L7: Mergers & Acquisitions

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Roadmap

Definitions

- **Merger**: transaction in which assets of two or more firms are combined into a new firm.

- **Acquisition**: purchase of one firm (target) by another firm (acquirer).
    - **"Friendly"**: offer made directly to management.
    - **"Hostile"**: tender offer made to shareholders.

- **Tender offer**: agreement to buy a certain amount of shares at a specified price.

- I'll just refer to mergers and acquisitions **interchangeably** throughout the lecture.

Types of mergers

- **Vertical**: combination of firms at different stages of production.

- **Horizontal**: combination of firms in the same line of business.

- **Conglomerate merger**: firms in unrelated markets combine.

- When might each type of merger be a good idea?
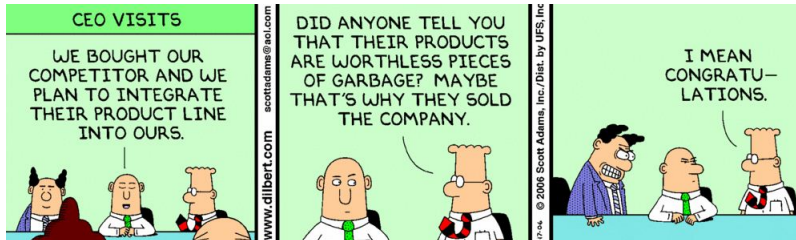
Reasons to merge

- Corporate synergies: efficiency gains from pooling resources.

- Market power: reduce the competition; can lead to higher markups.

- Taxes: assume more debt; higher tax shields.

- Replace inefficient managers: company is "undervalued"; make more efficient use of resources.

- Empire building: could be wasteful or inefficient spending.

Roadmap

Modes of payment (1)

- The idea that the acquirer wants to buy all the **shares** of the target company.
    - Debts of target assumed by the acquirer.

- Two potential payment methods — cash or stock.

- **Cash deal**: pay for the outstanding shares with cash.
    - Generally preferred by target shareholders.
    - More likely deal will go through.
    - Will trigger capital gains tax for shareholders immediately.

- **Share deal**: buy shares with the acquirer's stock.
    - No immediate taxable gains.
    - Exposes the target shareholders to higher risk (and potential return).

- **Hybrid deals** also exist — combinations of both.

- **Premium**: will generally need to pay a price above prevailing market price in cash deal.

Valuation overview (1)

- Once we have a target, we need to put a **valuation** on the merger.

- Several potential methods for valuing a firm you're about to acquire.

- Best method to use is always **DCF** analysis.

    - Treat the acquisision as a project just like any other.

    - Gives you a direct valuation of the project.

    - Can be hard to estimate cash flows.

- Another popular method uses **multiples**.

    - Widely used in industry.

    - Quick and easy.

- I'll talk about both methods here, but **DCF** is the best bet usually.

Valuation overview (2)

- Consider Firm A, who is considering acquiring Firm B.

    - Value of Firm A is V_A and Firm B is V_B.

    - Assume that both firms are 100% equity.

    - Value of combined Firm is V_{AB}.

    - S is synergy gains.

    - E are expenses associated with the transaction.

- Let's consider first a cash deal where Firm A pays Firm B cash in the value of P.

- Value of the combined firm in a **cash deal** is

$$V_{AB} = V_A + V_B + S - P - E$$

Valuation overview (3)

- NPV **in cash deal** for Firm A (acquirer)

$$NPV_A = V_{AB} - V_A$$
$$= S - (P - V_B) - E$$

- NPV **in cash deal** for Firm B (target)

$$NPV_B = P - V_B$$

- Both Firm A and Firm B NPVs are the incremental gains for the firm shareholders in question.

Valuation overview (4)

- In **stock deal**, the cash for the acquisition no longer leaves the firm.

$$V_{AB} = V_A + V_B + S - E$$

- The share of ownership given to the Firm B shareholders is given by $0 < \alpha < 1$ such that

$$\alpha V_{AB} \geq V_B$$

which says their share in the combined firm must be at least as valuable as if the deal didn't take place.

- NPV **in a stock deal** for Firm A is given by

$$\begin{aligned}
NPV_A &= (1 - \alpha)V_{AB} - V_A \\
&= (1 - \alpha)[V_A + V_B + S - E] - V_A \\
&= (1 - \alpha)[V_B + S - E] - \alpha V_A
\end{aligned}$$

Valuation overview (5)

- We know the value of our own firm — V_A.

- We should have a very good idea as to what the expenses of facilitating the transaction would be — E.

- We now need to figure out the values of S and V_B.

- We can use DCF or multiples approaches to find V_B.

- Use DCF to estimate S.

Example I (1)

- Firm A is considering a takeover of Firm B. Both firms are 100% equity.

- Firm A currently has market value of $100m and that for Firm B is $20m.

- There are no expenses associated with the takeover.

- Synergy gains are estimated to come through cost savings from combining the firms. These synergies are estimated to be to the value of $5m per year for the first 2 years (starting in the year after the deal) and then to grow at 1% per year thereafter in perpetuity.

- Assume a discount rate of 5%.

Example I (2)

(a) What is the smallest amount that the shareholders of Firm B would accept in a cash deal?

(b) What is the smallest fraction of the combined firm that the shareholders of Firm B would accept in a share deal?

(c) What is the maximum amount Firm A is prepared to pay in a cash deal?

(d) What is the largest fraction of the combined firm that the shareholders of Firm A would offer in a share deal?

(e) What can we say about the cash price and fraction that would prevail under the two types of deals?

Example I solutions (1)

(a) Under a cash deal, the NPV to the shareholders of Firm B is given by

$$NPV_B = P - V_B$$
$$= P - \$20m$$

where P is the amount of cash offered. The minimum offer they'd take is \$20m.

(b) Firstly we need to value the synergies. We do this using the formula

$$S = \frac{5}{1.05} + \frac{5}{1.05^2} + \frac{5(1.01)}{1.05^3} + \frac{5(1.01)^2}{1.05^4} + ...$$
$$= \frac{5}{1.05} + \frac{1}{1.05}\left[\frac{5}{1.05} + \frac{5(1.01)}{1.05^2} + ...\right]$$
$$= \frac{5}{1.05} + \frac{1}{1.05}\frac{5}{0.05 - 0.01}$$
$$= \$123.81m.$$

Example I solutions (2)

- The NPV to Firm B shareholders under the share deal is

$$\widehat{NPV}_B = \alpha[\$100m + \$123.81m] - (1 - \alpha)\$20m$$
$$= (\$243.81m)\alpha - \$20m.$$

where α is the share they retain. We need to then set α such that the project has a zero NPV

$$243.81\alpha - 20 = 0$$
$$\Rightarrow 243.81\alpha = 20$$
$$\Rightarrow \alpha = 0.082$$

Example I solutions (3)

(c) The NPV of the cash deal for Firm A shareholders is given by

$$NPV_A = \$123.81m - (P - \$20m)$$
$$= \$143.81m - P$$

meaning that \$143.81m is the maximum cash price the Firm A shareholders would be willing to pay.

(d) The NPV of the share deal for Firm A is

$$\widehat{NPV}_A = (1 - \alpha)(\$20m + \$123.81m) - \alpha(\$100m)$$
$$= \$143.81m - (\$243.81m)\alpha.$$

So we can then set this NPV equal to zero and re-arrange for α to get $\alpha = 0.59$.

Example I solutions (4)

(e) From the previous 4 parts of the problem, we get two ranges — one
for the P value and one for α.

$$\$20m \leq P \leq \$143.81m$$
$$0.082 \leq \alpha \leq 0.590.$$

This is the extent of the information we have though. Where the
price/fraction would land in the actual negotiation would depend on
the **bargaining power** of the respective two parties.

Valuing target company: DCF approach

- This method will generally work for public companies

  - Need financials to be readily available.

- Determine forecast period.

  - Usually give accurate forecasts for short/medium period and then use perpetual/terminal value for the future cash flows.

- Just like a stream of cash flows from a project, we'll discount them and sum them up.

Valuing target company: multiples approach (1)

- This method is good for when cash flow estimates are hard to find.

    - E.g. when the company is private.

- Basic idea: similar companies should have similar valuations.

- Procedure:

    (1) Find comparable companies to the target.

    (2) Choose an appropriate multiple to use, (e.g. price/sales).

    (3) Find multiples that correspond to the comparables.

    (4) Average multiples found in step (3).

    (5) Apply target's data to average from step (4), (e.g. sales).

- This method will generally give you a wide variance in valuations when you use different multiples.

Valuing target company: multiples approach (2)

- Potential multiples you could use:
    - Price/earnings.
    - Price/sales.
    - Price/book.
    - Enterprise value/EBITDA.
    - Enterprise value/Sales.
    - Price/cash flow.

- Important to choose the right multiple for the firm you're trying to value.
    - What data do you have about their financial performance going forward?
    - Will a particular multiple produce a reasonable estimate, (e.g. target currently has negative EBITDA — EV/EBITDA will give a negative value!)?

- Often a good idea to try several multiples and compare the results.

Valuing synergies (1)

- These are not so easy to estimate.

- Need to think about what the gains might be from something like economies of scale or **cost savings**.

- E.g. in a vertical acquisition this should be relatively easy — just look at how much you'll be saving on paying suppliers in the future.

- Formal definition

$$\text{Synergies} = \sum_{t=1}^{T} \frac{\Delta FCF_t}{(1 + r_{synergies})^t}$$

  where the change in FCF (ΔFCF_t) is relative to the **sum of the two firms**.

  - I.e. $\Delta FCF_t = FCF_t(AB) - FCF_t(A) - FCF_t(B)$.

- Need to examine the effect on each component of FCF separately.

Valuing synergies (2)

- What discount rate should we use on the synergies?

- Needs to reflect systematic risk associated with the change in free cash flows.

- One suggestion:

$$r_{synergies} = \frac{V_A}{V_A + V_B} r_A(\text{Firm A}) + \frac{V_B}{V_A + V_B} r_A(\text{Firm B})$$

Example II

- Company A is considering an acquisition of Company B. Both firms are 100% equity.

- Company B is a private firm in the automotive manufacturing industry, with an expected sales of $2m and EBITDA of -$1m. No other information is available about Company B's financials.

- Companies C and D are also in the automotive industry.

- Company C has equity valued at $50m, debt worth $100m, sales of $20m and EBITDA of $10m.

- Company D has equity valued at $60m, debt worth $20m, sales of $10m and EBITDA of $5m.

- Company A has enterprise value of $500m.

- Assume no expenses associated with administrating the transaction.

- If the expected synergy gains have a present value of $20m, what is the **maximum price** that Company A would pay for Company B **in cash**?

Example II solution (1)

- We will use Company B and Company C as comparables for the valuation.

- Two multiples we could use are EV/sales and EV/EBITDA.

- For **Company C**:

    - $V_C = E + D = \$150m$.

    - EV/sales $= 150/20 = 7.5$.

    - EV/EBITDA $= 150/10 = 15$.

- For **Company D**:

    - $V_D = E + D = \$80m$.

    - EV/sales $= 80/10 = 8$.

    - EV/EBITDA $= 80/5 = 16$.

Example II solution (2)

- Next we average these ratios across Company C and Company D

- Average(EV/sales) $= 7.75$.

- Average(EV/EBITDA) $= 15.5$.

- Now let's estimate the EV for Company B.

- Using **EV/sales**: $V_B = \$2m \times 7.75 = \$15.5m$.

- Using **EV/EBITDA**: $V_B = (-\$1m) \times 15.5 = -\$15.5m$???

- Using EV/EBITDA is nonsense.

- $15.5m is a reasonable estimate using EV/sales.

Example II solution (3)

- If we let P be the price paid for the transaction, the NPV can be found using

$$NPV_A = S - P + V_B$$
$$= \$20m - P + \$15.5m$$
$$= \$35.5m - P$$

- Means that the **maximum price** they'd be willing to pay is \$35.5m — would set the **NPV equal to zero**.

- If they get the firm for a price below that, then they'd be getting a **good deal**.

Roadmap

1 Introduction

2 Mechanics of M&A

3 Conclusion

Takeaways

- M&A are interesting transactions, but should be valued in the same way as any other project.