

**The Impact of the Introduction of Mandated Market Makers on Transaction
Costs: Evidence from the Sydney Futures Exchange**

Angelo Aspris
PhD candidate
University of Sydney

Alex Frino
Futures Industry Research Centre Director
Professor of Finance
University of Sydney

Andrew Lepone
Futures Industry Research Centre Assistant Director
Lecturer
University of Sydney

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1. Introduction

Several stock and derivative exchanges, including the Toronto Stock Exchange, Sydney Futures Exchange and Paris Bourse have recently incorporated designated market makers into their market structures, remonstrating from a central economic tenet that competition for order flow in an open consolidated book will render the structure ‘*inevitable*¹’. This paper examines a core empirical issue concerning the effect of these affirmative market maker obligations on market quality and discusses its implications for market design.

The role of market makers and their impact on market quality has received considerable attention in the area of financial market design.² Whilst the proliferation of exchanges with designated market makers suggests that their presence may imbue some positive effect on market quality, evidence regarding the incremental benefits/costs of a specialist augmented limit order book structure is mixed in its outcome.

Our findings show an improvement in market quality following the introduction of a designated market maker supporting the empirical findings of Venkataraman and Waisburd (2006) and Anand, et al. (2005). We examine options listed on derivative contracts that are ‘thinly-traded’ following the adoption maximum spread obligations. We specifically show that following the introduction of a designated market maker a decrease in the volatility of the spread which is consistent with an increase in trading

¹ Glosten (1994)- referring to liquidity provided by liquidity providers.

² The studies include Grossman and Miller (1988) Madhavan and Smidt (1993), Bessembeider and Kaufman (1997), Seppi (1997), Madhavan and Sofianos (1998), Madhavan and Panchapegesan (2000), Nimalendran and Petrella (2002), Viswanathan and Wang (2002), Parlour and Seppi (2003), (Neal (1992), Mayhew (2002) and Anand and Weaver (2003).

activity. Despite a decrease in the variance of the spread, provided by the restraints of the maximum spread rule, we additionally find no significant decrease in transaction costs.

Further examining why on average transaction costs have not decreased following the introduction of a market maker we examine the idea of cross-subsidization. The basic idea of this is that at times when the competitive spread would be wide, restrictions on the allowable spread would result in the market maker making losses. At other times, when the competitive spread would be narrow, the monopoly power of the market maker allows the liquidity provider to recoup these losses.

Grossman and Miller (1988) formalize a framework characterised by the non-synchronization of trading activity and show that a specialist in such a setting can enhance liquidity or reduce adverse selection costs.³ Whilst this model does not consider the role of affirmative market maker obligations, Venkataraman and Weisburd (2006) provide a model to quantify the effect of a designated market maker in a periodic auction market and show that the market maker resolves temporal imbalances in order flow and reduces investor price risk by increasing the likelihood that trade will occur. They further conclude that the designated market maker can improve the terms of trade offered by public limit orders for less liquid securities.

A limited set of empirical results have also examined the impact of designated market makers on market quality. Anand and Weaver examine market quality on the CBOE

³ See also Viswanathan and Wang (2002) and Parlour and Seppi (2003). This analysis is extended in Rock (1996) and Seppi (1997).

during 1999, when that market began to assign designated market makers to each traded option.⁴

A. Institutional Background

This study examines Treasury Option trades executed on the Sydney Futures Exchange (SFE). The SFE is the largest derivatives exchange in the Asia Pacific Region and is ranked among the top ten futures and options exchanges worldwide by notional value of trading.⁵

Since the late 1990s the SFE has undertaken a raft of structural initiatives in a pursuit to improve market quality. Following changes in international trends, market officials introduced market maker obligations in 3 year CTB Options on February 16, 2005 to promote execution certainty and lower transaction costs.⁶ These obligations require the market maker to maintain a continuous market presence by providing a maximum spread and minimum depth at which orders were executed against. Specifically, the maximum quote could not exceed 2 basis points a minimum depth of 200 lots was required in first quarter and serial months.⁷ Furthermore, the market maker is additionally required to respond to 75% of requests for quotes in 2nd quarter month, serial months and custom market strategies.

⁴ Continuous maximum spread rule and a requirement to execute odd lot trades. In return, the designated market maker was allowed exclusive access to the limit order book and was guaranteed a share of order flow.

⁵ Aitken, Frino, Hill and Jarnecic (2004) and Frino, Harris, McInish and Tomas (2004).

⁶ Introduced in 10s 6 months later.

⁷ Between delta ranges of 0.05 and 0.5

The privileges granted to the designated market maker in return for providing liquidity in the market include the reduction in standard exchange fees from 90cents to 45 cents for each contract side traded, a market maker fixed payment of \$25,000 AUD and a volume related payment.⁸ Chartiou and Panayides (2006) show that a ‘maximum spread rule’ is by far the most common affirmative obligation in a survey of international stock markets, however, privileges extending to fix annual payments are well scripted for dealers in Paris, Amsterdam and Athens. The designated market makers have no inherent informational advantages.

B. Data and Method

This paper examines trade and order book data pertaining to the introduction of the market maker in 3 year Treasury bond options. The Reuters data used in this study are provided by SIRCA and are captured in real time from SYCOM. This data extends thirty months around the execution date, from November 16, 2003 to May 16, 2005. The data includes both serial and quarterly contracts, however, intra-day and overnight options are excluded from the analysis for liquidity purposes. The data contains records describing every transaction, quote change and change in aggregate limit order volume at each disclose price step, time stamped to the nearest second.

Univariate Results

Table II reports averages for quoted absolute spread, percentage spread and daily option volume for the sample period. Despite the introduction of a market with

⁸ The structure of this payment can be found in the appendix.

affirmative obligations and without controlling for other determinants, quoted spreads on call and put options did not significantly decrease for the average trader in the given sample.⁹ Figure 1 further illustrates this point however, additionally shows that whilst the average bid-ask spread remains constant throughout the period, the volatility of the spread decreases such that the specialists intervention allows for improved execution certainty. Panayides (2005) provide an explanation for this behaviour finding that the specialist may engage in the cross-subsidization of profits under circumstances where obligations are binding.

The univariate results in Table II, for trading activity measures, exhibit an inconsistent pattern across option classes. We show that whilst trading volume more than doubles for call options series, put options show no significant evidence of change following the introduction of specialist obligations. Consistent with these findings, the daily number of trades executed increases for call options, however, decreases for put option series. Finally, the introduction of affirmative market maker obligations corresponds with an increase in trade size for call and put options by 79%. This translates to increase in trade size of over 200 contracts per trade in the post period and reflects the intentions of exchange officials to improve liquidity so to allow traders to establish or close out positions with greater confidence.

Multivariate Results

⁹ Similar results were obtained across time periods of varying lengths.

We next test whether the improved market quality we find is due to factors other than the introduction of liquidity providers. We perform the following regression of the form;

$$QS_{it} = \alpha_0 + \alpha_1 DTM_{i,t} + \alpha_2 Money_{i,t} + \alpha_3 Volume_{i,t} + \alpha_4 MMaker_{i,t}$$

To control for confounding factors, where QS_{it} is the mean quoted spread for contract i on day t ; $DTM_{i,t}$ is the maturity of the contract in days; $Money_{i,t}$ is the ratio of the underlying stock price divided by the strike price for call options and the ratio of strike price and the underlying stock price for put options, on day t ; $Volume_{i,t}$ is the summed across all trades in the series over the day; and $MMaker_{i,t}$ is equals 0 prior to the introduction of the designated market maker and 1 following the introduction.

The results are reported in Table III. We find that the parameter estimate for the *MMaker* variable is statistically insignificant. This suggests that our findings are not due to confounding effects and that the designated market maker does not appear to exhibit any significant effect on the quoted bid-ask spread.

Conclusion

Our findings show an improvement in market quality following the introduction of a designated market maker supporting the empirical findings of Venkataraman and Waisburd (2006) and Anand, et al. (2005). We examine options listed on derivative

contracts that are 'thinly-traded' following the adoption maximum spread obligations. We specifically show that following the introduction of a designated market maker a decrease in the volatility of the spread which is consistent with an increase in trading activity. Despite a decrease in the variance of the spread, provided by the restraints of the maximum spread rule, we additionally find no significant decrease in transaction costs.

Appendix

Table I

Eligible Contracts	Volume Related Payment
Less than 275,000	Nil
275,000 to 300,000	\$25,000
300,001 to 325,000	\$37,500
325,001 to 350,000	\$50,000
350,001 to 375,000	\$62,500
375,001 to 400,000	\$75,000
400,001 to 425,000	\$87,500
425,001 and greater	\$100,000

Summary Statistics

Table II describe sample characteristics for options on the 3 Year Treasury Bond Options prior to and following pre-negotiation. *Absolute Quoted Spread* indicates the best prevailing quotes available at the time of trade averaged over the sample period. *Percentage Quoted Spread* is measured as the quoted absolute spread relative to the midpoint of prevailing bid-ask quotes. Quoted Underlying spread is the prevailing absolute spread on the underlying contract at the time of option trade execution. *Daily Volume* describes average number of contracts traded per trading day. A double and single asterisk implies 99% and 95% levels of significance, respectively.

Table II

A. Calls

	Pre- Period	Post-Period	Mean Change	t-statistic for differences
Absolute Quoted Spread	0.014	0.012	-0.002	-1.71
Percentage Quoted Spread	0.305	0.344	0.038	2.83
Implied Volatility Spread	0.149	0.139	0.009	-1.15
Trade Size	216	431	215	6.96
Trade Depth	502.8	602.5	99.7	4.48
Number of Trades	9.80	10.9	1.09	2.39

B. Puts

	Pre- Period	Post-Period	Mean Change	t-statistic for differences
Absolute Quoted Spread	0.011	0.013	0.002	2.79
Percentage Quoted Spread	0.230	0.355	0.125	11.51
Implied Volatility Spread	0.12	0.138	0.018	3.91
Trade Size	304.18	502.01	197.90	4.51
Trade Depth	768.92	505.44	-263.48	-4.89
Number of Trades	11.82	10.53	-1.29	-3.04

Table III
Determinants of Bid-Ask Spreads

This table shows reports the results from the following regression model:

$$QS_{it} = \alpha_0 + \alpha_1 DTM_{i,t} + \alpha_2 Money_{i,t} + \alpha_3 Volume_{i,t} + \alpha_4 MMaker_{i,t}$$

Where QS_{it} is the mean quoted spread for contract i on day t ; $DTM_{i,t}$ is the maturity of the contract in days; $Money_{i,t}$ is the ratio of the underlying stock price divided by the strike price for call options and the ratio of strike price and the underlying stock price for put options, on day t ; $Volume_{i,t}$ is the summed across all trades in the series over the day; and $MMaker_{i,t}$ is equals 0 prior to the introduction of the designated market maker and 1 following the introduction. A single and double asterisk implies 99% and 95% levels of significance, respectively.

	Coefficient Estimate	Standard Error	t-statistic
Intercept	-1.3479	0.44076	-3.06
Days to Maturity	0.00011953	0.00001966	6.08
Money	1.35728	0.44112	3.08
Volume	8.46E-08	1.92E-07	0.44
Market Maker	0.00063398	0.00082392	0.77

Figure 1: Daily Average Bid Ask Spread for 3 Year CTB Options.
(Pre): November 16, 2003 - February 15, 2005 (Post) February 16, 2005 - January 6, 2006
Source: *Reuters*

