Capital structure with Asymmetric information

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Empirical question: what happens when new equity issues are announced?

- Asquith and Mullins did an event study on announcement of both primary and secondary issues.
- The effects are concentrated in the two day announcement period.

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Empirical evidence: results

	All Issues	Primary	Secondary
Day before announcement	-1.8%	-2.3%	-1.0%
Announcement Day	-0.9%	-0.7%	-1.0%
Two day return	-2.7%	-3.0%	-2.0%
T-statistic	14.8	12.5	9.1
N observations	266	128	85

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Empirical evidence: conclusions

- Primary issues are met with a 3 percent decline in the stock price.
- Secondary issues are met with 2 percent decline in the stock price
- Since secondary issues do not change the capital structure, at most 1 percent is attributable to capital structure changes.
- **Information content**. Since the market reacts differently to primary and secondary issues, managers probably have more information than outside shareholders. Evidence on market's reaction to issues by utilities support the asymmetric information hypothesis.

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How can we explain this empirical evidence?

- **Outline:**
  - **Introduce a simple example of managerial decisions under symmetric information.**
  - **Change the hypothesis; managers have relevant information before other investors and prior to making investment and financing decisions.**
  - **Discuss the difference between the 2 assumptions and derive implications for optimal capital structure.**

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Example with symmetric information

Table II	State 1	State 2	E[Value]
Assets in place	150	50	100
Investment opportunity (NPV)	120-100	110-100	115-100
Value of Firm: Post-issue (P+E)	270	160	215

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Example with symmetric information

- **Assume that:**
  - **Firm has to issue equity to finance the project. Equity is issued before the state is known.**
  - **There are no taxes, transactions costs or other market imperfections.**
  - **Managers maximize the wealth of the old (current) shareholders. We also assume that the old shareholders do not purchase the new stock issue.**
  - **Until the end of the lecture, assume the firm can only issue equity.**

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Example with symmetric information

- Since the expected NPV is positive the investment should be taken in both states.
- To finance the project a fraction of the firm is sold to new shareholders. After the equity sale, the value of the firm is 215. For $100 we must give up 46.5% of the firm

- 100 = k(115 + 100) k=100/215=46.5%

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Example with symmetric information

- **Compare old and new shareholders' wealth:**
  - **Shareholders' wealth is the fraction of the firm owned by the shareholders times the value of the firm owned by the shareholders time the value of the firm in the respective states.**
  - **Old shareholders own 53% of the firm, new shareholders own 46.5% of the firm.**

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Compare old and new shareholders' wealth:

- **State 1:**
  - **Old shareholders' wealth=.535*270=144**
  - **New shareholders' wealth=.465*270=126**
- **State 2:**
  - **Old shareholders' wealth=.535*160=86**
  - **New shareholders' wealth=.465*160=74**

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Example with symmetric information

- **Who captured the positive NPV?**
  - **The NPV is captured entirely by the old shareholders**
    - E(value old)=1/2*144+1/2*86=115
    - E(value new)=1/2*126+1/2*74=100
- **Financial markets are efficient in this example:**
  - **Both the old stock and the new stock are correctly priced. This implies that securities purchase a zero NPV transaction.**

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Example with asymmetric information

- Consider the same example, but:
  - (only) managers know the state before the investing and financing decision is taken
  - Outsiders know that managers have extra information
  - Managers maximize the wealth of old shareholders

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Example with asymmetric information

Table III Payoff to old shareholders	Issue 46.5% of new shares & invest (E=100)	Do nothing (E=100)
State 1	144	150
State 2	86	50

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Example with asymmetric information

- Optimal decision:
  - **Old shareholders' wealth is maximized by issuing stocks and investing only in state 2.**
  - **Note that the optimal strategy will change all the payoffs; managers do not act anymore the same way in each state.**
    - **Since equity is issued only in state 2, the new equity issue is:**

    100=k(60+100) k==100/160=62.5%

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Example with asymmetric information

- Old shareholders wealth in state 2 is now:
  -.375*160=60
- New shareholders wealth in state 2 is now:
  -.625*160=100
- Total value of the firm:
  60+100=160

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Example with asymmetric information: conclusions

- **The investment is undertaken only in state 2. This is inefficient because half of the time a project with +NPV is foregone.**
- **The expected wealth of old shareholders is**
  - **½*(150+60)=105<115**
  - **Expected loss is $10 (half of the time a project with NPV=20 is foregone).**

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Example with asymmetric information: Intuition

- **Why does the firm forego the project in state 1?**
- **Suppose you take the project in state 1:**

  NPV (financing in state 1)= 100-.625*270=100-168.75=-68.75
- **… and also the NPV of the project is not big enough to overcome the NPV of financing:**

  APV (with asymmetric info):

  NPV (project| with CS irrelevance)+ NPV (financing)=

  In state 1:

  APV=20-68.75=-48.75<0

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If managers have more information than the market:

- Managers who know that their securities are overpriced would be more inclined to issue securities;
- If investors know that managers have better information, they will consider the issue a signal that the securities are overvalued. Investors would react negatively to a new issue.

	NPV [Project]>0	NPV [Project] <0
Equity is overvalued NPV[Financing] >0		
Equity is undervalued NPV[Financing <0		

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Potential solutions when insiders have more information then outsiders

- **Risk free borrowing or cash on hand. Retained earnings are cheaper than external financing because then the firm isn't forced to forego positive NPV projects.**
- **Risky Debt is better than equity, but it is not perfect. The value of debt changes less in response to new that the value of equity, so the cost of under pricing is less for debt.**
- **Bank debt. If managers can reveal information to the bank, then it is possible to bypass the asymmetric information problem.**

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Pecking order theory of financing

- Managers prefer retained earnings to external financing, because it allows them to consider projects on their merits, rather than depending on whether markets are pricing their securities correctly.
- The issue of securities is a signal that the securities are overpriced. This signal is likely to be more negative for stocks (in which the asymmetry of information is greater) than debt. This explains the ranking.

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Potential solutions when insiders have more information than outsiders

- Rights Issue. Sell the equity only to old shareholders. This eliminates the conflict between old and new shareholders because they are the same people.
- Spin-off the assets in place. If there is no uncertainty about the assets in place for sale has the same problem as before.
- Raise money before managers have inside information.

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Takeaway

- Learn what are the consequences of asymmetric information on capital structure and capital budgeting
- Because the market assumes that the CFO will decide to issue equity only when stocks are overpriced, if your stock is not overpriced, equity is too expensive.
- So, when there is asymmetric information about the firm (quality of the investments and assets in place), equity may become too expensive. Either you find an alternative source of finance or you may be forced to forego positive NPV projects.

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