Strategic Trading Around Predictable Liquidation Events: Evidence from Index Reconstitutions

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December 2021

JEL classification: G11, G13.

Keywords: Strategic trading, predatory trading, sunshine trading, resiliency, index reconstitutions.

Abstract

This study tests the competing theoretical predictions of strategic trading around predictable liquidation events. We take an event study approach centered on the liquidity shocks resulting from index reconstitutions. We find that stocks with resiliency that is one standard deviation below the cross-sectional average prior to index reconstitution exhibit relative bid-ask spreads that are 2.36 basis points higher on reconstitution days. The equivalent increase in the depth-weighted relative spread measured across ten price levels is 24.22 basis points. This relationship is consistent with the Bessembinder, Carrion, Tuttle, and Venkataraman (2016) model prediction that strategic traders absorb a portion of order imbalance in resilient stocks through liquidity provision. However, we find no evidence of predatory trading nor liquidity provision for index deletions, which we attribute to high post-reconstitution trading costs.

1. Related Literature

This study relates to the literature examining strategic trading around known liquidation events. Admati and Pfleiderer (1991) show that pre-announcing uninformative trades can lead to more favorable transaction prices for liquidators. Brunnermeier and Pedersen (2005) consider "predatory" strategic trading by which traders withdraw liquidity when liquidators are forced to trade. Bessembinder et al. (2016) demonstrate that strategic traders may enhance proceeds from liquidation if markets are sufficiently resilient, i.e. prices quickly revert to fundamental values following large uninformative trades.

2. Data

Our sample consists of stocks added to and deleted from the Australian S&P/ASX 200 market index from 2006Q4 to 2014Q4. This time period encompasses 105 index additions and 105 index deletions. We choose this setting as the Australian market for equities represents a well-developed and highly concentrated market that is dominated by a single market index. Trade and quote data is extracted from SIRCA. Data is extracted from the 30-day period surrounding each liquidation event. We define the "reconstitution period" as the effective date of the reconstitution. We define the "non-reconstitution period" as the three weeks leading up to the effective reconstitution date.

3. Model

We follow Bessembinder et al. (2016) and estimate the model below:

$$\Delta P_t = \beta_0' q_t + \beta_1 q_{t-1} + \beta_2 q_{t-2} + ... + \beta_t q_0 + \gamma_0 \left[D_t - D_{t-1}\right] + \epsilon_t \qquad (1)$$

where $\Delta P_t = P_t - P_{t-1}$. P_t is the last transaction price and q_t is the sum of signed trade volume in ten-second time period t. In addition, $\beta_0' = [(\lambda_B s_t + \lambda_S(1-s_t)) + \gamma]$, $\beta_1 = \gamma(\theta - 1)$, $\beta_2 = \beta_1\theta$, $\beta_3 = \beta_1\theta^2$, $\beta_4 = \beta_1\theta^3$, ... , $\beta_{t-j} = \beta_1\theta^{t-j-1}$, where s_t is an indicator variable that takes the value of one when $q_t > 0$ and zero otherwise. The D_t variable takes the value of 1 (-1) if the last trade in period t is initiated by a buyer (seller). The parameters of interest are θ, γ, γ_0, λ_S, and λ_B. Inverse resiliency is captured by θ. The time-varying and fixed components of temporary price impact are denoted by γ and γ_0, respectively. The permanent price impact of buyer-initiated trades is indicated by λ_B. The equivalent figure for seller-initiated trades is λ_S. Equation (1) is estimated for each non-reconstitution period and reconstitution period.

Table 1. Price Impact and Resiliency Estimates.

Sample Period	θ	γ	γ_0	λ_S	λ_B	R^2
Non-Recon Period	0.7564	0.0005	0.0020	0.0005	0.0004	0.2644
Recon Period	0.5212	0.0003	0.0018	0.0008	0.0009	0.3081
Difference	-0.2352***	-0.0002***	-0.0002*	0.0003**	0.0005***	
	(40.83)	(16.13)	(3.33)	(5.63)	(14.70)	

Median liquidity estimates are presented in Table 1. The results reveal significant differences across all liquidity parameters. Strikingly, the inverse resiliency measure, θ, decreases by 31% from the non-reconstitution to the reconstitution period. This is indicative of an enhancement to liquidity on reconstitution days, as in Bessembinder et al. (2016). Moreover, this result opposes predictions of predatory trading and liquidity withdrawals, as in Brunnermeier and Pedersen (2005). Temporary price impact costs, γ and γ_0, similarly decline on reconstitution days. However, permanent price impact costs, given by λ_S and λ_B, increase on reconciliation days.

4. Resiliency and Spreads

The Bessembinder et al. (2016) model predicts that if markets are resilient, strategic traders will supply liquidity during liquidation events, such that the proceeds to liquidators are increased. To examine this empirically, we test whether market resiliency (inverse of estimated θ from Equation (1)) in the non-reconstitution period can explain cross-sectional variation in spreads during the reconstitution period with the following regression model:

$$\Delta DWRS_{i,q}^{\{l\}} = \alpha_1 DELETION_{i,q} + \alpha_2 \hat{\theta}_{i,q} + \alpha_3 \hat{\theta}_{i,q} \cdot DELETION_{i,q} + YEAR_q + \epsilon_{i,q} \qquad (2)$$

where the dependent variable, $\Delta DWRS_{i,q}^{l}$, is the change in bid-ask spread from the non-reconstitution period to the reconstitution period for stock i's announcement in quarter-year q. Yearly fixed effects are represented by $YEAR_q$. The bid-ask spread is calculated as the time-series mean of the dollar-weighted relative quoted spread calculated over l price levels.

Table 2 presents the results of Equation (2). Two key inferences can be made. First, liquidity conditions on reconstitution days are worse for index deletions than additions. The marginal impact of a deletion on the change to the relative quoted spread is 20.7 basis points. The equivalent value for the dollar-weighted average relative quoted spread calculated over ten price levels is 2.207 per cent. Second, pre-reconstitution market resiliency is associated with enhanced liquidity when stocks are added to market indices. The positive estimated α_2 coefficient in column (1) demonstrates that a one standard deviation decrease in market resiliency (inverse of θ) from the cross-sectional average in the non-reconstitution period translates to a 2.36 basis point increase in relative quoted spreads in the reconstitution period. The equivalent value for the dollar-weighted average relative quoted spread measured across ten price levels is 24.22 basis points. Overall, we find no evidence of predatory trading nor liquidity provision for index deletions, possibly due to high post-reconstitution trading costs (wide spreads and low depth).

Table 2. Effect of Resiliency on Spreads.

	(1)	(2)	(3)	(4)
Coefficients	$\Delta DWRS_{i,q}^{\{1\}}$	$\Delta DWRS_{i,q}^{\{2\}}$	$\Delta DWRS_{i,q}^{\{3\}}$	$\Delta DWRS_{i,q}^{\{10\}}$
α_1	20.7*	51.5*	72.7*	220.7**
	(1.68)	(1.87)	(1.92)	(2.38)
α_2	6.3*	12.3**	18.9**	64.6**
	(1.92)	(2.10)	(2.23)	(2.04)
α_3	-18.4	-51.0	-69.4	-208.7*
	(-1.20)	(-1.47)	(-1.45)	(-1.76)
Year FE	Yes	Yes	Yes	Yes
Observations	210	210	210	210
R-squared	0.0678	0.0694	0.0746	0.0951

5. Conclusion

This study examines liquidity conditions around anticipated liquidation events. Consistent with the Bessembinder et al. (2016) model, market resiliency and temporary price impact costs are reduced on index reconstitution days. Moreover, market resiliency prior to reconstitutions is associated with reduced transaction costs on reconstitution days.

References

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