

Online Appendix to

The Whack-A-Mole Game: Tobin Taxes and Trading Frenzy

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In this appendix, we present additional empirical tests.

In Table A1, we analyze the behavior of first-time put warrant traders over the post-event period. For each warrant, we calculate the number of the first-time put warrant traders on each day (i.e., the measure we use in Figure 5) and regress it onto the warrant's contemporaneous and lagged returns up to three days. The result suggests that the new warrant investors are likely to enter the put warrants that experience high returns on the previous day. The coefficient implies that a 10% return leads to a 2.6 to 5.4% increase in the number of the first-time put warrant traders on the following day.

Table A2 shows the result of the regressions in Panel B of Tables 3 and 4, which compare the price, volume, and volatility of put and call warrants over 20 trading days before and after the event. Recall from Table 3 that put warrants experienced substantially increased prices and trading during the 20 trading days after May 30, 2007. Table A2 shows that the results are largely mixed across the five placebo event days. Overall, there is no clear pattern similar to what we find after May 30, 2007. Specifically, after February 27, 2007, both price and volume of put warrants increased, but after June 07, 2006, and July 05, 2007, the signs all flipped, and after July 13, 2006,

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and January 31, 2007, the changes in prices and turnover are in the opposite directions. Even after February 27, 2007, the placebo event day where both the price and the volume of put warrants increased, the magnitudes of these increases are substantially smaller than those after May 30, 2007. The results for call warrants are also mixed across the five placebo event days.

In Table A3, we report the analysis of Table 9 by each of the four put warrants traded on May 30, 2007.

Table A1. Positive feedback trading of first-time put warrant traders

The dependent variable is the log of one plus the number of first-time put warrant investors trading the warrant on day t . The independent variables include the warrant returns on days t , $t-1$, $t-2$, and $t-3$. Warrant and day fixed effects are controlled in some columns. The sample includes the four put warrants traded on the Shenzhen Stock Exchange from May 30, 2007, to June 26, 2007. T -statistics based on robust standard errors are reported in parentheses.

Dep. Variable: log (1+ number of first-time traders) on day t					
	(1)	(2)	(3)	(4)	(5)
$Return_t$	-0.0611 (-0.46)	-0.0437 (-0.40)	-0.0492 (-0.41)	-0.151 (-0.88)	-0.166 (-0.85)
$Return_{t-1}$	0.533 (4.15)	0.540 (3.72)	0.512 (3.80)	0.281 (2.30)	0.259 (2.16)
$Return_{t-2}$			0.153 (1.17)		0.102 (0.71)
$Return_{t-3}$			0.116 (0.75)		-0.0461 (-0.37)
Warrant Fixed Effect	No	Yes	Yes	Yes	Yes
Day Fixed Effect	No	No	No	Yes	Yes
Observations	77	77	77	77	77
Adjusted R^2	0.119	0.337	0.339	0.704	0.696

Table A2. Warrant price and trading around placebo events

This table reports the results of regression analyses of put and call warrants' price, turnover, volume, and price volatility before and after each of the placebo event dates listed in Table 8. *Adjusted_Price* refers to a warrant's daily closing price minus its fundamental value based on the Black-Scholes model. *Log_Volume* is the log of one plus daily trading volume (in yuan). *Turnover* equals the number of shares traded on each day divided by the number of outstanding shares. *Volatility* is measured on a daily basis as the difference between the highest and lowest intraday prices scaled by the average. *Post_Event* equals one for days on or after the placebo event date, otherwise zero. All regressions include maturity fixed effects. The sample period is from 20 trading days before and after the placebo event. Standard errors are clustered by day, and the corresponding *t*-statistics are reported in parentheses.

	PUT				CALL			
<i>February 27, 2007</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>
<i>Post_Event</i>	0.109 (2.95)	0.280 (2.24)	0.690 (5.76)	0.00347 (0.24)	0.602 (7.90)	-0.427 (-5.18)	0.0426 (0.55)	-0.0196 (-1.56)
Maturity Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	417	417	417	417	512	512	512	512
Adjusted R-squared	0.010	0.038	0.184	-0.002	0.021	0.066	-0.001	0.016
<i>June 07, 2006</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>
<i>Post_Event</i>	-0.534 (-8.46)	-0.441 (-4.75)	-1.066 (-7.33)	-0.0405 (-3.19)	0.499 (5.01)	-0.416 (-6.43)	-0.580 (-6.65)	-0.0599 (-4.91)
Maturity Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	466	466	466	466	309	309	309	309
Adjusted R-squared	0.073	0.127	0.364	0.107	0.017	0.133	0.090	0.216
<i>July 05, 2007</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>
<i>Post_Event</i>	-1.782 (-8.95)	-2.228 (-8.01)	-1.188 (-11.89)	-0.155 (-5.65)	-0.512 (-2.78)	-0.231 (-3.19)	-0.471 (-4.25)	-0.0186 (-2.45)
Maturity Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	156	156	156	156	357	357	357	357
Adjusted R-squared	0.228	0.457	0.549	0.345	0.001	0.055	0.078	0.067
<i>July 13, 2006</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>	<i>Adjusted_Price</i>	<i>Turnover</i>	<i>Log_Volume</i>	<i>Volatility</i>
<i>Post_Event</i>	-0.0472 (-1.04)	0.545 (6.26)	0.930 (6.76)	0.0232 (1.83)	0.0778 (1.45)	-0.0329 (-0.49)	-0.226 (-1.88)	-0.00670 (-0.70)
Maturity Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	629	629	629	629	396	396	396	396
Adjusted R-squared	-0.001	0.191	0.266	0.050	0.000	-0.001	0.011	0.003

<i>January 31, 2007</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Adjusted_Price	Turnover	Log_Volume	Volatility	Adjusted_Price	Turnover	Log_Volume	Volatility
<i>Post_Event</i>	-0.157 (-3.72)	0.397 (3.56)	0.192 (1.33)	0.0229 (1.54)	0.196 (2.30)	-0.129 (-3.67)	0.0619 (0.90)	-0.000459 (-0.05)
Maturity Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	453	453	453	453	514	514	514	514
Adjusted R-squared	0.018	0.081	0.012	0.015	0.001	0.017	-0.001	-0.002

Table A3. Put investor trading on and prior to May 30, 2007: by each put warrant

Investors trading on each of the four put warrants is sorted into five groups based on the *Number of trades* on the put warrant on May 30: the top 0.1%, 0.1% to 1%, 1% to 5%, 5% to 50%, and the bottom 50%. *Number of trades* equals the daily number of trades on each put warrant. *Number of purchases/sales* equals the number of purchases/sales on the put warrant per day. *Total value of trades/purchases/sales* is the total yuan volume of investors' daily trades/purchases/sales (in thousands) on the put warrant. Columns labeled with "Pre-Event" report the mean of the statistics over the 20-day window prior to May 30, 2007. Columns labeled with "On Event" report the mean of statistics on May 30, 2007. Column "First time" refers to the group of investors who traded the put warrant for the first time on May 30. The sample includes all investors who traded a put warrant on the event day.

<i>Panel A: 38003 Hualing</i>											
	First time	Top 0.1%		0.1%–1%		1%–5%		5%–50%		Bottom 50%	
<i>(per day)</i>	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event
<i>Number of trades</i>	3.3	6.7	70.2	1.9	25.4	0.9	12.7	0.4	4.1	0.4	1.4
<i>Number of purchases</i>	1.9	3.4	30.7	1.0	12.9	0.5	6.6	0.3	2.2	0.3	0.7
<i>Number of sales</i>	1.4	3.3	39.5	0.9	12.6	0.4	6.1	0.2	1.9	0.1	0.7
<i>Total value of trades</i>	167.3	875.2	24505.0	142.0	2865.3	41.5	932.5	16.6	202.3	12.2	52.5
<i>Total value of purchases</i>	91.9	496.3	11941.3	73.8	1402.5	22.5	457.6	9.5	103.0	7.8	26.6
<i>Total value of sales</i>	75.4	378.9	12563.8	68.2	1462.8	19.0	474.9	7.2	99.3	4.4	25.8
<i># of Investors</i>	24044	50		452		2011		22622		25136	
<i>Panel B: 38004 Wuliang</i>											
	First time	Top 0.1%		0.1%–1%		1%–5%		5%–50%		Bottom 50%	
<i>(per day)</i>	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event
<i>Number of trades</i>	3.2	10.8	73.0	3.0	25.1	1.4	12.3	0.7	3.9	0.7	1.4
<i>Number of purchases</i>	1.8	5.4	31.4	1.6	12.2	0.8	6.3	0.4	2.0	0.5	0.6
<i>Number of sales</i>	1.4	5.4	41.6	1.4	12.9	0.6	6.0	0.3	1.8	0.2	0.8
<i>Total value of trades</i>	178.8	751.9	19148.8	210.8	2856.8	94.8	935.1	29.0	204.6	18.5	54.2
<i>Total value of purchases</i>	97.2	380.8	9446.6	106.4	1430.0	47.9	471.6	15.4	103.9	11.4	25.6
<i>Total value of sales</i>	81.6	371.0	9702.1	104.4	1426.8	46.9	463.4	13.6	100.7	7.0	28.6
<i># of Investors</i>	14316	39		355		1577		17745		19716	

Panel C: 38006 Zhongji

	First time	Top 0.1%		0.1%–1%		1%–5%		5%–50%		Bottom 50%	
<i>(per day)</i>	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event
<i>Number of trades</i>	3.3	12.3	91.3	2.6	26.3	1.2	12.4	0.6	4.0	0.6	1.5
<i>Number of purchases</i>	1.9	5.8	39.9	1.3	13.3	0.6	6.4	0.3	2.1	0.4	0.7
<i>Number of sales</i>	1.4	6.5	51.4	1.3	13.0	0.5	5.9	0.2	1.9	0.2	0.8
<i>Total value of trades</i>	156.1	1917.5	23083.4	260.3	3844.9	70.7	809.0	22.7	183.7	14.7	51.1
<i>Total value of purchases</i>	84.7	955.4	11501.5	131.8	1921.3	36.9	406.5	12.3	92.9	9.2	24.8
<i>Total value of sales</i>	71.4	962.1	11581.8	128.5	1923.7	33.8	402.4	10.4	90.8	5.5	26.3
<i># of Investors</i>	17425	39		353		1569		17657		19619	

Panel D: 38008 Jiafei

	First time	Top 0.1%		0.1%–1%		1%–5%		5%–50%		Bottom 50%	
<i>(per day)</i>	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event	Pre-Event	On Event
<i>Number of trades</i>	3.7	4.2	79.8	3.2	31.8	1.3	15.3	0.6	4.7	0.5	1.7
<i>Number of purchases</i>	2.0	2.0	38.8	1.6	16.0	0.7	7.8	0.3	2.5	0.4	0.8
<i>Number of sales</i>	1.7	2.1	41.0	1.6	15.8	0.6	7.5	0.3	2.3	0.2	0.8
<i>Total value of trades</i>	140.1	334.5	12220.4	299.7	2769.2	62.2	796.5	21.1	178.6	11.8	44.5
<i>Total value of purchases</i>	72.2	167.2	6016.7	150.8	1366.1	31.6	397.8	11.1	89.2	6.7	22.8
<i>Total value of sales</i>	68.0	167.3	6203.7	148.8	1403.2	30.6	398.7	10.1	89.4	5.1	21.8
<i># of Investors</i>	22681	38		347		1544		17367		19296	