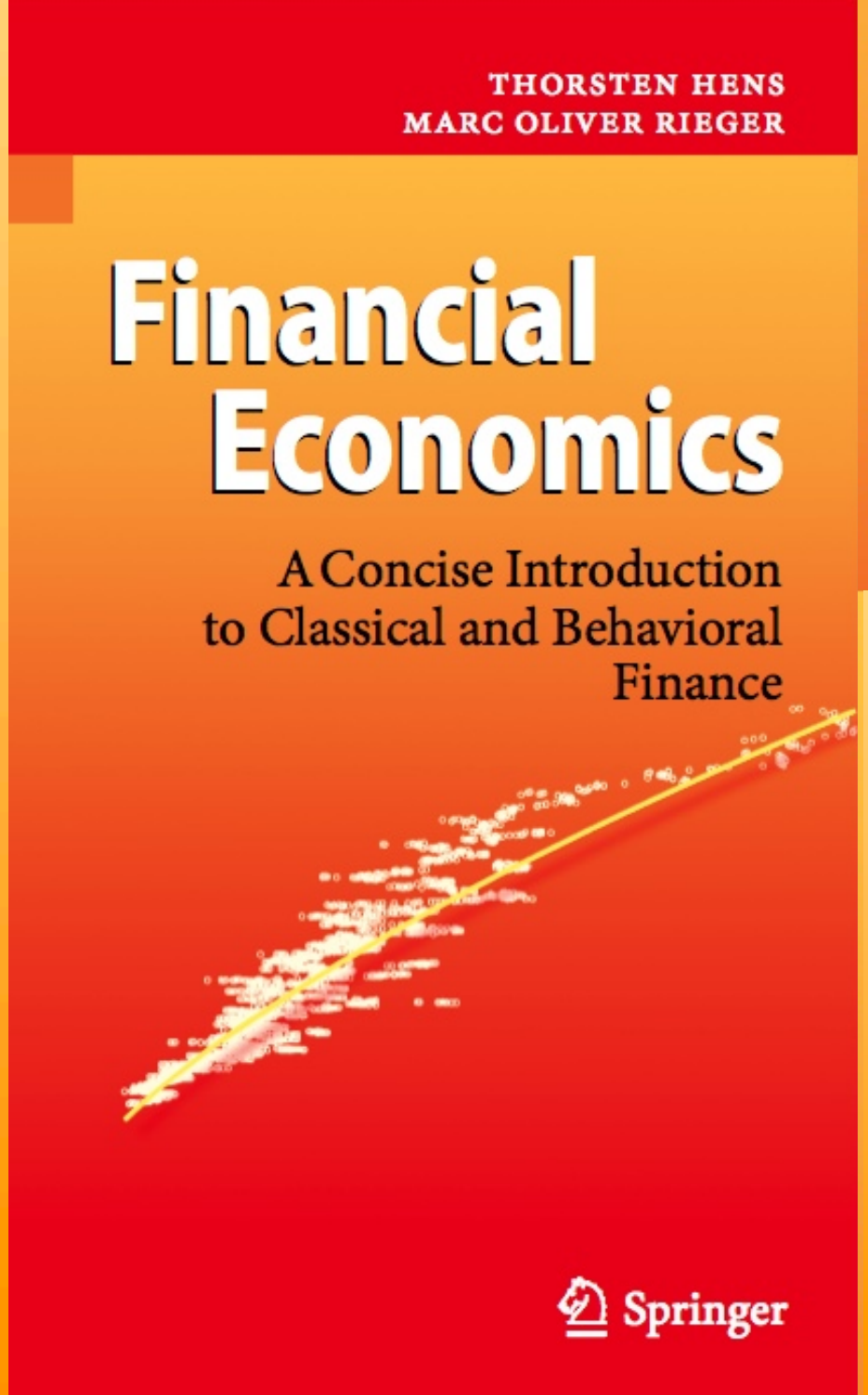

HENS · RIEGER

Financial Economics

Financial economics is a fascinating topic where ideas from economics, mathematics and, most recently, psychology are combined to understand financial markets. This book gives a concise introduction into this field and includes for the first time recent results from behavioral finance that help to understand many puzzles in traditional finance. The book is tailor made for master and PhD students and includes tests and exercises that enable the students to keep track of their progress. Parts of the book can also be used on a bachelor level. Researchers will find it particularly useful as a source for recent results in behavioral finance and decision theory.

The text book to this class is available at www.springer.com

On the book's homepage at www.financial-economics.de there is further material available to this lecture, e.g. corrections and updates.

Financial Economics

A Concise Introduction to Classical and Behavioral Finance

Chapter 7

Thorsten Hens and Marc Oliver Rieger

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July 26, 2010

Information Asymmetries on Financial Markets

"All of the books in the world contain no more information than is broadcast as video in a single large American city in a single year – Not all bits have equal value." Carl Sagan

Starting point

- Classical economic theory is focused on the market.
- But what other mechanisms are possible?
- Ronald Coase: *The nature of the firm* 1937
  Transactions whose coordination by a market is too cost-intensive, they could be coordinated better via a firm.
- Economic theory assumes all market participants have all relevant information.
- In this chapter: typical problems when this assumption is not satisfied.
- Often methods from game theory, rather than general equilibria models.

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Consequences of information asymmetry

Introductory example

In Gelosia, wives are not lenient towards unfaithful husbands. One morning, the queen summoned all women: "Word has reached me that at least one of our husbands has been unfaithful. If one of you discovers that her husband has cheated, she must kill him come midnight on the same day she found out." Gelosian women love to gossip, so if one of their husbands was unfaithful, the entire country knows by next morning. Only his wife is kept in the dark out of respect. For a long time after the queen's speech, nothing happens. Suddenly, 39 days later, all 40 women resort to the knife and send their husbands to kingdom come in a country-wide massacre.

The "lemmon" story (1)

- Akerlof:
  If a vendor is too willing to lower prices, potential customers will think the quality on sale is rather low. This might lead to the vendor not being able to sell at all.
- Model a product in two different quality levels: H (high) and L (low)
- μ: proportion of good products
- q: price of the good product

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The "lemmon" story (2)

- Seller knows the quality Q, his utility is then $V(Q) = q - Q$. If $V(Q) < 0$, he will not make the deal.
- Buyer has *beliefs*.
  β: buyer's belief that the product is of quality H.
  Utility: $U(q, \beta) := \beta H + (1 - \beta)L - q$.
- $\overset{*}{\beta} = 0$ and $\overset{*}{q} = L$ forms an equilibrium, even the only equilibrium.

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The "lemmon" story (3)

Akelof

"The cost of dishonesty, therefore, lies not only in the amount by which the purchaser is cheated; the cost also must include the loss incurred from driving legitimate business out of existence."

- Another example:
  Efficient market hypothesis: all currently known information should be already included in the market process.
- No-trade-Theorem: since nobody has superior information there is no reason for speculative trade, i.e. there will only be trades for secondary motifs (risk mitigation, company takeovers etc.)
- However, how can prices entail all information if nobody trades based on information? (Grossmann)

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Informative trades and dividends (1)

- Amusing example:
  Performance of companies is significantly reduced if their CEO has just bought a new house.
- More serious example:
  Dividends as information revealing signals.
- Two firms $i = g, b$, for *good* and *bad*
- Investors do not know the type of the firm.
- Two possible outcomes (states): H_i and L_i, for high and low profits.

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Dividends (2)

- Let $H_g > H_b$ and $L_g > L_b$: firm can announce a dividend d_i, where $d_i < L_i$
- Since $L_g > L_b$, g can differ from b by paying $d_g = L_g$.
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Rational herding

- Risk-neutral investors are to decide, one after the other, whether to buy a security or not. If they don't buy, they get \$10 at the end. If they do, they get \$20 or nothing with equal probability.
- Every player gets a binary signal that is not observable by, and independent from, the other players.
- First player observes his personal signal and decides to buy if he got the signal H, and not to buy otherwise.
- Other players can guess his signal from his actions.
- The longer the chain of agreeing preceding decisions, the more weight they will gain compared to the player's own signal.
- This finally leads to the situation where the actions of others are the main criterion for one's own decisions. This (rational!) model for herding is called "information cascade".
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Moral Hazard and investments (1)

- Firm has a choice between two projects $i = a, b$ that carry a risk.
- Let each project yield X_i with probability p_i, and 0 with probability $1 - p_i$.
- Assume $p_a X_a > p_b X_b$ and $X_b > X_a$.
- Firm needs an investment I that must be financed with outside capital.
- Repayment $R > I$
- In the negative case ($X_i = 0$), no repayment is made.
- Expected profit of $U(R, i) = p_i(X_i - R)$.
- Expected profit of the bank is $\Pi(R, i) = p_i R - I$.

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- Symmetric information: they will agree on project a.
- The bank will completely claim the profit for itself.
- Asymmetric information: firm can claim it will implement project b.
- Using our assumptions, we can determine a threshold for R, past which project b will be favored over a.
- The bank chooses the repayment such that its profit becomes maximal.
- Therefore, $R = \hat{R}$ if $p_a \hat{R} > p_b X_b$, else $R = X_b$.
- In the first case, it does not manage to appropriate the complete profit.
- The firm has an *information benefit*: $U(\hat{R}, i) = p_a(X_a - \hat{R}) > 0$

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Moral hazard and the subprime crisis

- Another, very topical example for moral hazard problems : banks gave out loans to "subprime" investors.
- The risk of the loans was then partially sold to other investors.
- The banks were interested in increasing the number of loans, even if their default probability was high, since their risk was mostly sold off to investment banks and hedge funds.
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