to Merge

All the motives up know increased the value.
But this one is different: this is really the decision of managers that deviates from the optimal decision to maximize value. Why would they deviate?

## Conflicts of Interest

- Managers may prefer to run a larger company due to additional pay and prestige
- Agency cost: conflict of interest where managers is hired by the stock owners in order to maximize their stock value however stockholders cannot monitor the CEO on a day-to-day basis so if the CEO has other interest then with the lack of monitoring the CEO might deviate in what to do. Rather to maximize the stock value he will maximize his own value.
- While your salary could depend on the value of stock there are other considerations for you like whether you can retain your job in the future. Imagine things change in the industry and the good you produce is no longer as valuable, that can make the shares prices go down. So, the share price will be cheap, and another firm may be acquiring you. If your firm is taking over, you as a manager will be fired because after all you will be blamed why your company didn't do well. So, to defend yourself from this, you can try avoiding this. It's always easier to buy out a smaller company so if you acquire a company and you grow in size it would be more difficult to be taken over. You could grow your size of your company, so you lower the probability a takeover even if you in the future mismanage. How do you grow your firm? Investments or acquiring other companies. Here is then a rational explanation why the manager of a company might engage in acquisition of other firms even if it
brings no value to the company. But it will bring value to the manager/CEO because it lowers that probability. = empire building


## Overconfidence

- Roll's "hubris hypothesis" maintains that overconfident CEOs pursue mergers that have low chance of creating value because they believe their ability to manage is great enough to succeed
- Managers might think that acquiring other firm is smart, but in reality this could be a bad idea.


## Valuation and the takeover process

A key issue for takeovers is quantifying and discounting the value added as a result of the merger.

- For simplicity, any additional value created will be referred to as the takeover synergies
The price paid for a target is equal to the target's pre-bid market capitalization plus the premium paid in the acquisition.

Amount Paid $=$ Target's Pre-Bid Market Capitalization + Acquisition Premium

- If the pre-bid market capitalization is viewed as the stand-alone value of the target, then from the bidder's perspective, the takeover is a positive-NPV project only if the premium it pays does not exceed the synergies created

The offer

- Once the acquirer has completed the valuation process, it is in the position to make a tender offer. That is, a public announcement of its intention to purchase a large block of shares for a specified price.
- Not all tender offers are successful.
- Often acquirers have to raise the price to consummate the deal
- A bidder can pay for a target using cash or stock (sometimes also debt)
- In a cash transaction, the bidder simply pays for the target, including any premium, in cash
- In a stock-swap transaction, the bidder pays for the target by issuing new stock and giving it to the target shareholders.
- Exchange Ratio for Stock-Swaps
- The number of bidder shares received in exchange for each target share
- A stock-swap merger is a positive-NPV investment 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
- If the acquirer has $N_{A}$ shares outstanding before the merger and issues $x$ new shares to pay for the target, then the acquirer's share price should increase post-acquisition if

$$
\frac{A+T+S}{N_{A}+X}>\frac{A}{N_{A}}=P_{A}
$$

The left side is the share price of the merged firm. The numerator indicates the total value of the merged firm: the stand-alone value of the acquirer and target plus the value of the synergies created by the merger. The denominator represents the total number of shares outstanding once the merger is complete.

The right side is the premerger share price of the acquirer: the total premerger value of the acquirer divided by the premerger number of shares outstanding.

- $\quad x$ gives the maximum number of new shares the acquirer can offer and still achieve a positive NPV:

$$
\begin{gathered}
\frac{A+T+S}{N_{A}+x}>\frac{A}{N_{A}}=P_{A} \\
\frac{A+T+S}{A}>\frac{N_{A}+x}{N_{A}} \\
\frac{T+S}{A}>\frac{x}{N_{A}} \\
T+S>\frac{x A}{N_{A}}=x P_{A} \\
x P_{A}<T+S
\end{gathered}
$$

- This can be expressed as an exchange ratio:

$$
\text { Exchange ratio }=\frac{x}{N_{T}}<\frac{P_{T}}{P_{A}}\left(1+\frac{S}{T}\right)
$$

## Textbook Example 28.4: Maximum Exchange Ratio in a Stock Takeover Problem

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. If the projected synergies were $\$ 12$ billion, and Nextel had 1.033 billion shares outstanding, what is the maximum exchange ratio Sprint could offer in a stock swap and still generate a positive NPV? What is the maximum cash offer Sprint could make?

## Solution

Nextel's premerger marker was $T=1.033 \times 30=\$ 31$ billion. Thus using
Eq. 28.5,

$$
\text { Exchange ratio }<\frac{P_{T}}{P_{A}}\left(1+\frac{S}{T}\right)=\frac{30}{5}\left(1+\frac{12}{31}\right)=1.665
$$

That is, Sprint could offer up to 1.665 shares of Sprint stock for each share of Nextel stock and generate a positive NPV. For a cash offer, given synergies of

$$
\frac{\$ 12 \text { Billion }}{1.033 \text { Billion shares }}=\$ 11.62 \text { per share, }
$$

Sprint could offer up to $\$ 30+11.62=\$ 41.62$. Note that this cash amount equals the cash value of the exchange offer: $\$ 25 \times 1.665=\$ 41.62$.

$$
\begin{gathered}
\frac{\left(\frac{1}{P_{A}}\right)(T+S)}{N_{T}}>\frac{x}{N_{T}} \\
\frac{1}{P_{A}}(T+S)\left(\frac{P_{T}}{T}\right)>\frac{x}{N_{T}} \\
\left(\frac{P_{T}}{P_{A}}\right)\left(\frac{1+S}{T}\right)>\frac{x}{N_{T}} \\
\frac{1}{N_{T}}=P_{T} \\
\frac{1}{N_{T}}=\frac{P_{T}}{T}
\end{gathered}
$$

This equation tells us that there is an upper bound: the highest exchange ratio that the acquirer can offer to the target shareholders. So, it means that the acquirer will be indifferent if instead of ' $<$ ' there is a ' $=$ '.

- The higher the price of the target $\mathrm{P}_{\mathrm{t}}$, the higher the exchange ratio
- The higher the price of the acquirer $P_{A}$, the lower the exchange ratio $S / T=$ the value is increasing of synergie per target


## Merger "Arbitrage"

Once a tender offer is announced, the uncertainty about whether the takeover will succeed adds volatility to the stock price

- This uncertainty creates an opportunity for investors to speculate on the outcome of the deal


## Risk-Arbitrageurs

- Traders who, once a takeover offer is announced, speculate on the outcome of the deal

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, while the price of Compaq was $\$ 11.08$ per share
- Thus, Compaq's share price after the announcement was $\$ 0.8553$ below the implied value of HP's offer.

$$
\$ 18.87 \times 0.6325=\$ 11.9353
$$

If just after the announcement, a risk-arbitrageur simultaneously purchased 10,000 Compaq shares and short sold 6325 HP shares, he would net $\$ 8553$.

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

So, the price they calculated was 11.9 but the market price was 11.08 , its almost the same but there is a spread. If you hold on to the price of 11.08 and wait till hp acquirers the company, then you can have the spread.

If the takeover was successfully completed on the original terms, the risk-arbitrageur would pocket the $\$ 8553$ as a profit.

- This potential profit arises from the merger-arbitrage spread.


## 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. If the deal was successful you will materialize this profit. Otherwise, you don't.

Figure 28.2 Merger-Arbitrage Spread for the Merger of HP and Compaq
There were some rumors about the deal and when HP announced that it postponed the deal the spread increased. If the deal would not materialize this would means massive losses for you.


Tax and accounting issues

- How the acquirer pays for the target affects the taxes of both the target shareholders and the combined firm
- Any cash received in full or partial exchange for shares triggers an immediate tax liability for target shareholders
- They will have to pay a capital gains tax on the difference between the price paid for their shares in the takeover and the price they paid when they first bought the shares
- If the acquirer pays for the takeover entirely by exchanging bidder stock for target stock, then the tax liability is deferred until the target shareholders actually sell their new shares of bidder stock
- Step Up
- Refers to an increase in the book value of a target's assets to the purchase price when an acquirer purchases those assets directly instead of purchasing the target stock
- Any goodwill created can be amortized for tax purposes over 15 years
- The method of payment (cash or stock) does not affect the combined firm's financial statements for financial reporting
- The combined 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 and is examined annually by the firm's accountants to determine whether its value has decreased


## Board and shareholder approval

For a merger to proceed, both the target and the acquiring board of directors must approve the deal and put the question to a vote of the shareholders of the target.

- Friendly Takeover
- When a target's board of directors supports a merger, negotiates with potential acquirers, and agrees on a price that is ultimately put to a shareholder vote.
- Hostile Takeover
- A situation in which an individual or organization purchases a large fraction of a target corporation's stock and in doing so gets enough votes to replace the target's board of directors and CEO
- Corporate Raider
- The acquirer in a hostile takeover

If the shareholders of a target company receive a premium over the current market value of their shares, why would a board of directors ever oppose a takeover? There are a number of reasons.

- The board might legitimately believe that the offer price is too low.
- If the offer is a stock-swap, target management may oppose the offer because they feel the acquirer's shares are over-valued, and therefore that the value of the offer is actually less than the stand-alone value of the target.
- Managers (and the board) might oppose a takeover because of their own selfinterests, especially if the primary motivation for the takeover is efficiency gains.
- In this case, the acquirer most likely plans to undertake a complete change of leadership of the corporation. Upper-level managers could view opposing the merger as a way of protecting their jobs (and the jobs of their employees).


## Takeover defenses

= How managers can defend themselves against being acquired
If the company's internal regulation states that in order to make important decision they have to call e.g., board of directors, how many shares the company needs to secure. So in this context, it means that you can execute decisions.

What the company can do to defend itself:

- The first question is should it defend itself? Because we talked about M\&A as part of external market control. The thing is that for publicly traded companies, if managers do not efficiently control the company the shares of the company decrease. When the current manager mismanages the company, it becomes profitable for other companies to acquire the company, replace this manager in a more efficient manager, improve the company and can make money out of that. But managers anticipate that this can happen, so it has to behave efficient and try to maintain the share prices as high as possible. Managers try to avoid being replaced, the only thing they can do to avoid this is to behave efficient.
- The life of managers would improve if they could somehow put some obstacles for other companies to buy their company:

For a hostile takeover to succeed, the acquirer must go around the target board and appeal directly to the target shareholders. The acquirer can do this by making an unsolicited offer to buy target stock directly from the shareholders (a tender offer). The acquirer will usu- ally couple this with a proxy fight:

## Proxy Fight

In a hostile takeover, the acquirer attempts to convince the target's shareholders to unseat the target's board by using their proxy votes to support the acquirers' candidates for election to the target's board.

Poison Pills
A defense against a hostile takeover

- It is a rights offering that gives the target shareholders the right to buy shares in either the target or an acquirer at a deeply discounted price.
- Because target shareholders can purchase shares at less than the market price, existing shareholders of the acquirer effectively subsidize their purchases, making the takeover so expensive for the acquiring shareholders that they choose to pass on the deal.

Image two companies: in the target company way before the takeover, there is a rule within this company that says whenever we become a target in acquisition we will issue new shares at a discounted price, and whenever at that point in time the shareholder of the target will have a right to buy those cheap shares. Imagine the situation that there is an acquiring company, immediately the poison pill is activated. Imagine the acquirer already holds $40 \%$ of the shares. We activate this poison pill. The target company issues new shares, and the target shareholders are allowed to buy their shares, and they will do it because they are lower than the market price. But as they buy these shares, after the target issues for example 20 shares, there will be in total 120 shares instead of 100 . The acquiring company holds 40 shares, before the activation of the poison pill this was $40 \%$. Now its only $30 \%$. Now it becomes harder for the acquiring company to have $51 \%$ of shares. The point is that it becomes harder and harder to buy sufficient amount of shares to be able to take over the target.

By adopting a poison pill, a company effectively entrenches its management by making it much more difficult for shareholders to replace bad managers, thereby potentially destroying value. If a takeover occurs, the premium that existing shareholders receive for their stock is higher. Therefore, because a poison pill increases the cost of a takeover, all else being equal, a target company must be in worse shape (there must be a greater opportunity for profit) to justify the expense of waging a takeover battle.
Poison pills also increase the bargaining power of the target firm when negotiating with the acquirer because they make it difficult to complete the takeover without the cooperation of the target board. If used effectively, this bargaining power can allow target shareholders to capture more of the takeover gains by negotiating a higher premium than they would get if no pill existed.

## Staggered Boards (Classified Board)

If I as an acquiring company approach the board of directors to acquire their company the likelihood of the success that they will agree, depends on how friendly the members of the board of directors are towards me. If I know the member of the board of directors, then they are more likely to agree on the offer. I can try to strategically install my own people in the board of directors. This could be a strategy for me to facilitate the success of the acquisition. Because the shareholders of the target anticipate that, they know that this might happen, so they install a strategy, for a perspective acquirer that it makes it harder for him the implement the strategy. We will make a staggered board, we make the list more rigid so when there will be a vote that it is harder for the acquirer to set his own people (= people that are friendly to me as an acquirer).

- In many public companies, a board of directors whose three-year terms are staggered so that only one-third of the directors are up for election each year.
- A bidder's candidate would have to win a proxy fight two years in a row before the bidder had a majority presence on the target board.
- Every 2 years only $1 / 3$ of the members of the board can be replaced. There is like a rolling process where every 2 years, a fraction of the board will be changed during the election. By implementing this strategy it will be harder for the acquirer to put friendly people on the board.


## Disappearing defenses

Since 2002 we observe a steady decline of the usage of these strategies and mainly for poison pill. Staggered board are a great defense and has great benefits. This pure emptive defenses are declining this is because of shareholders activism. Because there is separation between control and ownership. This creates a environment for agency problems. In reality when shareholders have limited ability to control or managers have limited ability
 to implement punishment. Managers often deviates and optimize their own utility. (zie eerder) One of these examples: m\&a as part of market control is useful for shareholders beause it's a market mechanism which effectively removes. Managers mismanaged $\rightarrow$ shares go down $\rightarrow$ other companies can acquire. If this is how you view m\&a then of the point of view of the shareholders in the target, $\mathrm{m} \& \mathrm{a}$ are a good thing. But it is not a good thing for managers because if manager makes a mistake or doesn't try hard, it can easily lose its job trough $M \& A$. this defense is a perfect example of pre emptive strategies.

Shareholder activism: it's the active strategy to reduce the problem on the side of managers. You could say that the manager is trying to implement one of these defenses to make his life easier. Shareholders know that, but its difficult for them to vote out the manager, it might be difficult for them to get together and vote on this decision. What would help, is if there were a sufficient large block holders that would have sufficient pression on the manager not to implement this inefficient defense mechanism. This is what we see since 2000, you have more and more shareholder activism, they try to create enough pressure on managers to act on a efficient way.

## White knights

= reactive strategies, those that are implemented when a hostile takeover is already ongoing.

## White Knight

A target company's defense against a hostile takeover attempt in which it looks for another, friendlier company to acquire it

## White Squire

A variant of the white knight defense, in which a large, passive investor or firm agrees to purchase a substantial block of shares in a target with special voting rights

Example: if you become a target you can go to another large company that is friendly to you and ask them to start purchasing your shares. It will effectively increase competitive pressure on the acquirer, and it would make it more difficult to buy your shares. Because it would become more expensive. The risk of this strategy is that this friendly company as it helps you to avoid become the victim of this acquisition, it might become the acquirer itself. So with the white squire it buys stock with restricting voting rights.

## Golden Parachutes

This is a strategy of how to offset the managers desire to prevent M\&A. While the other strategies they are about lowering probability of M\&A this strategy increase the probability of an M\&A when its needed.
= 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

- Perhaps surprisingly, the empirical evidence suggests that the adoption of a golden parachute actually creates value.
- If a golden parachute exists, management will be more likely to be receptive to a takeover, lessening the likelihood of managerial entrenchment.

Manager resigns, these managers receive massive payment, this works to provoke the right incentive for managers. Intuitively the managers are afraid of take overs, at the same time M\&A is useful for value creation, but not for the manager. But if he prevents value creation: what if I simply compensate his loose of income because of the M\&A, it lowers the chances that the manager would intervene. The shareholders are buying the manager to leave the company and let the M\&A take place.

Recapitalization
With recapitalization, a company changes its capital structure to make itself less attractive as a target.

- For example, companies might choose to issue debt and then use the proceeds to pay a dividend or repurchase stock.
- Here if I am an acquiring company and there is a target, the target can try to worsen the situation and sabotage the company to making it less interesting to take over the company.
Why does increasing leverage make a firm less attractive as a target? In many cases, a substantial portion of the synergy gains that an acquirer anticipates from a takeover are from tax savings from an increase in leverage as well as other cost reductions. By increasing leverage on its own, the target firm can reap the benefit of the interest tax shields. In addition, the need to generate cash to meet the debt service obligations provides a powerful motivation to managers to run a corporation efficiently. In effect, the restructuring itself can produce efficiency gains, often removing the principal motivation for the takeover in the first place.


## Other defensive strategies

A firm can

- Require a supermajority (sometimes as much as $80 \%$ ) of votes to approve a merger
- Restrict the voting rights of very large shareholders
- Require that a "fair" price be paid for the company, where the determination of what is "fair" is up to the board of directors or senior management


## Regulatory approval

All mergers must be approved by regulators.

- In the United States, all mergers above a certain size (approximately $\$ 60$ million) must be approved by the government before the proposed takeovers occur.
- The European Commission has a similar process.


## Who gets the value added from a takeover?

Now that we have explained the takeover process, we can return to the remaining questions posed at the beginning of this chapter: why the price of the acquiring company does not rise at the announcement of the takeover and why the bidder is forced to pay a premium for the target.

Evidence suggests that the premium the acquirer pays is approximately equal to the value it adds, which means the target shareholders ultimately capture the value added by the acquirer. It does not appear that the acquiring corporation generally captures this value.

If there are managerial reasons to acquire this might not add value at all or sometimes value added might be destroyed. Let's know say suppose indeed value is created who secures the value? We want to understand why we have a counter intuitively result.

## The free rider problem

- Often times the target firm is poorly managed, resulting in a low share price. If the corporate raider (is the acquirer in the context of a hostile takeover) can take control of the firm and replace management, the value of the firm (and the raider's wealth) will increase.
- Assume the current price of the target firm is $\$ 45$ per share and the potential price if the firm is taken over is $\$ 75$ per share.
- If the corporate raider makes a tender offer of $\$ 60$ per share, tendering shareholders gain $\$ 15$ per share.
- $\$ 60-\$ 45=\$ 15$
- But non-tendering (not selling their shares) shareholders can "free ride".
- By not tendering, 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 $\$ 75$, they will not tender their shares and the deal will not go through.
- But the fraction of those not tendering is so small that it does not affect the takeover.
- If the shareholder holds on to the share, then it gets 75 dollar per share. But the problem is that all the shareholders might think the same way and hold on to the share. Because they all think that it does not change the probability of the take over.
- 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 corporate raider.
- The problem is that existing shareholders do not have to invest time and effort but still participate in all the gains from the takeover that the corporate raider generates, hence the term "free rider problem".
- The corporate raider is forced to give up substantial profits and thus will likely choose not to bother at all.


## Overcoming the Free-Riding Problem: Toeholds

What can be done on the side of the raider to reduce the free rider problem?
We have a raider and holds some block of shares in the target, because it has a block of shares before to try to acquire, the free rider problem is not eliminated but mitigated. We said that the outcome that we get, is because of the value created by the raider is completely appropriated by the shareholders. But the raider is also a shareholder, even if the raider will take over and the share price will be 75 , the raider will still generate profit herself because it is already holding shares.

- Toehold
- An initial ownership stake in a firm that a corporate raider can use to initiate a takeover attempt.
- Once an investor has a toehold, they must make their intentions public by informing investors of their large stake.
See HB p 23

Overcoming the Free-Riding Problem: The leveraged buyout

- Assume a corporate raider announces a tender offer for half the outstanding shares of a firm
- Instead of using his own cash to pay for these shares, he borrows the money and pledges the shares themselves as collateral on the loan
- Because the only time he will need the money is if the tender offer succeeds, the banks lending the money can be certain that he will have control of the collateral
- If the tender offer succeeds, the corporate raider now has control of the company.
- The law allows the corporate raider to attach the loans directly to the corporation-that is, it is as if the corporation, and not the corporate raider, borrowed the money.
- At the end of this process the corporate raider still owns half the shares, but the corporation is responsible for repaying the loan.
- The corporate raider has effectively gotten half the shares without paying for them!

It effectively merges two companies and the debt that was on the balance moves to the target company. This decreases the value of the shares in the newly merged company and then it is also as if the target borrowed that debt to pay for their own shares. And then you will pay a lower price for these shares so the raider can secure some value that he created in the target and the improvement no longer goes to the shareholders of the target.

## Textbook Example 28.5: Leveraged Buyout Problem

FAT Corporation stock is currently trading at $\$ 40$ per share. There are 20 million shares outstanding, and the company has no debt. You are a partner in a firm that specializes in leverage buyouts. Your analysis indicates that the management of this corporation could be improved considerably. If the managers were replaced with more capable ones, you estimate that the value of the would be increased by $50 \%$. You decide to initiate a leveraged buyout and issue a tender offer for least a controlling interest- $50 \%$ of out-standing shares. What is the maximum amount of value you can extract and still complete the deal?

## Solution

Currently, the value of the company is $\$ 40 \times 20$ million $=800$ million, and you estimate you can add an additional $50 \%$, or $\$ 400$ million and the tender offer succeed, and you will take the control of the company and install new management. The total value of the company will increase by $50 \%$ to $\$ 1.2$ billion. You will also attach the debt to the company, so the company will now have $\$ 400$ million in debt. The value of the equity once the deal is done is the total value minus debt outstanding:

$$
\text { Total Equity }=1200-400=\$ 800 \text { million }
$$

The value of the equity is the same as the premerger value. You own half the shares, which are worth $\$ 400$ million, and paid nothing for them, so you have capture the value you anticipated adding to FAT.

What if you borrowed more than $\$ 400$ million? Assume you were able to borrow $\$ 450$ million. The value of equity after merger would be

$$
\text { Total Equity }=1200-450=\$ 750 \text { million }
$$

This is lower than the premerger value. Recall, however, in the United States, existing shareholders must be offered at least the premerger price for their shares. Because existing shareholders anticipate that the share price will be lower once the deal is complete, all shareholders will tender their shares. This implies that you will have to pay $\$ 800$ million for these shares, and so to complete the deal, you will have to pay $800-450=\$ 350$ million out of your own pocket. In the end, you will own all the equity, which is worth $\$ 750$ million. You paid $\$ 350$ million for it, so your profit is again $\$ 400$ million. Thus you cannot extract more value than the value you add to the company by taking it over.

The examples we have illustrated are extreme in that the acquirer takes over the target without paying any premium and with no initial investment. In practice, premiums in LBO transactions are often quite substantial-while they can avoid the free rider problem, acquirers must still get board approval to overcome other defenses such as poison pills, as well as outbid other potential acquirers. And while in earlier times it was possible to fund deals with over $90 \%$ leverage, lenders today typically require that the acquirer have a significant equity stake as protection for the debt holders, in case the claimed post-acquisition benefits do not materialize.

Figure 28.4 Average Equity Stake in LBO Transactions, 1987-2017
While early LBOs were often financed with over $90 \%$ leverage, average equity stakes for U.S. LBOs have averaged about $40 \%$ over the past decade. They exceeded $50 \%$ during the 20082009 financial crisis, when debt markets were extremely tight.


Overcoming the Free-Riding Problem: Toeholds:

## The Freezeout Merger

A situation in which the laws on tender offers allow an acquiring company to freeze existing shareholders out of the gains from merging by forcing non-tendering shareholders to sell their shares for the tender offer price

An acquiring company makes a tender offer at an amount slightly higher than the current target stock price. If the tender offer succeeds, the acquirer gains control of the target and merges its assets into a new corporation, which is fully owned by the acquirer. In effect, the non- tendering shareholders lose their shares because the target corporation no longer exists.

In compensation, non-tendering shareholders get the right to receive the tender offer price for their shares. Because the value the non-tendering shareholders receive for their shares is equal to the tender price, the law generally recognizes it as fair value and non-tendering shareholders have no legal recourse. Under these circumstances, existing shareholders will tender their stock, reasoning that there is no benefit to holding out: If the tender offer succeeds, they get the tender price anyway; if they hold out, they risk jeopardizing the deal
and forgoing the small gain. Hence the acquirer is able to capture almost all the value added from the merger and, as in a leveraged buyout, is able to effectively eliminate the free rider problem.

- The freezeout tender offer has a significant advantage over a leveraged buyout because an acquiring corporation need not make an all-cash offer but can use shares of its own stock to pay for the acquisition.


## Competition

Why do acquirers choose to pay so large a premium?

- The most likely explanation is the competition that exists in the takeover market.
- Once an acquirer starts bidding on a target company and it becomes clear that a significant gain exists, other potential acquirers may submit their own bids.
- The result is effectively an auction in which the target is sold to the highest bidder.

Quiz in the ppt!

## Lecture 2: Valuation Techniques for M\&A

## Lecture Preview:

- Target valuation is a crucial part of M\&A success

Note: by firm valuation we mean the valuation of the firm's equity (stock), not the total value of the firm (a.k.a. enterprise value), which is the sum of equity and debt value

- A major cause of M\&As failure is misvaluation, which may result in, for example, overpaying for a target
- In this lecture, we examine two main approaches to firm valuation, namely

1. The Comparables Approaches (Chapter 9 from WMM)
2. The Discounted Free Cash Flow Valuation Model (Chapter 9 from "Corporate Finance The Core" by Berk \& DeMarzo)

Theory and practice: Case study of WhatsApp Acquisition by Facebook
Firm valuation $=$ valuation of equity $\neq$ total value of the firm
Market value combined = sum market value target and market value acquirer

## The comparables approaches

- In comparable companies or comparable transactions approach, the key relationships are calculated for a group of similar companies or similar transactions as a basis for the valuation of companies involved in an M\&A
- This is a very common approach widely used by investment bankers and in legal cases
- Basically, these approaches are based on the idea that similar companies should sell at similar prices


## A simple example

- Suppose we want to place a value on company $W$ (i.e., we want to find its equity value)
- We identify three comparable companies $A, B$, and $C$ for which equity values are available
- First, we would like to test for comparability by considering size, similarity of products, age of company, recent trends, etc
- Suppose, that these companies meet our comparability requirements
- We then calculate the ratio of market equity value to sales, the ratio of market equity value to book equity value, and price-earnings ratio for companies $A, B$, and $C$

| TABLE 1a | Comparable Companies Ratios (Company W Is Compared with <br> Companies A, B, and C) |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Ratio | Company A | Company B | Company C | Average |
| Market/sales $^{a}$ | 1.2 | 1.0 | 0.8 | 1.0 |
| Market/book | 1.3 | 1.2 | 2.0 | 1.5 |
| Market/net income <br> = price/earnings ratio | 20 | 15 | 25 | 20 |

${ }^{a}$ "Market" refers to the market value of equity.

- We then average these ratios and use them to recover the equity value of firm $W$
- For example,
let (Markets/Sales); denote the market equity value to sales ratio of firm $i$ for $i=A, B, C$, and Salesw the sales of firm $W$. Then the market equity value of firm $W$ can be approximated as

$$
\frac{1}{3} \sum_{i=A}^{C}\left(\frac{\text { Markets }}{\text { Sales }}\right)_{i} \times \text { Sales }_{w}
$$

- We then perform analogous valuation of $W$ 's equity value other different ratios
- The final estimate of $W$ 's equity value is then obtained by taking the average across the estimates based on different ratios
- Note: the method of course assumes that there is not much variation in the values of the ratios across the comparable firms (after all these are comparable firms)
- For the averages to be meaningful, it is important that the ratios we calculate for each company be relatively close in value. If they are greatly different, which implies that the dispersion around the average is substantial, the average is not meaningful.

| TABLE 1b Application of Valuation Ratios to Company W |  |  |  |
| :--- | ---: | :---: | :---: |
| Actual Recent Data <br> for Company $\boldsymbol{W}$ | Average <br> Market Ratio | Indicated Value <br> of Equity (in millions) |  |
| Sales $=\$ 100$ | 1.0 | $\$ 100$ |  |
| Book value of equity $=$ | 60 | 1.5 | 90 |
| Net Income | 5 | 20 | 100 |
|  |  |  | Average $=\$ 97$ |

- Normally we would think that firm $W$ is not publicly traded (or maybe its stock is not liquid enough), otherwise the market value of equity is already available
- One could still run this analysis for a publicly traded firm $W$ to identify any possible market misvaluation
- In the latter case, however, one should strongly believe that there is no misvaluation issues with the comparable firms

One of the advantages of the comparable companies approach is that it can be used to establish valuation relationships for a company that is not publicly traded. This is a method of predicting what its publicly traded price is likely to be. The methodology is applicable in testing for the soundness of valuations in mergers also. The buyer and the seller in a merger seek confirmation that the price is fair in relation to the values placed on other companies.

## Comparable Transaction Analysis

- Rather than using a comparable firm approach, we can use a comparable transaction approach
- Suppose instead we have firms TA, TB, and TC which involved in comparable M\&A transactions
- IMPORTANT: But instead of using a prevailing market value before the transaction announcement, you use the market value of the firm in a deal which was recently completed (there's on average an increase in value of the target and acquirer by the time the deal is completed)
- So, we now view the companies as targets in acquisitions
- and the market values are interpreted as the transaction market prices paid when the companies were acquired

Note: in all slides below the market value of equity (of target or combined (target + buyer)) is given by the market value after the M\&A announcement so that any announcement effect (positive on average) has been accounted for

If the price you want to estimate is the price you want to pay what then?
Somehow you need to take into account not just market value of the target but also the premium on top. We want a comparable value that you want to use to buy the company.

a"Market" refers to the transaction price of the deal.
TABLE 2b Application of Valuation Ratios to Company W

| Actual Recent Data <br> for Company $\boldsymbol{W}$ | Average <br> Transaction Multiple | Indicated Value <br> of Equity |  |
| :--- | ---: | :---: | :---: |
| Sales | $\$ 100$ | $1.2 \times$ | $\$ 120$ |
| Book value of equity $=$ | 60 | $1.7 \times$ | 102 |
| Net Income | $=5$ | $24 \times$ | 120 |
|  |  |  | Average $=\$ 114$ |

We postulate that the premiums over market that were paid caused the multiples (ratios) to be increased. We now view the companies as targets in acquisitions. The market values are now interpreted as the transaction market prices that were paid when these companies were acquired. Before a merger transaction, the prevailing market prices of companies include some probability that they will be acquired. But when they are acquired, the transaction price reflects the actual takeover event. Because takeover bids typically involve a premium over prevailing market prices, we accordingly illustrate this in the multiples reflected in Table 2b. We now observe that the average transaction ratios for the comparable transactions have moved up. The indicated market value of company W is now $\$ 114$, compared with $\$ 97$, reflecting a premium of $17.5 \%$ over general market valuation relationships.

|  | $\begin{gathered} B P \\ \text { Amoco } \end{gathered}$ | Chevron <br> Tevaco | Phillips Соносо |
| :---: | :---: | :---: | :---: |
| Total paid | \$47.1 | S35.8 | \$15.2 |
| Market value target | \$39.1 | \$310.4 | \$15.2 |
| Market value combined | \$113.3 | \$85.4 | \$34.9 |
| Book value target | \$15.7 | \$12.8 | \$6.6 |
| LTM net income target | \$2.1 | \$2.3 | \$2.0 |
| LTM sales targel | \$34.2 | \$46.4 | \$40.6 |
| Premium paid, \% target | 22.3\% | 17.7\% | 0.0\% |
| Premium paid, \% combined | 7.7\% | 6.3\% | 0.0\% |

Here we do it in the transaction model.
LTM = last twelve months
Premium paid \% target/combined can you calculate yourself.

| TABLE 3b Comparable Transaction Ratios |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
|  | Amoco | Texaco | Conoco | Average |
| Total paid/sales | 1.38 | 0.77 | 0.37 | 0.84 |
| Total paid/book | 3.00 | 2.79 | 2.29 | 2.69 |
| Total paid/net income | 22.46 | 15.46 | 7.60 | 15.18 |
| Premium paid, \% target | $22.3 \%$ | $17.7 \%$ | $0.0 \%$ | $13.3 \%$ |
| Premium paid, \% combined | $7.7 \%$ | $6.3 \%$ | $0.0 \%$ | $4.7 \%$ |

Premium paid to the target and combined:
A premium paid to the target is defined as the following ratio
(Total paid - Market value target) $\times 100$ Market value target
and premium combined as the following ratio
(Total paid - Market value target) $\times 100$ Market value combined

Table 3a and 3b (on the previous two slides) come from WMM textbook. If you try to compute the premiums using the above formulas you will find that the numbers in the tables are a little bit off (do it as you voluntary homework)

Case Study: Valuing Mobil for the Exxon-Mobil Merger in 1998

| TABLE 3c | Application of Valuation Ratios to Mobil (dollar amounts in <br> billions) |  |  |
| :--- | :---: | :---: | ---: |
|  | Mobil | Average <br> Transaction Multiple | Value of <br> Equity |
| LTM sales | $\$ 63.0$ | 0.84 | $\$ 53.0$ |
| Book value | 19.0 | 2.69 | 51.2 |
| LTM net income | 2.9 | 15.18 | 43.8 |
| Market value target ${ }^{a}$ | 58.7 | $13.3 \%$ | 66.5 |
| Market value combined ${ }^{b}$ | 233.7 | $4.7 \%$ |  |$\quad \underline{69.6}$|  |
| :--- | :--- | :--- |

Note: Footnotes $a$ and $b$ in the above table explain how the figures 66.5 and 69.6 were obtained. Also, the market value of buyer in footnote $b$ is given by "market value combined" - "market value target"-that is, 233.7-58.7 = 175. This is because "market value combined" is the sum of "market value target" and "market value buyer (i.e., acquirer)."

- The resulting average indicate price that Exxon should have paid for Mobil is \$56.8 billion
- The range of prices from $\$ 43.8-69.6$ billion
- Exxon actually paid $\$ 74.2$ billion
- In the next table we use only the multiples based on BP-Amoco transaction

|  | Mobil | Amoco <br> Transaction Multiple | Value of Equity |
| :---: | :---: | :---: | :---: |
| LTM sales | \$ 63.0 | 1.38 | \$86.7 |
| Book value | 19.0 | 3.00 | 57.0 |
| LTM net income | 2.9 | 22.46 | 64.9 |
| Market value target ${ }^{\text {a }}$ | 58.7 | 22.3\% | 71.8 |
| Market value combined ${ }^{\text {b }}$ | 233.7 | 7.7\% | 76.7 |
| Average $=\$ 71.4$ |  |  |  |

$\begin{aligned} & \text { Value of equity }=\text { market value target } \times(1+\text { average premium paid, } \% \text { target }) \\ & \\ & \\ & b \text { Value of equity }\end{aligned}=$ market value combined $\times(1+$ average premium paid, $\%$ combined $)-$ market value buyer

- The resulted price is $\$ 71.4$ billion which is much closer to the actual price and to the price of the advisory opinion of the investment bankers in the Exxon-Mobil merger
- Among the important considerations the comparable transactions method does not take into account is the estimated synergies (cost and revenues improvements) that can vary between different transactions.
- J.P. Morgan, financial advisor to Exxon, reviewed 38 large capitalization stock-forstock transaction
- Their analysis indicated that a premium of 15-20\% for Mobil "matched market precedent"
- Goldman Sachs for Mobil used six larger oil companies judged to be similar to Mobil. They used price/earnings and price/cash ratios ranging between 19.3-23.8 and 8.512.5 , respectively


## Issues with Comparable approaches

- The methods based on comparables fails to arrive at definitive values in practice: Input of the method is something that would vary from different professionals. Its not pure statistic analysis.
- The companies used in comparisons are likely to have different track records and opportunities even though they are in similar businesses and are comparable in size: there will always be some variation between those companies.
- In particular, these companies are likely to differ in their prospective
(i) growth rates in revenues
(ii) growth rates in cash flows
(iii) riskiness (beta) of a company
(iv) stages in the life cycle of industry and company
(v) competitive pressures
(vi) opportunities for moving into new expansion areas
- It may be even harder to account for some differences which are unobservable

A very important step is decide which price to offer to the target, if this company is publicly traded then you kind of know what the price is. There is a price per share available every day and then you decide how much you want to pay more on top of that. But if it is not publicly traded, then there is no easy accessible prices. Then you will have to estimate the market price.

- Comparables: if you have 5 companies, and I happen to know the price of these companies and if they act similar then the target than I can evaluate. Those similar companies are not gonna be identical but you hope they will be smilar.
- This startsfrom multiples of ratio's. we don't know market value of the target but we do know of other similar companies.
- We always want ratio's so we can compare
- Statistically speaking you can imagine that we sample from different companies.
- A nice ratio would be the average, you wanna know what the market to sales ratio is for tyour target but you don't know that


## The Discounted Free Cash Flow (DFCF) model

## Chapter 9 from WMM, pp237-25 1, but do skip "A Real Options Analysis" = mandatory!!!

But this chapter is based upon chapter 9 of Corporate Finance The Core" by Berk \& DeMarzo

- The DFCF model begins by determining the total value of the firm to all investors (to both equity and debt holders), a.k.a. enterprise value
- The enterprise value relates to the market value of equity via the following identity

Enterprise Value $=$ Market Value of Equity + Debt - Cash.

- So, if we knew the value of enterprise we could then obtain the market value of equity (Debt and Cash are accounting items and are, thus, readily available)
- We, thus, begin with valuing the firm's enterprise


## Enterprise valuation

- From the no-arbitrage theory we know that the firm's value (price) is equal to the present value of all future free cash flows
- Mathematically, let $V_{0}$ denote the present value of firm's enterprise, $r$ denote the appropriate discount rate, and $F C F_{+}$denote a free cash flow at time $t$, then

$$
V_{0}=\sum_{t=1}^{\infty}\left(\frac{1}{1+r}\right)^{t} F C F_{t}
$$

- So, if you knew what FCF1, FCF2, FCF3, ... were, you then could solve the above equation for V0


## What is a Free Cash Flow?

- Recall from your corporate finance course that a free cash flow is given by

$$
\begin{gathered}
\text { Free Cash Flow }=\mathrm{EBIT} \times\left(1-\tau_{c}\right)+\text { Depreciation }- \text { Capital Expenditures }- \text { Increases in Net } \\
\text { Working Capital }
\end{gathered}
$$

- Future values of FCF are either forecast or assumed to grow at a constant growth rate
- It is common to forecast the future FCF for a relatively small number of periods $N$ and then assume that after that the FCFs continue growing at a long-run growth rate gFCF (more on it on the next slides)


## What is the appropriate discount rate?

- Weighted Average Cost of Capital (WACC) (you should be familiar with this from your previous corporate finance course)

$$
r_{\text {wacc }}=r_{e} \frac{E}{D+E+P}+r_{b} \frac{D}{D+E+P}+r_{p} \frac{P}{D+E+P}
$$

- where $r_{e}, r_{b}$, and $r_{p}$ the cost (return on) of equity, $E$, debt, $D$, and preferred stock, $P$, respectively
- From your previous course you should know that you obtain $r_{e}$ from

$$
\begin{aligned}
& \text { CAMP: } R_{i, t}-R_{f, t}=\alpha+\beta\left(R_{m, t}-R_{f, t}\right)+\epsilon_{i, t} \\
& \text { and then } r_{e}=\bar{R}_{f}+\beta \bar{R}_{m}
\end{aligned}
$$

- For rou you take weighted average across different maturities of after-tax debt interests or alternately use any investment manual to determine the rating of the firm's outstanding publicly held bonds
- $\quad r_{p}$ is normally given by promised dividend over its current market price


## Enterprise Valuation

- Putting it all together the present value of the firm's enterprise is

$$
V_{0}=\frac{F C F_{1}}{1+r_{\text {wacc }}}+\frac{F C F_{2}}{\left(1+r_{\text {wacc }}\right)^{2}}+\ldots+\frac{F C F_{N}+V_{N}}{\left(1+r_{\text {wacc }}\right)^{N}}
$$

where $V_{N}$ is the terminal/continuation value of the enterprise at $t=N$

- When the terminal value is estimated by assuming a constant long-run growth rate $g_{\text {fCF }}$ for free cash flows beyond year N , that is
FCF $_{N+j}=\left(1+\right.$ gFCF $\left.^{\prime}\right)$ iFCF $F_{N}$ then

$$
V_{N}=\frac{F C F_{N+1}}{r_{\text {wacc }}-g_{F C F}}=\frac{1+g_{F C F}}{r_{\text {wacc }}-g_{F C F}} F C F_{N}
$$

## Equity value

Once we have obtained the enterprise value $V_{0}$, the estimated market value of equity $E_{0}$ is given by

$$
E_{0}=V_{0}-\text { Debt }+ \text { Cash }
$$

## The DFCF Model: Example

Suppose firm $W$ has sales of $\$ 518$ mill in 2018. Furthermore, suppose that the sales are expected to grow at $9 \%$ in 2019 and that this growth rate then will gradually slows by $1 \%$ per year to a long-run growth rate for the industry of $4 \%$ by 2024. Based on the $W$ 's past profitability and investment needs, you expect EBIT to be $9 \%$ of sales, increase in net working capital to be $10 \%$ of any increase in sales, and net investment (capital expenditure in excess of depreciation) to be $8 \%$ of any increase in sales. Finally, $W$ has $\$ 100$ mill in cash, $\$ 3$ mill in debt, a tax rate $20 \%$, and a WACC of $11 \%$.

What is your estimate of the value of W in 2018?

| Year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Sales | $\mathbf{5 1 8}$ | $\mathbf{5 6 4 . 6 2}$ | $\mathbf{6 0 9 . 7 9}$ | $\mathbf{6 5 2 . 4 7}$ | $\mathbf{6 9 1 . 6 2}$ | $\mathbf{7 2 6 . 2 0}$ | $\mathbf{7 5 5 . 2 5}$ |
| growth rate |  | $9.00 \%$ | $8.00 \%$ | $7.00 \%$ | $6.00 \%$ | $5.00 \%$ | $4.00 \%$ |
| EBIT | $\mathbf{5 0 . 8 2}$ | $\mathbf{5 4 . 8 8}$ | $\mathbf{5 8 . 7 2}$ | $\mathbf{6 2 . 2 5}$ | $\mathbf{6 5 . 3 6}$ | $\mathbf{6 7 . 9 7}$ |  |
| Income Tax |  | 10.16 | 10.98 | 11.74 | 12.45 | 13.07 | 13.59 |
| Net Investment |  | 3.73 | 3.61 | 3.41 | 3.13 | 2.77 | 2.32 |
| Inc. in NWC |  | 4.66 | 4.52 | 4.27 | 3.91 | 3.46 | 2.90 |
| Free Cash Flow | $\mathbf{3 2 . 2 6}$ | $\mathbf{3 5 . 7 7}$ | $\mathbf{3 9 . 2 9}$ | $\mathbf{4 2 . 7 5}$ | $\mathbf{4 6 . 0 6}$ | $\mathbf{4 9 . 1 5}$ |  |

EBIT is $9 \%$ of sales, Income Tax is 0.20 , Net Investment is $8 \%$ of $\Delta$ Sales, and Inc. in NWC is $10 \%$ of $\Delta$ Sales, where $\Delta$ Sales $_{t}=$ Sales $_{t}-$ Sales $_{t-1}$

## The continuation value

We expect the free cash flow to grow at a constant rate of $4 \%$ after 2024. And the WACC is given by 11\%. Thus,

$$
V_{2024}=\frac{1+g_{F C F}}{r_{\text {wacc }}-g_{F C F}} \times F C F_{2024}=\frac{1+0.04}{0.11-0.04} \times 49.15=\$ 730.22 \mathrm{mill}
$$

## The enterprise and equity value

The enterprise value is given by
$V_{2018}=\frac{32.26}{1.11}+\frac{35.77}{1.11^{2}}+\frac{39.29}{1.11^{3}}+\frac{42.75}{1.11^{4}}+\frac{46.06}{1.11^{5}}+\frac{49.15+730.22}{1.11^{6}}=\$ 559.01 \mathrm{mill}$
And the equity value is given by

$$
E_{2018}=559.01-3+100=\$ 656.01 \mathrm{mill}
$$

Note: The estimated value of equity is 656.01 mill, which is larger than the enterprise value V . This might seem odd at first but do recall that the enterprise value is the value of the firm net of cash-that is, the enterprise value is the sum of the market value of equity and net debt (defined as total debt D net cash reserves C). Thus, when the firm's cash holdings are larger than the firm's total outstanding debt then the enterprise value is always smaller than market value of equity. However, the total value of the firm, which is defined as the sum of the market value of equity and total debt, is always larger than the market value of equity.

Issue with the DFCF Approach

- The valuation under the DFCD heavily depends on the assumption about the future dynamics of free cash flows
- In fact, the valuation under the DFCF model is often very sensitive to parameter values:
- For example, suppose that the long-term industry growth rate of sales were $3.5 \%$ instead, which is just .5pp lower, then the equity value is $\$ 628.23$ (vs. $\$ 656.01$ !!!)
- or suppose that WACC were instead $10 \%$ then the equity value would be $\$ 751.85!!!$
- Thus, for a complete examination you should always supply the sensitivity analysis of your equity value estimate with respect to key parameters
- and that brings us to your first voluntary homework: replicate this spreadsheet (clickable) and perform a sensitivity analysis with respect to different model parameters

To sum up

- Valuation uses historical data as a starting point to establish approximation patterns
- Valuation depends on forecast
- The quality of forecast depends on a thorough analysis of the industry, on how it impacted by evolving changes in the economies, and by competitive strategies and tactics
- Valuation requires a thorough understanding of the business economics and financial characteristics of the industry
- In the end, valuation is more of an art than a science

Case study Whatsapp acquisition by Facebook

- In February 2014 Facebook announced the firm's biggest acquisition ever: Facebook CEO Mark Zuckerberg managed to agree on the deal with WhatsApp founders Jan Koum and Brian Acton for astonishing $\$ 22$ billion deal
- The acquisition was the sixth biggest in technologies and biggest ever in history of acquisitions of software companies (according to Reuters)
- In the moment of announcing the acquisition, WhatsApp had more than 450 million of active users
- Only 32 people were working in the company in February. Later in October, when merger was realized, company was employing 56 people.
- WhatsApp charged a service fee $\$ 1$ per year, which translated into annual revenue of about $\$ 20$ million (talking about Free Cash Flows???)
- Why the heck would somebody pay billions for an application developed by a dozen of people which did not even generate any decent cash flows?
- Back in April 2012, Facebook bought Instagram, iPhone application of the year in 2011, for 1 billion dollars. And some said it was overpriced
- Then Mark Zuckerberg announced new buy operation worth $\$ 19$ billion at first word and nearly $\$ 22$ billion when signing...
- WhatsApp was serving more than 450 million monthly active users, and Facebook was of course buying this potential too. To compare, Twitter had 241 million users at the end of the same year, operating 3 years longer than WhatsApp. By the way,

WhatsApp had more than 600 million of users in the end of that year. Zuckerberg envisioned that application may reach to 3 billion users in future

- Facebook was all around a while, but acquiring WhatsApp would enable company to practically reach users on mobile devices using fresh instant messaging service
- Large volumes by WhatsApp: messaging volume was comparable with entire global SMS telecommunication volume - 19 billion of sent and 34 billion of received messages, more than 600 million photos, 200 million voice messages and 100 million video messages were sent daily
- Security: Within WhatsApp, every message was deleted from servers
- Facebook offered $\$ 19$ billion to buy WhatsApp. Koum holding bigger share in WhatsApp was to get about $\$ 6.8$ billion and Acton $\$ 3.5$ billion after taxes. Jan Koum was also granted a seat on the Facebook board with salary of 1 dollar (the same as Zuckerberg)
- Facebook gave $\$ 177.8$ million of its Class A common stock shares and $\$ 4.59$ billion in cash to WhatsApp's shareholders
- Fortunately for WhatsApp owners, Facebook's share value had risen from February 2014 to October 2014 when deal was realized by another $\$ 2.8$ billion. In the end, acquisition was worth $\$ 21.8$ billion
- The acquisition of that size had to go through regulatory approvals. Companies were worried and it was said that WhatsApp may hurt players such as Deutsche Telekom, Orange and Telecom Italia with its plan to offer free voice calls to customers. However, The European Commission decided the deal would not hurt competition


## Lecture 3: Theories of M\&A's

(vanaf deze lecture heb ik geen HB pagina's meer gelezen)
Required: WMM: Ch. 6 pp. 130-142
Voluntary: J. Tirole "Theory of Corporate Finance" Ch. 11 pp. 431-434 (the Grossman and Hart 1980 analysis)

## Theory of value creation vs distraction in M\&A's

- Mergers as value-increasing decisions
- Mergers as value-reducing decisions
- Managerial hubris


## Mergers as value-increasing decisions

- Coase (1937) argued that mergers increase value since they help to lower transaction costs
- Firms may also want to merger due to synergistic effects
- economy of scale
- more effective management
- improved production techniques
- the combination of complementary resources

Mergers as value-reducing decisions

- Jensen (1986)'s free cash flow problem could lead to value-reducing mergers
- The agency problem in management derives from the separation of ownership and control in a corporation
- CEO's interests are not always aligned with those of shareholders'
- There is evidence of CEOs retaining unprofitable operations, resisting takeovers and pursuing short term profits
- The principal-agent problem gets worse with listed companies: dispersed ownership leads to free riding problems in monitoring efforts
- Jensen posits that firms generating cash in excess of that required to fund positive NPV projects face greater agency problems as the free cash flow exacerbates the conflict of interest between shareholders and managers
- One implication from Jensen's free cash flow theory is found in Shleifer and Vishny (1989): firms with high levels of free cash flow are more likely to initiate takeovers and investments that are value-decreasing
- the manager may invest to increase his own value which does not necessarily increase the value of shareholders (think of the manager trying to minimize its replacement probability despite not being a good one)
- for example, such investment can be in the form of acquisition in which the manager overpays for the target but reduces the probability of becoming the target himself (and subsequently be replaced)

Managerial hubris and zero-value M\&A's

- Roll (1986) proposes managers' hubris as a source of inefficient mergers
- Roll assumes that the managers are prone to excessive self-confidence (hubris)
- the managers who have the most optimistic forecast of another firm's value falls prey to the winner's curse in a bidding competition
- winner's curse is a phenomenon that may occur in common value auctions, where all bidders have the same (ex post) value for an item but receive different private (ex-ante) signals about this value; the winner is the bidder with the most optimistic evaluation of the asset, will, therefore, tend to overestimate and overpay
- as a result Roll's model suggest that mergers can occur even when they create no value, thus, resulting in a value transfer from the bidder to the target
- the important part of Roll's paper was a suggestion to consider the combined value to target and bidders in a merger


## The theories of takeovers

From now on, we will continue with the analysis of firm ownership transfer, particularly, about the market for corporate control in which a new company or managerial team replaces its existing management (i.e., takeovers).

- We will briefly discuss the managerial incentives that come from the possibility of a takeover
- And then we will turn to the analysis of a positive theory of takeovers in which we will study the implementation (or non-implementation) of the economic rationale for takeovers

What is the impact of takeover prospect on managerial incentives to increase shareholder value?
$\uparrow$ The manager incentives to work harder and to improve firm profitability may be higher when there is a prospect of being taken over. Naturally, the threat of replacement the incumbent manager via takeovers can results in the managers increasing their effort levels (e.g., Manne (1965) and Jensen (1988))
$\downarrow$ Yet, the prospect of being replaced in the future via a takeover may also induce myopic
(short-termism) behavior on the side of the incumbent manager resulting in excessive risktaking or empire building (Bebchuk and Stole (1992), Laffont and Tirole (1988), Schnitzer (1992), and Stein (1988, 1989))
$\times$ Bertand and Mullainathan (2003) analyze empirically the impact on corporate behaviour of the passage of laws restricting takeovers of firms incorporated in a given state in the USA. Managers found to enjoy "quite life," but doesn't support empire building theories.

Positive theory of takeovers
What kind of corporate strategies can be employed by the raider?
The first formal analysis of positive theory of takeovers: in economics you have positive and normative analysis
> Positive: how things are? Why things are the way they are?
> Normative: how things should be? We just want to know why takeovers happen. Will it or not happen? Nothing about how it should happen.

- A typical target has many highly dispersed shareholders
- As such they cannot cooperate when the bidder (acquirer) makes a bid (tender offer)
- So, we want to understand the equilibrium price at which the takeover takes place, and the likelihood of takeover are determined
- To do so, we turn to the seminal analysis of Grossman and Hart (1980)


## Grossman and Hart (1980)

- The main message of the model is that when the shareholders of the target are atomistic (i.e., small and highly dispersed) then-rather counterintuitively-takeover may not take place even if it leads to overall value improvement!
- The reason behind this surprising result is that the value improvement following the takeover is effectively a public good to which no shareholder wants to contribute but everyone hopes that others will (free-rider problem)
- This result helps to explain the importance of larger block holders, toeholds, and dilution in facilitating the success of takeovers

At what price would the shareholders of the target be willing to sell the shares? The shareholders of the target would sell at the price that accounts for all the future improvements, so meaning that the raider cannot get out of the transaction.

## Getting technical

- The target has infinitely many shareholder (mathematically, we assume that there is a continuum of them seating on the interval $[0,1]$ )
- So, we assume infinite shareholders
- This result will always be true when we have like 1000 shareholders but mathematically it is easier to say infinite
- There is a single bidder (raider, acquirer) who makes a price offer
- The bidder approaches each of the shareholders, he offers one price per share
- There are unit shares: all shares have a number between 0 and 1
- The target's shareholders then individually decide whether to accept or reject this offer
- they cannot collaborate with others (they cannot control the facts there is too many of them)
- Suppose the value of the target without takeover is given by $\vee>0$
- If the raider does take over the target it will improve the target's value $\hat{V}>V$
- For simplicity, assume that $\hat{V}-V=1$ ( 1 is just a normalization)
- The raider needs to capture a fraction $\kappa$ of the target's shares to become its owner


## Value-enhancing raider: The Grossman and Hart Analysis

- Let $P$ denote the premium over $V$ that the raider offers to the target's shareholders
- Thus, the raider's bid - price that he offers for the target - is $P+V$
- It is straightforward to argue that the relevant range of $P$ must be between 0 and 1 . Why? Because:
- $\quad P<0$ is always rejected (in this case the target's shareholders are better off by keeping the firm to themselves since then they enjoy $V>V+P$ if $P<0$ )
- $P>\hat{V}-V=1$ is always accepted by the target's shareholders but is wasteful for the raider
- Why does the raider pay above the market premium? Because he wants to get something out of that transaction. He will not get more then the value improvement. P cannot be bigger than one.

Let $\beta$ denote the probability of takeover - that is,

$$
\beta=\mathbb{P}(\{\text { takeover success }\})
$$

Then we can show that the probability of takeover $\boldsymbol{\beta}$ must be equal to premium $P$. Why?
Suppose instead that the success probability was higher than the premium - that is, $\beta>P$. Then each shareholder would be better off holding on to his share since the expected payoff from holding on to his shares would be larger than the price he obtains from the raider:

$$
\underbrace{\beta \hat{V}+(1-\beta) V}_{\text {If not trading }}=\beta(\hat{V}-V)+V=\beta+V>\underbrace{P+V}_{\text {lf trading }}
$$

but this means that takeover fails with probability 1. This contradicts to our initial assumption that $\beta>P$

Similarly, suppose the takeover probability is strictly smaller than the premium - that is, $\beta<P$. In this case each shareholder would be better off selling off his shares, since his expected payoff from holding on to his shares is strictly smaller than the payoff from tendering his shares

$$
\underbrace{\beta \hat{V}+(1-\beta) V}_{\text {If not trading }}=\beta(\hat{V}-V)+V=\beta+V<\underbrace{P+V}_{\text {If trading }}
$$

In this case, everyone tenders, and the probability of takeover is 1, which contradicts our initial assumption $\beta<P$.

Therefore, in equilibrium the only possible outcome it that $\beta=P$
Different way to show that $P=\beta$ in equilibrium
Suppose there is only one shareholder. In this case, the takeover is successful if an only if he tenders his share. If he tenders his share, then he receives a net payoff of

$$
(P+V)-V=P
$$

If he does not tender his share his net payoff is zero since he is left with $V$.
What should the shareholder do? If the premium is zero, $P=0$, then he is indifferent between tendering the share or not. He should tender the share if $P>0$. Thus, any $P \in[0,1]$ can be an equilibrium premium (depending on bargaining powers between the raider and the shareholder).

When there is just one shareholder, he fully internalizes the consequence of his actions: if he tenders then the takeover takes place, while if he does not tender then no takeover takes place. We don't really know if there would be an equilibrium. Imagine that all the bargaining power is in the raider, then he would make an offer; a tiny premium. Basically you could argue that our raider could get away with offering zero premium. The premium is zero so our raider does not share any increase in the value; any increase will go directly to the raider. This is what happens if you have one unique shareholder. The reason why it happens is because the shareholder fully internalizes the outcome. But the assumption of one shareholder does not make any sense.

Now, let's see how things change if we have infinitely many shareholders $\rightarrow$

Suppose that there are infinitely many atomistic shareholders. The takeover is successful if an only if $k$ fraction of all shareholder tenders. Each shareholder assigns probability $\beta$ that takeover takes place. Each shareholder knows that whether he tenders or not $\beta$ will not be affected-he is just too small to make a difference. So, taking $\beta$ as given each shareholder then compares what he gets if he tenders and if he does not. If he tenders, he gets the price per share, which is

$$
P+V
$$

If he does not tender his share, then his payoff depends on whether the takeover takes place or not. If the takeover does take place, then the value of his share increases to $\hat{V}$. If the takeover fails to materialize, then the value of his shares remains $V$. Thus, his expected payoff is:

$$
\beta \hat{V}+(1-\beta) V=\hat{V}+\beta(V-\hat{V}) V
$$

$\rightarrow$
Because there are infinitely many shareholders who can sell shares to the raider, the raider must offer $P$ so that it makes shareholder indifferent between tendering and not tendering his share:

$$
P+V=\hat{V}+\beta(V-\hat{V}) V
$$

which means that

$$
P=\beta
$$

The expected payoff by the raider is:

$$
\begin{aligned}
\pi & =\kappa[\beta(\hat{V}-V)+V-(P+V)] \\
& =\kappa[\beta(\hat{V}-V)-P] \\
& =\kappa[\beta \times 1-P]=0
\end{aligned}
$$

Thus, in expectation the raider is unable to derive any benefit from the value enhancement!
Free riding by shareholders fully captures the raider's value enhancement (e.i. $\hat{V}-V$ )
$\hat{V}-V$ is the benefit from the improvement and $B(\hat{V}-V)$ is the chance that the takeover actually takes place

Despite it's the raider who improves the value he gets nothing. Does it make sense? If we look at the empirical evidence, we see that the premium that the raider pays roughly matches the improvement of the target cost. Most of the improvement will benefit the shareholders and the raider will get nothing.

Burkart et al. (2005) analyzes takeovers of companies owned by a set of atomistic shareholders and one minority block holder. The block holder has more incentives to tender his shares than atomistic bidders. Intuitively, unlike an atomistic shareholder a large block holder knows that his actions will affect the probability of takeover, so there is not free-rider problem in this case.

If the premium is too low, then the shareholder will not sell. But at some point, premium will be so high that this point does not stand anymore. It will reach a point where you are indifferent and where you would sell or not.
The premium thus should be high enough so the shareholder would be indifferent.
Beta is endogenous object in the model that I do not know. In equilibrium it has to be true that $P=$ Beta.

When we had just one shareholder beta could be between 0 and 1 but if all the bargaining power is in the hands of the raider $p=0$.
But with infinite shareholders, $\mathrm{P}=$ Beta.
Positive raider surplus despite free riding
How does the takeover take place If he does not receive anything?

- If you are indifferent, you still might do things
- There could be some objective benefits; I might be aiding this company because if I take over, I get fewer competitors and I secure my CEO position for a longer time.

When the raider derives a private surplus $\widehat{\omega}$ from the control of the target, then he gets to keep this surplus and optimally bids $P=1$. Why? Well, because in this case the raider's profit is

$$
\pi=\kappa[\beta \times 1-P]+\beta \hat{\omega}=P \hat{\omega},
$$

and the raider then strictly prefers to bid the maximum premium of 1 .

- If you assume that our raider derives some personal benefit: $\widehat{\omega}$
- All the calculation is the same except when the takeover takes place then the raider receives $\widehat{\omega}$ for himself.
- If there is a private benefit, the premium that the raider will be willing to pay is equal to one. When we have private benefit, what is the probability of take over? Then it is 1 . He will definitely do the takeover.
- One example is: managerial incentives to take over, they do not want to lose their job, making sure the company is as big as possible.


## A tender offer mechanism fully extracts the raider's investor value enhancement under shareholder free riding and captures none of the raider's private surplus.

By contrast a large shareholder of the target company can extract some of the raider's private benefit, if
a) the large shareholder has sufficient bargaining power
b) the raider is not cash constrained

Discussion of Grossman and Hart's (1980) Analysis

- Free-riding problem: with a large number of shareholders, each feels that (s) he is nonpivotal, i.e., will not influence the outcome of the takeover attempt
- each shareholder thus refuses to sell as long as the premium does not match the subsequent value enhancement
- as a result, the raider is unable to benefit from the value enhancement he brings along
- how restrictive is the assumption of nonpivotal shareholders?
- Segal (1999) derives a general result that with small players and exogenous source of risk the shareholder will rationally anticipate that (s)her is not going to impact the likelihood of takeover
- at the same time gradually acquiring the target give the raider the toehold which encourages the raider to buy more


## The Role of Toeholds in Encouraging Takeover

Are there ways so the free rider problem will overcome?
Toehold: before I make the announcement, I buy some shares. You hold for example $3 \%$ of the shares $=\theta$, but he still needs to capture $\kappa$ to do the takeover.
$\theta$ : what he owns is exactly the same as when other shareholders have it.

- Raiders often have substantial toeholds when making a tender offer (e.g., they may have already purchased shares prior to a tender offer)
- Suppose the raider already holds $\theta<\kappa$ fraction of target's shares
- Assume no private benefit, $\widehat{\omega}=0$
- The raider's profit given the premium $P$ :

$$
\begin{aligned}
\pi(P) & =(\kappa-\theta)[\beta(\hat{V}-V)+V-(P+V)] \\
& +\theta[\beta(\hat{V}-V)+(1-\beta)(V-V)] \\
& =(\kappa-\theta)[\beta \times 1-P]+\theta P=\theta P \Longrightarrow P=1
\end{aligned}
$$

- the first term is what the raider gets, in expectation, on the additional shares that he captures, which is ( $\kappa-\theta$ )
- the second term is what the raider gets, in expectation, on the part of the stock that he/she already holds in the target (i.e., the toehold) - that is, on fraction $\theta$


## The raider fully appropriates the value added to the toehold shares

The raider already has $\theta$ shares, he is already shareholder in the target. Because of the mechanism of how he buys it, he also gets benefit as other shareholders, and it's in proportion of the fraction he holds in the company. He should choose premium 1 which means the probability of takeover is also 1 .

## The Role of Dilution in Encouraging Takeovers

Suppose there was a mechanism through which the raider could dilute the share prices: buy the company of such a way that after buying, the value of the shares will dilute.
I take a massive loan at the bank, and he will buy all the shares of the company, and it becomes a liability of the shell company (is the debt loan) and the assets is the shares of the target. Now the shell company owns the target company $\rightarrow$ merger $\rightarrow$ debts will transfer $\rightarrow$ the shares will dilute

- The following analysis can be found in Grossman and Hart (1980)
- Suppose the raider is able to capture a fraction $\varnothing \in[0,1]$ of the gains made by the shareholders who have not tendered their shares
- "partial expropriation of minority shareholders" (can be against the law)
- e.g. the raider forces the firm to purchase some supplies at an inflated price from the raider's affiliate
- this increases $\widehat{\omega}$ and decreases $\hat{V}$
- for example: $\widehat{\omega}=\emptyset(\hat{V}-V)=\emptyset$ and the actual value improvement enjoyed by target shareholders is $(1-\emptyset)(\hat{V}-V)=(1-\emptyset)$
- As a voluntary home assignment show that in equilibrium $P=(1-\emptyset) \beta(P)$, and the raider's profit (for $P \leq(1-\emptyset)$ ) is $\pi(P)=\beta(P) \emptyset$ so that it optimally sets the premium to $P=$ 1 - $\emptyset$. = UOVT KOMT MSS OP EXAMEN
- UOVT: Suppose you can lower the value of the shares of the shareholders that do not tender their shares. In equilibrium the price would not be $\beta$ but $(1-\pi) \beta$

If you want to come up with a mechanism to lower the value of the shares, it would be against the law because you go against minority shareholders. But there are many ways to do it $\rightarrow$ Müller and Panunzi (2004) on the Dilution (mandatory reading!)

- Dilution may not be feasible since the controlling shareholders have fiduciary duty to minority shareholders (e.g. the tunneling of assets by the raider to his affiliates is prohibited in the USA)
- In the 1980s merger wave the dilution was practiced in more subtle ways:
- before making public tender offer, the raider organizes highly leveraged shell company (the acquisition subsidiary) that is "assetless"
- then obtains a loan commitment from lenders by pledging the future cash flow of the target firm conditional on the majority of shareholders tendering their shares
- the cash flow from the loan is used to pay (i) the tendered shares and (ii) to compensate the raider, but it does not go to the new (merged) entity
- the minority shareholders, thus, bear some of the debt once the acquisition subsidiary is merged with the target, but do not receive any proceeds from this debt

UOVT (verplicht!)

- Try understand how this dilution mechanism works in the implementation of a takeover, you do not need to read everything (intro + the model)
- He will not ask to derive the model, but he will ask questions like can you describe mechanism of this dilution of this paper
- Just try to get the intuition


## Multiple bidders <br> What changes if instead of a single bidder we assume multiple ones?

Fishman (1988): Two bidders with different valuations ( V 1 and V 2 ). The bidder with higher valuation enters the deal. Empirically, a second bidder is less likely to appear and compete after a high-premium bid than a low one (Jennins and Mazzeo, 1993)

Burkart (1995) and Singh (1998) show that a toehold increases the bidder's chance of winning a takeover contest

Bullow et al. (1999) assume "common values" of the target among the bidders. Common values as usual give rise to the "winner's curse". The severity of the winner's curse increases in the size of the opponent's toehold. Which in turn decreases incentives of those without toehold to bid aggressively.

## Final points: Managerial resistance

Managers typically resist hostile takeover attempts in multiple ways:

- routinely advise shareholders against tendering their shares
- lobby ex-ante and ex-post for takeover defense
- in response to take over the target may
- threaten the raider with litigation
- sell of some of the assets desired by the raider
- increase debt prior to the bid
- acquire another firm to create antitrust problems for the raider
- agree on "greenmail" - repurchase the raider's current block of shares for a high price
- But should the incumbent managers really have a say in takeovers?
- on the one hand, there is a clear conflict of interest (who wants to lose their lucrative job?)
- on the other hand, the managers may have superior information (maybe they know that a takeover is a bad thing for the firm)

Golden Parachutes - a large payment or other financial compensation guaranteed to a company executive if they should be dismissed as a result of a merger or takeover - are often used to reduce the bias against takeovers

## Lecture 4: Event study analysis

## Event study - The empirical Method

A standard (formal) tool in testing M\&As theories or evaluating M\&As, in general, is an event study.

An event study is a statistical method to assess the impact of an event on the variable of interest. For example
the effect of the announcement of a merger between two business entities on the market value of equity of one (or both) of the entities

In a way such an analysis would tell us if the market views this merger as a good thing (the value increases) or not a good thing (the value decreases).

Moreover a theory may predict certain direction of an event impact. Thus, an event study may be used to empirically test such a theory.

This is a statistical tool: the output is informative, and it shows how precise your estimates is.

The event we will be analyzing is the announcement with the event day where the announcement is made. If we see that the share prices of the acquiring company goes up, then we know that the market thinks it's a good idea. If we hear the announcement and the shares of company A go down then the market thinks its not a good idea.

- Merger arbitrage: it's not certain the merger takes place, there has been an announcement. So you hold on to your investment, and wait till the price goes up and every investor thinks the same.
- We have wealth transfer theories, or some theories that say that they reduce value.
- We can use event study to see if the entire value of the acquiring company increases or decreases.


## But before we begin with an event study...

...let's review a one variable regression model. This will be useful since an event study is a special case of a one variable regression model
Suppose that you believe that a variable $x$, call it control or explanatory variable, has explanatory power over a variable $y$, call it dependent or explained variable. Then you might want to consider the following linear model to describe the dependence

$$
y_{i}=\beta_{0}+\beta_{1} x_{i}+\varepsilon_{i}
$$

normally you assume that $\mathbb{E}\left(\epsilon_{i} \mid x_{i}\right)=0$ and $\mathbb{E}\left(\epsilon_{i}^{2} \mid x_{i}\right)=\sigma^{2}$
Index i can mean an individual observation (cross section) or a time observation (time series)
$X$ = how much money you make
$Y$ = how much money you spend in a given year
$\rightarrow$ I think how much you earn affects how much you spend

## Ordinary least squares (OLS)

Suppose your sample size is N . Collect your data in matrices in the following way

$$
\begin{aligned}
& \beta:=\left[\beta_{0}, \beta_{1}\right] \\
& \text { and } \\
& X:=\left[\begin{array}{cc}
1 & x_{1} \\
\vdots & \vdots \\
1 & x_{N}
\end{array}\right], Y:=\left[\begin{array}{c}
y_{1} \\
\vdots \\
y_{N}
\end{array}\right]
\end{aligned}
$$

Then the OLS estimator of $\beta$ is given by

$$
\hat{\beta}:=\left(X^{\prime} X\right)^{-1}\left(X^{\prime} Y\right)
$$

## Statistical Inference

You have obtained $\hat{\beta}$, now what? Next, you'd like to check if your estimate of $\beta$ is statistically significant - that is, $\beta$ is statistically different from zero.

To that end, you perform a (two-sided) t-test in which you test if $\beta_{j}$ (and element of $\hat{\beta}$ ) is zero. Under the null hypothesis $\left(\mathbf{H}_{0}\right)$ of this test it is assumed that $\beta_{j}$ is zero.

If you reject $\mathbf{H}_{0}$, you claim evidence against an alternative hypothesis $\left(\mathbf{H}_{1}\right)$ that $\beta_{j} \neq 0$
First, you need to construct the test statistic. For a t-test it is given by

$$
t^{*}=\frac{\hat{\beta}_{j}-0}{\text { s.e. }\left(\hat{\beta}_{j}\right)} \sim t_{\nu}
$$

Then choose a significance level for your test: $1 \%, 5 \%, 10 \%$-levels are common

Reject $\mathbf{H}_{0}$ at the selected significance level if

$$
\left|t^{*}\right| \geq t_{\alpha, \nu}
$$

where $t_{\alpha, \nu}$ is a "critical value," which is the boundaries of the acceptance region of the test. This can be obtained from the table.

There is only one piece missing now. How do you obtain s.e. $\left(\hat{\beta}_{j}\right)$ ? Well, you know that

$$
\hat{\beta}:=\left(X^{\prime} X\right)^{-1}\left(X^{\prime} Y\right)
$$

you then easily can compute its variance as

$$
\operatorname{var}(\hat{\beta}):=\sigma^{2}\left(X^{\prime} X\right)^{-1}
$$

but you still don't know $\sigma^{2}$ ! But do not panic as this can be estimated in the following way

$$
\hat{\sigma}^{2}=\frac{1}{N-k-1}(Y-X \beta)^{\prime}(Y-X \beta)
$$

and $k$ is the number of slope coefficients in the linear model (2 in this case: $\beta_{0}$ and $\beta_{1}$ )
s.e. $\left(\hat{\beta}_{j}\right)$ is then the square root of the $j$-th element of the main diagonal of vâr $(\hat{\beta})$

## An Event Study

In this slides, I will closely follow the following paper, which is accessible on Toledo in "Course Assignment" folder. Note, this paper is part of required reading

MacKinlay, A. Craig. "Event Studies in Economics and Finance." Journal of Economic Literature 35, no. 1 (1997): 13-39

- not rarely do we to assess the effect of an economic event on a variable of interest quantitatively
- using financial data, an event study allows to rather easily quantify the impact of an event (e.g., profit/loss announcement, equity issuance announcement, M\&A announcement, etc.) on the firm's stock (it's market value)
- an implicit assumption behind this method is that rational market participants will act on the event - that is, on the disclosure of new information - immediately, thus, the event of interest will be reflected in the data upon it taking place

What was the effect of the announcement of Brexit for example?
Finance is just not just about if its bigger or smaller but also about quantifying.
How much value did those companies lose? Or what is the effect of an announcement of paying out dividends?

All this kind of idea that you can trace the effect of the event of prices is based on the efficiency of fincial markets. What we think about is what markets typically react.

- typically, the variable of interest is the price of an actively traded security (expressed in terms of returns): equity returns or debt credit spreads
- under efficient market hypothesis new relevant information should be quickly reflected in the price after being disclosed
- there are myriad of applications of an event study methodology:
- M\&A announcements
- equity issue announcements
- granting of bank loan announcements
- earnings announcements
- regulatory change environment
- etc

So what is the effect of an event on a variable of interest (which is often price)? Prices change because people buy and sell, different orders have different bid and ask prices. There is always an event that drives prices up or down.

If there is an important event to see what effect it has on the price, you need to look really closely to the event, not more than for example 3 days. Because than it is possible there are other factors that influences the effect on price.

## Procedure of an Event Study

We will discuss how to conduct event study in 14 steps. Do not view these as "the 14 steps of event study." This is merely one way to structure this process. The first three steps are below:

1. Identify the event of interest
2. Identify the variable of interest
3. dentify the event window which is the period over which the variable of interest is examined

Example:
Event: Equity issuance announcement
$>$ Event is a day event
$\Rightarrow$ The event took for example place on Monday, then what happened on Tuesday?
$>$ In many cases of M\&A the reactions start days before the announcement. A typical window is hard to tell. If I see effect, how do I know if this effect is because of the event and not something else?

The variable of interest: Daily abnormal equity returns
Event window: With daily data, a typical event window is the day of the announcement
! Naturally, sometimes you may want to expand the event window to account either for slow adjustments in the market following the announcement (illiquid markets) or for possible information leaks prior the official announcement

The shares will go down if an acquisition takes place with cash, and it issues equity. If I buy equity, what do I get? I get dividends, when things are good. If the company sells shares, will they do it when they are profitable or make losses? When they make losses. If you raise debt you commit to fixed payments. The announcement of equity issuance always signals that the company might have some problems because if it didn't have problems it gives aways dividends, but if they have debt they have a fixed payment and if they expect profits in the future debt is better.
4. Decide on the selection criteria for your firm sample

- by data availability
- by membership in a specific industry
- by some other characteristics

Step 4 not important for the assignment: you want to have an experiment. What would have happened to the return if there was no announcement. Once you estimate the return you call it normal return.
H0 and HA. If I cannot reject H0 than you can prove that the announcement had no effect. If you reject H0 that means that whatever number you got here; that you believe that on that day the abnormal return was $x \%$ and that you believe that the stock price moved up by $x \%$.
5. Construct abnormal returns

Abnormal return is the actual ex-post return of the security over the event window minus the normal return of the security over the event window, that is


We will discuss how to construct $\mathbb{E}\left(\mathbb{R}_{i, t} \mid X_{t}\right)$ later

What is the return on this day? = realized return
The question is what would the return be if the event did not take place? How do I come up with this return? I can try to estimate it from the data = normal return
6. Choose a normal performance model (to estimate $\mathbb{E}\left(\mathbb{R}_{i, t} \mid X_{t}\right)$ )

Estimating can in two ways:

- Market based approach
- Simple mean approach (if you don't know OLS)

7. Choose an estimation window (to estimate your normal performance model)

Ideally, you should use the period prior to the event window for the estimation window. Do not include the event day into the estimation window. You want to avoid the event from influencing the normal performance model parameter estimates. It should not overlap with the event window. For example, 21/10/2021 event; event window is 2 days before 2 days after. Estimation window should be maybe 8 months, august 2021-december 2021.
8. Given the estimates of the normal performance model construct the measure of abnormal return $A R_{i, t}$

## Steps 7-8 Graphically: The timeline of an event study



- Use the data from the estimation window to estimate the normal performance model
- Use the estimated performance model to construct (counterfactual) normal returns in the event window
- Subtract the counterfactual normal returns from the realized returns within the event window to obtain the abnormal returns
- You estimate your model (estimation window) and based on that model you will extract what normally should have happened at the event. The difference is the AR.
- Estimation window is to estimate your normal return. Once you estimate there the normal return you will use it to predict normal returns in your window.
- The last question is this statistically significant?

9. Design the testing framework

- define your null hypothesis (e.g. "An acquisition announcement has no effect the target firm's equity abnormal returns")
- determine the techniques for aggregating the individual firm abnormal returns

10. Present your empirical result

- This largely depends on your exact question

11. Present diagnostic checks (robustness analysis)
12. Discuss the causes of the effect or the lack of it
13. Discuss competing explanations if any
14. Conclude

Explain what you did, what you got. For the assignment. Interpret the results. Explain everything that you did. The professor should be able to replicate everything that we did: so every piece is important so he could replicate that. Look for the case where both companies are publicly traded.

## How do we construct abnormal returns?

- Remember we examine the effect of our event in terms of abnormal returns
- If abnormal returns are not statistically different from zero there is no effect (no abnormality related to the event)
- Abnormal return is, thus, a return which is different from that which would have taken place had there been no event
- (Thus, it makes sense to talk about abnormal returns within the event window!)
- That "would have been" return is what we call a normal return (counterfactual return)
- Suppose we have a way to estimate this normal return
- Then abnormal return would just be the difference between actual (realized, observed) return and normal return
- So, let's talk about how we estimate normal returns


## Models for measuring Normal Returns

We need to assume an econometric model for the period- $t$ returns on a security $i$ to estimate the normal returns. These are the two most common model specifications:

1) Constant mean return model (when you don't know econometrics very well)

$$
\begin{gathered}
\mathbb{R}_{i, t}=\mu_{i}+\xi_{i, t}, \\
\text { where } \xi_{i, t} \sim \mathcal{N}\left(0, \sigma_{\xi_{i}}^{2}\right)
\end{gathered}
$$

2) Market Model

$$
\begin{aligned}
\mathbb{R}_{i, t}=\alpha_{i} & +\beta_{i} \mathbb{R}_{t}^{m}+\epsilon_{i, t}, \\
\text { where } \epsilon_{i, t} & \sim \mathcal{N}\left(0, \sigma_{\epsilon_{i}}^{2}\right)
\end{aligned}
$$

Beta is sensitivity of the stock return of the company. If beta is bigger than 1 than very sensitive.

## Constant Mean Return (CMR) Model

$$
\begin{gathered}
\mathbb{R}_{i, t}=\mu_{i}+\xi_{i, t}, \\
\text { where } \xi_{i, t} \sim \mathcal{N}\left(0, \sigma_{\xi_{i}}^{2}\right)
\end{gathered}
$$

Remember we are after the normal returns which is $\mathbb{E}\left(\mathbb{R}_{i, t} \mid X_{t}\right)$. It is straightforward that under the CMR model

$$
\mathbb{E}\left(\mathbb{R}_{i, t} \mid X_{t}\right)=\mu_{i}
$$

hence its name "Constant Mean Return"
How do you estimate it? Easy, by a sample mean

$$
\hat{\mu}_{i}=\frac{1}{T} \sum_{t=1}^{T} R_{i, t},
$$

where $R_{i, t}$ are the realized returns from your sample which covers the estimation window from $t=0$ to $t=T$

- $\mu_{i}=$ constant
- $\xi$ is noise: on average the noise is zero
- If I have sufficient observations of this returns I can use all this information to try to estimate the constant $\mu_{i}$,

Are the abnormal returns under the CMR Model statistically different from zero?
The abnormal returns under the CMR model are given by

$$
\mathbb{R}_{i, t}-\mu_{i} \sim \mathcal{N}\left(0, \sigma_{\xi_{i}}^{2}\right)
$$

your estimator of the abnormal returns is then

$$
\hat{A R}_{i, t}=R_{i, t}^{*}-\hat{\mu}_{i}
$$

where $R^{*}{ }_{l, t}$ are the realized returns from your event window that is between
$t=T^{*}-i$ and $t=T^{*}+j$
$M \cup \wedge=$ estimates for the estimation window and are my best guess for the event window

Your estimator for variance of $A R_{i, t}$, that is for $\sigma_{\xi, i}^{2}$, is

$$
\hat{\sigma}_{\xi_{i}}^{2}=\frac{1}{T-1} \sum_{t=1}^{t=T}\left(R_{i, t}-\hat{\mu}_{i}\right)^{2}
$$

To test if $A R_{i, t}$ is statistically different from 0 compute the following z-statistics

$$
z=\frac{\left|\hat{A R_{i, t}}-0\right|}{\sqrt{\hat{\sigma}_{\xi_{i}}^{2}}}
$$

if $z>z_{\alpha}$ then the null hypothesis is rejected at $\alpha$ level of significance, where $z_{\alpha}$ is the critical value of standard normal distribution at $\alpha \in\{0.01,0.05,0.10\}$ significance level (check the statistical tables for the critical values for the standard normal distribution under a two-sided test)

Die 0 is het gemiddelde onder de nulhypothese

- Although simple, the CMR model often performs as well as more sophisticated models
- At a daily data frequency, the model is applied to nominal returns
- At lower frequencies, such as monthly, the model is applied to real or excess returns
- Use this approach if your statistical/econometric skills aren't great


## A Market model for normal returns

$$
\begin{gathered}
\mathbb{R}_{i, t}=\alpha_{i}+\beta_{i} \mathbb{R}_{t}^{m}+\epsilon_{i, t} \\
\text { where } \epsilon_{i, t} \sim \mathcal{N}\left(0, \sigma_{\epsilon_{i}}^{2}\right)
\end{gathered}
$$

where $\mathbb{R}_{i, t}$ and $\mathbb{R}_{t}^{m}$ are the period-t returns on security $i$ and the market portfolio, respectively. Remember we are after the normal return which is $\mathbb{E}\left(\mathbb{R}_{i, t} \mid X_{t}\right)$. It is straightforward that under the Market Model

$$
\mathbb{E}\left[\mathbb{R}_{i, t} \mid X_{t}\right]=\alpha_{i}+\beta_{i} \mathbb{R}_{t}^{m}
$$

How do you estimate that? We use the OLS estimator to estimate ai and $\beta i$. We then construct the normal returns. This is capm: it's an equilibrium model.

Exposure to the aggregatic/systematic risk = beta. The higher beta the more exposure to aggregate risk. And idiosyncratic risk (rare e): firm specific and independent from other things in the economy. This type of risk does not matter for the investor because he can eliminate this by diversification. So this risk has no price. We use OLS because it is a linear model.

Let

$$
X:=\left[\begin{array}{cc}
1 & R_{1}^{m} \\
\vdots & \vdots \\
1 & R_{T}^{m}
\end{array}\right], Y:=\left[\begin{array}{c}
R_{i, 1} \\
\vdots \\
R_{i, T}
\end{array}\right]
$$

Then

$$
\left[\begin{array}{l}
\hat{\alpha}_{i} \\
\hat{\beta}_{i}
\end{array}\right]=\left(X^{\prime} X\right)^{-1}\left(X^{\prime} Y\right)
$$

Once you have obtained $\hat{\alpha}_{i}$ and $\hat{\beta}_{i}$ you can construct the normal return at time $t \in\left[T^{*}-i, T^{*}+j\right]$, within the event window, as follows

$$
\hat{R}_{i, t}=\hat{\alpha}_{i}+\hat{\beta}_{i} R_{t}^{*, m}
$$

where $R_{t}^{*, m}$ is the return on market portfolio during the event window, that is $t \in\left[T^{*}-i, T^{*}+j\right]$
$\rightarrow$ This is what you do within the event window.
Here you benchmark how the stock of the target company behaves.

The abnormal returns under the Market Model are constructed as follows

$$
\hat{A R}_{i, t}=R_{i, t}^{*}-\hat{R}_{i, t}
$$

Again, remember that $R_{i, t}^{*}$ are the realized returns from your event window that is between $t=T^{*}-i$ and $t=T^{*}+j$

Easy but tedious to show that

$$
\operatorname{var}\left(A R_{i, t}\right)=\sigma_{\epsilon_{i}}^{2}+(\beta-\hat{\beta})^{2} X^{\prime} X
$$

Your (asymptotic) estimator of $\operatorname{var}\left(A R_{i, t}\right)$ is given by

$$
\hat{\sigma}_{\epsilon_{i}}^{2}=\frac{1}{T-2} \sum_{t=1}^{T} \hat{\epsilon}_{i, t}^{2}
$$

where $\hat{\epsilon}_{i, t}$ is the residual from $R_{i, t}=\hat{\alpha}_{i}+\hat{\beta}_{i} R_{t}^{m}+\hat{\epsilon}_{i, t}$ (the estimation window)
Where 2 is the number of parameters we are estimating
Under the null hypothesis we assume that the abnormal returns are zero, which is equivalent saying that the event has no impact on returns.
Mathematically, under $H_{0}$

$$
A R_{i, t} \sim \mathcal{N}\left(0, \sigma_{\epsilon_{i}}^{2}\right)
$$

So, the $z$-statistic for the two-sided test of $A R_{i, t}$ not being statistically different from zero at time $t$ is

$$
z=\frac{\left|\hat{A R} R_{i, t}-0\right|}{\sqrt{\hat{\sigma}_{\epsilon_{i}}^{2}}}
$$

if $z>z_{\alpha}$ then the null hypothesis is rejected at $\alpha$ level of significance, where $z_{\alpha}$ is the critical value of standard normal distribution at $\alpha \in\{0.01,0.05,0.10\}$ significance level (check the statistical tables for the critical values for the standard normal distribution under a two-sided test)

- for the return on market portfolio, $R_{t}^{m}$, you typically use a broad based stock index (S\%P 500 Index, the CRSP Value Weighted Index, the CRSP Equal Weighted Index)
- these is of course if you look at the impact of an event on stock returns of the firms in the USA
- for the firm which are not listed on the US stock exchanges other local indexes can be more appropriated
- What do you do if instead you are interested in the impact on debt price?
- typically, you specify the Market Model in term of excess returns rather than returns
- this means that before estimating the coefficients you subtract the nominal risk free rate, $R$, from both $R_{i, t}$ and $R_{t}^{m}$, that is your estimate the following model

$$
R_{i, t}-R=\alpha_{i}+\beta_{i}\left(R_{t}^{m}-R\right)+\epsilon_{i, t}
$$

- Use this approach if you have run a linear regression at least once in your life


## Other specifications for Market Model

The following methods are other methods you can use but not required for the assignment. Dit kan je eventueel ook gebruiken als je iets 'fancy' wil

These include the so-called multi-factor models (Arbitrage Pricing Theory (APT) ). Structurally, these models take place of multivariate linear model. An $N$-facto model in excess returns is given by

$$
\begin{gathered}
\mathbb{R}_{i, t}-R=\alpha_{i}+\beta_{1, i} X_{1, t}+\beta_{2, i} X_{2, t}+\ldots+\beta_{N, i} X_{N, t}+\epsilon_{i, t}, \\
\text { where } \epsilon_{i, t} \sim \mathcal{N}\left(0, \sigma_{\epsilon_{i}}^{2}\right)
\end{gathered}
$$

where $X_{j, t}$ is a $j$-th pricing factor.
Some prominent examples include:

- Fama-French 3-factor model
- Fama-French 4-factor model
- Fama-French 5-factor model


## Aggregation of the Abnormal Returns

- The abnormal return observations must be aggregated in order to draw overall inference for the event of the interest
- The aggregation is along two dimensions: through time ( $t$ ) and across securities/firms (i)
- We will only focus on the market model. The analysis based on the constant mean model is virtually identical

Abnormal returns can be aggregated in different ways: you aggregate all firms per section and then you do one single regression. You do compute abnormal returns for each firm seperaterly but then you collapse everything together and then you calculate a mean. You can also aggregate through time but! you need to find a smart way to compute standard errors, see next slides:

## Some Handy Notation

- Returns during the event window will be indexed by t and not $\dagger$
- t $\in\{-i,-(i-1), \ldots,-1,0,1, \ldots, j-1, j\}$, event window
- Thus, $т=0$ - the event date


## Aggregation trough time: cumulative abnormal returns (CARs)

CAR concept is necessary if you want to accommodate the effect of the event based on multiple periods. CAR over period $\left[\tau_{1}, \tau_{2}\right]$ is just the sum of the abnormal returns over this period, that is

$$
\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)=\sum_{\tau=\tau_{1}}^{\tau=\tau_{2}} A R_{i, \tau}
$$

It is easy to show that under the $H_{0}$ CAR has the following distribution

$$
\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right) \sim \mathcal{N}\left(0, \operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)\right)
$$

Therefore the test of the null hypothesis of the CAR over $\left[\tau_{1}, \tau_{2}\right]$ is significantly not being different from zero can be conducted.

For example event window of 3 days. What would be the CAR across my event window: AR before the day announcement, the day of the announcement, and the day after. So for example I only have 3 days in my event window, how many CARs can I have? The easiest way is I do not just care on how much AR on each day but also troughout my event window.

Under the $H_{0}$ CAR has the following distribution

$$
\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right) \sim \mathcal{N}\left(0, \operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)\right)
$$

Suppose $\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)$ is your estimate of $\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)$ and $\operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)$ is your estimate of $\operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)$.

Then the corresponding $z$-statistics has a standard normal distribution under the Null test and is given by

$$
z=\frac{\left|\operatorname{CAAR}_{i}\left(\tau_{1}, \tau_{2}\right)-0\right|}{\sqrt{\operatorname{VÂR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)}}
$$

if $z>z_{\alpha}$ then the null hypothesis is rejected at $\alpha$ level of significance, where $z_{\alpha}$ is the critical value of standard normal distribution at $\alpha \in\{0.01,0.05,0.10\}$ significance level (check the statistical tables for the critical values for the standard normal distribution under a two-sided test)

To know if CAR is statistically significant I need to know the distribution.
$\sqrt{\operatorname{VARR(\operatorname {CAR}_{i}(\tau _{1},\tau _{2}))}}$
$\rightarrow$ what is this? This depends on the return model you use.

## How to compute Variance for CARs?

Computing $\operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)$ for market model is somewhat difficult. See
MacKinlay, A. Craig. "Event Studies in Economics and Finance." Journal of Economic Literature 35, no. 1 (1997): 13-39. JSTOR link for the paper (to download this paper you must be at the premises of KU Leuven, use VPN, or check it on Toledo)

Later in on these slides, I will show you a much easier approach of conducting the Null text for CARs under the market model!

But if you decide to use the Constant Mean Return model then

$$
\operatorname{VAR}\left(\operatorname{CAR}_{i}\left(\tau_{1}, \tau_{2}\right)\right)=\left(\tau_{2}-\tau_{1}+1\right) \hat{\sigma}_{\xi_{i}}^{2},
$$

where $\hat{\sigma}_{\xi_{i}}^{2}=\frac{1}{T} \sum_{t=1}^{t=T}\left(R_{i, t}-\hat{\mu}_{i}\right)^{2}$
(Note: if $\tau_{1}=-3$ and $\tau_{2}=4$ then $\left(\tau_{2}-\tau_{1}+1\right)=8$ periods)
Aggregation across firms is required

- However, testing the null hypothesis with only one observation may not be useful if we are looking for some "general patterns" in the data
- Thus, we need to aggregate across firms (think that we have $N$ different M\&A announcements and we want to know what the average effect of a M\&A announcement on the combine value is)
- We will assume that there is no clustering (no overlaps in the event windows of the included securities, that is the M\&A announcements don't all just happen in around same time)


## Aggregation across Firms

Let us begin by aggregating the abnormal return. The average (over the firms) abnormal return is

$$
\overline{A R_{\tau}}=\frac{1}{N} \sum_{i=1}^{N} A R_{i, \tau}
$$

when estimation window is large enough the variance of the average
abnormal returns is

$$
\operatorname{var}\left(\overline{A R_{\tau}}\right)=\frac{1}{N^{2}} \sum_{i=1}^{N} \sigma_{\epsilon}^{2}
$$

Thus, one can conduct the null test using these statistics

## Aggregation across Firms and Time

We now can aggregate the average abnormal returns across time, that is, compute conditional average abnormal returns. Over a period $\tau_{2}-\tau_{1}$, these are given by

$$
\operatorname{C\overline {A}R}\left(\tau_{1}, \tau_{2}\right)=\sum_{\tau=\pi}^{\tau_{2}} \overline{A R_{\tau}}
$$

and the variance is given by

$$
\operatorname{var}\left(C \bar{A} R\left(\tau_{1}, \tau_{2}\right)\right)=\sum_{\tau=\tau_{1}}^{\tau_{2}} \sigma_{i}^{2}\left(\tau_{1}, \tau_{2}\right)
$$

Thus, under null $C \bar{A} R\left(\tau_{1}, \tau_{2}\right)$ has the following distribution

$$
C \bar{A} R\left(\tau_{1}, \tau_{2}\right) \sim \mathcal{N}\left(0, \operatorname{var}\left(C \bar{A} R\left(\tau_{1}, \tau_{2}\right)\right)\right)
$$

The rest see ppt (extra)

## Lecture 5: Empirical Evidence on M\&As

## This lecture

This lecture follows closely Chapter 8 from Takeovers, Restructuring, and Corporate Governance by Weston, Mitchel, and Mulherin 4th ed. (required reading)
In this lecture we will:

- Quickly review the main theories of M\&A
- Define the notion of the combined returns in M\&As and examine the empirical evidence on these
- We will further examine the empirical evidence on
- the factors related to target returns
- the factors related to bidder (raider) returns
- M\&A regulation, takeover impediments, takeover hostility, long-term stock performance, efficiency, and concentration
- Finally, we will a look at some "recent" M\&A activities in Belgium


## Main Theories

- Mergers as value-increasing decisions: $\rightarrow$ Synergy stories
- Mergers as value-reducing decisions: $\rightarrow$ Agency cos $\dagger$
- Mergers as value-neutral decisions: $\rightarrow$ Managerial hubris


## Mergers as value-increasing decisions

- Coase (1937) argued that mergers increase value since they help to lower transaction costs
- Firms may also want to merger due to synergistic effects
- economy of scale
- more effective management
- improved production techniques
- the combination of complementary resources

Mergers as value-reducing decisions

- Jensen (1986)'s free cash flow problem could lead to value-reducing mergers
- The agency problem in management derives from the separation of ownership and control in a corporation
- CEO's interests are not always aligned with those of shareholders'
- There is evidence of CEOs retaining unprofitable operations, resisting takeovers and pursuing short term profits
- The principal-agent problem gets worse with listed companies: dispersed ownership leads to free riding problems in monitoring efforts
- Jensen posits that firms generating cash in excess of that required to fund positive NPV projects face greater agency problems as the free cash flow exacerbates the conflict of interest between shareholders and managers
- One implication from Jensen's free cash flow theory is found in Shleifer and Vishny (1989): firms with high levels of free cash flow are more likely to initiate takeovers and investments that are value-decreasing
- the manager may investment to increase his own value which does not necessarily increase the value of shareholders (think of the manager trying to minimize it's replacement probability despite not being a good one)
- for example, such investment can be in the form of acquisition in which the manager overpays for the target but reduces the probability of becoming the target himself (and subsequently be replaced)
- Roll (1986) proposes managers' hubris as a source of inefficient mergers
- Roll assumes that the managers are prone to excessive self-confidence (hubris)
- the managers who have the most optimistic forecast of another firm's value falls prey to the winner's curse in a bidding competition
- (winner's curse is a phenomenon that may occur in common value auctions, where all bidders have the same (ex post) value for an item but receive different private (ex ante) signals about this value; the winner is the bidder with the most optimistic evaluation of the asset, will, therefore, tend to overestimate and overpay)
- as a result Roll's model suggest that mergers can occur even when they create no value, thus, resulting in a value transfer from the bidder to the target
- the important part of Roll's paper was a suggestions to consider the combined value to target and bidders in a merger


## The Combined Returns in Mergers and Acquisitions

Are mergers positive net present value investment? That is, is the combined returns to bidders and targets positive or negative?

- The combined returns are the estimated (C)AR from the event study using the weighted portfolio of the bidder and the target stock
- Theories based on synergy and efficiency predict that the combined return in a merger is positive
- Theories based on the agency costs of free cashflow and managerial entrenchment argue that mergers destroy wealth and predict that the combined returns in a merger are negative
- Some theories (such as Roll 1986) suggest that any wealth gain to target firms merely represent redistribution from bidders and predicts that the net merger gains are zero
- Much of the empirical analysis of the combined returns in mergers has employed event study methods
- Early evidence by Jensen and Ruback (1983) found that mergers created wealth for target shareholders and were roughly at break-even for bidders
- This was interpreted as the evidence of mergers creating value
- Roll (1986) stressed that it is important to properly examine merger gains:
- Since bidders are often much larger than targets it means that the proper consideration of merger gains must carefully match each target and bidder firm and estimate a combined return that takes into account the size of the two merger parties


## Evidence on Combined Returns

- in what follows, we will survey a large body of empirical literature (many papers)
- you are not responsible for memorizing these papers individually (authors, titles, year of publication, etc)
- what you are responsible is to understand what the general results of this literature are


## Bradley, Desai, and Kim (1988)

- A sample of 236 tender offers during the period 1963-1984
- Event window: 5 days before the announcement of the first bid through 5 days after the announcement of the ultimately successful bid
- Target shareholder gains 31.77\%, on average: this means that the CAR over this period was $31.77 \%$ on average. When the target makes a public announcement to acquire a target the gains that they had upon the announcement for the bidder was $1 \%$.and $31 \%$ for the target
- Why is there an impact? It is the efficiency of the market. Once there is an announcement, this announcement itself has allot of information to the market. If the market did not know, then the market would react. Because if firm A wants to acquire firm $B$ this means that firm $A$ knew something that no
one else knew. So when you have that special information, you make that announcement. Then the stock price will be corrected. If the market beliefs that this is good news, the share prices will increase and return increase.
- and bidder shareholder gains $0.97 \%$, on average, at the announcement of the tender offer.
- The value-weighted portfolio of matched targets and bidders gains $7.43 \%$
- The authors conclude: "Successful tender offers generate synergistic gains and lead to a more efficient allocation of corporate resources"


## More Evidence on combined returns

- Kaplan and Weisbach (1992) and Servaes (1991) examine several hundred mergers and acquisitions occurring in the 1970s and 1980s
- The estimated combined return is about $4 \%$
- Mulherin and Boone (2000) analyze a sample of 281 takeovers from the 1990 s and found positive combined returns
- They also find that the magnitude of the combined return positively relates to the size of the takeover event
- They conclude that their results "are consistent the synergistic theory of the firm ... and inconsistent with nonsynergistic models based on management entrenchment, empire building and managerial hubris"

Side note: even periodically you do find a positive combined return to a merger, you cannot conclude that the theories that suggest that mergers destroy value, you cannot be disregarded by that. Because maybe some mergers are indeed having synergetic effects and do make value but maybe some are not. It is just that on average you see this kind of effect. Likewise, it is possible that on average you see a return of $4 \%$. If some of these mergers are destroying value were not included, then the combined returns would maybe be higher. So, in that case you cannot claim that mergers do not destroy value.

- Andrade, Mitchell, and Stafford (2001) perform a comprehensive analysis of the combined returns in a sample of 3688 mergers from the period 1973 to 1998
- They find that the combined return to targets and bidders is roughly $2 \%$ on average
- They conclude that "mergers create value on behalf of the shareholders of combined firms"

The Combined Returns in Mergers and Acquisitions

| Research Paper | Time Period | No. of Targets | No. of Bidders | Event Window | $\begin{gathered} \text { Target } \\ \text { Return (\%) } \\ \hline \end{gathered}$ | Bidder Return (\%) | Combined <br> Return (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bradley et al. (1988) | 1963-1984 | 236 | 236 | $(-5,+5$ last bid) | 31.77 | 0.97 | 7.43 |
| Kaplan and Weisbach (1992) | 1971-1982 | 209 | 271 | ( $-5,+5$ last bid) | 26.90 | -1.49 | 3.74 |
| Servaes (1991) | 1972-1987 | 704 | 384 | ( -1 , resolve) | 23.64 | -1.07 | 3.66 |
| Mulherin and Boone (2000) | 1990-1999 | 281 | 281 | $(-1,+1)$ | 20.2 | -0.37 | 3.56 |
| Andrade, Mitchell, and Stafford (2001) | 1973-1998 | 3,688 | 3,688 | $\begin{aligned} & (-1,+1) \\ & (-20, \text { close }) \end{aligned}$ | $\begin{aligned} & 16.0 \\ & 23.80 \\ & \hline \end{aligned}$ | $\begin{array}{r} -0.7 \\ -3.8 \\ \hline \end{array}$ | $\begin{aligned} & 1.8 \\ & 1.9 \\ & \hline \end{aligned}$ |

Target returns are different but not drastically different. You see that these returns are mostly positive or zero.

## Combined Returns in Mergers and Acquisitions: General Conclusion

- Earlier research on the combined returns to target and bidder shareholders in M\&A finds positive returns
- Subsequent analysis reports similar evidence
- These evidence are supportive of $M \& A s$ as value-creating decisions
- These evidence, however, cannot be used to reject theories of M\&As as value destroying decisions


## Combined Returns: Extended Analysis

- Berkovitch and Narayanan (1993) propose further tests to distinguish among synergy, hubris, and agency theories of M\&As
- They test the correlation between target gains and total gains
- They argue that if synergy is the driving force, these correlations will be positive (both parties gain)
- If hubris is at play then the correlation between the target gain and total gain will be zero (since total gains are zero)
- If agency is the primary factor, this correlation will be negative (target extracts rent from the bidder)
- Berkovitch and Narayanan (1993), in their sample of 330 tender offers from 1963 to 1988, find that $76 \%$ achieved positive total gains
- Moreover, the correlation between target gains and total gains is positive and significant
- They conclude that synergy is the dominant force in mergers and takeovers
- Yet, they note that hubris and agency also are at play in some takeovers

Combined Returns: Banking Industry

- Becher (2000) studies the shareholder wealth effect of 558 bank mergers from period 1980 to 1997
- there was a significant increase in bank merger activity that accompanied the deregulation of the industry in the 1990s
- Becher uses event study to test whether heightened merger activity that was spurred by deregulation led to synergistic combination of banks or instead allowed empire building by entrenched bank executives
- event window is 30 days prior to and 5 after the day of the announcement
- Becher finds that merger create wealth
- the average combined return is estimated at $3.03 \%$ for the entire period and $3.53 \%$ for the period of deregulation
- Becher interpret his findings in favor of synergistic theory of merger and that deregulation improved efficiency in the industry
- Related evidence on the effect of the takeover deregulation in banking is provided in Brook, Hendershott, and Lee (1998)
- The study the wealth changes of banks in the period around the passage of the Interstate Banking Branching Efficiency Act of 1994
- This act effectively removed the barrier to takeovers in the US banking industry
- They find that the passage of the act had a positive shock price effect on a portfolio of 290 publicly traded banks
- They conclude that the takeover deregulation creates value


## Combined Returns Studies: Conclusion

- In summary, the empirical research in financial economics generally shows that mergers and acquisitions, on average, create wealth for the combined target and bidder shareholders
- This evidence supports the synergy and efficiency theory of mergers (but does not reject agency cost theories)
- Next, we turn to the factors which determine the cross-sectional patterns in target and bidder returns

Side note: the point of this lecture is to understand what empirical evidence of $M \& A$ are. You should remember that combined returns on average are positive, and that returns to target are typically higher to bidders. It's important to understand what that entails to theories of M\&A.

## Factors Related to Target Returns

- The announcement of takeovers is associated with a large increase in the wealth of target shareholders (Jensen and Ruback (1983), Jarrell, Brickley, Netter (1988), as well as more recent studies, which we have discussed)
- Moreover, these gains seem to stem from actual merger effect rather than mere revaluation of target firms
- The returns realized at the day around the announcement; maybe the announcement itself had some information about the target and that the market did not know and somehow did not pay attention too. But then when the announcement was made everyone was like oh wow, this target is a good firm. So, the prices of the target goes up.
- The empirical evidence itself shows that it actually is the acquisition itself and not the announcement that drives the prices up.
- Bradley, Desai, and Kim (1983) report that the positive announcement returns revert to zero for targets in unsuccessful takeovers: for example if firm A acquire $B$ and makes the announcement, the market reacts positive and the share prices of firm B went up. But if the deal was not finalized: the gains due to announcement is actually diverted back to what it was before the announcement.
- To better understand the effect of mergers and acquisitions we will next look at how things such as type of merger, methods of payment, target run-up, and number of bidders affect target returns

Target Returns: Type of Merger and Method of Payment

- Huang and Walkling (1987) show that taking the method of payment and degree of resistance into account, abnormal returns in tender offers (takeovers) are not higher than those in mergers
- The method of payment matters to the target shareholders. If cash than the target shareholders sell their shares and have to pay taxes on capital gains. Whereas if you give them stock then it is just a swap so no capital gains and no taxes.
- So when the acquirer offers cash it has to offer more cash because it has to compensate for the taxes. (exam! TRUE of FALSE: what is bigger target returns when payed with cash or stock?)
- 169 transactions from 1977 to 1982
- a narrow event window of $(-1,0)$ around the takeover announcement
- They find that the most powerful influence on target returns is the method of payment
- cash offers yield $29.3 \%$, whereas stock offers yield $14.4 \%$
- combination of cash and stock offers yielded on average 23.3\%
- Asquith, Brunner, and Mullins (1990) report similar findings. Both papers suggest that these could be due to taxation effect
- Andrade, Mitchell and Stafford (2001) also find that cash deals create more wealth to target shareholders that do stock deals
- They find that for $(-1,+1)$ event window cash deals result in on average $20.1 \%$ target return, whereas, stock deals in only $13 \%$
- For longer event windows those figures are $27 \%$ and $20.8 \%$, respectively
- Similar results reported by Servaes (1991) for different event windows


## Target Returns: Single vs Multiple Bidders

- Another factor related to the magnitude of target returns is the number of bidders in the transaction
- The more bidders, the more competition and the one that offers the highest price than they have a higher chance of acquiring the target
- Servaes (1991) shows that return to target increases in the number of bidders
- He shows that on average target return with event window (-1, resolution) is $20.8 \%$ when there is only one bidder, while it increases to $30.5 \%$ on average when there are multiple bidders
- Consistent with semistrong efficient market, the higher returns on multiple-bidder contests accrue in the period after the announcement of the initial bid
- Dradley, Desai, and Kim (1988) find that returns in the event window $(-20,+1)$ around the initial announcement are similar in magnitudes for single- and multiple-bidder contests
- But for a wider event windows $(-20,+40)$ the returns to single-bidder contests is on average $26.65 \%$, whereas for multiple-bidder contests it is on average 46.12\%
- This is because larger event windows also include competing bids
- Similar results can also be found in Schwert (1996) on run-up and markup (target run-up is the increase in targets stock return prior to the announcement and markup is the post-announcement increase in the target's stock price)
- Schwert finds that target run-up in the event window $(-42,-1)$ is similar for single- and multiple-bidder contests
- but the markup in the period $(0,+126)$ is noticeably larger for the multiple-bidder contests
- this is consistent with Schwert's statement that "the type of competition feared by the bidder is the best systematic explanation for variation in takeover premiums, and whether this type of competition will occur is not generally known before this first bid occur"
- this markup really depends on the amount of bidders

Target Returns: Method of Payment and Number of Bidders

| Panel A. Method of Payment |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Research Paper | Time Period | No. of Observations | Event Window | Cash (\%) | Mixed (\%) | Stock (\%) |
| Huang and Walkling (1987) | 1977-1982 | 169 | $(-1,0)$ | 29.3 | 23.3 | 14.4 |
| Asquith et al. (1990) | 1973-1983 | 80 | $(-1,0)$ | 27.5 | 32.2 | 13.9 |
| Servaes (1991) | 1972-1987 | 688 | ( -1, resolve) | 26.7 | 21.1 | 20.5 |
| Andrade, Mitchell, and Stafford (2001) | 1973-1988 | 3,688 | $\begin{aligned} & (-1,+1) \\ & (-20, \text { close }) \\ & \hline \end{aligned}$ | $\begin{aligned} & 20.1 \\ & 27.8 \end{aligned}$ | $\begin{aligned} & \text { NA } \\ & \text { NA } \\ & \hline \end{aligned}$ | $\begin{aligned} & 13.0 \\ & 20.8 \end{aligned}$ |
| Panel B. Single Versus Multiple Bidders |  |  |  |  |  |  |
| Research Paper | Time Period | No. of Observations | Event Window | Single (\%) | Multiple (\%) |  |
| Bradley et al. (1988) | 1963-1984 | 236 | $\begin{aligned} & (-20,+1) \\ & (-20,+40) \end{aligned}$ | $\begin{aligned} & 23.95 \\ & 26.65 \end{aligned}$ | $\begin{aligned} & 25.98 \\ & 46.12 \end{aligned}$ |  |
| Servaes (1991) | 1972-1987 | 704 | ( -1, resolve) | 20.8 | 30.5 |  |
| Schwert (1996) | 1975-1991 | 1,523 | $\begin{aligned} & (-42,-1) \\ & (0,+126) \\ & \hline \end{aligned}$ | $\begin{array}{r} 13.4 \\ 8.5 \\ \hline \end{array}$ | $\begin{array}{r} 12.7 \\ 18.2 \\ \hline \end{array}$ |  |

## Target Run-Up

- A number of papers have documented a positive target stock run-up prior to acquisition announcement:
- on average, the increase of target returns prior to acquisitions announcement is about $11.8 \%$ (so a big chunck of target returns comes from run-ups)
- Possible explanations:
- Keown and Pinkerton (1981) suggest that "impending public merger announcements are poorly held secrets, and trading on this nonpublic information abounds"
- So, people talk there are no secrets. They plan in advance when they will make the announcement. So, some people will bid on this announcement. If I know in advance when they will make the announcement, then I buy shares of the target. And sell after the announcement. But it is illegal to share this information.
- Jarrell and Poulsen (1989) state that much of the run-up is related to media rumors and pre-bid share acquisition by eventual bidders
- Acquirers try to build a toe hold then it will be easier to acquire.
- Sander and Zdanowicz (1992) further address the sources of run-up
- the use the Background section of 14 D filings to determine when each of a sample of 30 tender offers was initiated
- Before the announcement you have to file a form. This deal should first be allowed by the regulator (anti-monopoly regulation). So you should first make sure that you have a green light. This is done privately because if this would be public there is no point in announcement.
- they find that the run-up does not begin until the date that the bidder or target initiates the transaction, the date that is known privately prior to the public announcement
- this result indicates that the run-up is not simply due to idle speculation but tied to the likelihood of an actual deal
- Meulbroek (1992) employs a propriety database of illegal insider trades during the period 1980-1989
- $\quad$ she identifies specific days on which illegal insiders trade prior to a takeover announcement
- she finds that the abnormal return on an insider trading day averages to $3 \%$ (half of the run-up in her sample)
- Schwert (1996) considers the relation between the run-up in the ( $-42,-1$ ) period preceding a takeover and the markup (the post-announcement increase in the target's stock price) that occurs in the $(0,126)$ period
- he finds no correlation btw the run-up and markup, concluding that the run-up is an added cost to the bidder
- Meulbroek and Hart (1997), using a more direct evidence, show that illegal insider trading increases takeover premiums

| Reseanch Puper | Toue Periond | Na of Ohecrvartores | Fiow-Lp <br> Htudow | $\operatorname{Rup}\left(x_{0}\right)$ | Anımur. <br> Resurw (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Doda (1980) | 1971:977 | 151 | ( $-40,-2$ ) | 11.2 | 13.0 |
| Kcown and Pituserksa (1981) | 1975-1978 | 19.4 | $(-25,-1)$ | 13.3 | 12.0 |
| Dennis and MeCimnell (1986) | 1502-1980 | 76 | $(-19,-2)$ | $k .1$ | 18.84 |
| Hnang aod Walk.ing (1967) | 1973-1982 | 234 | (-51),-2) | 9.1 | 23.4 |
| Readley et al. (1998) | 196-1984 | 236 | $(-21),-1)$ | 11.50 | 14.5 |
| Jatrelli ind Peulsen (1969a) | 1981 1985 | 172 | (-20,-1) | $\cdot 1.0$ | 13.9 |
| Meultroek (1992) | 1974 1693 | 145 | (-20, 1) | \% 3.0 | 17.6 |
| $\begin{aligned} & \text { Parclay and } \\ & \text { Warner (1993) } \end{aligned}$ | 1981-1.934 | 108 | (-3n.-2) | L.t. 3 | 15.15 |
| Sohaert (1906) | 1975-1991 | 1,523 | (-42,-1) | 13.7 | 10.1 |
| Schment (2000) | 1975 1996 | 2,296 | ( $\kappa 3,-1$ ) | 12.4 | 9.6 |
| Simpte averuge |  |  |  | 11.8 | 13.3 |

## Takeover Bidding and Takeover

- One more measure of the effects of a takeover on the value of target is a takeover premium
- A premium in a takeover bid is the percentage difference btw the price offered in a merger and a price based on a date prior to the merger offer
- Bradley (1980) studies 161 successful takeovers during 1962-1977
- using a base date of 41 days prior to the offer he finds an average premium of $49 \%$
- Betton and Eckbo (2000) provide in-depth treatment of the bidding process in a sample of 2335 takeover bids in 1353 tender offers during 1971-1990
- They find that the initial premium with a single bidder is about $51 \%$, which exceeds the initial premium of $45 \%$ in a tender offer that ends up with multiple bidders
- The conclude that a bidder sometimes opts to make a preemptive bid to deter competition


## Target premium

TABLE 4 Takeover Premiums for Targets

| Research Paper | Time Period | No. of Observations | Base Price Date | Premium (\%) |
| :---: | :---: | :---: | :---: | :---: |
| Bradley (1980) | 1962-1977 | 161 | 41 days before offer | 49 |
| Jarrell, Brickley, and Netter (1988) | 1981-1984 | 225 | 1 month before offer | 53 |
| Jennings and Mazzeo (1993) | 1979-1987 | 647 | 10 days before offer | 23 |
| Cotter and | 1988-1991 | 141, initial | 30 days before rumor | 47 |
| Zenner (1994) |  | 141, final | 30 days before rumor | 60 |
| Betton and | 1971-1990 | 697, initial, single bid | 60 days before offer | 51 |
| Eckbo (2000) |  | 194, initial, multiple bids | 60 days before offer | 45 |

## Factors Related to Bidder Return

- We next examine the literature which looks at the cross-sectional determinants of bidder returns
- This literature looks at how
- method of payment
- number of bidder
- affect bidder returns from a merger/takeover

Bidder Return: Method of Payment

- In general the research finds that bidders have more negative returns in stock transactions compared with cash deals
- Travlos (1987) studies 167 M\&As during 1972-1981
- he finds an average bidder return in stock of $-1.6 \%$ and the return in cash deals of -0.13\%
- Asquith, Bruner, and Mullins (1990) and Servaes (1991) also report that bidder returns are lower, and negative, in stock mergers as compared wit cash mergers
- Andrade, Mitchell, and Stafford (2001) find that $100 \%$ cash deals are associated with better bidder returns than transactions with stock
- this is potentially due to asymmetric information between bidder managers and investors along the lines of Myers and Majluf (1984)
- pecking order hypothesis: the shareholders know more about their firm than outsiders and because they know more, they would be happier to sell their shares when things go bad than when things go good. The fact that the shareholder want to share its shares it is a signal.
- When you offer the shares to the target shareholders, they would think how would we know if these shares of the target are good quality? What if the acquirer is not going good?


## Digression: Myers and Majluf (1984) Pecking Order Hypothesis

- Prediction: Managers follow a hierarchy when considering sources of financing: internal sources (cash), debt, and only then equity
- The pecking order theory arises from the concept of asymmetric information: managers (insiders) possess more information regarding the company's current status and prospects than prospective (outside) investors
- To compensate for information asymmetry, external users demand a higher return to counter the risk that they are taking
- When investing in equity one is subject to relatively more of this risk than when investing in debt; thus debt financing is cheaper and should be preferred
- if a firm is offering equity to raise external funds it must be that the firm is overvalued otherwise it would issue debt
- Implication: equity issuance announcement $=\Rightarrow$ firm's stock price $\downarrow$


## Bidder Return: Single Vs Multiple Bidders

- Bradley, Desai, and Kim (1988) compared the returns in 236 tender offers with 163 of single-bidder contest and the rest with multiple-bidder: competition between bidders will turn the return for the acquirer down
- the single-bidder contest experienced positive bidder returns
- the multiple-bidder contest was on average characterized by a negative bidder return
- this was primarily driven by the bidders who were not the first bidders
- competition among the bidders reduced the return to the acquirer
- other research finds similar results


## Bidders' Returns, Method of Payment, and Number of Bidders

TABLE 5 Research on Factors Affecting Bidder Returns

| Panel A. Method of Payment |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Research Paper | Time Period | No. of Observations | Event Window | Cash (\%) | Mixed (\%) | Stock (\%) |  |
| Travlos (1987) | 1972-1981 | 167 | $(-10,+10)$ | -0.13 | NA | -1.60 |  |
| Asquith et al. (1990) | 1973-1983 | 186 | $(-1,0)$ | 0.20 | -1.47 | -2.40 |  |
| Servaes (1991) | 1972-1987 | 380 | ( -1, resolve) | 3.44 | -3.74 | -5.86 |  |
| Andrade, Mitchell, and Stafford (2001) | 1973-1998 | 3,688 | $\begin{aligned} & (-1,+1) \\ & (-20, \text { close }) \end{aligned}$ | $\begin{array}{r} 0.4 \\ -0.2 \\ -0 . \end{array}$ | $\begin{aligned} & \mathrm{NA} \\ & \mathrm{NA} \\ & \hline \end{aligned}$ | $\begin{aligned} & -1.5 \\ & -6.3 \\ & \hline \end{aligned}$ |  |
| Panel B. Single Versus Multiple Bidders |  |  |  |  |  |  |  |
| Research Paper | Time Period | No. of Observations | Event Window | Single (\%) | Multiple (\%) | $\begin{gathered} \text { First } \\ \text { Bid } \\ \text { Acquirer (\%) } \end{gathered}$ | $\begin{gathered} \text { Late } \\ \text { Bid } \\ \text { Acquirer (\%) } \end{gathered}$ |
| Bradley et al. (1988) | 1963-1984 | 236 | $\begin{aligned} & (-20,+1) \\ & (-20,+40) \end{aligned}$ | $\begin{aligned} & 2.75 \\ & 2.97 \end{aligned}$ | $\begin{aligned} & -0.41 \\ & -0.21 \end{aligned}$ | 2.0 | -2.5 |
| Servaes (1991) | 1972-1987 | 384 | ( -1, resolve) | -0.35 | -2.97 |  |  |
| Schwert (1996) | 1975-1991 | 1,523 | $\begin{aligned} & (-42,+1) \\ & (0,+126) \\ & \hline \end{aligned}$ | $\begin{array}{r} 1.9 \\ -0.4 \end{array}$ | $\begin{array}{r} 0.2 \\ -3.5 \\ \hline \end{array}$ |  |  |

Do Bad Bidders Become Good Targets?

- Mitchell and Lehn (1990) find that acquisition performance is roughly a break-even endeavor: bidder announcement return of $0.14 \%$
- they classify each firm according to whether it was a takeover target in the period of their sample 1980-1988
- the acquisition performance of the targets and nontargets was then compared to using event study methodology
- splitting firms in their sample into the target and nontarget subsamples revealed the existence of good and bad bids
- for firms which remained nontargets the average bidder return remained positive
- for firms which subsequently became targets themselves, the average bidder return was negative
- "takeovers can be both a problem and a solution"


## Takeover Regulation and Takeover Hostility

- The William Act 1968 imposed federal constraints on the tender offer process by forcing greater disclosure by bidders and setting a minimum bidding period
- in the 1980s the state laws and firm-sponsored poison pills imposed further impediments on the takeover process

The Effect of the William Act

- Bradley, Desai, and Kim (1988) compared the returns to targets, bidders, and combined returns in the period before and after 1968
- The report that following the act the combined returns did not change but the distribution between targets and bidders shifted
- After the act, the target premiums increased and bidder returns fell
- similar finding in Jarrell and Bradley (1980) and Jarrell and Poulsen (1989)


## Takeover Impediments in the 1980s

- Comment and Schwert (1995) studies the effect of 1980s impediments such as state antitakeover laws and poison pills on the market of corporate control
- They find that the decline in in the takeover market in the late 1980s was due to general economic conditions rather than factors such as state laws of poison pills
- "Antitakeover measures increase the bargaining power of a target firms, but they do not prevent transactions"
- So this measures shifted the anti-bargaining power, but these impediments did not themselves prevent transactions


## Takeover Hostility

- Research in general suggests that the regulation might affect the form (hostile vs friendly) but not the substance of mergers and acquisitions
- for example, Schwert (2000) concludes that "Most of the characteristics of takeover offers that are related to hostility seem to reflect strategic choices made by the bidder or target firm to maximize their respective gains from a potential transaction"


## Postmerger Operating Performance

- Apart from studying stock returns in the period around merger announcement, the effects of mergers on subsequent performance have also been measured
- this is problematic, however, since mergers often follow industry shocks
- Healy, Palepu, and Ruback (1992) examine the post-acquisition operating performance of 50 largest U.S. mergers in the period 1979-1984
- they perform pro-forma performance of the two combined firms in the 5 years prior to the merger with the actual performance of the merged entity in the 5 years after the merger
- they control for economic changes by benchmarking to the overall changes in the industry
- they find that the operating cash-flow for the merged firms increased relative to industry
- the increased cash-flow was driven by an improvement in asset turnover for the target firms
- similar findings are in Andrade, Mitchell, and Stafford (2001)


## Long-Term Stock Price Performance Following Mergers

- The event study evidence on mergers uses a relatively narrow event window
- The efficient markets hypothesis maintains that any new info will be quickly reflected in the prices
- As a result, the way the abnormal returns are estimated is not extremely crucial
- Thus, event studies avoid the joint hypothesis problem (Fama, 1991): if you are testing a hypothesis you are testing 2 things at the same time
- A prediction of the theory
- The empirical model: by assuming certain empirical relations, you make an assumption. So then when you are testing a hypothesis you are also testing your model.
- When you are testing on a large period of time it really matters if your model is correct or not. The errors will be much more pronounced in a long period of time.
- However, this is an issue with long-term stock price performance studies since
- we do not have a perfect model for normal returns
- there is lack of theory, therefore findings of positive or negative performance could really be due to random factors (Fama, 1998)

| Research Paper | Time Period | No. of Observations | Method | Stock Return (\%) |
| :---: | :---: | :---: | :---: | :---: |
| Panel A. Overall Results |  |  |  |  |
| Loughran and Vijh (1997) | 1970-1989 | 947 | 5-year EW BHAR | -6.5 |
| $\begin{aligned} & \text { Rau and } \\ & \text { Vermaelen (1998) } \end{aligned}$ | 1980-1991 | 2,823 | 3 -year CAR | -4.04 |
| Mitchell and Stafford (2000) | 1961-1993 | 2,068 | 3-year EW BHAR 3-year VW BHAR 3-year EW Calendar 3-year VW Calendar | $\begin{aligned} & -1 \\ & -3.8 \\ & -5.0 \\ & -1.4 \\ & \hline \end{aligned}$ |
| Panel B. Results Based on Form of Payment |  |  |  |  |
| Loughran and Vijh (1997) | 1970-1989 | $\begin{aligned} & 314 \text { Cash } \\ & 405 \text { Stock } \end{aligned}$ | 5-year EW BHAR 5-year EW BHAR | $\begin{array}{r} 18.5 \\ -24.2 \end{array}$ |
| Mitchell and Stafford (2000) | 1961-1993 | $\begin{aligned} & \text { 1,039 Cash } \\ & \text { 1,029 Stock } \end{aligned}$ | 3-year VW Calendar 3-year VW Calendar | $\begin{array}{r} 3.6 \\ -4.3 \\ \hline \end{array}$ |
| Panel C. Results Based on Book-to-Market Ratio |  |  |  |  |
| Rau and Vermaelen (1998) | 1980-1991 | 931 Value <br> 932 Growth | $\begin{aligned} & \text { 3-year CAR } \\ & \text { 3-year CAR } \end{aligned}$ | $\begin{array}{r} 7.64 \\ -17.3 \end{array}$ |
| Mitchell and Stafford (2000) | 1961-1993 | 257 Value <br> 526 Growth | 3-year VW Calendar 3 -year VW Calendar | $\begin{array}{r} 1.1 \\ -7.2 \\ \hline \end{array}$ |

Two issues with the results of the long-term stock price performance studies

- the average long-term price performance following a merger is insignificantly different from zero (which is sufficient with efficient markets hypothesis)
- results based on partitioned samples such as method of payment and book-to-market ratio are sensitive to estimation methods (consistent with Fama's critique)


## Efficiency Vs Market Power

- Do merger gains stem from efficiencies or the benefits of collusion?
- Ellert (1976) provides some evidence which are inconsistent with a market power explanation or merger gains
- Stillman (1983) and Eckbo (1983) provide evidence against anticompetitive effect of mergers on other firms within the industry
- Furthermore, a number of studies (Slovin, Sushka, and Bendeck (1991), Mitchell and Mulherin (1996), and Song and Walkling (2000)) document positive industry spillovers from mergers
- Fan and Goyal (2002) do not find statistical evidence that the combine returns in mergers differ between horizontal and vertical mergers


## Effects of Concentration

- the data suggest that despite increased merger activities aggregate concentration has been virtually unchanged (White, 2002)
- industry concentration measures stay constant too despite merger activities (Scherer, 1980)


## Lecture 6: Initial Public Offerings (IPOs)

## References for this lecture

1. Brau, J. C. and Fawcett, S. E. (2006), Initial Public Offerings: An Analysis of Theory and Practice. The Journal of Finance, 61: 399-436
2. Gao, X., Ritter, J., \& Zhu, Z. (2013). Where Have All the IPOs Gone? Journal of Financial and Quantitative Analysis, 48(6), 1663-1692
3. Lowry, M., Roni, M., \& Volkova, E. (2017). Initial Public Offerings: A synthesis of the literature and directions for future research, Working Paper

Required reading for this lecture is the paper by Brau, J. C. and Fawcett, S. E. (2006). All the above references will be available on Toledo

When you want to acquire another company sometimes you pay with your own stock. If your own stock is not publicly traded than it would be difficult to pay with stock. So some firms might want to go public because they want to do an M\&A.

## External financing and IPO

Business can be financed internally via retained earnings or owners' savings.
However, when internal funds are limited, and typically they are, the firm can try to raise funds externally either via issuing debt or equity:

- Debt (typically either a bank loan or a bond issuance)
- Equity (either via the initial or seasoned public offering)

An Initial Public Offering or an IPO is a type of public offering in which shares of a company are sold to institutional investors and usually also retail (individual) investors for the first time. Prior to IPO the firm is held private.

In contrast, a Seasoned Equity Offering or a SEO is the offering of the stock of already publicly traded firm. That means the firm needs to raise external funds and funds it trough equity.

IPO = going public

- It's the first time you sell shares to a public.
- An IPO decision is not just a decision about raising external funds
- But it is also a decision about whether to take firm public
- After the IPO the firm's stock is traded publicly at a stock exchange
- Therefore, an IPO decision is a highly strategic decision which will have a large impact on the firm's future

Why going public?
There are myriad of reasons to go public. The academic literature provides four main groups of reasons to go public:

- To reduce the cost of capital
- To allow the insiders to cash out
- To facilitate the takeover activities
- Strategic reasons


## Going public \& the cost of capital

- The cost of capital literature (e.g., Scott (1976) and Modigliani and Miller (1963)) argues that firms conduct a public offering when external equity will minimize their cost of capital (thereby maximizing the value of the company)
- Firms would go public when that might reduce their cost of capital and increase the value of the company
- Based on asymmetric information and possible stock price misvaluation, Myers and Majluf (1984) and Myers (1984) further argue for a pecking order of financing: internal equity, debt financing, and external equity
- The idea is that when firm has a project and needs financing it always first resorts to internal financing, if that is not sufficient than it issues debt and onky when that is also insufficient than it needs to use external equity
- Asymmetric information: that is the managers of the firm know more about the state of the firm than outsiders. Observing that the firm wants to issue equity externally, why would the managers want to issue equity? If the firm is doing well and has high profits in the future than why? By issuing external equity they are diluting their dividends in the future. Maybe the managers of the firm know that the firm is not really doing well than it makes sense to issue equity.
- If everyone knows this this would be anticipated meaning that the market would want to but at a discount. In anticipation of this discount the managers will thus first resort to internal equity, than debt and as last resort external equity.
- Basically, if the firm needs external funds, it will issue equity (i.e., will go public), if this minimizes its cost of capital

Going public \& cash-out by insiders

- Zingales (1995) and Mello and Parsons (2000) argue that an IPO allows insiders to cash out = to convert their equity stocks into cash
- Ang and Brau (2003) demonstrate that insiders opportunistically sell shares in the IPO for personal gain
- Additionally, Black and Gilson (1998) argue that the IPO gives Venture Capitalists the opportunity to exit, providing an attractive harvest strategy:
- this can also start up some funds. There will be a massive growth period and ones that over than the startup firm becomes a big firm and then it's time to go public. This is nice for venture capitalists because they then own a share of the firm.

Going Public \& Takeover Activities

- IPOs may facilitate takeover activity
- Zingales (1995) argues that an IPO can serve as a first step toward having a company taken over at an attractive price
- Suppose you are a company, and you want to become a target in a takeover. If you are private, then it's in a way it would be harder for other market participants to purchase you because if you are private, it means that there is no really available price of your shares. The potential acquirer has to perform some valuation to assess the quality of your firm. And if you are private there is allot of asymmetric information. If you go public allot of information will be available and a fair price would be available. So, once you go public there is a price available on the stock exchange and it becomes more easier for the acquirer to purchase you and also for the target shareholders there will be a less discount when the takeover takes place.
- Brau et al. (2003) argue that IPOs may be important because they create public shares for a firm that may be used as "currency" in either acquiring other companies or in being acquired in a stock deal


## Strategic reasons for going public

- IPOs may serve as strategic moves
- Chemmanur and Fulghieri (1999) argue that IPOs broaden the ownership base of the firm
- Can be useful depending on the strategy of the firm: If the ownership of the firm is concentrated in the hands of few people in some sense that might be inefficient. Again depending on your strategy if you want to broaden the ownership of your firm than IPO can be a good reason.
- Maksimovic and Pichler (2001) assert that firms conduct IPOs to capture a first-mover advantage. They also suggest that an IPO can increase the publicity or reputation of the firm going public
- When a firm goes public, the firm comes in light. For example when Facebook announced that it is going public it received additional attention and publicity.
- Reputation matters too: when you are private you are in the dark because once you become public you have to do many things that you did not do before. For example: once public anyone can buy your shares and you have to start disclosing allot of relevant financial information about your own state. You are more open if you are publicly traded and then its assumed that there is potentially less uncertainty about your firm and that improves your reputation.
- Finally, Bradley, Jordan, and Ritter (2003) show that analyst recommendations are often biased upward after an IPO. Analyst coverage may thus motivate a firm to conduct an IPO
- If your shares are publicly traded there will be financial analysts that will keep an eye on you and provide different recommendations and this will be reflected in your stock price

What do CFOs say about the reason to go public?
from Brau and Fawcett(2006): Survey
responses to question: How important
were/are the following items for conducting
an IPO? Answers are on the scale from 1 to
5 with $1=$ unimportant and $5=$ very
important. The IPOs are during 2000-2002.
The top 3 reasons:

- Future acquisitions
- Market price value for the firm
- Enhance reputation

The rest is consistent with our theory

## Other advantages of IPO

- Improved market discipline: if the firm is public than it is always on the spot. If everyone sells your shares than the value of the shares goes down and the capitalization of your firm goes down and then it becomes harder for the firm because it is not valuable anymore.
- Improved transparency: now you have to report allot of information about your firm that you don't have to do if you are private.
- Creating multiple financing opportunities: equity, convertible debt, cheaper bank loans, etc.
- It can always go to the capital market to issue equity
- Convertible debt will be possible
- A bank will give better conditions to publicly traded firms
- Employee stock option compensation plans: We can tie bonuses to stock prices and this align the objectives of managers and shareholders


## Disadvantages of going public

- Potentially large underpricing of IPO (this will be discussed in detail later)
- Significant legal, accounting and marketing costs, many of which are ongoing: you have to disclose allot of information and thus hire a big army of accountants
- Requirement to disclose financial and business information: this results in financial costs but the business information that you have to disclose will also be used by your competitors
- Public dissemination of information which may be useful to competitors, suppliers and customers. This can make you less competitive or give you more competition.
- Loss of control and stronger agency problems due to new shareholders (equity dilution): when you were private you had like 5 equity holders but when you go public you have allot of shareholders.
- Increased risk of litigation, including private securities class actions and shareholder derivative actions

What do CFOs say about not going public?
from Brau and Fawcett(2006): Survey responses to question: How important were/are the
following in your decision to withdraw/not to conduct the IPO? Answers are on the scale from 1 to 5 with $1=$ unimportant and $5=$ very important. The IPOs are during 2000-2002.

- First one: when you go public you have other shareholders and maybe they want other things, and you have to find a middle ground for this problems
- Third thing: you want to go public during a boom when you know you will get the most

| Reasons | Mean | $\% 4-5$ |
| :--- | :---: | :---: |
| Desire to maintain decision-making control | 3.48 | 55.56 |
| To avoid ownership dilution | 3.19 | 47.02 |
| Bad market/industry conditions | 3.13 | 48.24 |
| Disclosing information to competitors | 2.78 | 32.81 |
| SEC reporting requirements | 2.71 | 31.56 |
| Already have enough capital | 2.65 | 29.87 |
| Cost/fess of an IPO | 2.64 | 27.12 |
| Officer liability (The Sarbanes-Oxley Act) | 2.31 | 19.30 |
| Low price of our stock | 2.24 | 19.48 |
| Would prefer to be acquired | 1.96 | 15.04 |
| To avoid EPS dilution | 1.9 | 9.42 |

Timing of an IPO: Factors that influence IPO timing?

- Similar to M\&As, IPOs come in waves too (Ibbotson and Jaffe (1975) and Ritter (1980)))
- Three theoretical domains that explain the timing of IPOs
- Managers take advantage of bull markets and attempt to capture attractive stock prices
- Timing is driven by attractiveness of the IPO market
- Firms do IPOs when reaching sufficient maturity

Bull market and IPO activities

- Empirical measures of bull markets include current overall market conditions (Lucas and MCDonald (1990)), current industry conditions (Pagano et al. (1998)), predicted overall market conditions (Lucas and McDonald (1990)), predicted industry conditions (Lowery (2002)), and recent historical market conditions (Ritter and Welch (2002))
- Using long-run returns, Ritter (1991) and Loughran and Ritter (1995) posit that firms time IPOs to take advantage of favorable windows that allow them to get the most attractive offering prices

Attractiveness of the IPO market

- Lowery and Schwert (2002) argue that recent first-day stock performance of firms going public leads other firms to decide to go public
- Choe, Masulis, and Nanda (1993) argue that firms prefer to go public when other good firms are currently issuing


## What do CFOs say about IPO timing?

from Brau and Fawcett (2006): Survey responses to question: To what extent did/do the following influence the timing of a possible IPO? Answers are on the scale from 1 to 5 with l=unimportant and $5=$ very important. The IPOs are during 2000-2002.

| Factors | Mean | $\% 4-5$ |
| :--- | :---: | :---: |
| Overall stock market conditions | 4.21 | 82.94 |
| Industry conditions | 3.87 | 69.82 |
| The need of capital to continue growing | 3.82 | 66.47 |
| Other firms going public | 2.53 | 24.26 |
| First-day stock performance of recent IPOs | 2.17 | 13.02 |

## IPO Process

We can identify five main steps of an IPO process:

1. Selection of an underwrite
2. Due diligence and filings
3. Pricing
4. Stabilization
5. Transition

## Underwriters and IPO

- IPOs generally involve one or more investment banks known as "underwriters"
- Investment banks are financial intermediaries in IPOs and thus play an important role
- The company offering its shares, called the "issuer", enters into a contract with a lead underwriter to sell its shares to the public
- The underwriter then approaches investors with offers to sell those shares
- A large IPO is usually underwritten by a "syndicate" (a group) of investment banks, the largest of which take the position of "lead underwriter"
- Upon selling the shares, the underwriters retain a portion of the proceeds as their fee
- This fee is called an underwriting spread
- The spread is calculated as a discount from the price of the shares sold (called the gross spread)
- Usually, the managing/lead underwriter, also known as the bookrunner, typically the underwriter selling the largest proportions of the IPO, takes the highest portion of the gross spread, up to $8 \%$ in some cases.


## Selecting an Underwriter

from Brau and Fawcett (2006): Survey responses to question: How important were/are the
following criteria in selecting a lead IPO underwriter? Answers are on the scale from 1 to 5
with 1=unimportant and 5=very important. The IPOs are during 2000-2002.
The top 3:

- is not surprising because when it comes to investment banks reputation is the most important
- again reputation

| Criteria | Mean | \%4-5 |
| :--- | :--- | :--- |
| Underwriter's overall reputation and status | 4.39 | 90.58 |
| Quantity and reputation of the research department/analyst | 4.25 | 82.53 |
| Underwriter's industry expertise and connections | 4.24 | 87.50 |
| Market making, trading desk, and liquidity provision services | 3.50 | 55.62 |
| Institutional investor client base of underwriter | 3.50 | 56.89 |
| Pricing and valuation promises | 3.24 | 44.97 |
| Fee structure | 2.75 | 24.85 |
| Retail client base of the underwriter | 2.67 | 20.24 |
| Nonequity-related services (e.g., advice on M\&A, debt) | 2.54 | 13.69 |
| Underwriter has a reputation for spinning | 1.86 | 8.54 |

Due Diligence and Filings
The following underwriting arrangements are available to the issuing company:

- Firm Commitment: Under such an agreement, the underwriter purchases the whole offer and resells the shares to the investing public. The firm commitment underwriting arrangement guarantees the issuing company that a particular sum of money will be raised
- Best Efforts Agreement: Under such an agreement, the underwriter does not guarantee the amount that they will raise for the issuing company. It only sells the securities on behalf of the company
- Syndicate of Underwriters: Under such an agreement, the lead investment bank forms a syndicate of underwriters by forming strategic alliances with other banks, each of which then sells a part of the IPO. Such an agreement arises when the lead investment bank wants to diversify the risk of an IPO among multiple banks

An underwriter must draft the following documents:

- Engagement Letter which includes reimbursement clause (mandates that the issuing company must cover all out-of-the-pocket expenses incurred by the underwriter, even if the IPO is withdrawn during the due diligence stage, the registration stage, or the marketing stage) and gross spread/underwriting discount defined as the \% difference between sale and purchase price of stock by the underwriter (typically fixed at 7\%)
- Letter of Intent: agreement between the issuer and the underwriter
- Red Herring Document: the prospectus which includes neither price nor quantity to be sold and is used in "roadshows" (when underwriters approach different parties in acquiring the shares for the issuing firm, here they advertise the firm)
- Underwriting Agreement replaces the Letter of Intent after the pricing of the securities
- Registration Statement: includes The Prospectus (detailed description of a product sold) and Private Filings (documents for SEC)


## Pricing

- After the IPO is approved by the relevant regulatory body (SEC in the USA), the effective date of the IPO is decided
- On the day before the effective date, the issuing company and the underwriter decide the offer price (i.e. the price at which the shares will be sold by the issuing company) and the precise number of shares to be sold
- Deciding the offer price is important because it is the price at which the issuing company raises capital for itself
- If the price is set too low the issuing firm might raise little equity and will not raise enough cash
- If the price is set too high it might fail to sell enough shares and again the problem of raising too little equity because of the lack of shares
- However, after the stock starts trading on the secondary market, money raised through the sale of shares the company, not the underwriter

The following factors affect the offering price:

- the success/failure of the roadshows (as recorded in the order books)
- the company's goal
- condition of the market economy

IPOs are often underpriced to ensure that the issue is fully subscribed/ oversubscribed by the public investors, even if it results in the issuing company not receiving the full value of its shares.

If an IPO is underpriced, the investors of the IPO expect a rise in the price of the shares on the offer day. This increases the demand for the issue. Furthermore, underpricing compensates investors for the risk that they take by investing in the IPO. An offer that is oversubscribed 2 to 3 times is considered to be a "good IPO". But more on IPO underpricing later.

## Stabilization

- After the issue has been brought to the market, the underwriter has to provide analyst recommendations, after-market stabilization, and create a market for the stock issued
- So underwrites do not just place the equity they also stabilize the market after the IPO
- The underwriter carries out after-market stabilization in the event of order imbalances by purchasing shares at the offering price or below it
- Stabilization activities can only be carried out for a short period of time - however, during this period of time, the underwriter has the freedom to trade and influence the price of the issue as prohibitions against price manipulation are suspended
- Very important again $\rightarrow$ providing stabilization: in general this will be pricing regulations


## Transition to Market Competition

- The final stage of the IPO process, the transition to market competition, starts 25 days after the initial public offering, once the "quiet period" mandated by the SEC ends
- During this period, investors transition from relying on the mandated disclosures and prospectus to relying on the market forces for information regarding their shares
- After the 25 -day period lapses, underwriters can provide estimates regarding the earning and valuation of the issuing company
- Thus, the underwriter assumes the roles of advisor and evaluator once the issue has been made


## Reverse Merger: Going Public without an IPO

A reverse merger is a type of merger in which a private company becomes public by acquiring a publicly-traded company. Thus, reverse merger saves a private company from the complicated process and expensive compliance becoming a public company

- Advantages: easier than an IPO and could help to lower the tax bill of a private company
- Disadvantage: lawsuits are common (various potential violations) and the reverse stock split (reduction in number of shares held by the shareholders of the private firm)


## IPOs Are on Average Underpriced in Most Years

When a newly placed stock closes its first day of trading above the set IPO price, the stock is considered to have been underpriced.

- In markets without daily price limits, most of the underpricing is evident by the closing of the offering day
- In most markets, the offer price is set only hours before the offer starts, so market movements between the offer price determination and opening are negligible
- The total dollar value of the underpricing represents "money left on the table" only if the entire offering could have been sold at the closing price
- There is substantial time variation in average underpricing. The average tends to fluctuate between 5-20 \% (in the USA)
- In the "hot issue markets" of 1999 and 2000 it was about $78 \%$ and $60 \%$, and the issuer left $\$ 62$ billion on the table in these two years alone
- Underpricing is relatively low in France and Germany, and relatively high in Asia


## Average IPO underpricing by year

Horizontal axis = years
Vertical axis = initial returns and number or IPOs

Initial returns are the returns when you purchased the shares of the IPO when the IPO was offered. These are the returns from the offering price to the first day closing price, where the offer price is from SDC and the first closing price from CRSP. This offering price is basically underpricing.

You can see that underpricing fluctuates allot and it went up around 1999-2000. Pretty massive underpricing: how is it that a firm that wants to go public sets a price and hours later it is traded at a higher price? So it looks like this firm could have set a higher price, as the end of the trading day and there would not be underpricing. But firms don't do

Figure 2. Number of IPOs and Initial Returns
The IPO sample is constructed based on information from the SDC Platinum database. The sample consists of companies that went public between 1972 and 2015 on NYSE, Nasdaq and AMEX stock exchanges. IPOs with an offer price below S5, REITs, ADRs, units, and companies without CRSP records are excluded. The final sample includes 8,543 IPOs. Initial returns equal the return from the offering price to the first day closing price, where the offer price is from SDC and the first closing price from CRSP.

Number of IPOs and Average Initial Returns, 1972-2015
 it. Why?

## Why IPOs are underpriced?

Numerous explanations for underpricing have been advanced. We discuss them below.

1. Asymmetric information between the underwriter and the issuer leads to underpricing: Baron and Holmstrom (1980) and Baron (1982) argue that underwriters exploit superior market knowledge to underprice issues, minimize marketing effort, and ingratiate themselves with buy-side client
2. Underpricing exists due to asymmetric information between issuers and potential investors:
a. Beatty and Ritter (1986) argue that investor uncertainty about the IPO firm biases offering prices lower than the unknown future market price
b. Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), and Spatt and Srivastava (1991) argue that underpricing rewards sophisticated investors for divulging accurate valuation information during the bookbuilding process
3. Underpricing occurs because of asymmetric information between informed and uninformed investors: Rock (1986) argues that the risk of the IPO drives underpricing and that uninformed investors must be compensated for participating in the IPO
4. Underpricing serves as a protection against possible future litigation from investors (Tinic (1988), Hughes and Thakor (1992), and Drake and Vetsuypens (1993))
5. Underpricing may serve a marketing function:
a. Welch (1992) models the idea that underpricing can cause a domino or cascade effect among investors that raises demand for the issue
b. Habib and Ljungqvist (2001) argue that underpricing allows for cost savings in other areas of marketing the issue
c. Demers and Lewellen (2003) assert that underpricing brings attention to the stock on the opening day
d. Boehmer and Fishe (2001) demonstrate that underpricing increases the after-issue trading volume of the stock
6. Underpricing broadens the ownership base after the IPO:
a. Booth and Chua (1996) propose that underpricing helps ensure a wide base of owners increase the liquidity of the newly public firm
b. Brennan and Franks (1997) agree that underpricing allows for a wide base of owners but argue that the motivation is to entrench management
c. Stoughton and Zechner argue that underpricing allows for the creation of a block holder that can increase monitoring
7. Underpricing may facilitate questionable practices:
a. Maynard (2002) and Griffith (2004) suggest that underpricing permits spinning - the enriching of executives of prospective investment bank clients
b. Aggarwal (2003), Fishe (2002), and Krigman et al. (1999) argue that underpricing allows for the practice of flipping by favored investors
c. Ljungqvist and Wilhelm (2003) assert that underpricing enriches friends and family through directed share program
8. Behavioral explanation:

Loughran and Ritter (2002) advance a behavior theory that suggests issuers are pleasantly surprised with the amount they can raise in the IPO (i.e., their new-found personal wealth). Under prospect theory, they are not significantly concerned with underpricing and therefore it exists

There are allot of explanations and there is not "one explanation". All of them provides some potential explanation. The idea here is that even though you have underpricing and it may seem there is some money left on the table actually underpricing could really be an equilibrium phenomenon. As a kind of compensation for the effort of taking this participants in the process.

Where have all the IPOs gone?
The number of U.S. IPOs by year, 1980-2012, with pre-IPO last twelve months sales less than (small firms) or greater than (big firms) \$50 million (2009 purchasing power).

- During 1980-2000, an average of 310 companies per year went public in the U.S. Since 2000, the average has been only 99 initial public offerings (IPOs) per year, with the drop especially precipitous among small firms
- Many have blamed the SarbanesOxley Act of 2002 and the 2003 Global Settlement's effects on analyst coverage for the decline in IPO activity
- Gao, X., Ritter, J., \& Zhu, Z. (2013) put
 forward the economy of scale hypothesis. According to it the advantages of selling out to a larger organization, which can speed a product to market and realize economies of scope, have increased relative to the benefits of operating as an independent firm
- They provide empirical evidence in support of this hypothesis

Case study: Facebook's IPO in 2012

- Facebook, Inc. is a U.S.-based Internet corporation that runs the social networking website, Facebook, which had about 1 billion of active monthly users back in 2012 (and 2.3 billion monthly active users in 2018)
- Facebook, Inc. was founded in 2004 by Mark Zuckerberg, along with Chris Huges, Eduardo Saverin, and Dustin Moskovitz
- The site made $\$ 3.7$ billion in revenue in 2011, which was an $88 \%$ increase over 2010
- Roughly $84 \%$ of this income came from advertising
- The remaining revenue came from payments for games and other add-on applications (e.g., FarmVille, etc)
- In November 2011 Facebook starts to plan an IPO seeking to raise $\$ 10$ billion at a valuation of \$ 100 billion

Why did Facebook go public? After all, for years, Facebook and Zuckerberg resisted both buyouts and taking the company public. The three main reasons were:

- Securities and Exchange Commission rule from 1964 says that any private company with more than 500 "shareholders of record" must adhere to the same financial disclosure requirements that public companies do. That means filing detailed quarterly and yearly financial reports, and dealing with all the scrutiny that comes with a powerful company opening its books
- Facebook's VCs and employees held a lot of shares and were looking forward to cash out
- Facebook started an active takeover policy but paying every time with cash is too "expensive." Once a public company Facebook could acquire with its stock (recall the case study on the Facebook's acquisition of WhatsApp from one of the previous lectures)
- Facebook, Inc. filed for an initial public offering on February 1, 2012
- The company planned a $\$ 5$ billion IPO, the largest in Internet history and one of the largest in the history of the technology sector at that time
- Facebook valued its stock at $\$ 38$ a share, which priced the company at $\$ 104$ billion: the largest valuation to date for a newly public company at that time
- The company's shares began trading on May 18, 2012 and though the stock struggled to stay above the IPO price for most of the first day of trading, it set a new record for trading volume of an IPO with 460 million shares raising $\$ 16$ billion
- The first day of trading was marred by numerous technical glitches that prevented orders from going through
- These glitches and misleading information from underwriters prevented the stock price from falling below the IPO price on the first day of trading
- However, the stock price quickly fell in subsequent days, closing at $\$ 34.03$ a share on May 21 and $\$ 31.00$ a share on the following day
- The IPO had immediate impacts on the stock market
- Other technology companies took hits, while the exchanges as a whole saw dampened prices
- Investment firms faced considerable losses due to technical glitches
- Bloomberg estimated that retail investors may have lost approximately $\$ 630$ million on Facebook stock since its debut
- The IPO impacted both Facebook investors and the company itself: It was said to provide healthy rewards for venture capitalists who finally saw the fruits of their labor.
- In contrast, it was said to negatively affect individual investors such as Facebook employees, who saw once-valuable shares become less lucrative.[12] More generally, the disappointing IPO was said to lower interest in the stock by investors
- CBS News said "the Facebook brand takes a pretty big hit for this," mostly because of the public interest that had surrounded the offering
- More than 40 lawsuits were filed regarding the Facebook IPO in the month that followed
- Facebook's IPO was under investigation and a class-action lawsuit was in the works due to the trading glitches that led to botched orders
- Additional lawsuits were filed due to allegations that an underwriter for Morgan Stanley selectively revealed earnings information to preferred clients
- Other underwriters and Facebook's CEO and Board of Directors were facing similar litigation
- The litigation against Facebook alleged that it failed to fully disclose its weakened financial outlook before its IPO
- The reputation of both Morgan Stanley, the primary IPO underwriter, and NASDAQ were damaged in the fallout from the botched offering
- By the end of May 2012, the stock had lost over a third of its initial value, dropping to $\$ 25.50$. The Wall Street Journal called the IPO "a fiasco." Fortunately, for Facebook investors, by mid-June 2012, the stock value had rebounded to $\$ 32$ a share


## Lecture 7: Corporate restructuring and divestures

## References for this Lecture

- this lecture is based on chapter 11 and 12 from the text book (WMM)
- required reading: read Chapters 11-12 from WMM (Note: chapters' appendices are not the part of the required reading)


## In this lecture

- We will talk about a special type of corporate restructuring: divestitures
- Define different forms of divestitures
- Discus theories and evidence on divestitures
- In general, Corporate Restructuring is an action taken by the corporate entity to "significantly" modify its capital structure or its operations
- Divestiture is a prominent technique of corporate restructuring accomplishing the partial or full disposal of a business unit through sale, exchange, closure, or bankruptcy
- Here you want to get smaller instead of bigger as in M\&A
- in a way, you can think of a divestiture as a de-merger


## Corporate Restructuring Strategies

- Corporate managers face a dynamic and ever-changing environment
- They respond to these changes by restructuring
- Managers have a variety of strategic options when deciding how to respond to these changes
- Typically, corporations have multiple restructuring options: reorganization of assets, financial claims (liabilities), etc
- No one-size-fits-all approach


## Corp. Restructuring \& Reorganization Strategies

1. Reorganization of assets and ownership via divestitures*

- Asset sales
- Equity carve-outs
- Spin-offs
- Other variations: split-ups, tracking stocks, and exchange offers

2. Reorganizing financial claims*

- Debt-equity exchange offers
- Dual-class recapitalization
- Leveraged recapitalization
- Financial reorganization (bankruptcy)
- Liquidation

3. Other strategies

- Alliances and join ventures
- ESOPs and MLPs
- Going private and leverage buyouts*
- Using international markets
- Share repurchase programs*


## In this lecture,

- the focus is on reorganization of assets and ownership through divestitures
- next lectures will deal with the reorganization of financial claims and other reorganization strategies


## Primary Reasons for Divestiture

- In finance, divestiture is the process of disposing of an asset through a sale, exchange, or closure
- A divestiture is an important means of creating value for companies in mergers, acquisitions, and a consolidation process
- Through divestiture, a company can eliminate redundancies, improve operational efficiency, and reduce costs
- Reasons why companies divest part of their business include bankruptcy, restructuring, to raise cash, or to reduce debt

Primary Methods of Divestitures and Its Variations

- Reorganization of assets and ownership through asset sales, equity carve-outs, and spin-offs are all examples of primary methods of divestitures
- Asset sales:
sale of a division, subsidiary, product line, or other assets to another firms usually for cash
- Subsidiary: a company that belongs to another company, it is an independent legal unit however it belongs to another company
- Equity carve-outs:
offering of a full or partial interest in a subsidiary to the investors; creates a separate, publicly traded company
- Spin-offs:
pro rata distribution of the shares in a subsidiary to existing shareholders of the parent; creates a separable, publicly traded company
- Other variation of these methods include split-ups, tracking stocks, and exchange offer, which we will discuss later

Equity carve-outs (ECO)

- Through the process of an equity Carve-Out, a company tactically separates a newly created subsidiary from its parent as a standalone company, typically via an IPO
- You create a new company but you want to make it a stand alone company
- The new organization is complete with its own board of directors and financial statements
- The parent company usually retains its controlling interest in the new company
- It also offers strategic support and resources to help the new business succeed.
- The carve-out is not about selling the business unit outright but, instead, is selling a portion of the equity stake of that business
- This helps the parent organization to retain its hold over the subsidiary by keeping the majority equity for itself
- The Equity Carve-Out allows a company to strategically diversify into some other businesses which may not be its core operation


## Benefits of ECO and its End Goal

- An Equity Carve-out strategy usually benefits both the parent company and the new company
- One of the benefits is the creation of two separate entities out of the larger, old one with diversified core business
- This, in turn, might just help in the separation of operations and streamline the focus on the core operation
- E.g.: one might concentrate on production and the other subsidiary on marketing
- If successful, this will increase the value of both companies due to increased profitability
- With M\&A you hope that merging company $A$ and $B$ together will create more value than $A$ and $B$ separately do. Here the idea is opposite: you have company A and it creates a subsidiary, and you hope that the result of this
carve-out will be that the value of the parent will be higher than that of the subsidiary.
- The ECOs are initially created with the idea of maintaining indefinite corporate control over carve-outs
- The data suggest, though, that only a few parent companies are able to maintain the control beyond a duration of a few years
- Typically when the carve out is made than the parent company will for some years retain certain control over this subsidiary but in the long run most carve outs are going to be acquired by a third party in the future
- Most carve-outs go on to be acquired by third parties in the future


## Efficiency of ECOs

- Conflicts between the parent companies and carved-out entities intensify over a period of time
- Because the subsidiary want to be at some point completely independent
- Carve-outs grow at a higher rate starting with their initial IPO
- Empirical evidence suggest that ECOs raise share prices in the short-term but over the long-term shareholders are at loss
- In fact, empirical evidence suggest that the shareholder value increases if the company follows a structured plan to fully separate the subsidiary in the future


## Example of a ECO

- In the year 1994, the investment banking unit (Lehman Brothers) carved out from its parent American Express to form a new independent entity that was jointly owned by shareholders of American Express and employees of Lehman Brothers
- Jointly because we will talk about other types of divestures where the shareholders own only 1
- The core business of the unit included corporate services, signature charge card, travel and financial planning
- American Express also infused more than $\$ 1$ billion into Lehman Brothers in the form of capital to financially support the newly formed company
- Although the former parent had no directors on the board of Lehman Brothers, it continued to get a share of the entity's future profits

Spin-offs

- A corporate spin-off is an operational strategy used by a parent company to create a new independent (publicly traded) business out of its existing subsidiary
- A spin-off occurs when a parent corporation distributes the shares of the its subsidiary directly to its current shareholders on the pro-rata basis as a dividend payment
- There are no other investors included in this
- The newly created subsidiary $100 \%$ belongs to the parent company and the shares of the subsidiary are distributed pro-rata
- When subsidiary is created the new entity takes assets, employees, or existing product lines and technologies from the parent in exchange for a predetermined amount of cash
- The spun entity may take on debt to provide a distribution to the parent in exchange for those assets or loss of cash flow


## Why Spin off?

- A spin-off may be a method for the parent to reduce agency costs and create tax shields or to enter a new industry while retaining a close relationship with the spun-off company
- It is a way of reorganizing a company's administrative structure in order to improve its profitability/efficiency
- When a company plans to consolidate or streamline its workflow, it can spin off a less productive division to form a new independent company-that is, a company creates a new business entity out of its already existing divisions, subsidiaries, or sub-units
- The new individual company is expected to be more profitable and worth more alone than it would be as a part of the larger business entity
- When a spin-off occurs, the shareholders of the parent corporation are not required to surrender any of their parent corporation stock in exchange for the subsidiary's stock
- If I hold $20 \%$ in the parent company and this parent creates a spin-off than I am entitled to $20 \%$ of the subsidiary


## What Are the Disadvantages of a Spin-off?

- The downside of a spin-off is that its share price can be more volatile and can tend to underperform in weak markets and outperform in strong markets
- Spin-offs can also experience high selling activity; shareholders of the parent may not want the shares of the spinoff they received because they may not fit their investment criteria
- The share price may dip in the short term because of this selling activity, even if the spinoff's long-term prospects are positive


## Example of a Spin-off: PayPal and eBay

On June 17, 2015, online marketplace eBay announced that that it would spin-off its payment processing company PayPal, after eBay's board of directors gave its final stamp of approval

- Why? CEO John Donahoe said in a statement:
"...eBay and PayPal are two great, special businesses. As separate, independent companies, eBay and PayPal will each have a sharper focus and greater flexibility to pursue future success in their respective global commerce and payments markets. I am confident that eBay and PayPal each have the right leadership team, strategy, structure and operational discipline to create sustainable, long-term value for stockholders and deliver great opportunities and experiences for customers worldwide."
- The terms of the deal. EBay shareholders will receive one PayPal share for every eBay share they own as of July 8 . No action is required by eBay's stockholders in order to receive shares of PayPal common stock in the distribution
- PayPal, like its parent, was set up to trade on the Nasdaq stock market under the symbol "PYPL"
- PayPal's Independence. EBay and PayPal would operate under a five-year agreement that would guarantee a reliable source of revenue for PayPal after the separation. Interestingly, under the agreement, PayPal could partner with competing retailers and other financial firms, and even tech companies looking at getting into payments, like Google and Apple


## Variation of Primary Methods of Divestitures

- Split-up:

Separation of the company into two or more parts, often via spin-off

- It is kind of a de-merger: you take company A and you split is into A1 and A2
- Tracking stock:

Creation of a separate class of stock with value based on the cash flows of a specific division; sometimes part of a public offering

- Exchange offer:

Distribution giving shareholders a choice to retain parent or exchange for shares in new subsidiary; creates a separate, publicly traded company

## Split-up

- A split-up describes the action of a corporation segmenting into two or more separately-run entities
- No subsidiary-parent relationship
- Split-ups usually occur because a company wants to slug out different business lines in an effort to maximize efficiency and profitability (exogenous), or because the government forces this action so as to combat monopolistic practices (endogenous)
- After split-ups are complete, shares of the original companies may be exchanged for shares in any of the new resulting entities, at the investor's discretion
- Company A split in A1 and A2: now it is up to me to choose if I want shares in A1 or A2


## Why Split Up?

## Strategic Advantage:

- Some companies undergo split-ups because they are attempting to strategically revamp their operations
- Such companies may have a broad range of discrete business lines-each requiring its own resources, capital financing, and management personnel split-ups may greatly benefit shareholders, because separately managing each segment often maximizes the profits of each entity
- Ideally, the combined profits of the separated entities exceed those of the single entity from which they sprang from


## Governmental Mandate

- Companies often split-up due to the intervention of the government, which forces such action in an attempt to minimize monopolistic practices
- This is rare, however, because antitrust laws do not allow monopolies to form
- Ideally, the combined profits of the separated entities exceed those of the single entity from which they sprang from
- Mini case: in the late 1990s, the U.S. Department of Justice (DOJ) sued Microsoft for alleged monopolistic practices. Interestingly, the case ended in a settlement, not a split-up. Some market participants believe that Meta (Facebook), and Google are essentially monopolies that the government must split-up to protect consumers.


## Split-up Case Study: Hewlett-Packard

- In October 2015, the Hewlett-Packard Company completed a split-up that resulted in the official formation of two new entities: HP Inc. and Hewlett-Packard Enterprises
- The split-up was executed to strategically silo (isolate) these two groups, because each one focused on different business models
- Hewlett-Packard Enterprises markets hardware and software services to large businesses seeking big data storage and cloud computing technology
- HP Inc. focusses on manufacturing personal computers, printers, and other devices geared toward small and medium-sized business owners
- This split-up ultimately allowed each business entity to more efficiently run its own organizational structure, management team, salesforce, capital allocation strategy, and research and development initiatives
- After the split-up, existing shareholders of the original company and new investors alike were given the opportunity to choose which of the two new entities they wished to obtain shares in
- Investors who favored exposure to a perceptively more stable, slower-growing company likely opted for shares in HP Inc., while those who preferred a faster-growing entity that could better compete in the crowded IT space likely leaned toward shares in Hewlett-Packard Enterprises

In short,

- spin-offs are the formation of a fresh independent company from the parent company by distributing the shares of the existing company
- a split-up takes place when a parent company splits up into two or more independent companies
- a carve-out is when the parent company sells some of the shares from its subsidiary company to the external investor
- is kind of a spin off where the shares of the subsidiary are not hold only by the shareholders of the parent by also by other external investors


## Tracking Stock

- Shares issued by a company which pay a dividend determined by the performance of a specific portion of the whole company
- Typically a corporation issues stock, who gets that stock is entitled to the free cash flow of this corporation
- It ties the entitlement not for the entire company but for a certain division
- It is generally a class or series of common stock of the issuing corporation (may or may not have voting rights)
- It is generally class A shares; it is just one of the types of common stock which is traditionally accompanied by more voting rights than B shares. Class A shares are not sold to the public, but when it comes to tracking stock you can still find some of it trading publicly.
- Class B typically have reduced voting right
- Tracking stock does not represent or require any change in business structure
- Holders of tracking stock are considered to hold equity in the parent company and not the specific entity represented by the tracking stock
- If you have a profitable division you could create a new subsidiary of that division (easier growth, collecting financing, ...) or;
- You could issue publicly stock which would pay dividends of the CF of this division (similar to equity carve-out except in a ECO you create a subsidiary and here you don't)
- Payment is subject to the risk of the operations of the issuer as a whole
- However if the division does really well, you would except to get more dividends than the other stock than this company would pay.
- Tracking stock is often set up by companies that have several diverse divisions, both so that investors can take a share in a division of their interest, and so that the performance of these divisions can be tracked in terms of shareholder interes $\dagger$
- A company will sometimes issue a tracking stock when it has a very successful division that it feels is underappreciated by the market and not fully reflected in the company's stock price
- Issuing tracking stock means you want someone else to invest in this stock. Why? Because if someone else buys this, you as a corporation get money. Than you have two option either you go with a carve-out or a tracking stock.
- But this depends on the LT objectives: if you believe that this division is inexistent as a subsidiary maybe in the long run you would want to create a separate entity (than you go for a ECO or a spin off) but if this is temporary than tracking stock is more preferable


## Salient Features of Tracking Stock

## 1. Voting Rights

Holders of tracking stock typically have voting rights, which may be fixed at the time of issuance or floating ( e.g., fixed but subject to periodic adjustments based on relative market values)

## 2. Dividend Rights

The dividend rights of tracking stock are based on the earnings of the tracked business. The
dividend policy ( i.e., when and how much of the tracked business' earnings are to be distributed) is subject to the discretion of the Board of Directors of the issuer
$\rightarrow$ this are still dividends and this is discretionary, they know when to pay dividends. They have to pay it because otherwise no one will want to buy their stock. Sometimes companies have allot of money and can pay out dividends but sometimes they don't and can't pay out dividends. So this is what is meant by dividends are discretionary.

## 3. Liquidation Rights

Holders of tracking stock do not have a special right to the tracked assets and share in all of the issuer's assets. Liquidation rights are often based on the relative values of the tracked and total assets at the time of issuance, but are sometimes fixed in proportion to relative market capitalization immediately prior to liquidation

## 4. Conversion Rights

The issuer can generally elect to convert the tracking stock, often at a premium, into another class of stock subject to certain restrictions. In some transactions, the tracking stock automatically converts to another class of stock if the issuer sells the tracked assets. In other instances, conversion may be one of several options

## Pros and Cons of Tracking Stock

- Pros:
a. Tracking stocks give investors access to the more promising divisions of a company.
b. The performance of tracking stocks comes only from the tracked segmentnot from the parent company as a whole. (parent here is synonym of company as a whole)
c. New issuance of tracking stocks provides companies with capital to pay down debt and fund growth.
- Cons
a. Investors can lose money on tracking stocks if the division performs poorly even if the parent company does well.
b. Tracking stocks typically come with limited or no voting rights. (in principal they have voting rights, but often they are limited, it depends on the size of the division)
c. If the parent company goes into bankruptcy, creditors may have a claim on the tracking segment's assets (even if it is doing well financially).
- Let's say you bought tracking stock and you expect that it does well but it get into trouble and needs cash. When default takes place the creditors can come in and seize some of the assets and cashflows, including the cashflows of the divisions you have tracking stock on.


## Example of a Tracking Stock

- In 1999, the Walt Disney Company issued a tracking stock for its internet holdings division, Go.com. Go.com's websites included ESPN.com, ABCNews.com, Disney Online, and Disney's Daily Blast
- The tracking stock traded under the ticker symbol "GO"
- In January 2001, just as the tech bubble was popping, Disney was forced to close Go.com, lay off hundreds of employees, and retire the tracking stock permanently


## Exchange Offer

- is defined as a distribution of the ownership of a subsidiary of which shareholders have a choice to retain parent shares or exchange their existing shares for the new shares in the subsidiary
- it resembles a spin-off in that shares are issued to a separate, publicly traded company
- the difference is that the shares in the new firm are received only by those shareholders who opt to trade in the shares in the parent and not based on pro-rata basis as in spin-off transactions


## Theory: Why Might Divestitures Create Wealth?

It is essentially not obvious that divestures create wealth. These theories suggest that either you have one company that creates a new company and then the value will just be split in half.

- Transaction Cost (Coase, 1837; Williamson, 1975; Klein et al., 1978) Choice btw firm and market is a function of transaction costs; divestitures is a response to in changes transaction cost
The benefits from restructuring should come from transaction cost and the minimization of the transaction costs. For example, lets say your corporation is so large that it just becomes too expensive to pay all the managers, maybe you have multiple divisions, you have managers in every division. Maybe you should split your company then in three different companies.
- Information/Signaling (Myers and Majluf, 1984; Nanda, 1991) Corporate managers posses information not known to the market (outsiders); divestitures could signal information
You assume that there are some frictions, like adverse selection. You try to argue that certain corporate restructuring can mitigate the costs of asymmetric information. This paper points out that inside managers know more than outside investors and in this type of asymmetric information, managers and outside investors, whatever actions managers take regarding financing or restructuring, this is informative. The managers can leave some information to the investors.
Nanda emphasizes two aspects of equity carve outs:
- ECO create a new public entity but at the same time it raises money for the parent. So there is an important informative content in creating a carve-out and particularly for the downside investors a creation of an ECO rather issuing its own equity, the corporation creates an subsidiary and uses the equity of the subsidiary. Nanda says that this is a positive piece of information: rather than using its equity, (using its own equity is a sign of overvaluation of the company), but if managers use the equity of the subsidiary this mitigates this negative effect. According to Nanda the prediction will be that the announcement of the firm setting up an ECO is a positive new, would increase the stock price of the parent company.
- Incentives/Monitoring Costs

Corporate governance geared towards monitoring; divestitures could enhance monitoring
The logic here is that if divestures improve managerial incentives or allow shareholders to exert better monitoring of managerial performance than, the separation of corporation in different pieces can improve the efficiency of different pieces and can increase the combined value of the firm because it effectively lowers the agency costs.

Empirical question: "So, do divestitures create wealth?" see here under

## Empirical Evidence: Type of Divestitures and Parent Returns

This kind of studies in their design are very similar to those of M\&As. Basically we use event studies: event is the announcement that the corporation will undertake a divesture and you check what happens to the AR of the parent company in the event window around this announcement. The event windows here are relatively small. The event is the announcement of spin-off.

Empirical Tests of Corporate Restructuring and Divestitures

| Research Paper | Divestiture Type | Time <br> Period | Number of Observations | Event Window | Parent <br> Return (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Miles and Rosenfeld (1983) | Spin off | 1963-1980 | 55 | $(0,+1)$ | 3.34 |
| Hite and Owers (1983) | Spin-off | 1963-1981 | 123 | $(-1,0)$ | 3.30 |
| Schipper and Smith (1983) | Spin-off | 1963-1981 | 93 | $(-1,0)$ | 2.84 |
| Copeland et al. (1987) | Spin-off | 1962-1981 | 73 | $(0,+1)$ | 2.49 |
| Mulherin and Boone (2000) | Spin-off | 1990-1999 | 106 | $(-1,+1)$ | 4.51 |
| Schipper and Smith (1986) | Carve-out | 1965-1983 | 76 | $(-4,0)$ | 1.83 |
| Mulherin and Boone (2000) | Carve-out | 1990-1999 | 125 | $(-1,+1)$ | 2.27 |
| Klein (1986) | Asset sale | 1970-1979 | 202 | $(-2,0)$ | 1.12 |
| Lang, Poulsen, and Stulz (1995) | Asset sale | 1984-1989 | 93 | $(-1,0)$ | 1.41 |

In this table we see that the empirical studies highlight the fact that divestures do produce returns. In the point of view of markets they evaluate divestures positively. So divestures do create value.

## Empirical Evidence: Asset Sales

This presents research on seller and buyer returns in corporate asset sales. This is similar to examining returns in acquisitions (you have a seller and buyer/bidder) here in asset sale you also have a seller

| Research Paper | Time Period | $\begin{gathered} \text { Number } \\ \text { of } \\ \text { Sellers } \end{gathered}$ | Number of Buyers | $\begin{gathered} \text { Event } \\ \text { Window } \end{gathered}$ | $\begin{gathered} \text { Seller } \\ \text { Return (\%) } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Buyer } \\ \text { Return (\%) } \\ \hline \end{gathered}$ | Combined Return |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rosenfeld (1984) | 1969-1981 | 30 | 30 | $(-1,+1)$ | 2.76 | 2.10 | Not reported |
| Jain (1985) | 1976-1978 | 1,062 | 304 | day -1 | 0.44 | 0.34 | Not reported |
| Hite, Owers, and Rogers (1987) | 1963-1981 | 55 | 51 | $(-1,0)$ | 1.66 | 0.83 | Not reported |
| Hanson and Song (2000) | 1981-1995 | 326 | 326 | $(-1,+1)$ | 0.602 | 0.477 | 0.269\% |
| Mulherin and Boone (2000) | 1990-1999 | 83 | 83 | $(-1,+1)$ | 1.75 | 1.34 | 1.18\% | and buyer. This study show that the returns of asset sales are on average positive. Suggesting that indeed asset sales are positive projects. But we can note some differences between empirical on M\&As and asset sales:

- here the empirical evidence is as such that both sellers and buyers both generate positive returns $\leftrightarrow \rightarrow$ M\&As where only target returns were positive


## Empirical Evidence: Related vs. Unrelated Divestitures

We can also look at corporate focus, meaning that if divestures took place within related or unrelated industries. Let's say you perform a divesture within a related industry: a parent and subsidiary share a similar industry $\leftrightarrow-\rightarrow$ unrelated is then unsimilar industry. How can we find that? Look at the SIC.

| Research Paper | Divestiture Type | Time Period | $\begin{gathered} \text { Related } \\ \text { Definition } \end{gathered}$ | Number Related | Number <br> Unrelated | Event Window | Related <br> Return (\%) | Unrelated Return (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Krishnaswami and Subramaniam (1999) | Spin-off | 1979-1993 | 2-digit SIC | 30 | 88 | $(-1,0)$ | 1.86 | 3.59 |
| Daley, Mehrotra, and Sivakumar (1997) | Spin-off | 1975-1991 | 2-digit SIC | 25 | 60 | $(-1,0)$ | 1.6 | 4.5 |
| Desai and Jain (1999) | Spin-off | 1975-1991 | 2-digit SIC | 41 | 103 | $(-1,+1)$ | 2.71 | 4.45 |
| Boone (2000) | Spin-off | 1985-1990 | 2-digit SIC | 15 | 43 | $(-1,+1)$ | 0.85 | 4.07 |
|  | Spin-off | 1991-1996 | 2-digit SIC | 30 | 60 | $(-1,+1)$ | 3.29 | 4.82 |
| Allen and McConnell (1998) | Carve-out | 1978-1993 |  |  |  |  |  |  |
|  |  | Payout | 2-digit SIC | 16 | 56 | $(-1,+1)$ | 6.56 | 5.83 |
|  |  | Retain | 2-digit SIC | 28 | 67 | $(-1,+1)$ | -0.11 | -0.16 |
| Boone (2000) | Carve-out | 1985-1996 | 2-digit SIC | 79 | 145 | $(-1,+1)$ | 2.91 | 2.76 |
| Vijh (2002) | Carve-out | 1980-1997 | 2-digit SIC | 100 | 221 | $(-1,+1)$ | 0.80 | 2.34 |
| Hulburt, Miles, and Woolridge (2002) | Carve-out | 1981-1994 | 4-digit SIC | 30 | 153 | $(-1,+1)$ | 0.98 | 2.10 |

We see that the empirical evidence is that in general divestures in unrelated industries produce higher returns than in related industries. Intuition in this result: the improvement in focus and reduction of information asymmetry.

## Lecture 8: Financial restructuring

## Required and Voluntary Readings for This Lecture

- this lecture is based on chapter 13 from the text book (WMM)
- required reading: read Chapters 13 from WMM (Note: chapter's appendix is not the part of the required reading)
- additional required reading is provided at the end of the lecture slides and on Toledo
- voluntary reading is provided on Toledo as well


## In this lecture

- What is financial restructuring
- Why to undergo financial restructuring
- Leverage Recapitalizations
- Debt Restructuring and Bankruptcy Procedure
- Equity restructuring
- Exchange Offers and Equity-for-Debt swaps


## Financial vs. Operational Restructuring

- Corporate restructuring entails any fundamental change in a company's business or financial structure, designed to increase the company's value to shareholders or creditor
- Corporate restructuring is often divided into two parts: operational and financial restructuring
- Previously, we talked about operational restructuring-the process of increasing the economic viability of the underlying business model (M\&As or the sale of divisions or abandonment of product lines, or cost-cutting measures such as closing down unprofitable facilities, etc.)


## Financial Restructuring

- Financial restructuring relates to improvements in the capital structure of the firm
- Balance sheet: asset that are financially backed: equity or debt
- How much of firm assets are backed with debt or with equity?
- An example of financial restructuring would be to add debt to lower the corporation's overall cost of capital
- For viable firms: financial restructuring might thus be increasing debt
- For otherwise viable firms under stress, it may mean debt rescheduling or equity-fordebt swaps based on the strength of the firm: decreasing the amount of debt
- If the firm is in bankruptcy, this financial restructuring is laid out in the plan of reorganization to avoid liquidation
- Note, however, that in most turnarounds and bankruptcy situations, both financial and operational restructuring must occur simultaneously to save the business
- Corporate financial restructuring involves restructuring the assets and liabilities of corporations, including their debt-to-equity structures, in line with their cash-flow needs to promote efficiency, support growth, and maximize the value to shareholders, creditors and other stakeholders
- Sometimes restructuring is done pro-actively and is initiated by management or the board of directors - examples include share buybacks and leveraged recapitalizations
- More often, however, the existing structure remains in place until a crisis emerges, in which case, the motives are usually defensive - as in defenses against a hostile takeover - or distress-induced, where creditors threaten to enforce their rights


## Why and How to Undergo Financial Restructuring

Why?

- Unlocking the value in the firm in normal times (not in financial distress)
- Increasing the value of the firm in financial distress
- This to avoid inefficient liquidation: imagine a firm that has interesting projects and good assets in the future but is facing some liquidation problems. What this means is that such a firm is unable to repay its debt timely.
- The thing about debt is that if you are in that situation, you are in default. And once you are in default this might unravel into bankruptcy. This can than lead to liquidation of the firm.
- But the firm in this example has only a temporary liquidity problem. Such a firm is than in financial distress, but it would be very inefficient to shut down this firm. So, undergoing some financial restructuring might be optimal.
How?
- Optimizing leverage (debt-to-equity ratio)
- Less monitoring when issuing bonds. Bank or capital markets?
- Fine-tuning debt structure
- Banks; use collateral or not? Imagine you are a company, and you have an asset, if you use this asset as collateral the benefit of that is the loan is backed with that asset and then the bank will ask lower interest rate. If the asset is used as collateral, it is you $r$ property but if there is something that happens in the future the ownership will move to the bank. That is one reason why you want to fine tune your structure.
- If you take a bank loan than you are dependent on that amount and if you want more funds than you would have to re-apply again = disadvantage
- If you take a term-loan of for example $2 \%$, it stays the same but if you take a credit-line the interest rate will be adapted to inflation.
- Fine-tuning equity structure
- How? You can do this by reorganizing them between:
- Common Vs preferred stock (no voting rights, perpetuity)
- Another way: who owns the equity that owns the company? Trying to change the ownership structure. E.g., if you want to buy your own equity back, by this structure you change the ownership structure of your firm.
- Financial reorganization (bankruptcy)
- You can try to improve this thing in advance to increase value and avoid falling in financial distress. If those things don't work out and you still find yourself as a company unable to payout your debt than you can do a bankruptcy procedure with two outcomes: you get liquidated or you get reorganized to a new entity.
- Liquidation


## Leverage and Leveraged Recapitalization

Optimal Leverage: Trade-off Theory
What is the benefit and cost of leverage? Why would a firm go for a type of leverage. There must be an underlining reason for leverage.
One theory is the pecking order theory and the other theory is the trade off theory. We will talk about the second one because you can incorporate all the tradeoffs of agency costs and asymmetric information.

Firms can finance their operations through capital $\rightarrow$ these costs something. If you issue debt, what is the cost of debt? If you take equity what is the cost of equity? Cost of equity consists of two things: the investor forgoes other potential investments (opportunity costs) and what is the reason that he buys equity? He wants to get a return, which is trough dividends but those
are uncertain. If I buy equity, I am entitled to cash flows, but since they are uncertain they are risky. The higher the risk the higher the required return on equity.
$\rightarrow$ what is cheaper? Issuing equity or issuing debt?
Debt is cheaper. Equity could be the same if you compare the rate of return of debt and equity but that is not the point. Once I account for the risk, will the return be the same?

Unlike payments to equity, debt payments are tax-deductible:

$$
(\mathrm{R}-\mathrm{rD})(1-\tau)=\text { income }
$$

$R$ is the return with already all other costs subtracted but the cost of debt payment.
= income but what matters for shareholders is the cashflow.
I also have to pay the actual principal $D:(R-r D)(1-\tau)-D$

$$
\begin{aligned}
& =(1-\tau) \mathrm{R}-\mathrm{r}(1-\tau) \mathrm{D}-\mathrm{D} \\
& =(1-\tau) \mathrm{R}-(1+\mathrm{r}(1-\tau)) \mathrm{D}
\end{aligned}
$$

If you borrow from a bank $D$ with interest rate r. (1+r)D is the amount you have to repay but because you subtracted the taxes is identical to getting a subsidy: $(1+r(1-\tau)) D<(1+r) D$

$$
=(1-\tau) R-(1+r) D+r \tau D
$$

This is a benefit of debt and one of the reasons why it is cheaper than equity, it is almost like a subsidy ( $\mathrm{r} \tau \mathrm{D}$ ).

In equilibrium when there are no frictions, the equity and debt should have the same costs.

- Trade off theory of capital structure: tax-benefits of debt vs financial distress cost
- This theory highlights the cost and benefit of leverage
- The primary benefit is the tax-benefit of debt
- And the primary cost is the cost of financial distress
- If you think theoretically and you take away all the frictions, (you don't have tax benefits ...) than leverage does not matter. Leverage has zero value on the firm.
- In a world without frictions, leverage does not matter.
- This theory gives you a benchmark to think about firms. If you have a world without frictions than leverage does not matter. But in the real-world leverage does matter. What are those real-world frictions that make the choice of leverage not trivial? It is taxes and financial distress.
- Interest rate on debt is tax-deductible and thus generate a tax-shield per unit of debt $\tau r, \tau$ is a corporate tax rate and $r$ is the interest rate on debt
- Higher level of debt means higher interest payments and, thus, increased default risk
- With equity you have allot of flexibility. Here with debt, you are obligated. The bigger debt, the bigger $r$, meaning that you actually going to have very little revenue.
- The fact when bankruptcy and liquidation begin is not the problem. The problem starts when the transfer of assets to creditors involve some loss of the value of the asset.
- The cost of debt is that it increases the likelihood that the firm defaults
- thus, too little debt means losing on tax shields but too much debt means a higher default risk, thus, a higher cost of financial distress
- From the tradeoff theory's point of view:

Firm value $=$ PV(FCF) + PV (tax-shields) - PV (bankruptcy cost)

- FCF = unlevered equity, normal free cashflows. If you don't have debt, you will only have this term.
- As you increase debt the tax shields will go up but the bankruptcy cost also; but even if you use very little debt, you still have these benefits.

Once firms fail and go into financial distress it is costly. This expense destroys the value of the firm. The point of the tradeoff theory is the more debt you use for financing operations, the higher the interest expense, the higher the tax shield you generate. If I use more debt, this creates a tax shield, so debt is cheap, and I should go for debt financing. But the problem is that as I pay more and more with debt, my expenses will keep on increasing, and the chance that at some point I will not be able to repay these high interest payments. So too little debt means losing on tax shield but too much debt means higher default risk and therefore higher cost of financial distress.

## Trade-off Theory: Optimal Leverage

The dotted line is our tax shield value ( $r_{\tau} \mathrm{D}$ ). The more debt we us for financial purposes, the higher the tax shield. First due to tax shield the firm value is increasing, but at some point, the marginal benefit of tax shield is not enough to benefit from the increasing cost of financial distress. This means that at some point the cost of financial distress is too high and dominates, this starts to bring the value of the firm down. The point is that there is some amount of debt that maximizes the value of the firm. This is the basic tradeoff theory.


Blue: even if you don't have distress costs, the tax shield benefits will not be linear over time:

- You only pay taxes if you have positive profits. So, the tax shield is only here when having positive profits. So, then what it means is that if at some point I borrow so much that on a regular basis I have negative profits there is no point in having this.
- You only have your tax shield for as long you have your company. The value of the tax shield that you extract depends on the probability of having positive returns.
Purple: Once you add the cost of financial distress there is an additional negative value. If I keep on increasing debt than I increase the value of my firm. But at some point, it starts slowing down and there is where I reach the maximum. Every additional debt will only decrease the value of the firm. So without the cost of financial distress, I go as high as possible but with the financial distress cost than I have an optimum.
Green: here the likelihood of bankruptcy arises (some industries with typical larger costs of financial distress). In that case the marginal costs in getting close to default increases, and the benefits of the value of debt is even lower.
$\Rightarrow$ Just by using two simple ingredients: tax-deductibility of debt and cost of financial distress you can explain a tradeoff of having too much or too little debt.

You can use this model for financial predictions. It can also predict what happens if the debt would not be tax deductible. But these are not the point of the model.

Agency Cost

- Agency costs arise when there are conflicts of interest among the firm's stakeholders
- Conflicts of interest between shareholders and debtholders
- debt repayments (obligatory) have priority over dividend (discretionary)
- debt holders are always the same amount happy because they only get 1 payment
- when the firm does not go well then, they get less and less happy
- they like something safe
- equity is a residual claim: whatever cash the firm generates it needs first to repay its debt
- they are happy, and their happiness increases as the return of the company increases because higher dividends.
- When the firm is doing badly, they are unhappy but in the same amount
- This means that they like risk
- when firm has too much debt it can give a wrong incentive to shareholders, e.g., shareholders prefer investing in much riskier projects than debtholders. The reason is that if you are a residual claimer and you only get cash when debtholders are paid, in that case you would prefer allot of risk and this increases the chances that things go really well, and you get allot of cash. But if things did not work out really well then there would be massive losses but you as a shareholder, nothing will happen to you because you are protected, you just get zero and lose your equity.
- So, too much debt aggravates the risk shifting and debt overhang problems
- Debt overhang: when firm has positive NPV projects, however if you have already allot of debt outstanding than you know that most benefits from investing in positive NPV projects will go to creditors. Why? Because you already have allot of debt. Most of the cash you generate you will use it to repay your creditors. So why put effort to finance some investment project when the benefits of this projects will go to debtholders? Then an equity holder will not invest.
- Agency problems between managers and investors
- Managerial moral hazard: private benefit extraction. So, managers once they are hired, can have their own interest. They might to try not to lose their jobs to a hostile takeover. Shareholders cannot control the managers on a daily basis. Managers can misbehave and take inefficient decisions.
Solution: align manager's payoff with those of stockholders by giving them stock options
When we talk about moral hazard you want to give more equity, but the opposite is true when you have a free cash flow problem:
- The free cash flow problem: when a corporation has to many cash flow the managers might use this cash flow for their own interest. Too little debt leads to inefficiencies "empire building," etc. The more debt, the less cash there is the less chance that the manager will misbehave.
- The trade-off theory with agency cost:

Firm value $=$ PV(FCF) + PV (tax-shields) - PV (bankruptcy cost) - PV (agency cost $)$
So, agency costs theory can be merged together with the tradeoff theory. We can also subtract the agency costs. But the agency costs are tricky: some of the agency costs actually increase with debt for example with the more risk-taking situation. But for the free cash flow problem increasing debt decreases agency costs. So, in that case, more debt works in the same direction as the tax shield.

Taxes, Financial Distress \& Agency Cost Once you merge these two theories you get this graph. For any amount of debt issued, lower than D* the amount of debt will be too low. For any amount above D*, we will have excess interest payments, ... (see graph). What we want to highlight is that there are tradeoffs: too little debt can be a problem, too much debt can be a problem. So, there is always room for optimizing the amount of leverage. So, restructuring your capital structure can create value.

If you have too little leverage then by
 adding more debt you can increase the value of the firm.
Exam question: if you have higher agency costs, does it mean that you will select lower leverage? The only right answer is it can go any way; agency costs that pushes leverage down or up.

## Leveraged Recapitalization

- A leveraged recapitalization is a type of financial restructuring in which a company changes its capitalization structure by replacing the majority of its equity with a package of debt securities consisting of both senior bank debt and subordinated debt
- Here we will increase debt
- That is, the company will borrow money in order to buy back shares that were previously issued, and reduce the amount of equity in its capital structure
- If you think about a corporation that undergoes a financial recapitalization, there might be increased misalignment between shareholders and managers. A solution is giving more equity to the managers.
- Senior managers/employees may receive additional equity, in order to align their interests with the bondholders and shareholders
- They are also issued during periods of low interest rates because it is than cheaper to borrow. You lock yourself in a low interest payment.
- Usually, a leveraged recapitalization is used to prepare the company for a period of growth, since a capitalization structure that leverages debt is more beneficial to a company during growth periods
- Leveraged recapitalization is also popular during periods when interest rates are low since low interest rates can make borrowing money to pay off debt or equity more affordable for companies
- Leveraged recaps have a similar leveraged buyouts (LBO) as they significantly increase financial leverage, yet unlike LBOs, they firms remain publicly traded
- Unlike issuing new stock, leveraged recaps do not dilute the value of the firm's stock and thus less likely to negatively affect shareholders
- The dilution is if you have for example a number of shares outstanding. Than each share can expect to have a dividend. But if you issue new equity, there will be dilution.
- But by issuing new debt you do not dilute your shares
- Leveraged recaps are often used by private equity firms to exit some of their investment early or as a source of refinancing
- Leveraged recaps can increase the value a tax shield, decrease the likelihood of a takeover, improve incentives ("the free cash flow problem")
- However, leveraged recaps can increase default risk and agency costs (debt overhang/risk shifting)


## Debt Restructuring

In normal times it might be normal to issue additional debt. You grow in terms of balance sheet. You can sell a claim, or you can also replace equity with debt. You cancel out the equity of your company and increase the debt of your company. = equity-to-debt swap ( $\neq$ equity-for-debt is I am replacing debt with equity). You approach shareholders and you ask an amount of their equity, and you give them the same amount but in terms of debt. So, the size of your balance sheet does not change but just the distribution between equity and debt. The total assets stay the same.

- Debt restructuring is the process of reorganizing the whole debt capital of the company
- It involves reshuffling of the balance sheet items as it contains the debt obligations of the company
- Debt restructuring is more commonly used as a financial tool than compared to equity restructuring (discussed next)
- Debt restructuring can be done based on different circumstances of the companies; broadly, there are 3 ways of debt restructuring:
- A healthy company can go in for debt restructuring to change its debt part by making use of the market opportunities by substituting the current high-cost debt with low-cost borrowings
- A company that is facing liquidity problems (e.g., low debt servicing capacity problem) can go in for debt restructuring so as to reduce the cost of borrowing and to increase the working capital position
- A company that is in default and, thus, is in the prospect of bankruptcy, may attempt debt restructuring in order to make improve its solvency and avoid liquidation
- It is the last chance to avoid bankruptcy.
- Default is you don't repay debt $\neq$ bankruptcy
- If the reason behind default is your inability to repay your debt than you file in for bankruptcy (legal process): a company might want to do this to impose some rules about how the bankruptcy will go. You might do this as a firm to protect yourself, and you promise for example that you are improving things
- In the vast majority of cases, corporate debt restructuring is the reorganization of a distressed company's outstanding obligations to restore its liquidity and keep it in business
- It is often achieved through negotiation between distressed companies and their creditors (banks and other financial institutions) aimed at
- reducing the total amount (the principal) of debt the company owns $\rightarrow$ doing debt forgiveness; by agreeing the amount I owe to the creditor
- decreasing the interest rate (reducing the cost of debt) it pays $\rightarrow$ try to effectively lower the cost of debt. I still need to repay the debt principal, but you can renegotiate the interest rate.
- extending the period of time, it has to pay the obligation back (extending maturity)
- Occasionally, some of a company's debt can be written off in exchange for an equity position in the company (a debt-equity swap): offering an amount of equity for the amount of debt you own to the creditor
- Such arrangements are often the final opportunity for a distressed company to improve its situation and to avoid a more complicated and expensive bankruptcy process
- If there is no improvement than the only thing left is bankruptcy


## Bankruptcy

- Bankruptcy is a legal proceeding involving a business that is unable to repay its outstanding debts.
- Bankruptcy begins with a petition filed by the debtor, which is most common, or on behalf of creditors, which is less common
- Because of asymmetric information the borrower is more informed than the creditor, therefore, to anticipate any action of the creditor, it can file in for bankruptcy.
- Creditors can have more power. That is why it makes more sense for the weak size to anticipate this action.
- Types of Bankruptcy Filings (based on the US legal system)
- Chapter 7: liquidation
- Chapter 11: reorganization
- Chapter 13: arranges for debt repayment with lowered debt covenants or specific payment plans
- Liquidation and reorganization are by far the two most popular types of bankruptcy


## Liquidation

- A bankruptcy trustee is appointed to liquidate nonexempt assets to pay creditors; after the proceeds are exhausted, the remaining debt is discharged
- The unsecured debt is separated into classes or categories, with each class receiving priority for payment, and is paid first
- Secured debt is debt backed or secured by collateral to reduce the risk associated with lending, and is paid second
- The last is the payment of nonpriority, unsecured debt with funds remaining from the liquidation of assets. If there are not sufficient funds to pay the nonpriority unsecured debt, then the debts are paid on a pro-rata basis


## Reorganization

The aim of liquidation is to shut down the company and you try to recover as much cash as possible. Reorganization does not aim at liquidating the company, you try to fix the company and let it keep going.

- A form of bankruptcy that involves a reorganization of a debtor's business affairs, debts, and assets, and is known as "reorganization" bankruptcy
- It is most often used by large entities, such as businesses, though it is available to individuals as well
- The main difference from "liquidation" is that the entity filing for bankruptcy under "reorganization" remains in control of operations and is not required to liquidate assets
- It gives the company protection from creditors. Because in general as a creditor I have a right to take whatever I could from you if you don't repay me. But society realizes that this is not the way to go. Certain companies might have important social value (think about unemployment).
- Advantage over liquidation: the entity, usually a business, can continue operations while going through the reorganization process and generates cash flow that can aid in the repayment process and the incumbent management retains control (creditor are kept at bay)
- Disadvantage over liquidation: a very complex and expensive process-the legal costs incurred in the process could worsen the situation; the reorganization plan has to be approved by the bankruptcy court and must be manageable enough to where they can reasonably pay off the debt over time

Horizontal axis: years 2010-2020
Dark blue: liquidation
Light blue: reorganization
We see that in number of reorganizations was more popular. In 2021 during the pandemic, the number of findings were low but the proportions (\%) of reorganizations increased.

It is more large firms that will file for a reorganization because the fixed costs of going through a reorganization is too big for a small firm.


Case Study: General Motors Chapter 11 Bankruptcy in the US

- In May 2009, General Motors announced that it was closing more than 2,600 of its retail outlets in an effort to keep itself out of bankruptcy court
- GM wasn't able to keep itself out of bankruptcy court: the company filed for Chapter 11 on June 1, 2009
- It wasn't only the largest bankruptcy of the year for the U.S. retail industry, it was also the fourth largest bankruptcy reorganization in the history of United States business (yet lasted just 40 days)
- The U.S. government and the Canadian government are providing $\$ 30$ billion to the company to continue operating while in Chapter 11 (the "Too-Big-too-fail" problem)
- A new board chairman was appointed during restructuring process (Edward Whitacre)
- Restructuring proposal put forward: form a new entity owned $60 \%$ by the U.S. government, $12 \%$ by the Canadian government, $17.5 \%$ by the United Automobile Workers union, and $10 \%$ by G.M. bondholder has been presented to the court for approval
- During the bankruptcy process the U.S. government is backing GM vehicle warranties during the Chapter 11 process
- GN sold its Hummer and Saturn brands, and discontinue the Pontiac brand
- U.S. bankruptcy court approves GM's bankruptcy sale, leaving its most profitable assets intact and under government ownership on July 6, 2009
- GM emerged from bankruptcy protection on July 10, 2009, as a new company, which was majority owned by the U.S. Treasury
- On December 10, 2013, the U.S. Treasury sold the last of the 31.1 million shares it owned in GM
- Reportedly, the Treasury recovered only $\$ 39$ billion from its $\$ 49.5$ billion taxpayerfunded bailout of GM


## Strategic Bankruptcy

- Strategic bankruptcy occurs where bankruptcy is a strategic choice rather than an unavoidable condition
- A strategic bankruptcy may occur when an otherwise solvent company makes use of the bankruptcy laws for some specific business purpose other than simple inability to pay debts
- In the U.S., Chapter 11 bankruptcy made it possible for a business
(a) to declare bankruptcy without actually being insolvent
- I do not need to prove that I do not have the resources to pay my debts, I can just decide to not pay the debts and file for bankruptcy
- This can be maybe because the interest rates of back then were made in bad conditions and now you don't want to pay this interest
- Then you file in for chapter 11 and you do a reorganization (b) to retain its incumbent management, both conditions give opportunity for strategic bankruptcy
- You do not have to replace management. If it was required that you have to change management than you would not file for chapter 11 .
- Benefits:
- strategic debt cutting (possibility for debt forgiveness/restructuring)
- breaking outstanding contracts with unfavorable conditions
- same name, different company: "phoenix company", e.g. the General Motors Chapter 11 reorganization in 2009
- different name, same company: re-branding
- disadvantage:
- your reputation will suffer from this if you keep filing for bankruptcy; banks may charge you a higher interest rate in the future

This method is only possible when:

- you don't have to prove that you are in bankruptcy
- and that reorganization is a possibility


## Chapter 11 and Efficiency

Is it a good idea to have reorganization in the law?
Think about punishment; when a firm is not doing well in overall it is the firm's fault than it will be punished through liquidation. The question is what is the effect on reorganization on the firm's incentive to behave? When a firm know there could be a punishment it will try to behave. But there is a mismatch between misbehaving and the actual punishment. When you commit the action, the firm will try to avoid the punishment. Then you might do actions that affect the community worser. This is the problem with chapter 11, it is kind of a 'soft' punishment. Chapter 7 is effective as a punishment but because firms know that there is a chapter 11 they will misbehave and try to avoid chapter 7 and hide some things, ...

- What is the effect of Chapter 11 bankruptcy reorganization on the restructuring and investment of financially distressed firms?
- It gives great ex-ante incentives but induces also moral hazard.
- Theory message - can go any way:
- bankruptcy laws exacerbate the incentive to overinvest (Gertner and Scharfstein,1991); Chapter 11 may encourage corporate managers to reorganize when liquidation is efficient
- Chapter 11 improves efficiency (Baird, 1991; Bebchuk and Picker, 1992; Berkovich and Israel, 1991); inhibits the inefficient liquidation of firms in default (Harris and Raviv, 1993); Chapter 11 provides shareholders with the incentive to seek bankruptcy proceedings rather than delay the resolution of financial distress (Baird, 1991)
- Empirical evidence-some positive effects:
- $40 \%$ of reorganized firms continue to experience operating losses in the three years following bankrupt (Hotchkiss, 1995)
- the total cash flows of reorganized firms over the five years after they emerge from bankruptcy exceed the benchmark (Alderson Betker, 1999)
- firms that significantly restructure their assets and liabilities during Chapter 11 are more likely to achieve positive operating performance (Denis and Rodgers, 2007)


## Chapter 11 and Incentives

Ex-ante:

- the deviation from the absolute priority of debt over equity in bankruptcyChapter 11-is beneficial as it helps to reduce excessive risk shifting (Daige \& Maloney, 1994)
- intuitively, if equity holders never receive any share in post-reorganization firm then managers have incentive to shift investments to high-risk projects when firm is in distress to "gamble for resurrection"
Ex-post:
- there is evidence that less than half of the directors of the distressed firms remain with their firms after reorganization and that these directors are less likely to serve on the boards of other publicly traded firms (Gilson, 1990)
- intuitively, these result suggest that board members are monitored for the performance of their firms and are penalized if their firms get into distress


## Equity Restructuring

- Equity restructuring is the process of reorganizing the equity capital
- Most problem firms face is debt. But sometimes it may be useful to reorganize your equity.
- Some common methods of equity restructuring include:
- Repurchasing the shares from the shareholders for cash (equity buy backs/repurchasing): helps in reducing the liability of the company to its shareholders resulting in a capital reduction by returning the share capital
- You use your own cash of the company to buy back some of the equity of your firm.
- Dual-class stock recapitalizations (DCRs)


## Dual-class Stock

- A company or stock with a dual-class structure has two or more classes of shares with different voting rights
- Typically insiders are given access to a class of shares that provide greater control and voting rights, while the general public is offered a class of shares with little or no voting rights
- The advantage: the fact they do not get voting rights is getting a compensation
- These types of structures allow to retain the control in the hands of long-term investors-insiders/founders-rather than the shorter-term-oriented investorsoutsiders/speculative traders-who is likely to force on short term gains
- Some investors buy equity and stay with the company a very long time.
- Other investors try to generate short term gains by day trading $\rightarrow$ these investors do not care about the voting rights because they will only be in the company for a short period of time. The negative impact is that if every investor is that way this will be bad for the firm, and no one would want to monitor the firm and exert some effort.
- That is why it makes sense to try different types of equity for different types of investors.
- Common stock for long term investors
- Preferred stock for short term investors
- ...
- Likewise, the DC stock can also be used by the managers to entrench their positions against takeovers so that they are not replaced (i.e., an anti-takeover mechanism)


## Empirical evidence

- the 90-day period preceding the announcement of a DCR represents a period of possible abnormal returns of more than $6 \%$ (Lease et al., 1984; Partch, 1987)
- in a narrow window of 2-3 days including the day of the announcement to issue limiting voting right common stock, the market response is about $1 \%$
- insignificant cumulative returns over the period from the announcement of intend to issue DC stock to approval by shareholder meeting
- thus, the shareholder wealth is not adversely affected by the adoption of a DCR


## Paradox of Entrenchment

- Why DCRs are approved by shareholders if their purpose is management entrenchment?
- If I need to issue allot of equity, as a manager I make this decision. I can decide whether to issue common equity or preferred equity. As a manager I would prefer to issue equity who has limited rights. Because they can't be punished then by equity holders.
- If this is true, why do the current equity holders the decision to issue stock which has limited right?
- the voting power of insiders (managers) is often not sufficient enough to explain the approval
- coordination failure on the side of shareholders (Ruback, 1988):

DC stock offer higher dividends in exchange for reduced voting right; because of the reduced voting rights and a consequent aggravation of the management entrenchment problem the stock price decreases lowering the value of shareholders; still, because shareholders cannot collude-that is, to coordinate their actions-and together resist the exchange of stock, they find it individually optimal to replace their full-voting-right stock with the DC stock conditional on other shareholders engaging in the same exchange (the "prisoner's dilemma")

## Side note: Coordination Failure in the "prisoner's dilemma"

Two members of a criminal organization-prisoners A and B, for short-are arrested and imprisoned. Each prisoner is in solitary confinement with no means of communicating with the other. The prosecutors lack sufficient evidence to convict the pair on the principal charge, but they have enough to convict both on a lesser charge. Simultaneously, the prosecutors offer each prisoner a bargain. Each prisoner is given the opportunity either to betray the other by testifying that the other committed the crime, or to cooperate with the other by remaining silent. The possible outcomes are:

- If $A$ and $B$ each betray the other, each of them serves two years in prison
- If $A$ betrays $B$ but $B$ remains silent, $A$ will be set free and $B$ will serve three years in prison
- If $A$ remains silent but $B$ betrays $A$, $A$ will serve three years in prison and $B$ will be set free
- If $A$ and $B$ both remain silent, both of them will serve only one year in prison (on the lesser charge)

What should $A$ and $B$ do?

- If A stays silent, $B$ is better off by betraying $A$ since $-1<0$
- If $A$ betrays $B, B$ is still better off by betraying $A$ since $-3<-2$
- so, whatever A does B should always betray!
- The problem is symmetric for A ( you can easily verify it)
- In equilibrium $A$ and $B$ both betray each other and end up in jail for 2 years; if they both were to keep silent they would then only spend a year in jail; but they fail to coordinate due to strategic interactions.
- the same mechanism is used in Ruback (1988) to justify the existence of DCRs despite the managerial entrenchment problem
- even though each shareholder will benefit from not issuing a DCL it is optimal that every shareholder talks with each other and agree to not replace with a DCL. But because they do not do that it is optimal for each one of them to replace it with a DCL.


## Exchange Offers: Empirical Evidence

- an exchange offer provides one or more classes of securities the right or option to exchange part or all of their holdings for a different class of securities of the firm
- e.g., change equity to debt or change debt for equity
- not an obligation
- an exchange offer is usually open for a month but often is extended
- generally, two types of exchange offers: Debt-to-equity swaps or equity-to-debt swaps
- On average, exchange offers of debt for equity-that is, replacing equity with debtare a positive signal

| TABLE 7 Exchange Offers with Positive Returns |  |
| :--- | :--- |
| P1. Debt for common stock (Masulis, 1983) | $+14.0 \%$ |
| P2. Preferred for common stock (Masulis, 1983; Pinegar and Lease, 1986) | $+8.2 \%$ |
| P3. Debt for preferred stock (Masulis, 1983) | $+2.2 \%$ |
| P4. Income bonds for preferred stock (McConnell and Schlarbaum, 1981) | $+2.2 \%$ |

Debt for common stock: you exchange equity for debt. When you make that announcement, the market sees this as a good signal. This is also the case for preferred stock to common stock, ...P4; the seniority of income bonds is higher than preferred stocks.
All these offers all about reducing equity or increasing debt. You always move from something which is $100 \%$ equity to something that is $100 \%$ debt or something that is like equity (preferred stock eg). When companies announce the exchange of equity for different types of debt instruments, the market takes it as a positive signal. Here you are densifying your equity and increasing the value per share.

- while, exchange offers of equity for debt—that is, replacing debt with equity-are negative, on average. If you want to decrease your equity for debt the market thinks this is a negative signal.

| TABLE 8 Exchange Offers with Negative Returns |  |
| :--- | :--- |
| N1. Common stock for debt (Masulis, 1983) | $-9.9 \%$ |
| N2. Private swaps of common for debt (Finnerty, 1985: Peavy and Scott, 1985) | $-0.9 \%$ |
| N3. Preferred stock for debt (Masulis, 1983) | $-7.7 \%$ |
| N4. Common for preferred stock (Mauslis, 1983: Pinegar and Lease, 1986) | $-2.6 \%$ |
| N5. Calls forcing debt conversion (Mikkelson, 1981) | $-2.1 \%$ |

- Why? The effect of what is replaced with what really depends on whether:
- leverage increases or decreases
- cash flows are expected to increase or decrease
- is stock under- or overvalued
- increase/decrease of management (insider) ownership
- increase/decrease of management's control over the use of cash
- positive/negative singling effects
- exchange offers of debt for equity_that is, replacing equity with debt
- increased leverage-> higher return on equity
- imply increase in future cash flows
- typically, the control over cash usage by management is reduced
- benefits of leverage: potential signaling with leverage \& tax shields
- exchange offers of equity for debt-that is, replacing debt with equity
- decreased leverage
- imply decrease in future cash flows
- typically, the control over cash usage by management is increased
- loss of tax shields


## Side-note: Swaps vs Exchange offer (not exam material)

- Equity-for-debt swaps involve the exchange of equity for debt in order to write off money owed to creditors
- They are usually conducted during bankruptcies, and the swap ratio between debt and equity can vary based on individual cases
- In a bankruptcy case, the debt holder is required to make the debt/equity swap, but in other cases, the debt holder may opt to make the swap, provided the offering is a financially favorable one
- The stock-for-debt swaps that differ from the exchange offers of stock for debt:
- The exchange offers: the holders of an entire issue, belonging to one class of securities, are offered the opportunity to exchange those securities for securities of a different class
- The stock-for-debt swaps: involves the open market repurchase of a portion of one or more debt issue and the issuance of stock is designed to achieve particular tax objective
- If the stock-for-debt swap could qualify as a "recapitalization," in which case the gains would not be taxable


## Required reading: <br> Just because a company needs restructuring-financial or operational-does not mean it will undertake the necessary reforms

Management and controlling shareholders may prevail for an extended period, during which time minority shareholders and/or creditors suffer an erosion of value. A number of East Asian corporations, saddled with debt, nearly collapsed during the financial crisis of 1997. Many have managed to avoid both repayment and restructuring, however, and remain overly indebted and invested in unprofitable businesses. How could this happen? See Corporate Restructuring in East Asia: Promoting Best Practices by William P. Mako. $->$ the link:
https://www.imf.org/external/pubs/ft/fandd/2001/03/mako.htm
(also provided on Toledo)

## Lecture 9: Going private \& leveraged buyouts

## Required and Voluntary Readings for This Lecture

- this lecture is based on chapter 16 from the text book (WMM)
- required reading: read Chapters 16 from WMM (Note: chapter's appendix is not the part of the required reading)
- additional required reading is provided at the end of the lecture slides and on Toledo
- voluntary reading is provided on Toledo as well

We will talk about leveraged buyouts in the context of a corporate restructuring.

## In this lecture

- Going Private and LBO/MBO
- Private Equity
- Historical Overview of LBO Market
- LBO Deal Structure
- Stage of LBO
- Exist Strategies of LBO
- Empirical Evidence on LBOs
- LBO and Value Creation


## Going Private and LBOs

- Going private is the opposite of going public and refers to the transformation of a public corporation into a privately held firm
- A leveraged buyout (LBO) is the purchase of a company by a small group of investors using a high percentage of debt financing


## Going Private

- The term going private refers to a transaction or series of transactions that convert a publicly traded company into a private entity
- Once a company goes private, its shareholders are no longer able to trade their shares in the open market
- There are several types of going private transactions, including private equity buyouts, management buyouts, and tender offers
- A company typically goes private when its shareholders decide that there are no longer significant benefits to being a public company = active decision
- Also, a passive decision exists when a company is taken over


## Why Going Private?

- The firm can delist itself because it is no longer values the benefits provided by being publicly traded (see Lecture 6)
- As a result of takeover by a private company
- A distress publicly traded company can be taken private (by either a private equity company or its management) for restructuring purposes to be later sold or to taking through an IPO ( $\rightarrow$ topic of this lecture)


## Going Private: Private Equity Buyout

- In this transaction, a private equity firm will buy a controlling share in the company, often leveraging significant amounts of debt (i.e., LBO)
- In doing so, the private equity firm secures these debts against the assets of the company being acquired
- The interest and principal payments on the debt are then paid for using the cashflows from the business


## Example

- In December 2015, the private-equity group JAB Holding Company announced its plans to acquire Keurig Green Mountain. Unlike many private-equity buyouts, this was an all-cash offer
- The offer priced the shares at $\$ 92$, a nearly $80 \%$ premium over their market value prior to the announcement
- Unsurprisingly, the share prices rose dramatically following the announcement and the company accepted the offer shortly thereafter
- The transaction was completed in March of the following year
- The company's shares ceased trading on the stock market and Keurig
- Green Mountain became a private company

Going Private: Management Buyout

- Another common method is the management buyout transaction (MBO), in which the company is taken private by its own management team
- The main reason for a management buyout (MBO) is so that a company can go private in an effort to streamline operations and improve profitability.
- In a management buyout (MBO), a management team pools resources to acquire all or part of a business they manage
- Funding usually comes from a mix of personal resources, private equity financiers, and seller-financing (the seller receives the payment later from the profits of the sold company over 2-7 year horizon)
- A management buyout (MBO) stands in contrast to a management buy-in, where an external management team acquires a company and replaces the existing management
- Why would managers do an MBO? The management knows already allot of the firm and they might know things that others don't. It then makes sense that they will be the owner of the company.


## Private Equity (PE)

- Private equity is an alternative investment class and consists of capital that is not listed on a public exchange
- When you think about capital in general, we always think that it is either debt or equity (obviously with different types of equity and debt). But you could also classify capital from sources; equity from a group of investors on stock market VS one investor who invests allot of money into your firm, this person will be able to monitor you better. PE comes from a unique source.
- Think for example at venture capital; even though it is equity it is different. Here you want to identify firms who has great ideas and providing them allot of capital.
- With PE you identify companies that are not doing so well and you try to restructure them and selling them afterwards for a higher price.
- PE hold large portion of the market: Roughly $\$ 3.9$ trillion in assets were held by private equity (PE) firms as of 2019, and that was up 12.2 percent from the year before
- Private equity is composed of funds and investors that directly invest in private companies, or that engage in buyouts of public companies, resulting in the delisting of public equity
- Private equity investment comes primarily from institutional investors and accredited investors, who can dedicate substantial sums of money for extended time periods
- In most cases, considerably long holding periods are often required for private equity investments in order to ensure a turnaround for distressed companies or to enable liquidity events such as an initial public offering (IPO) or a sale to a public company

Some well-known PE funds worldwide


## Advantage and Disadvantage of PE Financing

+ It is favored by companies because it allows them access to liquidity as an alternative to conventional financial mechanisms, such as high interest bank loans or listing on public markets
+ Certain forms of private equity, such as venture capital, also finance ideas and early-stage companies

When you think about PE you think they just provide funds. This is not exactly
true; a degree of specialization is much more difficult for venture capital than PE. With venture capital you commit also to advise and monitor.

+ In the case of companies that are de-listed, private equity financing can help such companies attempt unorthodox growth strategies away from the glare of public markets

Let's say you want to implement a competitive advantage; it is much more difficult when you are public because you have to disclose allot of information. When you are private this is not the case.

- It can be difficult to liquidate holdings in private equity because, unlike public markets, a ready-made order book that matches buyers with sellers is not available If you give a portion of your money to a company you have allot of risk, you don't know if you can easily sell the company at the end.
- Pricing of shares for a company in private equity is determined through negotiations between buyers and sellers and not by market forces, as is generally the case for publicly-listed companies
- the rights of private equity shareholders are generally decided on a case-by-case basis through negotiations instead of a broad governance framework that typically dictates rights for their counterparts in public markets

Public versus Private Equity

- is there advantage of private equity-controlled businesses offer over public ownership?
- When some news is revealed like an M\&A this would have an effect on the price of equity of a publicly traded firm. And therefore, the stock prices are a great indicator of how the firm is doing. So, in a way markets exert monitoring on the company because if the company does well the share prices go up and otherwise something else will happen.
- You could then argue that PE is inefficient in normal times, but PE is used in abnormal times.
- private ownership of a firm may better mitigate some agency problems in corporate governance:
- A private equity investor with a controlling interest in a firm may be able to provide a high level of management oversight and put in place an effective corporate governance structure
- By contrast, some large investors in public companies are restricted under securities commission regulations from active management participation or board representation as this would make them insiders
- Private equity firms also seek to limit inefficient use of free cash flows (in a firm acquired through an LBO, a larger share of operating cash flows is used to service debt payments)
- Finally, the private equity model may promote long-term decision-making as the requirement to meet short-term earnings expectations is avoided


## Types of PE

Private equity firms raise money from institutional investors and accredited investors for funds that invest in different types of assets. The most popular types of private equity funding are:

- Distressed funding (Vulture Financing): invests in troubled companies with underperforming business units/assets to turn them around by making necessary improvements and sell later for profits
- Really specializing in companies that are distressed
- Leveraged Buyouts: most popular type of PE involving buying out a company completely with the intention of improving its business and financial health and reselling it for a profit to an interested party or conducting an IPO
- Here it is really about providing equity to the firm but the rest of financial muscles really comes from debt
- Real Estate Private Equity: typically targets commercial real estate
- Fund of funds: focuses on investing in other funds, primarily mutual funds and hedge funds (offer a backdoor entry to an investor who cannot afford minimum capital requirements in such funds)
- Venture Capital: technically is a PE but is very different from other types: funding goes to startups or other young businesses that show potential for long-term growth


#### Abstract

Here you have PE groups that have a record of dry powder (how much cash PE funds have). You have here the different types of PE. The point of this table is that the LBO are the largest.


US LBOs then and now
Horizontal axis = time
Vertical axis = red line and green line
We see the boom-and-bust cycles of LBOs activities. In the 1980 there was a huge volume of LBOs. Before the financial crisis there was allot of LBOs. They became not so popular but quite steady in 1990-2000.



Leveraged Buyouts-Historical Overview

- The stylized view is that buyouts are a tool for extracting value through reorganization by streamlining low-growth public firms that have stable cash flows
- Why using allot of debt? You promise collateral to debtholders namely future cashflows. Debt is a cheaper type of funding.
- Younger public firms experiencing weak financial interest from security analysts and low investor recognition are also more likely to go private (founders and managers of these firms with insufficient analyst following had the opportunity to ascertain firsthand the costs and benefits of both private and public ownership, and they decided to go private again)
- The dramatic surge in LBO activities in the 1980s was made possible by the emergence of the high-yield bond market as the dominant source of financing for speculative-grade debt
- While default was very rare among LBO firms in the early 1980s, by the end of the decade, excess speculation and overpriced deals became quite pervasive (lots of failures to actually implement the improvements in these LBOs)
- Following several high-profile corporate bankruptcies, the junk bond market imploded in 1989
- After the collapse of the junk bond market, interest in LBOs cooled off considerably in the 1990s
- Facing new, more stringent risk-weighted capital requirement rules (Basel I) and more intense regulatory scrutiny, commercial banks also contributed to the declining interest in buyouts by refusing to finance deals
- Basel requirements for commercial banks was implemented which restricted banks to give funds for LBOs which contributed to the decrease in LBOs
- The resurgence in the volume of LBO deals in the mid-2000s was spurred by the growing pool of private equity firms that raised capital from large institutional investors
- The emergence of asset-backed securitization also radically changed the funding of LBOs as the buyout market transitioned from high-yield bond financing to financing conducted largely through syndicated leveraged loans
- At the peak of the LBO market in 2007, collateralized loan obligation securities provided close to two-thirds of the funding for the institutional loan issuance
- Despite the collapse of the asset securitization market, buyout activities have slowly reemerged over the last few years
- In many ways, the LBO market has performed considerably better in the years following the recent financial crisis than it did in the wake of previous downturns
- For example, the collapse of the junk bond market in the late 1980s was more onerous for LBO sponsors that struggled to find alternative sources of financing for many years


## LBO's after the Financial Crisis and Until Present

The total years of LBOs transaction volume.
We see that the decline here corresponds to the decline in the other graph with the green balks.

Volume: Total US LBO transaction volume


## The Profile of LBO Targets

- LBOs - as takeovers - are a mechanism for disciplining inefficient corporate organizations and realigning the interests of stockholders and management
- Agency problems - that is, conflicts of interest between stockholders and management - are more prevalent in low-growth stable firms with substantial free cash flows
- Managers of these firms are more likely to squander these cash flows on unprofitable investment projects
- LBOs mitigate these agency conflicts by enabling managers to own a larger stake in the firm and enhance managerial discipline through the high debt service imposed on the firms
- The downside of greater leverage, however, is that it also raises default risks for debtloaden buyout targets that become more vulnerable to economic downturns and industry-specific shocks
- The importance of these firm features is seen in the table below, which shows that buyout targets generated significantly greater free cash flow and had lower investment spending than did their non-LBO peers over the last three decades

Buyout firms have higher free cash flow and lower capital expenditures

|  | Buyout Firms/ <br> Firms Going Private | Other <br> Non-Buyout Firms | Difference |
| :--- | :---: | :---: | :---: |
| $1980-89$ |  |  |  |
| Free cash flow ratio | 0.081 | 0.029 | $0.052^{* * *}$ |
| Capital expenditure ratio | 0.096 | 0.155 | $-0.059^{* *}$ |
| $1990-99$ |  |  |  |
| Free cash flow ratio | 0.049 | -0.018 | $0.067^{* * *}$ |
| Capital expenditure ratio | 0.103 | 0.133 | $-0.030^{* * *}$ |
| 2000-12 |  |  |  |
| Free cash flow ratio | 0.041 | -0.017 | $0.058^{* * *}$ |
| Capital expenditure ratio | 0.272 | 0.462 | $-0.190^{* *}$ |

Sources: Thomson Reuters, SDC databases; Standard and Poor's Capital IQ; Compustat; authors' calculations.
Note: Free cash flow ratio = after-tax net cash flow minus dividends and interest payments divided by net sales; capital expenditure ratio = capital expenditures divided by net sales.
*-Significant at the 1 percent level.

- Starting in the 1990s, the corporate sector experienced more proactive monitoring by institutional investors
- Managerial compensation was increasingly tied to performance as a significant portion of a chief executive officer's pay was awarded in stock
- All these improvements in corporate governance should have lessened the need for buyout discipline
- Thus, the resurgence of LBOs in the 2000s suggests that these transactions might also be motivated by several other factors - for example, the desire to avoid regulatory costs and shareholder scrutiny, or the use of debt financing to lower tax obligations
- many of the companies electing to go private did so only about five years after they went public for the first time (Mehran and Peristiani, 2010)
- the desire among these relatively young firms to go private is attributable to their inability to attract sufficient financial visibility, measured by analyst coverage
- One of the potential benefits of going public is that these firms would be more closely monitored by security analysts that collect and disseminate valuable information to investors
- Financial visibility is very important for younger, less known public companies
- Firms that go public strive to reach an optimal scale of financial recognition to compensate for the costs of public ownership
- Mehran and Peristiani (2010) show that firms that do not fully realize the benefits of their public listing are more inclined to go private

LBO Soon After IPO \& the Number of Analysts
Number of Security Analysts after Initial Public Offering


Sources: Thomson Reuters, SDC and I/B/E/S databases.
Note: IPO is initial public offering: LBO is leveraged buyout.

## LBO Deal Structure



This is a schematic picture of what an LBO looks like. The acquirer is a shell company = a company created for the sole purpose to acquire the target company. For this company to be able to buy the target it needs cash/assets. Some capital is also needed to back this cash. Where does this come from? PE funds. This fund supplies equity to this shell company so that this shell company has its own capital. (You could say that the PE fund creates this shell company). The shell company will also raise allot of debt which comes from a variety of sources (senior debt, underwriters of loans, a syndicate of banks ...). In order for a bank to be not so hard exposed to the risk of this shell company it could create a syndicate of banks.

Securitization: equity comes from the equity fund, some of the debt comes from banks. This debt is senior in terms of claims. Is there some kind of guarantee/collateral that this shell company can give to the bank? Because they don't have any machines or something else... this shell company could issue securitized obligations; (you can assess the riskiness of the CF of this target company), where you can create high-medium-low risk securities; the risk of these securities comes from the underlying CF of the company. (see explanation below)

## $\rightarrow$ opname bekijken

## GPs and LPs

- At the heart of the private equity fund are General Partners (GPs) and Limited Partners (LPs)
- General Partners (GPs) sponsor and manage private equity funds but they need capital to invest and to get the deal done
- Limited Partners (LPs) are the investors committing capital to those funds; There are two types of LPs:
- Institutional LPs (pensions, foundations and endowments)
- Wealthy individuals and families
- The relationship between GPs and LPs requires a careful balance of caution and trust. The limited partnership agreement governing the fund must provide a commercial relationship that will last for at least ten-plus-two years.
- These two get dividends from the PE funds. If the transaction is successful, then there will be allot of cash and maybe they will receive dividends. But if otherwise happens than they are exposed to allot of risk and losses.

Role of CLOs and other investment vehicles

- Securitization vehicles have play an important role in the growth of the leveraged loan market
- The leveraged loan is a type of loan that is extended to companies or individuals that already have considerable amounts of debt
- Collateralized loan obligation (CLO), securities that are backed by a pool of loans, have been part of a broader class of securitization and securitization vehicles that have contributed to a strong demand for leveraged loans
- When you do securitization from an economic point of view it is repacking risk so that you have different levels of risk. But the way to do it is to create another shell company which on his asset side it will have repacked CFs of the other company ...
- CLO: senior tranches and mezzanine tranches


## 4 Stages of LBO

1. Planning and fund raising. Financing: $10 \%$ from PE and about $50-60 \%$ bank loans, balance from senior and junior debt. Also, at this stage set up management incentives: stock price-based incentives (options, etc.)
2. Take firm (target) private. This is achieved either through stock acquisition or asset acquisition. If you buy the assets than you buy also the liabilities attached to it. It is usually problematic because the type of assets you typically want to buy are difficult to detach from its liabilities. After acquisition, the new owners would typically sell off parts of acquired firm to reduce debt. Again, you buy a company which has some problems so you will need to restructure it.
3. Cash flow improvement attempts. These are achieved by cutting operational costs and spending; delaying of capital expenditures; trying new marketing to increase revenues.
4. After this you will sell the company to external investors who take it public. Take the firm public again: Secondary IPO or SIPO because it was initially a public company. Investors reaching SIPO realize about the average annual return of a whopper $260 \%$ on their LBO investment (Muscarella and Vetsuypens, 1990). You could also sell this to another PE or another investor who specializes in this.

## Exit Strategies in LBO (stage 4)

Private equity investors need to recover their investment. Typically, it takes about 5 years after the deal to exit it. The typical exist strategy include:

- (S)IPO
- Sell the company to other company in the industry (strategic buyer")
- Secondary buyout (SBO): sell it to another buyout firm


Noes Bankuptices
Source: Dealogic

Here you can see the strategies and how frequent they are in relative terms. When you are doing this through an IPO this means that you sell all the shares. The strategic ones are the most frequent one which makes sense because who would value more these companies?

Would you rather sell to someone who commits to it long run or short run? Short run is mostly speculative buyers and will have the lowest possible price. For a long-term investor, the small changes in prices are not that material because he will hold it for a long time. This long-term investor is someone who understand the underlying business. So, it makes sense to sell it to someone who understands the industry and stays with the company a long time. Sponsor-to-sponsor transactions: if you want to exit the transaction but it turns out to be harder than you thought, so then it makes sense to just go to another sponsor.

Empirical Evidence on LBOs from the 80s

- DeAngelo et al. (1984): announcement effect of $+22 \%$ AR and the premium paid of $56 \%$ above the average stock price during the 2 months before the deal
- Lehn \& Poulsen (1989): announcement effect of $+20 \%$ AR and leverage (debt-toequity ratio, $D / E$ ) increases from $46 \%$ ( $=31.5 \%$ debt-to-total assets) to $552 \%$ ( $=84.7 \%$ debt-to-total assets)
- Lowenstein (1985): MBOs premium paid of $56 \%$ above the average stock price during the month before the deal; premium increases with the number of bidding parties: $69 \%$ on average if there are 3 or more bidders
- Hite \& Vetsuypens (1989): divisional MBOs: average division sold represents $16.6 \%$ of the parent's market value; announcement effect parent: $+0.55 \%$ AR
- Andrade \& Kaplan (1998): high-leveraged LBOs; Pre LBO: EBITDA/interest ratio $=7.95$ while post LBO it is 1.16; moreover, almost $1 / 3$ of high-leveraged deal leads to financial distress meaning that not all those LBOs are successful, they have allot of risk. (The kind of sample that these papers analyzed was a booming period of LBOs.)


## Recent evidence

Guo, S., Hotchkiss, E. S. and Song, W. (2011), Do Buyouts (Still) Create Value?, Journal of Finance, 66:479-517
US LBO's with deal value $>\$ 100$ million in the period 1990-2006

| Year | No. of LBOs | Capital <br> (\$mil) | EBITDA to Capital (\%) | Market EBITDA to Capital (\%) | EBITDA to Capital Less Market EBITDA to Capital (\%) | Premium (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Full sample |  |  |  |  |  |  |
| 1990-1996 | 14 | 380.1 | 10.83 | 10.53 | 0.90 | 30.3 |
| 1997 | 15 | 399.7 | 8.76 | 8.59 | 0.18 | 25.0 |
| 1998 | 16 | 319.5 | 10.77 | 7.97 | 2.62 | 24.8 |
| 1999 | 33 | 350.6 | 12.51 | 6.98 | 5.46 | 28.7 |
| 2000 | 19 | 486.2 | 15.06 | 6.69 | 8.37 | 50.0 |
| 2001 | 6 | 386.3 | 18.65 | 7.81 | 10.85 | 44.6 |
| 2002 | 11 | 538.3 | 14.11 | 8.19 | 5.74 | 33.7 |
| 2003 | 9 | 237.0 | 10.91 | 7.69 | 2.92 | 42.2 |
| 2004 | 14 | 1,827.3 | 11.18 | 7.47 | 3.71 | 18.2 |
| 2005 | 29 | 647.6 | 10.54 | 7.72 | 2.86 | 29.5 |
| 2006 | 26 | 1,231.2 | 8.95 | 8.23 | 0.86 | 20.7 |
| Total, 1990-2006 | 192 | 463.7 | 11.37 | 7.72 | 3.45 | 29.2 |

## LBO and Value Creation

- Tax advantages (increased deductibility of interest payments, accelerated depreciation, etc.)
- Allot of debt financing and that is cheap therefore the effective cost of debt is lower because it is tax deductible. (See earlier)
- the larger the potential advantages, the larger the premium
- substantial part of bid premium can be recovered through tax advantages
- Management incentives \& agency costs
- LBO/MBO increases managerial ownership and concentration of ownership: this is a good thing, the more ownership concentrated in the hand of managers the more the managers incentives are aligned with those of the shareholders
- better alignment of the interests of managers and shareholders: more incentives for management to spend effort, lower agency costs
- less asymmetric information problems: because managers are the party that are more involved than the rest, they know more, and if they hold a big portion of equity than effectively, there is less asymmetric information
- less free cash flow problems thanks to high leverage: again, this was the situation were managers abused the availability of free cash in the company to increase the perks
- the bottom line is that if they are the owners, they will take less action that go against that of shareholders
- empirical evidence:
- Kaplan (1989): managerial shareholdings triple post-LBO
- Muscarella \& Vetsuypens (1990): almost all LBO companies have extensive management incentive plans, management increases operational efficiency: sales and profits grow
- Lehn \& Paulsen (1989): higher premia are paid for companies with higher likelihood of free cash flow problems
- Advantages of being a private company:
- focus on long term goals because your stock is not traded on the stock market which means that you don't have to focus on daily things that impact your stock price. You pay less attention to unnecessary movements that are due to speculation.
- frees up management time
- reduces communication needs
- Wealth transfer from debt (bondholders, preferred stockholders) to equity
- massive increase in leverage lowers the value of existing debt instruments, despite the existence of covenants (any kind of restriction that is attached to a security)
- empirical evidence: losses for bondholders are statistically significant, but are quite small compared to the gains of shareholders
- Wealth transfer from employees to shareholders
- limited evidence: LBOs do sometimes result in reduction of employment
- Wealth transfer from taxpayers to shareholders
- increased deductibility is compensated by capital gains tax paid by selling shareholders in the LBO and SIPO deals; more taxes paid after leverage is reduced
- Asymmetric information: transfer from outsiders to insiders
- when you think about transfers, think about the parties involved: equity and debt holders. When you talk about wealth transfers between them than someone is losing, and someone is gaining. An example is you have debtholders in a company and the company is not doing well, then in this case equity holders will try to top up equity and improve the situation. By doing that they increase the likelihood that the company does not fail but they help also allot the debtholders. So even though equity holders try to improve the situation, most of the benefit will transfer to the debt holder because the probability of default declines.
- insiders have more information about the true value of the company: premium is too low (underpricing)


## LBO and Value Creation: Post Buyout

So, the bottom line is that there is sufficient empirical evidence that LBOs do create value. This value comes from excessive use of debt because this is cheaper than equity. So, whatever improvements you implement you do it at a lower cost. Second thing is the alignment of objective between shareholders and managers, therefore whatever implementations that are done are aligned with the firm.

- Comparison of LBO firm value and SIPO
(Muscarella and Vetsuypens, 1990)
- Median change in firm value was $89 \%$
- Median annualized rate of return was $36.6 \%$
- Correlated with ownership share of management
- Comparison with S\&P (Kaplan, 1991)
- Median excess return 26.1\% higher in LBO
- Excess return similar to premium earned by prebuyout shareholders
- Excess return relates to change in operating income, not to potential tax benefits
- Performance (Degeorge, Zeckhouser, 1993)
- Year before SIPO, $6.9 \%$ rise in industryadjusted operating performance
- Year following, 2.59\% decline
- Evidence of information asymmetries management will SIPO in exceptional years
- CAR of $\mathbf{4 . 7 \%}, 22.0 \%, 21.1 \%$ in first 3 years after SIPO - most of gains due to firms taken over (Mian, Rosenfeld, 1993)
- Firms outperform industries in 4 years following SIPO (Holthausen, Larcker, 1996)
- Reduction of leverage loosened cash constrair
- Capital expenditures increased

Guo, S., Hotchkiss, E. S. and Song, W. (2011), Do Buyouts (Still) Create Value?, Journal of Finance, 66:479-517

| Outcome | Capital | $N$ | Nominal Return |  |  | Market- and Risk-Adjusted Return |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Mean | Median | \# of Positive Returns | Mean | Median | \# of Positive Returns |
| 1. IPO | Pre | 28 | 232.6\%*** | 150.7\%*** | 28 | 172.6\%*** | 103.4\%*** | 26 |
|  | Post | 28 | $152.0 \%^{* * *}$ | 87.4\%*** | 27 | 127.3\%*** | 66.9\%*** | 26 |
| 2. Acquired | Pre | 15 | 115.4\%*** | 96.6\%*** | 13 | 76.4\%** | 47.0\%** | 13 |
|  | Post | 15 | 68.9\%** | 51.0\%** | 12 | 48.1\%** | 22.2\% ${ }^{\text {* }}$ | 12 |
| 3. 2nd LBO | Pre | 13 | 132.6\%*** | $112.4 \%^{* * *}$ | 12 | 92.9\%*** | 94.4\%*** | 11 |
|  | Post | 13 | 102.1\% ${ }^{\text {*** }}$ | 76.0\%*** | 12 | 70.5\%*** | 64.4\%*** | 12 |
| 4. Chapter 11 | Pre | 14 | -24.2\% | -25.5\% | 4 | -40.0\%** | $-36.5 \%$ ** | 2 |
|  | Post | 14 | -48.8\% ${ }^{\text {*** }}$ | $-53.5 \%^{* * *}$ | 3 | $-54.1 \%^{* * *}$ | $-59.7 \%^{* * *}$ | 1 |
| 5. Still private or unknown | Pre | 20 | 184.0\%*** | $135.7 \%^{* * *}$ | 20 | 105.1\%*** | 86.5\%*** | 20 |
|  | Post | 20 | 111.3\% | 74.3\%*** | 19 | $62.4 \%^{* * *}$ | 43.1\%*** | 17 |
| Total (1-5) | Pre | 90 | 147.9\%*** | 105.2\%*** | 77 | 97.0\%*** | 72.5\%*** | 72 |
|  | Post | 90 | 90.7\% ${ }^{\text {*** }}$ | 65.5\%*** | 73 | 63.3\%*** | 40.9\%*** | 68 |
| Total(1-4) | Pre | 70 | 137.5\%*** | 95.8\%*** | 57 | 94.7\%*** | 68.7\%*** | 52 |
|  | Post | 70 | 84.8\%*** | 64.5\%*** | 54 | $63.5 \%$ *** | 38.8\%*** | 51 |

When the PE exists, by selling the target through IPO or acquired by someone else in the industry, ...
Even though IPO is relatively rare as an exit strategy, this gives the highest return. Although the selling to another industry is very common it gives you the less return based on this paper.

Required reading
Apart from chapter 16 in the text book I would like to invite you to read the following paper: Guo, S., Hotchkiss, E. S. and Song, W. (2011), Do Buyouts (Still) Create Value?, Journal of Finance, 66:479-517
The paper is provided on Toledo
$\rightarrow$ you need to know the main message: introduction, sections about hypothesis and results, more complicated parts you do not need to read.

## Lecture 10: Share repurchase

Required and Voluntary Readings for This Lecture

- this lecture is based on chapter 17 from the text book (WMM) I
- the following pages from the text constitute the required reading: read pp. 446-470 (skip "Accounting Treatment of Share Repurchases") and pp. 474-476: Section "Related Dividend Studies" I
- additional voluntary reading is provided at the end of the lecture slides and on Toledo


## In this lecture

- Share Repurchase Activities
- Reasons for Buybacks
- Major Types of Share Repurchase
- Empirical Evidence on Share Repurchase
- Undervaluation and Share Repurchase
- Share Repurchase vs. Dividends

The idea is that as a company you are publicly traded and you happened to have 100 shares outstanding. You might as a company decide to decrease to number of shares and decide to go to the market and buy your own shares. If I buy my own share than I will be able to cancel them out. Your equity on the balance sheet will decrease and the numbers of shares outstanding also.

Why would companies want to do it? When does it make sense? Is it different from dividends?
If I buy my own share of someone back than I pay to this person all future dividends of the share (because a share price is an NPV discounted future cashflows). How is this then different from dividends?
Why would you buy your equity back if it resembles paying out dividends?

## Share Repurchase Activities

- Share repurchases are cash offers made by companies for outstanding shares of their own common stock
- How is share repurchase different from paying out dividends?
- Consider a firm with two types of assets: cash C and other $A-C$ other assets, so the total assets are A
- Furthermore, suppose the firm has debt $D$ and book equity $E$
- Suppose the firm uses its cash to payout a dividend $d=C$; what happens to firm's balance sheet?
- Its total assets become $A-C$ and equity $E-C$; note nothing happens to debt $D$
- Let's say as a company you pay out dividends. You have Assets A on your balance sheet which also consists of cash C. If I want to pay dividends, then I use this cash. This means I reduce C. This reduces your active side so on the passive side your equity should go down. The value of $C$ goes down and the ability of you paying dividends go down so equity goes also down.
- What happens to our firm if instead it buys back some of it shares?
- Let's say the firm has $N$ shares and the "effective" price per share is $P$
- Given the cash reserve $C$ at most the firm can repurchase $n(P, C)<N$ where $n(P, C)=$ $C / P$ (from $C=n P$ )
- in this case, its total assets are $A-C$ and book equity is $E-C$
- At first glance, there is no difference whether the cash reserves are used to payout dividends or to repurchase outstanding shares...
- ...except that in the first case we still have $N$ shares outstanding while in the second case only $N-n(P, C)$
- You again have Assets A and cash C, Debt D and Equity E. You have N shares and the price per share is i. You use your cash to buy these stocks. If the price is high than there is a limited amount that the firm can buy back. The amount you can buy back is C/P; if you use all your cash to buy $n$ shares than you can't buy more than C. Imagine I use the entire C to buy $n$ shares. If I spend some amount of C let's say e than C-e. This part e will convert to equity shares that I add to my asset side. But I buy them back so this cancels out on my asset side. So, on the passive side my equity goes down with e.
- Suppose that the net income (profits) next period (after dividends payout or shares buyout) is $\pi$; what are the earning per share in the first and second cases?
- in the first case it is $\pi / N$, while in the second it is $\pi /(N-n(P, C))$
- What if instead the firm uses a fraction $q$ of its cash reserves to repurchase its shares and the remaining cash is used to pay out dividends?
- The dividend per share is: $(1-q) C /(N-n(P, q C))$
- If you use q share of your cash to repurchase back shares and the rest you use as a payment for dividends, then your dividend per share will be what cash is left of your firm for the purpose of dividends/the number of dividends.
- The dividend per share without the buyback is $\mathrm{C} / \mathrm{N}$
- Which is better? Depends on $P$, how many shares you will be able to buy back depends on the price and the number of shares:
- If $P$ is "low" (i.e., the company is undervalued) then the per share dividend following the buyback can be higher than C/N. Then it makes more sense to buy back instead of paying dividends because they can increase the value of the company. If the share prices are priced perfectly in this context, it should not matter than.
- What do we learn from all that? Two important reasons behind stock buyouts:
(a) signaling that stock is undervalued and
(b) increasing dividends per share for "more informed investors"


## Reasons for buybacks

a. To signal that a stock is undervalued

If a company's management believes that the company's stock is undervalued, they may decide to buy back some of its shares from the market to increase the price of the remaining shares.
b. To distribute capital to shareholders with a high degree of flexibility in the amount and time Dividend payments do not provide much flexibility to the company's management since they must be paid on certain dates, and all common shareholders must be paid. On the other hand, stock buybacks generally provide a high degree of flexibility since they do not specify the amounts that must be paid or dates when the transactions must occur. Suppose for some reason you want to favor one investor from the others. In that case you could basically achieve this with a stock buyback. When you sell the stock, it is like a terminal dividend, the only investors who enjoy this dividend is the one who sells it.
c. To take advantage of tax benefits

Stock buybacks can be a great alternative to dividend cash payments in countries in which the capital gain tax rate (money that shareholders receive from the stock buyback are treated as capital gains) is lower than the dividend tax rate.
Now the question is are the capital gains higher or lower? If the capital gain tax is higher than the tax that you pay on income dividends than it might be easier to pay dividends.
(If the fiscal authority comes investigating why you opt for a stock repurchase instead of a dividend, then you can be guilty of tax evasion, so firms need to be careful. But you can't always easily prove it in all cases.)
The thing is that you can play with capital gains. As a company if I pay dividend to the investor, this investor pays tax on this income. At the same time as a company if I buy back this stock from the investor, this investor might still generate profit, then on the capital gain it will have to pay tax on it. This tax can be different than the tax on dividends (which is higher in BE ).
d. To absorb the increases in the number of shares outstanding due to the exercise of stock options
Companies that offer stock options as a part of compensation packages to its employees commonly initiate stock buybacks. The rationale behind the practice is that when the company's employees exercise their stock options, the number of shares outstanding increases. In order to maintain optimal levels of shares outstanding, a company buys back some of the shares from the market.
e. To use as a hostile takeover defense

If there is a threat of a hostile takeover, the management of a target company can buy back some of its shares from the market as a defense strategy. The goal of the defense strategy is to diminish the acquirer's chances of obtaining a controlling interest in the target company.

## Historical data: Buyback Boom

In terms of size, buybacks are larger than dividends. They are also much more volatile than dividends. When you think about the volatility of buybacks, it perfectly correlates with the market. From 2004Q4 onwards there was a very strong growth in share repurchases

- Corporate profits have never been higher
- Interest rates are low (substituting equity by debt is cheap)
- Shareholder activism: you try to mobilize more shares in the hand of large shareholders



## Major Types of Share Repurchases

1. Fixed-price tender offers (FPTs)
2. Dutch auction repurchases (DARs)
3. Transferable put rights (TPRs)
4. Open-market repurchases (OMRs)

## Fixed-Price Tender Offers

- A company makes a tender offer to the shareholders to buy back the shares on a fixed date and at a fixed price
- The price of the tender offer almost always includes a premium relative to the current share price
- Those shareholders who are interested in selling their stocks submit their number of shares for sale to the company
- Generally, a fixed price tender offer can allow completing a stock buyback within a short period of time (advantage)

Stock repurchase model (Vermaelen, 1981):

- Assumptions: efficient markets, no asymmetric information, perfect competition, wealth maximizing investors, etc.
- Value of company after repurchase =
value of company before repurchase - value paid to selling shareholders + value created by repurchase: $P_{E} N_{E}=P_{0} N_{0}-P_{T}\left(N_{0}-N_{E}\right)+W$
Where:
- $P_{E}$ is price after repurchase
- $P_{0}$ is price before repurchase
- $P_{T}$ is FPT offer price
- $N_{E}$ is the number of shares after repurchase
- $N O$ is the number of shares before repurchase
- $W$ is FPT value creation
$\mathrm{P}_{0} \mathrm{~N}_{0}=$ value of the firm before repurchase
$P_{T}\left(N_{0}-N_{E}\right)=$ value paid to selling shareholders
- The equation can be rewritten as

$$
\begin{aligned}
\frac{W}{N_{0} P_{0}}= & F_{P} \frac{P_{T}-P_{0}}{P_{0}}+\left(1-F_{P}\right) \frac{P_{E}-P_{0}}{P_{0}} \\
& \text { Value from selling } \quad \text { value of shares that we don't sell }
\end{aligned}
$$

where $F_{P}=\frac{N_{0}-N_{E}}{N_{E}}$ is the proportion of repurchased shares

- Thus, value creation is split between selling (tendering) and non-selling (nontendering) shareholders
- Example: Comment \& Jarrell (1991)
- average percentage of shares repurchases: $14 \%$
- average premium paid: 16\%; average abnormal return on remaining shares: $+11 \%$
- value creation $(\%)=0.14 \times 0.16+0.86 \times 0.11=2.24 \%+9.46 \%=11.7 \%$


## Dutch auctions

- A company makes a tender offer to the shareholders to buy back shares and provides a range of possible prices, with setting the minimum price of a range above the current market price
- the shareholders make their bids by specifying the number of shares and the minimum price at which they are willing to sell their shares
- The company reviews the bids received from the shareholders and determines the suitable price within a previously specified price range to complete the buyback program
- The main advantage of the Dutch auction is that it allows a company to identify the buyback price directly from shareholders: the advantage is that during the auction you try to identify the right price. That's why auction is a mechanism that allows you to identify the right selling price. Shareholders submit a bid and those bids are informative and it shows how much they are willing to pay.
- Using such a method, the stock buyback program can be completed within a relatively short time frame


## Example (from textbook)

- A company has 1000 shareholders who each own 1 share; current price $=\$ 80$
- Value function: $V(r)=80+0.04 r$
- DAR conditions: 200 shares (20\%) at [\$84-\$90]
- Since we know how many shares will be sold and $200 \times 0.04+80=88$
- Profit for selling shareholders: $0.5 \times(88-80) \times 200=\$ 800$


If you try to average the supply curve, the idea is that if no one tenders their shares the price would be 80 and this is the price before the announcement. If you want to buy 200 shares than the 200 share will be the lowest reservation price.

- Price which is paid (clearing price) is the same for all selling shareholders
- Average premiums in DARs are lower than those in FPTs
- DARs can be used as takeover defense: remove all shareholders which are willing to sell for a relatively small premium $\rightarrow$ if you remove shareholders you make it harder for the acquirer to purchase the shares
- Value creation:
- smaller than for FPT
- if large numbers of shareholders wish to take the offer (supply of shares > demand for shares) $\rightarrow$ prorationing: very small wealth effects
- if management/insiders increase their stake: larger wealth effects

|  |  | Pro Rata |  |  | OD at Risk |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Average | Yes | No |  | Yes | No |
| FPT | $12-13 \%$ | $0-5 \%$ | $15 \%$ |  | $16 \%$ | $4 \%$ |
| DA | $8 \%$ | 0 | $8 \%$ |  | $8 \%$ | 0 |

The bottom line from this table: when Officers and Directors are at risk than FPT's are larger than wealth effects are larger than when they are not at risk. FPTs will generate more value, higher increasing returns than DARS, this has to do with the structure of the deal. With a DA the shareholders get the lower reservation value, this option lets you separate those who want to sell at higher price and buy stock from those that ask lower prices.

## Transferable Put Rights

- An option issued by a firm to its shareholders to sell the firm one share of its common stock at a fixed price (the strike price) within a stated period (the time to maturity)
- The put right is "transferable" because it can be traded in the capital markets
- Example: in a $20 \%$ repurchase each shareholder receives 1 TPR per 5 shares held; put option gives the right to sell a share at a fixed price (strike price, set above the current stock price)
- Advantages relative to DAR: let the market identify the $20 \%$ of shareholders who are willing to sell without having to collect offers and without having to determine an equilibrium price $\rightarrow$ no mismatch in supply and demand of shares
- shareholders with high reservation prices will not be interested in exercising the TPR and will sell the right
- shareholders with low reservation prices will be willing to pay extra to buy more TPRs than they originally received
- Using the data from the previous example:
- Suppose the TPRs are issued with a strike price of $\$ 96: 1$ share +1 TPR can be exchanged for $\$ 96$ in cash
- for shareholders with a reservation price $>\$ 96$, the TPR is worthless
- for shareholders with a reservation price $<\$ 96$, the value of the TPR is inversely related to the reservation price: e.g. $\mathrm{RP}=\$ 84 \Rightarrow$ TPR value $=\$ 96-84=\$ 12$


## Open Market Repurchases

- A company buys back its shares directly from the market
- The transactions are executed via the company's brokers
- The buyback of shares generally happens over a long period of time as a large number of shares must be bought
- At the same time, unlike other methods, stock buybacks via open market do not impose any legal obligations on a company to complete the buyback program
- Thus, a company enjoys the flexibility to cancel the stock buyback program at any time
- The primary advantage of the open market stock buyback is its cost-effectiveness because a company buys back its shares at the current market price and doesn' $\dagger$ need to pay a premium
- By far the most commonly used method ( $90 \%$ of all repurchases)
- Amount of shares repurchased is relatively small (ca. $5 \%$ on average, while under FPT, DAR, TPR it is about $15-20 \%$ on average)


## Event Study Evidence on Share Repurchases

- Average pre-event CAR negative
- Announcement CAR positive:
- smaller effect for OMR than for other types
- smaller effect in the '90s than in the '70s and ' 80 s

This table summarizes some of the papers that analyzes these effects.
You can see that CARs over the following event windows are positive, so they create value. They are positive because the repurchased shars can create value. We see that the CARs of other types than OMR are substantially higher. One of the reasons might be because in the case of OMR the amount of shares repurchased is smaller than DA and FPT.

| Author | Year | Type | Window | CAR |
| :--- | :--- | :--- | :--- | :--- |
| Ikenberry et al | 1995 | OMR | $-2,+2$ | $3.54 \%$ |
| Grullon, <br> Michaely | 2002 | OMR | $-1,+1$ | $2.57 \%$ |
| Kahle | 2002 | OMR | $-1,+1$ | $1.61 \%$ |
| Netter, <br> Mitchell | 1989 | OMR | $-1,+1$ | $2.71 \%$ |
| Bagwell | 1992 | DA | $-1,0$ | $7.67 \%$ |
| Dann | 1981 | FPT | $-1,+1$ | $17.01 \%$ |

## Event Study from the 90s

- Cause of decreasing CARs during the '90s: repurchases are more and more used to neutralize employee stock option (ESO) plans instead of as a signal of undervaluation:
- Exercising ESOs leads to issuing of new shares $\Rightarrow$ dilution;
- As an employee you have an option to exercise a number of shares. What happens is that when you exercise this the number of shares increases and this leads to dilution.
- Neutralize dilution effect through share repurchases
- Value creation?
- Fenn \& Liang (2001): countering ESOs is more important than undervaluation in explaining the repurchase growth during the 90s
- Kahle (2002): companies start repurchasing shares as soon as it becomes likely that ESOs will be exercised


## Undervaluation and Share Repurchase

- Rappaport's model (1998):
- Share repurchases become more interesting as undervaluation increases (price of share of company is below its intrinsic value)
- If the company can buy back shares for less than their intrinsic value, the return on the buyback will be higher than the company's required return on equity:

$$
\text { Buyback return rate }=\frac{\text { Cost of Equity }}{1-\text { \%undervaluation }}=\frac{\text { Cost of Equity }}{\text { Market/Intrinsic_Value }}
$$

Following example (this you can find in the excel file):

| 1, Cash flow per year |  | $\$ 300$ |
| :--- | ---: | ---: |
| 2, Cost of capital | $10 \%$ |  |
| 3, Intrinsic value before repurchase $=(1) /(2)$ | $\$ 3.000$ |  |
| 4, Number of shares | 100 |  |
| 5, Intrinsic value per share $=(3) /(4)$ |  | $\$ 30,00$ |
| 6, Market value discount |  |  |
| 7, Market price per share $=(5) \times(6)$ | $33,3 \%$ | $\$ 20,00$ |
| 8, Rate of return on share repurchase $=(2) /[(7) /(5)]$ | $15,0 \%$ |  |
| 9, Share repurchase | $\$ 400$ |  |
| 10, Dollar gain on share repurchase $=(8) \times(9)$ |  | $\$ 60$ |

Everything in black is what we compute ourselves. The $\$ 60$ is the value created by the share repurchase.
If there is no undervaluation the ratio market/intrinsic value would be 1 but if there is undervaluation this would be smaller than 1.
The sum of a geometric series converges to $1 / r$. Because every year the company gets a CF of 300 you do 300/R this will be the PV of the Cfs in perpetuity.

What is better? Stock repurchasing or investment? Stock repurchasing is kind of an investment opportunity. If the stock is underpriced than a stock repurchasing might be better...

- Repurchase only makes sense if there are no superior alternative investment opportunities
- Suppose the company has 2 alternatives:
- A profitable project with a rate of return $=15 \%$ and a $\$ 400$ investment
- Repurchase $\$ 400$ worth of stock at a zero premium

| Repurchase vs. Investment Results |  | Case 1 Repurchase $\$ 400$ | Case 2 Invest $\$ 400$ |
| :---: | :---: | :---: | :---: |
| 1, Cash flow |  | \$300 | \$360 |
| 2, Cost of capital |  | 10\% | 10\% |
| 3, Intrinsic value = (1)/(2) |  | \$3.000 | \$3.600 |
| 4, Investment |  | \$400 | \$400 |
| 5, New equity value $=(3)-(4)$ |  | \$2.600 | \$3.200 |
| 6 , Initial number of shares |  | 100 | 100 |
| 7, Share repurchase premium | 0,00\% |  |  |
| 8, Market price per share | \$20.00 |  |  |
| 9, Price per share under share repurchase $=(8) *[1+(7)]$ | \$20,00 |  |  |
| 10, Number of shares repurchased $=(4) /(9)$ |  | 20,00 | 0,00 |
| 11, New number of shares $=(6)-(10)$ |  | 80,00 | 100,00 |
| 12, New shareholder intrinsic value per share =(5)/(11) |  | \$32,50 | \$32,00 |
| 13, Market value discount | 33,3\% |  |  |
| 14, New market value $=(5) \times[1-(13)]$ |  | \$1.733 | \$2.133 |
| 15, New market value per share $=(14) /(11)$ |  | \$21,67 | \$21,33 |
| 16, Percent increase in market price $=[(15)-(8)](8)$ |  | 8,33\% | 6,67\% |

We see that the percent increase in market price is $8.33 \%$ in the case of a stock repurchase and $6.67 \%$ in case of investment. The new market value is actually higher under the investment. The new market value per share is higher under the repurchase, but this has to do with the fact that we have fewer shares outstanding. Undertaking an investment opportunity will create more market value because it is more profitable. Repurchase will only make sense if there are no superior alternatives. The importance is the total value of the firm.

- If the premium paid equals the increase in share price caused by the investment project: indifferent between investment and buyback

| Repurchase vs. Investment Results |  | Case 1 Repurchase $\$ 400$ | Case 2 Invest $\$ 400$ |
| :---: | :---: | :---: | :---: |
| 1, Cash flow |  | \$300 | \$360 |
| 2, Cost of capital |  | 10\% | 10\% |
| 3. Intrinsic value $=(1) /(2)$ |  | \$3.000 | \$3.600 |
| 4, Investment |  | \$400 | \$400 |
| 5. Newequity value $=(3)-(4)$ |  | \$2.600 | \$3.200 |
| 6 , Initial number of shares |  | 100 | 100 |
| 7, Share repurchase premium | 6,67\% |  |  |
| 8, Market price per share | \$20.00 |  |  |
| 9 , Price per share under share repurchase $=(8)^{*}[1+(7)]$ | \$21,33 |  |  |
| 10, Number of shares repurchased $=(4) /(9)$ |  | 18,75 | 0,00 |
| 11, New number of shares = (6)-(10) |  | 81,25 | 100,00 |
| 12. New shareholder intrinsic value per share $=(5) /(11)$ |  | \$32,00 | \$32,00 |
| 13, Market value discount | 33,3\% |  |  |
| 14, New market value $=(5) \times[1-(13)]$ |  | \$1.733 | \$2.133 |
| 15, New market value per share $=(14) /(11)$ |  | \$21,33 | \$21,33 |
| 16, Percent increase in market price $=[(15)-(8)](8)$ |  | 6,67\% | 6,67\% |

In this case we see again that the new market value created will be higher under the investment. But since we assumed that the premium paid equals the increase in price, the percentage increase in market price is the same.

- Model's conclusions: repurchases become more attractive if undervaluation $\uparrow$, premium $\downarrow$ and the return on available investment projects $\downarrow$
- So, the choice between an investment or a stock repurchase depends on those three things.
- If you want share repurchasing to compete with other investment opportunities, there should be a considerable amount of undervaluation and a lower return on other available investment projects


## Buybacks vs. Dividends

- Are repurchases a substitute for common annual dividend payments?
- Advantages of repurchase versus a dividend increase:
- dividend payment is a strong signal for a company's long term profit outlook
- reducing the dividend has strongly negative impact on share prices
- if you think of any valuation model the price of shares is equal to the PV of future CFs
- Taxation:
- historical tax rates in the US: $40 \%$ for dividends; $20 \%$ capital gains tax on profits from repurchases (reduced and closer together after-tax reforms) - if you pay out dividends the shareholders need to pay $40 \%$ whereas if they receive a capital gain from a repurchase it is only $20 \%$
- tax timing: shareholders can choose whether or not to sell their shares and can therefore choose whether or not to pay capital gains taxes in that particular year; dividends are not optional
- Belgium: source tax (roerende voorheffing) on dividends 30\%; tax on repurchases de facto 0\%
- systematic repurchase of shares instead of dividends is not allowed (tax evation)

Repurchases vs. dividends: Empirical Evidence
Historical evolution in the relative importance of dividends and repurchases can be partly explained by changes in the characteristics of listed companies

- In $1973 \mathbf{5 2 . 8 \%}$ of nonfinancial, nonutility firms paid dividends; $66.5 \%$ in 1978; $20.8 \%$ in $1999-$ higher aggregate dividends(Fama,French,2001)
- Shift toward firms that don't pay dividends
- Higher rates of investment, R\&D, etc.
- 25 large dividend payers accounted for $\mathbf{5 3 . 5} \%$ of dividends (DeAngelo et al, 2002)
- Dividends and repurchases perform different functions for different segments of the economy
- Large, mature firms use dividend payouts
- Small growing firms use repurchases to offset option grants

The last point on this screenshot has to do with stock options that are a benefit which is often associated with startup companies, which may issue them in order to reward early employees when and if the company goes public.

## Motives of the Dividend vs. Repurchase Choice

Brav et al. (2005): survey of CFOs and CEOs of 256 US quoted companies


What are the drivers behind dividends and share repurchase? On the graph you see the responses:

- we can see right away that the difference would be fundamentally different; the light grey line is often used (dividends) while a repurchase is not as many used or you can have the other way around
- there are negative consequences to reducing payout: most of CEOs/CFOS answer that this would be either a reason for dividend or repurchase but less repurchases
- maintaining consistency: dividends are more used. Because if you switch allot between them the dividends could be very volatile and this is a bad signal to the market and then the market value of your firm could be going down.
- ...
- We again see the merger and acquisition motive: good motive to engage in share repurchase
- Temporary change in earnings: good motive to engage in share repurchase which makes sense because firms try to pay out dividends in regular intervals and regular sizes and any change in dividend policy can give the wrong signal in the market while share repurchase you do it only when the benefits are higher.
- Also when market price of stock is lower, and the CFO or manager of the corporation know what the intrinsic value is, then you have undervaluation and repurchases makes more sense.

Other question asked: What would your first payout be if you were hypothetically deciding to pay out capital for the first time?

- Shares repurchase was most chosen

Other question: Of the dividend funds, what is the most likely alternative used?

- pay down debt
- ...

Whenever you have cash (which is the same as dividends funds) on your balance sheet you typically use to pay down debt and then the rest



