Andreas Krause

Chapter 7.3.4

Security flipping

- Investment banks generate income from the underwriting spread and it could be assumed that they seek to maximise this income.
- However, investment banks have also other sources of income from which they can benefit. In the context of underwriting, this is the trading of the security after the securities have been allocated to investors.
- We will investigate how investment banks trade off these two sources of income and how this will lead to investment banks finding some degree of underpricing optimal.

Inducing trading in the security

- Investment banks do not only earn underwriting fees, but also benefit from trading the security
- Many investors allocated the security will trade through the investment bank, earning them brokerage commission
- Investment banks have an incentive to induce more trading and earn additional revenue

Inducing trading in the security

→ Underwriting encompasses the sale of securities to investors. While private placements can be found, in many cases the securities are subsequently traded on an exchange. Investment banks are also offering brokerage services and thereby benefit from securities being traded. We will explore how the trading of securities might affect the pricing decision of investment banks in the underwriting process.

- Investment banks earn the underwriting fee from the issuer of a security.
- Once the security is trading on an exchange, it will also generate income by traders submitting orders through the brokerage division of the investment bank.

- Those investors that have been allocated securities will often be clients of the underwriting investment bank. Given that the investment bank discretion over the allocation of securities with underpricing, they will prefer allocating securities to their own clients.
- These clients will then most likely use this investment bank's brokerage division if they sell the security and the bank earns its brokerage commission from the trade.

- This implies that investment banks want more trading in the security, especially more trading by their own clients, such as those they have allocated securities to.

→ We will now look at the connection between trading and underpricing.

Excess demand

- Assume that an issue is underpriced and the demand is Q, while the number of securities issued is $\hat{Q} < Q$
- Rationing is required and a fraction $\gamma = \frac{\hat{Q}}{Q}$ is allocated, the unmet demand is $(1-\gamma)\,\hat{Q}$
- The number of securities issued, $\hat{Q}$, is also the demand in equilibrium at price S^*

Excess demand

→ If we observe under pricing, there will be excess demand and we seek to characterise this excess demand here.

- If an issue is underpriced, it implies that there is more demand for the security at that price than there are securities sold. This is the reason the price will rise, there is excess demand compared to the number of securities issued.
- *Formula*

- In the allocation of securities the total demand needs to be rationed and only a fraction of the demand at this price can be met. How this rationing occurs is secondary here, it could be that some investors obtain their full allocation, while other receive none, or it could be that every investor receives a fraction of their demand; any combination of these extremes are also possible.
- This them implies that a fraction of the demand remains unmet. There are investors who are willing to purchase the security at that price, but are not able to do so due to the rationing.

- We assume that at the equilibrium price to which the security jumps after trading commences is the one in which demand equals supply, where supply is the total number of securities issued.

→ Havinf determined the excess demand, we can now use this to derive the trading demand and the profits of the investment bank.

Investment bank profits

- Investment banks charge an underwriting fee on the proceeds of the issue and a brokerage fee on any trading activity
- Profits: $\Pi_B = fS\hat{Q} + \hat{f}(1-\gamma)\,\hat{Q}S^*$
- The demand for security allocation is sensitive to the to the offer price and has elasticity $\eta = \frac{\partial Q}{\partial S}\frac{S}{Q} < 0$
- The optimal offer price is maximizes investment bank profits, $\frac{\partial \Pi_B}{\partial S} = 0$, which solves for $S = -\frac{\gamma \hat{f} \eta}{f} S^*$

Investment bank profits

→ Investment banks obtain revenue from the underwriting spread and brokerage income from trading. The underpricing can be chosen such that it is generate the highest revenue to investment banks.

- The income from underwriting is a fraction of the proceeds the company obtains; this consist of the number of securities sold at the offer price.
- In addition we assume that the entire unmet demand is traded, hence the investors having been allocated the security will sell those who have not been allocated the security; the investment bank will charge a brokerage fee for these trades.

▶ *Formula*

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- As the offer price increases, the demand will reduce. We will need to take this into account when maximising the profits of the investment bank.
- For this purpose we define the demand elasticity.

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- We now maximize the profits of the investment bank by choosing the optimal offer price.
- The first order condition for this maximum has to be met.
- Solving this conditions gives us the result obtained here, where the optimal offer price will be a fraction of the market clearing price.

→ We have now obtained the optimal offer price in relation to the market clearing and can continue to analyse its property.

Underpricing

- We have underpricing if $S < S^*$, or $-\frac{\gamma\lambda\eta}{f} < 1$, or $\eta > -\frac{f}{\gamma\hat{f}}$
- If the elasticity is sufficiently small (in absolute terms), issues are underpriced
- The investment bank balances the lower income from the underwriting fee against the brokerage income
- A small elasticity ensures that the trading demand for the security is not reduced too much as the price increases to its equilibrium, offsetting the loss in underwriting fees

Underpricing

→ We can now look at the properties of any underpricing that might be optimal from the investment bank's point of view.

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- Underpricing occurs is the offer price is below the market clearing price. The market clearing price is the price at which demand and supply meet, it should thus be the price at which trading occurs after the allocation of the securities.
- From the optimal offer price above, we see that the condition shown here must hold.
- This implies that the elasticity of demand must not be too small, or large in absolute terms as $\eta < 0$.

▶ The demand cannot be too sensitive to the offer price, then underpricing is optimal.

▶ Underpricing reduces the income from the underwriting spread as the proceeds to the issuer are lower, but it increases the trading of securities. The level of underpricing determined here optimally balances these two components of investment banking income.

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- If the elasticity is small, then the increased price at the market clearing price does not reduce the overall demand much, hence there will still be sufficient demand by investors to purchase the security at this increased price and the brokerage income will be high.
- This high brokerage income will compensate investment banks for the lower underwriting income. A high elasticity would reduce demand for trading and the revenue would not compensate for the loss in underwriting fees.

→ It is therefore optimal for investment banks to underprice in order to generate unmet demand for the security, which is then traded and the investment bank benefits through the brokerage income this generates.

Summary

- Investment banks will underprice issues to generate demand from traders not allocated the security but valuing it above the offer price
- Those allocated the security will include some who value it below the equilibrium price and sell
- This trading generates additional revenue for the investment bank, at the expense of the issuer receiving lower proceeds

Summary

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- As the allocation of securities requires rationing, some investors who value the security highly will not be allocated the security. At the market clearing they are still willing to purchase the security as they believe it to be valued higher; they will want to buy the security.
- Investors allocated the security might think that it is worth more than the offer price, but less than the market clearing price. This will induce them to sell the security at the market clearing price as they believe the security to be worth less.
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  - The resulting trade generates brokerage income for the investment bank.
  - The issuer of the security makes a loss from underpricing as their proceeds are less than they could have achieved at the market clearing price. Thus, issuers are making a loss so that investment banks can increase their profits.

→ We have seen how investment banks can use underpricing to incite trading of securities at the expense of the issuers of securities. We therefore have a clear conflict of interest between the interests of the investment bank to obtain the maximal revenue from the underwriting and the issuer seeking to obtain the highest possible proceeds of the issue.

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Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom

E-mail: mnsak@bath.ac.uk