Andreas Krause

Proprietary trading

- Investment banks have employees whose sole role it is to trade securities in markets with the aim of making profits from this trading activity.
- This activity is often referred to as the 'trading desk' or 'proprietary trading'.
- Traders use funds of the investment bank and any profits or losses they make are accruing to the investment bank.
- Proprietary trading contributes often a significant amount to the profits of the investment bank and in most investment banks its is a highly profitable activity.
- We will look at the incentives for investment banks to invest into the expertise of their traders, how traders are remunerated and the incentives they have to report higher profits than they actually generated.

Exploiting their informational advantage

- Investment banks generate substantial profits by trading on their own account
- Investment banks use their capital base and informational advantage to make profits from trading in financial markets
- Investment banks trade in stock markets, bond markets, commodities, foreign exchange markets, derivatives markets, cryptoassets

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→ Investment banks are often seen as being particularly well informed about financial markets. This informational advantage over other market participants they seek to exploit not only by advising their clients, but also by trading securities.

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- Concerns about proprietary trading arise from investment banks using information before revealing it to clients
- Investment banks could provide advice that allows their traders to generate profits
- Investment banks can take considerable risks when holding large positions
- Investment banks themselves are exposed to risks arising from the behaviour of traders
- We will look at incentives investment banks and traders seeking to maximize their own profits

Concerns about proprietary trading

→ Proprietary trading has been controversial as it can cause many conflicts of interest with their other activities as well as affect the stability of the financial system.

- Investment banks might use information they have obtained while conducting work for a client and then use this information to their own advantage before disclosing it to their client. By the time the client obtains the information, potential profits might have been eroded, at least in part because of the activity of the investment bank in the market.
- Rather than providing advice to the best of their knowledge and ability, investment banks might provide advice that allows them generate additional profits or limit their own losses. They might issue advice that a stock has particularly good prospects and hoping for the price to increase such that they can liquidate a position they hold at a profit.
- By holding large position, investment banks are exposed to significant risks. Even though most trading positions are very short-term and will be closed at the end of the trading day, unwinding large positions might be difficult and could cause significant losses.
- Traders are given freedoms to pursue trading strategies and are typically not well supervised. This might lead to traders engaging in trading strategies that are highly risky and opens investment banks up to fraud by those traders, especially if they are not successful with their trading strategy.
- We will look at how investment banks manage their traders, namely how they invest into their expertise and remunerate them, but will also explore the incentives of traders to defraud their employer.

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- Rather than providing advice to the best of their knowledge and ability, investment banks might provide advice that allows them generate additional profits or limit their own losses. They might issue advice that a stock has particularly good prospects and hoping for the price to increase such that they can liquidate a position they hold at a profit.
- By holding large position, investment banks are exposed to significant risks. Even though most trading positions are very short-term and will be closed at the end of the trading day, unwinding large positions might be difficult and could cause significant losses.
- Traders are given freedoms to pursue trading strategies and are typically not well supervised. This might lead to traders engaging in trading strategies that are highly risky and opens investment banks up to fraud by those traders, especially if they are not successful with their trading strategy.
- We will look at how investment banks manage their traders, namely how they invest into their expertise and remunerate them, but will also explore the incentives of traders to defraud their employer.

→ It is therefore that proprietary trading gives rise to a number of interesting questions and conflicts of interest, some of which we will address here.

Gaining knowledge

- In order to generate profits from trading, traders need to be informed
- The costs of acquiring and processing information has to be balanced against its benefits of generating profits
- We will investigate how much investment banks should invest into acquiring expertise

Gaining knowledge

→ Knowledge and skills are essential for traders to generate profits from trading. we will here look at incentives to acquire such expertise.

- Information is a key element to generate any profits in markets. it is not sufficient to know that a market is inefficient and that there are profitable trading strategies, a trader needs to have the information on who to exploit any informational efficiencies.
- Acquiring such expertise will be costly in terms of accessing the relevant information, but also the acquisition of the skills through training and practice. These costs will have to be balanced against the profits a trader can generate and this will lead to the optimal level of expertise a trader acquires.
- We will therefore look at the optimal level of expertise by traders and focus in particular on the impact that competition from traders in other investment banks has on the level of expertise.

→ We will see how competition with other investment banks leads to an arms race of expertise that leads to levels of expertise that are too high.

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Andreas Krause

Chapter 15.1

Investment in expertise

→ The model we are going to discuss is based on Chapter 15.1 of the book 'Theoretical Foundations of Investment Banking'. A more detailed description of the model, additional steps for its solution, and a more in-depth discussion of results can be found there.

Discussion of the model results

- Investment banks over-invest in expertise as an arms race against other investment banks
- Despite investing more into their expertise, traders do not generate additional profits
- ? If having no expertise would generate higher profits to all investment banks, why do they invest into expertise?
- ! Higher profits are only generated if all investment banks do not acquire expertise, but one investment bank acquiring expertise will increase that investment bank's profits and reduces the profits of other investment banks, leading to the arms race

Discussion of the model results

→ Now that we have derived the main results of the model, as far as relevant for us, we will briefly discuss some implications as well as limitations of this model. This will allow us to interpret the model in its context of the initial problem and enables us to apply it appropriately in a realistic context.

- We have seen that competition between investment banks to generate profits at the expense of each other leads to traders acquiring a level of expertise that higher than is socially optimal.
- The higher level of expertise does not increase the profits they generate as they trade against other traders that are similarly qualifies, limiting the trading profits, but having to bear the costs of acquiring this high level of expertise.
- [?] We have seen that all traders having no expertise generates the highest profits, this should then be the optimal level of expertise.
- [!] This assertion is correct only if the other traders also have no expertise. It is then, however, beneficial for at least one trader to increase his level of expertise; he would then make higher profits as he is more knowledgeable than the other traders, and with trading being a zero sum game, the other traders would have reduced profits. Consequently they will invest into their own expertise to avoid some of these losses, leading to the arms race in the level of expertise.

→ We thus see that individual rationality requires a higher level of expertise than is socially desirable.

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Bonus culture in trading

- Traders are commonly paid bonuses based on their performance
- High remuneration of traders might make proprietary trading unprofitable
- We will investigate under which conditions proprietary trading is conducted and bonus payments are optimal

Bonus culture in trading

→ We will investigate why it is optimal to pay traders bonuses based on their trading performance rather than a fixed wage. We do not rely on the argument of moral hazard in that traders would not exert sufficient effort, but instead show that it is most profitable for investment banks to use this form of remuneration.

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  - It is very common in investment banks that traders are relying on a bonus payment for the majority of their income; the base wage that is payable to a trader is often relatively small compared to the bonus he can receive.
  - This bonus will commonly be based on his own trading performance and the profitability of his division or the investment bank as a whole will only play a minor role in determining the size of the bonus.
- Paying traders a too high wage or even a too high share of the profits they generate may make proprietary trading unprofitable, once other costs are taken into account. Such costs might be losses of other traders, who need to be covered even if these traders do not receive a bonus. It is uncommon for traders generating losses to have to repay the investment bank some of these losses, although sometimes clawback clauses might allow some degree of 'negative bonuses'.
- We will look at when proprietary trading is profitable and whether the use of bonuses is preferred over the use of a fixed wage.

→ We will now look at a model that allows us to evaluate why boni to traders are preferred by investment banks over paying a fixed wage.

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Chapter 15.2

Remuneration of traders

→ The model we are going to discuss is based on Chapter 15.2 of the book 'Theoretical Foundations of Investment Banking'. A more detailed description of the model, additional steps for its solution, and a more in-depth discussion of results can be found there.

Discussion of the model results

- Proprietary trading is profitable if the informational advantage of investment banks is large enough to generate profits
- Investment banks use bonus payments as a tool to prevent low-quality traders from seeking employment

? Why would investment banks engage in proprietary trading where adverse selection is low?

! Investment banks might have strategic reasons to retain presence in a market, such as attracting clients or showing their expertise

Discussion of the model results

→ Now that we have derived the main results of the model, as far as relevant for us, we will briefly discuss some implications as well as limitations of this model. This will allow us to interpret the model in its context of the initial problem and enables us to apply it appropriately in a realistic context.

- We have seen that proprietary trading is sustainable in markets that have a sufficient degree of adverse selection from which the investment bank can benefit. Thus, if the informational advantage of traders in investment banks is sufficiently large, proprietary trading will be sustainable.
- Bonus payments are used by investment banks to prevent traders with low levels of ability from trading and causing the investment bank to incur losses.
- [?] We have seen that we need to have a sufficient degree of adverse selection in a market for proprietary to be profitable. However, we often find investment banks trading in markets that are characterised by low adverse selection.
- [!] The model here only considered the profits from trading directly; however, there might be reason to be active in markets even if trading itself is not profitable. This might be done for reputational reasons, showing a presence in all markets, gaining valuable information from these markets that cannot easily be gained when not actively involved in it. Thus there are reasons beyond the immediate profitability of the activity itself that can drive decisions to engage in activities.

→ For proprietary trading to be profitable the investment bank requires its traders to have a sufficient informational advantage and will reward traders through bonus payments linked to their trading performance.

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- Investment banks use bonus payments as a tool to prevent low-quality traders from seeking employment

? Why would investment banks engage in proprietary trading where adverse selection is low?

! Investment banks might have strategic reasons to retain presence in a market, such as attracting clients or showing their expertise

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→ Now that we have derived the main results of the model, as far as relevant for us, we will briefly discuss some implications as well as limitations of this model. This will allow us to interpret the model in its context of the initial problem and enables us to apply it appropriately in a realistic context.

- We have seen that proprietary trading is sustainable in markets that have a sufficient degree of adverse selection from which the investment bank can benefit. Thus, if the informational advantage of traders in investment banks is sufficiently large, proprietary trading will be sustainable.
- Bonus payments are used by investment banks to prevent traders with low levels of ability from trading and causing the investment bank to incur losses.
- [?] We have seen that we need to have a sufficient degree of adverse selection in a market for proprietary to be profitable. However, we often find investment banks trading in markets that are characterised by low adverse selection.
- [!] The model here only considered the profits from trading directly; however, there might be reason to be active in markets even if trading itself is not profitable. This might be done for reputational reasons, showing a presence in all markets, gaining valuable information from these markets that cannot easily be gained when not actively involved in it. Thus there are reasons beyond the immediate profitability of the activity itself that can drive decisions to engage in activities.

→ For proprietary trading to be profitable the investment bank requires its traders to have a sufficient informational advantage and will reward traders through bonus payments linked to their trading performance.

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Exaggerating trading profits

- There have been many cases where traders have claims to have generated profits, but actually hidden losses
- Supervision and control systems around proprietary trading are traditionally very slack
- We will look at the incentives of traders to exaggerate their profits and their supervisors to not thoroughly investigate their claims of making profits

→ Given the importance of trading profits for the remuneration of traders, it can be suggested that traders might seek to manipulate their trading profits in order to obtain larger boni. We will look into these incentives and how monitoring of traders can be used to reduce these incentives.

- From time to time cases become public where traders have manipulated their trading profits, usually using illegal methods,; the most famous case of such a 'rogue trader' was Nick Leeson at Barings Bank in 1995, accumulating undisclosed losses of £827m, leading to the failure of the bank. The largest losses were accumulated by Jérôme Kerviel at Société Générale at $6.9bn in 2008.
- The blame for the occurrence of such events is often given to a lack of supervision of traders and the large degrees of freedom they are given, in particular once they have generated substantial profits.
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  - We will look at why traders have incentives to exaggerate their trading profits,
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Chapter 15.3

Misrepresentation of trading outcomes

Andreas Krause

→ The model we are going to discuss is based on Chapter 15.3 of the book 'Theoretical Foundations of Investment Banking'. A more detailed description of the model, additional steps for its solution, and a more in-depth discussion of results can be found there.

- Traders weigh the benefits of misrepresenting their profits against the costs of being detected
- Their supervisors have few incentives to report such behaviour as they benefit from the reported profits

? Is misrepresenting their profits the only way traders can improve their remuneration?

! Traders can also make additional profits by engaging in larger positions than allowed, trading in securities they are not authorised to trade, or keep positions open for longer than they are allowed, for example over night

Discussion of the model results

→ Now that we have derived the main results of the model, as far as relevant for us, we will briefly discuss some implications as well as limitations of this model. This will allow us to interpret the model in its context of the initial problem and enables us to apply it appropriately in a realistic context.

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→ Rogue traders cannot be eliminated, the use of bonus payments, which are optimal for the bank, give incentives to exaggerate trading profits; monitoring will be imperfect due to the costs of doing so and thus some degree of misrepresentations of trading outcomes will emerge in equilibrium.

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Summary of key results

- Investment banks will engage in proprietary trading only if the possible informational advantage is sufficiently high
- Traders in investment banks overinvest into their expertise
- Unless investment banks can identify the quality of their traders precisely, they will remunerate traders through bonuses
- This reliance on bonuses provides strong incentives for traders to exaggerate profits and the incentives for monitoring are weak

Summary of key results

→ We can now summarize the key results we have obtained about trader behaviour in proprietary trading.

- We have seen that investment bank engage in proprietary trading in markets in which their informational advantage is sufficiently high.
- The level of expertise that is required to gain this informational advantage is higher than the social optimum due to the competition with other investment banks seeking to gain the same informational advantage.
- We have also seen that in most realistic cases, traders are rewarded through bonus payments linked to their individual trading performance.
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  - This use of boni gives incentives to manipulate the trading profits that are shown by a trader
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→ Proprietary trading is highly profitable for investment banks, but our results suggest that at least some of these profits are questionable and the resources put into the expertise of traders is higher than socially desirable.

Summary of key results

- Investment banks will engage in proprietary trading only if the possible informational advantage is sufficiently high
- Traders in investment banks overinvest into their expertise
- Unless investment banks can identify the quality of their traders precisely, they will remunerate traders through bonuses
- This reliance on bonuses provides strong incentives for traders to exaggerate profits and the incentives for monitoring are weak

Summary of key results

→ We can now summarize the key results we have obtained about trader behaviour in proprietary trading.

- We have seen that investment bank engage in proprietary trading in markets in which their informational advantage is sufficiently high.
- The level of expertise that is required to gain this informational advantage is higher than the social optimum due to the competition with other investment banks seeking to gain the same informational advantage.
- We have also seen that in most realistic cases, traders are rewarded through bonus payments linked to their individual trading performance.
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