Information and noise in stock markets: Evidence on the determinants and effects using new empirical measures

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A thesis submitted in partial fulfilment of the requirements for the degree of

Doctor of Philosophy in Finance

Finance Discipline Group, UTS Business School

University of Technology Sydney

July 2019

Certificate of original authorship

I, Thanh Huong Nguyen declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Finance, in the Business School at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of the requirements for a degree at any other academic institution except as fully acknowledged within the text.

This research is supported by the Australian Government Research Training Program.

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Date: 16/02/2020

Acknowledgements

First and foremost, I would like to express my sincere gratitude to my principal supervisor, Professor Talis Putnins, for his tremendous guidance, support, and encouragement. I would especially like to express my thanks for his patience and engagement throughout my research at UTS. The skills and knowledge that I have developed under his supervision will be of great value to my future academic career.

I am indeed fortunate to have Associate Professor Eliza Wu as my external supervisor. I would like to thank her for introducing me to UTS and providing me with a great opportunity to learn and work professionally at this university. Eliza also provided me with valuable comments for improving the materials in this thesis.

I am especially thankful to Dr Christina Sklibosios and Dr Adrian Lee for their helpful comments and encouragement. I also truly appreciate the help I have received from the administrative staff at the Finance Discipline Group: Andrea Greer, Mala Kapahi, Stephanie Ough, and Duncan Ford.

I gratefully acknowledge the Securities Industry Research Centre of Asia-Pacific (SIRCA), Thomson Reuters, and United Nations for providing access to data used in this thesis. I thank the Vietnam International Education Development (VIED) – UTS joint scholarship for financing my Ph.D. study, as well as colleagues from the University of Economics – The University of Danang for their great support when I was doing my Ph.D. overseas.

I extend my thanks to my friends and fellow research students for stimulating research discussions, and for the fun we have had over the last four years. A special thank you goes to Kate Ly's family for making my stay in Sydney so enjoyable.

I am very grateful to my family and my husband, Phu Mai; and it is to them I dedicate my thesis. None of my successes and achievements would have been possible without their endless love and continuous support.

Preface

Some of the research presented in this thesis has also been incorporated in four working papers co-authored with Prof. Talis Putnins, Assoc. Prof. Eliza Wu, and Prof. Jonathan Brogaard. The four papers are titled:

1. “What moves stock prices? The role of news, noise, and information”;
2. “Noisy prices and capital allocation efficiency”;
3. “Time-varying gambling in stock markets and its effect on asset prices”;
4. “Stock markets as casinos: International evidence on the drivers and effects of gambling in stock markets”.

This research has benefited greatly from the thoughtful insights and feedback provided by Paul Besson, Jean-Philippe Bouchaud, Amit Goyal, Alok Kumar, Charles-Albert Lehalle, Joshua Mollner, Ryan Riordan, Elvira Sojli, and seminar and conference participants at the Market Microstructure Confronting Many Viewpoints #5 Conference, the Investment Management Research Conference, the Asian Finance Association Annual Meeting, the Financial Research Network (FIRN) Annual Meeting, FIRN Asset Pricing Workshop, the Australasian Finance and Banking Conference, the J.P. Morgan Quantference, Brigham Young University, Monash University, the University of Western Australia, Curtin University, the University of Technology Sydney, the University of Sydney, and the Queensland University of Technology.

The first working paper is scheduled for presentation at the American Finance Association (AFA) Annual Meeting in San Diego, California in January 2020.

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List of Abbreviations

2SLS	Two-Stage Least Squares
AMEX	American Stock Exchange
CRSP	Center for Research in Security Prices
ETF	Exchange traded fund
EU	European Union
GBGC	Global Betting Gaming Consultants
GDP	Gross Domestic Product
IDV	Individualism versus Collectivism
IV	Instrumental Variable
IVR	Indulgence versus Restraint
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
SIRCA	Securities Industry Research Centre of Asia-Pacific
VAR	Vector Auto-Regression
VMA	Vector Moving Average
UAI	Uncertainty Avoidance Index
US	United States of America

Abstract

This thesis comprises four studies relating to stock market efficiency, its measurement, its effects, and its determinants.

The first study proposes novel empirical measures that separate different types of information and noise as drivers of stock return variance. Specifically, the new methods disentangle four components: market-wide information, private firm-specific information revealed through trading, firm-specific information revealed through public sources, and noise. Overall, in US stocks, 31% of the return variance is attributable to noise, 37% to public firm-specific information, 24% to private firm-specific information, and 8% to market-wide information. Since the mid-1990s, there has been a dramatic decline in noise and an increase in firm-specific information, consistent with increasing market efficiency.

The second study examines how noise affects inference in existing empirical measures, such as idiosyncratic volatility (one minus the R^2 of a market model) and decompositions of cash flow and discount rate news. This thesis finds that after accounting for noise, cash flow information plays a considerably larger role in driving individual stock returns than previously believed and discount rate information plays a smaller role. Furthermore, the decrease in idiosyncratic volatility (increase of market model R^2) since 1997 is the result of a decrease in noise during this recent period. The evidence indicates that the market has become more efficient in the past two decades, contrary to what is implied by standard interpretations of R^2 as an inverse measure of efficiency.

In the third study, this thesis examines the real effects of stock market efficiency by analysing the relation between noise in stock prices and the efficiency of corporate investment and capital allocation at both the firm and industry levels. The analysis uses a long time-series of data from 1963, as well as a cross-section of 42 countries. Consistent with the notion that noise decreases investment efficiency, this research finds strong evidence that noise is negatively associated with the sensitivity of corporate investment to firms' growth opportunities and the sensitivity of industry-level investment to value added. These findings highlight the important real effects of

secondary market quality in determining firms' investment behaviour and the efficiency with which capital is allocated.

The forth essay provides evidence on how individual investors' behaviour, in particular investors' gambling activity in stocks, affects stock market efficiency. We develop novel measures of the amount of gambling in stock markets based on the turnover differences between lottery stocks and non-lottery stocks, and validate the measure. Using a global sample, we examine how much gambling occurs in different countries, what determines these levels, and how the gambling that occurs on stock markets affects a country's capital markets. We find that culture and economic factors are all significant drivers of a country's gambling propensity in both traditional venues and stock markets. Interestingly, we find a substitution effect—restrictions/bans on traditional gambling lead to a spillover of gambling onto stock market(s). Exploiting regulation of traditional gambling as an instrument, we find that increased gambling on stock markets makes them more liquid and efficient. Our findings have implications for using gambling regulation as a policy instrument to affect financial market quality.

Collectively, these studies contribute to our understanding of market efficiency, how to measure it, what drives its variation through time and across stocks, and how it affects resource allocation across companies and sectors.