

The Impact of Pre-Negotiated Trading on Transaction Costs: Evidence from the Sydney Futures Exchange

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Abstract

This paper provides a natural experiment of the impact on market quality following changes in market design on the Sydney Futures Exchange. On 19th October 2004, the SFE introduced pre-negotiation to market participants – action that would allow participants to solicit counterparties and pre-arrange their orders – resulting in more flexible trading arrangements. We show the effect of this change in design resulted in lower quoted spreads. This reduction in quoted spreads is robust to changes in a control market over the defined sample period.

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Introduction

The debate over optimal market structures has intensified in recent years following the rapidly changing demands of market participants. Since the turn of the decade international options exchanges have undergone several fundamental market reforms including the establishment of fully-electronic markets, such as the ISE, the listing of option classes on multiple exchanges and reforms aimed at increasing inter-market competition.¹ As a result of these and other developments, the quality of options markets has improved considerably and their future success will depend on their ability to innovate and further improve trading efficiency.

Despite the proliferation of options markets, to date, a lack of cohesive research in the empirical market microstructure of options markets exists. This paper attempts to advance the literature by assessing the impact on market quality through the reduction of pre-trade transparency and the provision of more flexible trading arrangements upon market participants. Specifically, this paper addresses the introduction of trade pre-negotiation on the Sydney Futures Exchange and examines whether a more opaque trading system for SPI 200 Index Options, affects trade execution costs in a manner provided for by equities market literature.² The scarcity of such research in the derivatives markets provides practitioners and academics with a unique opportunity to explore and further understand the how changes in transparency impact on market liquidity, investor trade strategies and ultimately investor welfare.

¹ US SEC Commissioner Report – Options Markets, Annette Nazareth

² See Madhavan (1992), Biais (1992), Bloomfield and O'Hara (1999), Flood et al. (1999), Madhavan, Porter and Weaver (2005), Boehmer et al (2005).

Trade pre-negotiation was introduced on the Sydney Futures Exchange (SFE) in October 2004 for the SPI 200 Index Options market. Pre-negotiation allows a broker to withhold an order from the centralised market for the purpose of soliciting counterparties for trades of any size. A broker is permitted to disclose details of the particular order to selected customers and aggregate client orders in satisfaction (or part satisfaction) of the original client order before bringing the negotiated business to the Exchange to fulfil the market test.³ The process of bringing the order to the Exchange to be matched following trade pre-negotiation requires the Participants to issue a mandatory quote request to allow other participants to respond to the proposed deal arranged by the broker. This process ensures that any brokered price is *fair* and that the trade occurs at the best available price.

Prior to the introduction of trade pre-negotiation, the withholding of orders and details of the orders from the market was action expressly prohibited.⁴ So determined was the exchange at preventing such behaviour that in 1998, 20 separate cases were reported to the independent regulator involving 15 individuals undertaking illegally negotiated trades. This natural regulatory shift allows us to estimate the incremental benefits of allowing market participants the opportunity to procure liquidity away from the market.

Our empirical results indicate that pre-negotiation leads to a reduction in execution costs for market participants. Specifically, we show that following the rule change, a statistically significant decrease in quoted percentage spreads. We demonstrate

³ This market test is however limited since a broker is allowed to withhold price and volume information from the market – was not the case in the pre period.

⁴ ASIC – predicated on the belief that allowing pre-negotiation would threaten the open participation of the market and competitive price discovery.

through the use of a control market in a comparative contract that the reduction in trading costs is robust against general market trends.

The remainder of this study is organised as follows. The following section briefly describes the SFE. This is followed by a discussion of the change in market structure followed by setting up of hypotheses. A description of the data set and a presentation of the results are then provided. This section also contains a discussion of the economic significance of the results. The study ends with some concluding remarks.

Institutional Background

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 Trading in SPI 200 Index Options is conducted via a fully automated trading system, the Sydney Computerised Market (SYCOM) that encompasses a hybrid market structure of competing dealers. These dealers have exclusive knowledge of the limit order book and actively participate as both brokers and dealers.

During the period of this study, the SFE used two contrasting trading arrangements. The prior structural arrangements expressly prohibited the withholding of client orders. Following the introduction of pre-negotiation in October 1999, brokers are permitted to withhold client interest until an order is satisfied (or part-satisfied). Furthermore, whilst orders are still required to pass through SYCOM to allow any

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

third party participants to compete prior to execution, *neither* the price nor the size of the order is required to be disseminated to the market.⁶ This change represents a dramatic decrease in the level of pre-trade transparency and thus offers us the ability to analyse the impact on the cost of trading to market participants.

Literature Review & Hypothesis Development

Academic interest in pre-trade transparency has increased considerably in the last decade in accordance with international regulatory changes that are predicated on the belief that market quality will improve following more transparent rule changes.⁷ While the issue of transparency is directly linked to market quality, there is a mixed consensus as to whether the effects derived by market participants are predominately beneficial.

Early research in pre-trade transparency addressed the effects on market quality inherently through the development of theoretical models examining different market structures (Madhavan (1992) and Biais (1992)⁸. For example, Pagano and Roell (1996) consider trading costs associated with dealership markets relative to continuous markets and show the optimal level of transparency, modelled as a function of trading costs differs for different classes of investors. They conclude that

⁶ Thus even though an order may be negotiated between two parties in the post-negotiation period this deal remains tentative until the order is exposed to the market

⁷ US Securities and Exchange Commission (SEC, 1994) and the UK Office of Fair Trading (Carsberg, 1994) believe that greater pre-trade transparency will enhance the liquidity and specifically market depth. Furthermore Lehmann and Modest (1994) and Simaan et al. (2003) detail that the rise of ECN's which is presumed to be in part by the high level of order information flow on these systems.

⁸ Madhavan (1992) models a game where order quantities and beliefs are determined endogenously and finds that quote driven markets are more price efficient than order-driven markets. The cost to traders of this efficiency is reflected in higher information costs.

encouraging greater transparency may reduce transaction costs to uninformed investors but may adversely affect informed investors.

Experimental studies that examine the impact of a change in transparency within the context of a multiple dealer market also present mixed findings (e.g. Bloomfield and O'Hara (1999) and Flood et al. (1999)). For example, Bloomfield et al. find that a more transparent setting results in greater price level efficiency, but that this is achieved at the expense of increase trading costs. However, Flood et al, use a comparable setting to examine the impact of transparency in a foreign exchange market find that prices actually become less efficient as the trading environment becomes more transparent and have lower trading costs.

Empirical evidence on transparency and its effects on liquidity and execution costs is limited and conflicting in its conclusions. Madhavan, Porter and Weaver (2005) document a reduction in liquidity on the TSE following the increase in order book disclosure, providing support for their theoretical predictions. The authors report an increase in quoted and effective bid-ask spreads and conclude that market quality deteriorates post the event. In contrast, however, Boehmer et al (2005) document a reduction in effective bid-ask spreads on the NYSE following the introduction of Open Book, which allowed participants to observe much more information in the limit order book. The volume of contradictory findings leads to the following hypotheses.

H1: Transparency reduction will lead to a decrease in percentage bid-ask spreads..

Data

The Reuters data used in this study are provided by SIRCA and are captured in real time from SYCOM. The data extends from July 1, 2003 to January 31, 2006 for options contracts listed on SPI 200 Futures Index. Each record contains a date and time stamp, to the nearest second, as well as fields outlining the trade price, volume and prevailing quotes. Quoted spreads are also calculated using the best bid and offer prices.⁹ In addition, we use data from SIRCA for trade and quote data on the ASX SPI 200 Options contract to create a control sample for testing whether any observed spread changes are part of a general trend across markets. Consistent with prior event studies in derivative markets, this analysis is confined to daytime trading [eg. Aitken et al. (2004)].

A series of standard filters is applied to these data. All records with time stamps outside of the range 09:50 to 16:30 are excluded. We delete all quotes with a zero ask. We also exclude trades with absolute spread exceeding \$3 dollars. Finally, we exclude longer-term options¹⁰ as they are thinly trading making inferences difficult. The final data sample includes 4742 transactions in the pre-event period and 5877 transactions in the post period.

⁹ Most recent studies of the spreads in the stock market have focused on the effective spread (See Chistie, Harris and Schultz (1994), Huang and Stoll (1994)). Effective spreads capture the actual cost of executing trades by calculating the deviation of the trade price from the true price. Trading on the SFE carried out via an electronic auction market. Thus, no transactions occur within the best quotes, and the effective spread will equal the quoted spread.

¹⁰ A number of arbitrary periods were selected to be consistent with the literature. This sample that expires within 90 days, but not within 7 calendar days is used in line with De Fontnouvelle et. Al. (2003). Furthermore Stephen and Whaley (1990) find that approximately two-thirds of options transactions occur within a 90-day period prior to execution.

Table 1 contains summary statistics for our sample. The mean and medians are reported for both the pre and post periods. We report measures for trading activity price, moneyness, days to maturity, and notional value per trade. Comparing the results between two periods reveals during the sample a statistically significant increase in option price and number of trades. The number of trades increases by over 30% following the introduction of pre-negotiation. Conversely, there is a significant decrease in the trade size and days to maturity in the post pre-negotiation period.

Results

Univariate Results

The univariate results for the SFE 200 Index options data series are presented in [Table I](#). Panel A contains the univariate results for our sample. The result reveals a statistically significant decrease in percentage spreads for both the SFE and ASX. This decline in spreads for both ASX and SFE listed contracts suggests a market wide trend during the period of this study. While these results provide some weak support for our basic premise that pre-negotiation leads to lower trading costs for market participants they do not control for changes in other factors known to influence spreads. Accordingly we perform a multivariate analysis by regressing spreads as outlined in equation 1.1. If the change in percentage spread is related to the introduction in pre-negotiation we would expect the parameter estimate for the pre-negotiation dummy to be negative and significant.

Multivariate Analysis

The results for our multivariate analysis are contained in [Table II](#). We explicitly control for factors that exogenously affect percentage spreads through the following regression as defined in Anand and Weaver (2006):

$$QS_{j,t} = \alpha_0 + \alpha_1 Maturity + \alpha_2 Moneyness + \alpha_3 SFE + \alpha_4 Post \quad (1.1)$$

Where: $QS_{j,t}$ is the market quality measure for contract j on day t (separate observations are made for contracts traded on the SFE and ASX); *Maturity* is the maturity of the contract in days; *Moneyness* 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 ; *SFE* is a dummy variable assigned the value 1 if the observation is based on SFE quotes, zero otherwise; *Post* is a dummy variable assigned the value 1 if the observation is in the post period, zero otherwise. We would expect that if the observed changes in market quality measures are due to the introduction of pre-negotiation on the SFE, then the *Post* estimate to be negative and statistically significant.

The results in Panel B indicate that spreads are negative and significant at the 1% level after controlling for the general market trends. Consistent with Anand and Weaver (2006), days to maturity and moneyness are negative and significant and the negative *Post* coefficient supports our hypothesis that the reduction in spreads is due to changes in market structure.

Conclusion

Empirical research, to date, has provided limited and contradicting evidence regarding the issue of pre-trade transparency. Pre-trade transparency is an issue of considerable importance to regulators and investors and provides academics with an interesting conundrum for which they attempt to assess the impact on market quality through a variety of theoretical, experimental and empirical research designs. This study analyses empirically the impact of a decrease in pre-trade transparency and provides statistically significant evidence to indicate that this reduction is associated with a decrease in percentage bid-ask spreads. Our findings are economically robust across different market structures and general economic trends.

Our findings are consistent with the recent study of Madhavan et al. (2005) that shows that transparency does matter, affecting market quality and hence the value of traded securities. Whilst the authors generalise that greater opaqueness may benefit markets that offer an existing high degree of transparency, this paper serves to show that this conclusion transcends across other markets, including options exchanges.

Appendix

Table I

Summary Statistics

Table I describe sample characteristics for options on the SFE SPI 200 Futures Index prior to and following pre-negotiation. *Price* denotes the option price. *Daily No. Trades* refers to the average number of trades across option series per trading day. *Daily Volume* describes average number of contracts traded per trading day. The *moneyness* of an option is defined as 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. *Days to Maturity* indicates the number of days to maturity. *Notional value per trade* is the face value of an index option contract. The notional value of an SFE SPI 200 Options contract is valued at AU\$25 per index point. A double and single asterisk implies 99% and 95% levels of significance, respectively.

	Pre		Post		<i>t</i> -statistics for change
	Mean	Median	Mean	Median	
A. SFE SPI Index Options					
Option Price	29.43	22.5	42.70	32	21.45**
Daily No. Trades	13.66	13	18.08	18	8.48**
Daily Volume	182.96	159	202.16	180	2.00
Size	13.39	6	11.18	5	-4.66**
Moneyness	0.96	0.98	0.96	0.98	2.69*
Days to Maturity	73.47	72	65.98	59	-8.94**
Notional Value Per Trade (\$)	1,092,997	488,750	1,149,974	531,250	1.97

Table II
Determinants of Bid-Ask Spreads

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

$$QS_{j,t} = \alpha_0 + \alpha_1 Maturity + \alpha_2 Moneyness + \alpha_3 SFE + \alpha_4 Post$$

Where $QS_{j,t}$ is the quoted percentage spread for contract j on day t (separate observations are made for contracts traded on the SFE and ASX). *Maturity* is the maturity of the contract in days; *Moneyness* 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 ; The SFE post dummy provides a control for market structure changes and is equal to one following the corresponding introduction of pre-negotiation on the SFE. A single and double asterisk implies 99% and 95% levels of significance, respectively.

<i>A. Univariate Results</i>				
	Pre	Post	Difference	
SFE (%)	10.85%	9.03%	-1.82*	
ASX (%)	11.85%	7.87%	-3.984*	
<i>B. Control Regression Parameter Estimates</i>				
Parameter	Estimate			
Intercept	84.759*			
Maturity	-0.084*			
Moneyness	-66.48*			
SFE	-3.193*			
Pre-negotiation	-3.319*			

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