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A Market Microstructure Examination of Australian Treasury Bond Futures Overnight Options

by

Liping Zou

A Dissertation Submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

Massey University

2004
To my parents

&

My dear husband Max and daughter Rosie

This dissertation is completed with their love and encouragement
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ABSTRACT

The creation of the Black-Scholes-Merton options pricing model and its publication in 1973, expanded risk management financial research and practice. Concurrently, there have been many assets created in the derivative markets. In line with this, the introduction of Australian Treasury-Bond futures overnight options at the Sydney Futures Exchange (SFE) during 1993 offers a unique opportunity to examine trading behavior with a different market microstructure. This dissertation is the first study of its kind to investigate the market microstructure of the SFE overnight options market. This work explores market microstructure aspects of Australian Treasury Bond futures overnight options regarding market liquidity, transaction costs, market order flows, information asymmetry, and market volatility.

We first present an institutional overview of the Sydney Futures Exchange (SFE) and discussions about products traded at the SFE. This builds the foundation for the following empirical studies. Next, we examine trading behaviours of 3-Year and 10-Year T-Bond futures overnight options by looking at intra-night bid-ask spreads, trading volume, and volatility patterns. We observe different intra-night bid-ask spreads, trading volume, and volatility patterns compared to stocks and long dated options. Third, the impact of overnight options introduction on the underlying 3-Year and 10-Year T-Bond futures market is examined. Results indicate that the introduction of overnight options has influence on the underlying 3-Year and 10-Year T-Bond futures. Fourth, we examine information shocks on the underlying futures return volatility and present optimal time-varying models to estimate and forecast the underlying futures return volatility. The analysis undertaken allows us to recommend the most appropriate models for predicting return volatility for the underlying futures market, and hence presents a key element in the puzzle of how best to price these innovative products. Finally, implied, forecasted, and realized volatility are examined to determine information content of implied volatility when predicting future volatility. This information may be useful to traders wishing to accurately price overnight options.
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