ORAL EXAMINATION

ESSAYS ON BEHAVIORAL HETEROGENEITY AND ASSET PRICING

LI CHANGTAI, ECONOMICS

Abstract

Recent empirical works have confirmed the importance of investor behavior in asset pricing. This thesis explores the effect of behavioral heterogeneity on asset pricing with focuses on investor sentiment and trading volume. Other related issues on financial markets, including stylized facts, fundamental value, steady state, chart patterns and the formation of sudden, smooth and disturbing crises are also investigated. I mainly explore these issues by using a heterogeneous agent model methodology.

Chapter 1 introduces three pioneer heterogeneous agent models and the merits in these models motivate me to build a comprehensive model to capture the complicated features in financial markets.

Chapter 2 develops a heterogeneous agent model with a sentiment effect. Three types of agents (fundamentalists, momentum traders and contrarian traders) are modelled under a framework of market maker. A sentiment indicator is constructed by taking into consideration of behavioral heterogeneity of interacting investors, memory of sentiment and information shocks. I suggest that sentiment may not affect all agents in a homogeneous way. In other words, fundamentalists are assumed to be immune to sentiment, while momentum traders and contrarian traders are susceptible to market sentiment. An endogenous mechanism between sentiment and agent's belief switching is developed with investors switching between fundamentalist and chartist beliefs according to past performance while the sentiment index is contingent on the fraction of adopted beliefs in the market. I conduct in-depth analysis on two-type and three-type sentiment models by focusing on the sentiment-related steady states of the market equilibrium. The main finding in this chapter is that sentiment model could generate both fundamental steady state featured with neutral sentiment and non-fundamental steady states with polarized sentiment.

Chapter 3 applies the three-type sentiment model proposed in Chapter 2 to conduct numerical analysis. The model shows ability to duplicate various stylized facts in financial markets, namely, fat tails, clustering of volatility, long memory of return and excessive volatility. By comparing sentiment model simulation with non-sentiment one, I find the sentiment model is more powerful to explain these market features. It provides an indirect evidence that sentiment could be the source of these market dynamics. I further investigate

Thursday

03 Dec 2020

10am

Venue:
TEAMS Meeting

ALL ARE WELCOME!

SCHOOL OF SOCIAL SCIENCES

NANYANG TECHNOLOGICAL UNIVERSITY

ORAL EXAMINATION

ESSAYS ON BEHAVIORAL HETEROGENEITY AND ASSET PRICING

LI CHANGTAI, ECONOMICS

continued……..

the role of sentiment in the crisis formation. By excluding other non-linear components in the model, I conclude that investor sentiment could contribute to the formation of different types of crises, which include smooth, sudden and disturbing crises.

Chapter 4 examines a two-market sentiment heterogeneous agent model with a focus on estimation. I extend one market model to two market model by adding a new type of agent, internationalists, who serve as linkage of two symmetric markets. In each market, fundamentalists and chartists are allowed to switch their trading rules based on realized profits, but they can only trade in one market. While internationalists can freely switch their trading market based on the sentiment difference of two markets. Internationalists are assumed to adopt chartism strategy and tend to invest in market with higher sentiment. In this chapter, I attempt to estimate two market model by Bayesian approach with extended Kalman filter. Stock market and sentiment data on US, Japan and UK are used in the estimations. The results show evidence of investor heterogeneity in the two-market systems. Fundamentalists and chartists switch their beliefs more aggressively in US and Japan stock markets, while their fractions are more evenly distributed in UK market. The results also show the evidence of market switching for internationalists group, and it provides a channel to explain crisis contagion between markets through sentiment-induced market switching of international traders.

Chapter 5 investigates another important indicator – trading volume under a threetype heterogeneous agent model. The model setup is similar to that in Chapter 2, but without considering sentiment effect. The model is proven to have a greater potential to explain the stylized facts both on market prices and trading volumes. It also provides an option to theoretically explore the co-evolvement of prices, volumes and beliefs in financial markets. I also show that volume could play an important information rule when investors predict the asset price by conducting chart pattern analysis. Finally, I simulate three different crises as in Chapter 3, and the model with volumes provide a good explanation to the formation of crises.

Thursday

03 Dec 2020

10am

Venue:
TEAMS Meeting

ALL ARE WELCOME!

SCHOOL OF SOCIAL SCIENCES

ORAL EXAMINATION

ESSAYS ON BEHAVIORAL HETEROGENEITY AND ASSET PRICING

LI CHANGTAI, ECONOMICS

continued……..

Chapter 6 summarizes the findings and contribution of this thesis. It also points out the caveats and future research directions.

Proceedings

Duration	Session
5 mins	Chairperson Welcome & Introduction of Panel
30-45mins	Presentation by Student
15 mins	Q&A (by audience – faculty / students)
Break	Audience to leave the meeting
30 mins	Q&A by Panel
15 mins	Chairperson to ask candidate to leave the meeting Private Panel Discussion and Decision on the Oral Examination
15 mins	Candidate invited back by Chairperson Feedback and Outcome of Oral Examination

Thursday

03 Dec 2020

10am

Venue:
TEAMS Meeting

ALL ARE WELCOME!

SCHOOL OF SOCIAL SCIENCES

NANYANG TECHNOLOGICAL UNIVERSITY