Do Superstitious Traders Lose Money?

The APPENDIX

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Table AI. Descriptive Statistics of the Superstition Index

In this table, we report the summary statistics of the investor-level superstition index. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. In 2008, we only have data for the first nine months.

Panel A: Individual Investors

Year	Mean	Median	Standard Deviation	20th Percentile	40th Percentile	60th Percentile	80th Percentile
2003	0.0365	0.0292	0.0764	0.0000	0.0152	0.0435	0.0805
2004	0.0408	0.0323	0.0799	0.0000	0.0185	0.0462	0.0833
2005	0.0413	0.0323	0.0848	0.0000	0.0172	0.0476	0.0889
2006	0.0425	0.0324	0.0836	0.0000	0.0189	0.0465	0.0857
2007	0.0424	0.0303	0.0855	0.0000	0.0175	0.0439	0.0833
2008	0.0493	0.0333	0.0909	0.0000	0.0213	0.0474	0.0882

Panel B: Domestic Institutions

Year	Mean	Median	Standard Deviation	20th Percentile	40th Percentile	60th Percentile	80th Percentile
2003	0.0273	0.0158	0.0820	-0.0187	0.0000	0.0321	0.0690
2004	0.0359	0.0241	0.0828	-0.0083	0.0124	0.0364	0.0667
2005	0.0285	0.0223	0.0733	-0.0098	0.0114	0.0364	0.0684
2006	0.0186	0.0132	0.0660	-0.0114	0.0040	0.0270	0.0588
2007	0.0221	0.0146	0.0613	-0.0144	0.0000	0.0258	0.0601
2008	0.0328	0.0192	0.0712	-0.0065	0.0088	0.0313	0.0696

Panel C: Qualified Foreign Institutional Investors

Year	Mean	Median	Standard Deviation	20th Percentile	40th Percentile	60th Percentile	80th Percentile
2003	0.0005	0.0063	0.0356	-0.0258	0.0048	0.0157	0.0232
2004	0.0084	0.0124	0.0223	0.0037	0.0055	0.0140	0.0204
2005	-0.0087	-0.0037	0.0447	-0.0134	-0.0055	0.0000	0.0198
2006	0.0172	0.0063	0.0334	-0.0010	0.0034	0.0098	0.0335
2007	0.0150	0.0099	0.0347	-0.0131	0.0044	0.0176	0.0336
2008	0.0227	0.0131	0.0488	-0.0003	0.0077	0.0233	0.0549

Table AII. Individual Investors' Superstition and Mark-to-market Returns of Limit Orders at "8," "4," "0," and other Numbers – Quintile Analysis

In this table, we sort individual investors into quintiles by the superstition index in one year, and report the subsequent year's mark-to-market return of limit orders submitted at prices ending with "8," "4," "0," and other numbers. Quintile-5 (Q5) investors are more superstitious. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. Mark-to-market intraday return is the difference between the trade price and the daily closing price divided by the trade price. Mark-to-market 1-day and 5-day returns are calculated in a similar fashion. All items are first calculated for each investor-year observation and then averaged for each quintile with equal weights. To ensure a reasonable magnitude of superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. The Satterthwaite p-value assumes unequal variances of investor performance in quintiles 1 and 5. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Quintile Ranks	Q1	Q2	Q3	Q4	Q5	Diff (Q5-Q1)	p-value
Mark-to-market returns of limit orders submitted at prices ending with "8"							
Intraday (%)	-0.056	-0.056	-0.055	-0.068	-0.073	-0.017***	0.002
1-day (%)	-0.076	-0.102	-0.084	-0.109	-0.110	-0.034***	0.002
5-day (%)	-0.063	-0.153	-0.117	-0.134	-0.166	-0.103***	0.000
Mark-to-market returns of limit orders submitted at prices ending with "4"							
Intraday (%)	-0.054	-0.061	-0.059	-0.061	-0.065	-0.011*	0.099
1-day (%)	-0.081	-0.103	-0.097	-0.095	-0.089	-0.008	0.535
5-day (%)	-0.148	-0.176	-0.172	-0.175	-0.154	-0.006	0.821
Mark-to-market returns of limit orders submitted at prices ending with "0"							
Intraday (%)	-0.074	-0.089	-0.089	-0.084	-0.094	-0.020***	0.000
1-day (%)	-0.111	-0.128	-0.126	-0.119	-0.131	-0.021**	0.016
5-day (%)	-0.185	-0.241	-0.208	-0.183	-0.221	-0.036**	0.042
Mark-to-market returns of limit orders submitted at other prices							
Intraday (%)	-0.076	-0.086	-0.085	-0.084	-0.097	-0.021***	0.000
1-day (%)	-0.110	-0.132	-0.123	-0.128	-0.138	-0.027***	0.000
5-day (%)	-0.179	-0.223	-0.216	-0.217	-0.243	-0.065***	0.000

Table AIII. Individual Investors' Superstition and Mark-to-market Returns of Limit Orders at Prices Ending with "X" – Regression Analysis

In this table, we report the parameter estimates from the following regression:

$$
\begin{aligned}
Return_{X,i,t} = {} & \alpha + \beta_1 SI_{i,t-1} + (\beta_2 D_8 + \beta_3 D_4 + \beta_4 D_0) \times SI_{i,t-1} + \beta_5 D_8 + \beta_6 D_4 + \beta_7 D_0 \\
& + \beta_8 OrderSize_{i,t-1} + \beta_9 SubRatio_{0\ and\ 5,i,t-1} + \beta_{10} Ln(N_{i,t-1}) + \beta_{11} Disposition_{i,t-1} \\
& + \beta_{12} Return_{i,t-1} + \varepsilon_{X,i,t}
\end{aligned}
$$

where $Return_{X,i,t}$ is the performance of individual limit orders submitted at prices ending with "X" for investor i in year t (X is an integer ranging from 0 to 9). D_8, D_4, and D_0 are dummy variables for X=8, 4, and 0, respectively. Mark-to-market intraday return is the difference between the trade price and the daily closing price divided by the trade price. Mark-to-market 1-day and 5-day returns are calculated in a similar fashion. $SI_{i,t-1}$ is the superstition index of investor i in year *t-1*, and it is calculated as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year t-1. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year *t-1*. $Ln(N_{i,t-1})$ is the log of the number of limit orders submitted by investor i in year *t-1*. $Disposition_{i,t-1}$ is the disposition effect, which is calculated as the difference between the durations of losing and winning round-trip trades of investor i in year *t-1*, divided by their average. $Return_{i,t-1}$ is the average intraday, 1-day, or 5-day mark-to-market return for investor i in year *t-1*. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day
$SI_{i,t-1}$	-0.072***	-0.094*	-0.220**
	(0.000)	(0.054)	(0.014)
$SI_{i,t-1} \times D_8$	-0.016	0.046	0.028
	(0.666)	(0.555)	(0.858)
$SI_{i,t-1} \times D_4$	-0.050	-0.162	0.125
	(0.381)	(0.177)	(0.596)
$SI_{i,t-1} \times D_0$	-0.003	-0.082	-0.084
	(0.947)	(0.311)	(0.599)
D_8	0.011***	0.002	0.010
	(0.002)	(0.772)	(0.491)
D_4	0.022***	0.025***	0.032*
	(0.000)	(0.002)	(0.055)
D_0	0.002	0.016***	0.026**
	(0.406)	(0.004)	(0.028)
$OrderSize_{i,t-1}$	0.002***	0.000	-0.002
	(0.000)	(0.624)	(0.230)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.039***	-0.084***	-0.151***
	(0.000)	(0.000)	(0.000)
$Ln(N_{i,t-1})$	0.010***	0.013***	0.010***
	(0.000)	(0.000)	(0.008)
$Disposition_{i,t-1}$	-0.027***	-0.035***	-0.027***

	(0.000)	(0.000)	(0.000)
$Return_{i,t-1}$	0.015***	0.005	0.008**
	(0.000)	(0.185)	(0.026)
Constant	-0.052***	-0.083***	-0.071***
	(0.000)	(0.000)	(0.005)
Year fixed effect	Yes	Yes	Yes
Number of obs.	176,888	176,622	172,041
Adjusted R^2	0.008	0.003	0.005

Table AIV. Number of “X”s Where Superstitious Individual Investors Underperform

In this table, we sort individual investors into quintiles by the superstition index in one year, and examine the performance of limit orders submitted at prices ending with “X” in the subsequent year (X is an integer ranging from 0 to 9). We report the number of “X”s where Quintile-5 investors (significantly) underperform Quintile-1 investors. Quintile-5 (Q5) investors are more superstitious. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at “8” and “4.” The submission ratio at “8” of an investor is calculated as the number of limit orders submitted at prices ending with “8” divided by the total number of limit orders submitted at all prices within a year. The submission ratio at “4” is calculated in a similar fashion. The underperformance is determined based on the intraday, 1-day, as well as 5-day mark-to-market returns of limit orders. Mark-to-market intraday return is the difference between the trade price and the daily closing price divided by the trade price. Mark-to-market 1-day and 5-day returns are calculated in a similar fashion. To ensure a reasonable magnitude of superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. The Satterthwaite p-value assumes unequal variances of investor performance in quintiles 1 and 5. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Significance	Number of "X"s where Q-5 individual investors underperform Q-1 investors		
Level	Intraday	1-day	5-day
$p<1$	10	10	10
$p<0.1$	10	10	10
$p<0.05$	10	10	10
$p<0.01$	10	10	10

Table AV. Superstition Index and Investment Performance of All Investors – Regression Analysis

In this table we report the parameter estimates for the following panel regression:

$$Return_{i,t} = \alpha + \beta_1 SI_{i,t-1} + \beta_2 OrderSize_{i,t-1} + \beta_3 SubRatio_{0\ and\ 5,i,t-1} + \beta_4 Ln(N_{i,t-1}) + \beta_5\ Disposition_{i,t-1} + \beta_6 Return_{i,t-1} + \varepsilon_{i,t}$$

where $Return_{i,t}$ and $Return_{i,t-1}$ are the average mark-to-market returns or round-trip performance for investor i in year t and year t-1. $SI_{i,t-1}$ is investor i's superstition index in year t-1, calculated as the difference between limit order submission ratios at "8" and "4." In each year, we calculate the investor's submission ratio at "8" as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices. The submission ratio at "4" is calculated in a similar fashion. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year t-1. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year t-1. $Ln(N_{i,t-1})$ is the log of number of limit orders submitted by investor i in the previous year. $Disposition_{i,t-1}$ is the difference between the durations of losing and winning round-trip trades of investor i in year t-1, divided by their average. Mark-to-market return of limit (market) orders is the return under the assumption that the initiating limit (market) orders are covered at the closing price of a trading day. The round-trip daily profit and daily index return are calculated as the average round-trip profit or index return divided by the average round-trip duration for each investor. Results for individual (Panel A) and institutional investors (Panels B and C) are reported separately. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Panel A: Individual Investors

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day	Mark-to-market Return of Market Orders (%) Intraday	1-day	5-day	Round-trip Performance Daily profit (TWD)	Daily index return (%)
$SI_{i,t-1}$	-0.029***	-0.035*	-0.090**	-0.014	-0.092	-0.198*	-8,589.073*	-0.696*
	(0.003)	(0.094)	(0.045)	(0.627)	(0.120)	(0.090)	(0.065)	(0.064)
$OrderSize_{i,t-1}$	0.001***	-0.000	-0.001	0.000	-0.000	-0.005	-345.576	-0.022
	(0.001)	(0.745)	(0.425)	(0.672)	(0.861)	(0.169)	(0.556)	(0.632)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.023***	-0.050***	-0.096***	-0.017*	-0.050***	-0.076*	14,317.476	1.171
	(0.000)	(0.000)	(0.000)	(0.052)	(0.009)	(0.053)	(0.341)	(0.337)
$Ln(N_{i,t-1})$	0.005***	0.006***	0.004	0.008***	0.009**	0.006	2,450.266	0.200
	(0.000)	(0.000)	(0.189)	(0.000)	(0.012)	(0.427)	(0.209)	(0.205)
$Disposition_{i,t-1}$	-0.009***	-0.016***	-0.011**	-0.012***	-0.015**	-0.003	4,354.670	0.352
	(0.000)	(0.000)	(0.017)	(0.000)	(0.019)	(0.798)	(0.375)	(0.377)
$Return_{i,t-1}$	0.022***	0.010***	0.007**	0.003	-0.001	0.001	0.057**	0.056**
	(0.000)	(0.002)	(0.021)	(0.525)	(0.825)	(0.878)	(0.033)	(0.050)
Constant	-0.101***	-0.132***	-0.269***	-0.048***	-0.077***	-0.144***	-22,735.463	-1.848
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)	(0.190)	(0.188)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	140,724	140,700	140,180	53,412	53,260	51,247	140,608	140,608
Adjusted R^2	0.012	0.004	0.008	0.003	0.002	0.002	-0.000	-0.000

Panel B: Domestic Institutions

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day	Mark-to-market Return of Market Orders (%) Intraday	1-day	5-day	Round-trip Performance Daily profit (TWD)	Daily index return (%)
$SI_{i,t-1}$	-0.210	-0.630	-1.731	1.067*	1.603	0.909	-30,441.496	-2.953
	(0.250)	(0.164)	(0.136)	(0.090)	(0.108)	(0.697)	(0.852)	(0.804)
$OrderSize_{i,t-1}$	0.001	0.005	0.009	0.003	0.008	0.006	-2,702.743	-0.152
	(0.626)	(0.149)	(0.292)	(0.516)	(0.473)	(0.882)	(0.625)	(0.684)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.094	-0.298*	-0.067	-0.239	-0.239	0.781	-109,654.930**	-4.246
	(0.154)	(0.070)	(0.822)	(0.234)	(0.577)	(0.329)	(0.038)	(0.271)
$Ln(N_{i,t-1})$	-0.002	-0.015	-0.002	-0.003	-0.029	0.021	-43,337.750***	-1.131
	(0.720)	(0.337)	(0.951)	(0.860)	(0.381)	(0.765)	(0.006)	(0.332)
$Disposition_{i,t-1}$	-0.050***	-0.143***	-0.255***	0.051	0.155	0.020	-80,629.523***	-5.759***
	(0.002)	(0.000)	(0.001)	(0.322)	(0.111)	(0.919)	(0.001)	(0.002)
$Return_{i,t-1}$	0.100	-0.033	0.034	-0.107	-0.247	-0.205	0.043	0.008
	(0.140)	(0.645)	(0.480)	(0.340)	(0.129)	(0.110)	(0.817)	(0.965)
Constant	0.045	0.214	0.181	0.091	0.256	-0.351	297,375.906***	8.687
	(0.449)	(0.109)	(0.492)	(0.424)	(0.393)	(0.588)	(0.002)	(0.218)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	563	563	561	259	256	244	554	554
Adjusted R^2	0.024	0.034	0.036	-0.005	0.033	-0.015	0.063	0.035

Panel C: Qualified Foreign Institutional Investors

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day	Mark-to-market Return of Market Orders (%) Intraday	1-day	5-day	Round-trip Performance: Daily profit (TWD)	Daily index return (%)
$SI_{i,t-1}$	-0.491	-0.558	0.947	3.355*	-2.177	8.292	-3740699.500	-193.907
	(0.441)	(0.750)	(0.763)	(0.083)	(0.619)	(0.162)	(0.190)	(0.314)
$OrderSize_{i,t-1}$	-0.003	0.009	0.008	-0.012	0.037	0.105	26,424.318	1.699
	(0.416)	(0.348)	(0.689)	(0.279)	(0.203)	(0.195)	(0.432)	(0.484)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.021	-0.686**	-1.127**	0.211	-0.237	1.224	-100,800.758	-2.970
	(0.860)	(0.034)	(0.022)	(0.594)	(0.760)	(0.370)	(0.842)	(0.926)
$Ln(N_{i,t-1})$	0.007	-0.008	0.081*	0.017	0.000	-0.077	81,184.500	7.761**
	(0.447)	(0.799)	(0.092)	(0.648)	(0.999)	(0.698)	(0.107)	(0.030)
$Disposition_{i,t-1}$	-0.031	-0.008	0.091	-0.004	0.044	0.173	-43,563.090	-1.666
	(0.270)	(0.859)	(0.533)	(0.946)	(0.789)	(0.680)	(0.838)	(0.914)
$Return_{i,t-1}$	0.138	0.024	0.044	0.060	0.282	-0.159	-0.017	-0.047
	(0.195)	(0.829)	(0.734)	(0.713)	(0.132)	(0.453)	(0.864)	(0.597)
Constant	0.005	0.627	0.448	-0.053	-0.196	-1.158	1348741.250	104.336
	(0.967)	(0.140)	(0.433)	(0.894)	(0.837)	(0.645)	(0.302)	(0.299)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	166	165	165	65	64	60	153	153
Adjusted R^2	-0.012	0.016	0.043	-0.084	-0.052	-0.100	0.060	0.093

Table AVI. Superstition, Cognitive Limitation, and Intraday Mark-to-market Returns of Limit Orders of Individual Investors

In this table we double sort individual investors into quintiles by the superstition index and the submission ratio at "0" in year *t-1*, and report the intraday mark-to-market return of limit orders in year *t*. Quintile-5 (Q5) investors are more superstitious or have higher submission ratios at round number prices. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" and "0" are calculated in a similar fashion. Mark-to-market intraday return is expressed in percentage, and is the difference between the trade price and the daily closing price divided by the trade price. All items are first calculated for each investor-year observation and then averaged for each quintile with equal weights. To ensure a reasonable magnitude of superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. The Satterthwaite p-value assumes unequal variances of investor performance in quintiles 1 and 5. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Quintile Ranks of	Quintile Ranks of SI_{t-1}						
$SubRatio_{0,t-1}$	Q1	Q2	Q3	Q4	Q5	Diff (Q5-Q1)	p-value
Q1	-0.057	-0.058	-0.059	-0.074	-0.088	-0.032***	0.000
Q2	-0.077	-0.069	-0.070	-0.075	-0.092	-0.014***	0.003
Q3	-0.082	-0.074	-0.090	-0.079	-0.098	-0.015***	0.004
Q4	-0.092	-0.100	-0.095	-0.096	-0.103	-0.012*	0.051
Q5	-0.102	-0.109	-0.110	-0.106	-0.102	-0.000	0.990
Diff (Q5-Q1)	-0.045***	-0.050***	-0.051***	-0.032***	-0.014*		
p-value	0.000	0.000	0.000	0.000	0.051		

Table AVII. Individual Investors' Superstition Index and Investment Performance – Two-Stage Regression

In this table, we report the parameter estimates of a two-stage panel regression for individual investors. In the first stage, we perform the following regression for each of the eight return measures separately:

$$SI_{i,t-1} = \alpha + \beta_1 OrderSize_{i,t-1} + \beta_2 SubRatio_{0\ and\ 5,i,t-1} + \beta_3 Ln(N_{i,t-1}) + \beta_4\ Disposition_{i,t-1} + \beta_5 Return_{i,t-1} + \varepsilon_{i,t-1}$$

We take $Residual\_SI_{i,t-1}$, the residual superstition index, from the first stage regression and perform the following regression in the second stage:

$$Return_{i,t} = \alpha + \beta_1 Residual\_SI_{i,t-1} + \beta_2 OrderSize_{i,t-1} + \beta_3 SubRatio_{0\ and\ 5,i,t-1} + \beta_4 Ln(N_{i,t-1}) + \beta_5\ Disposition_{i,t-1} + \beta_6 Return_{i,t-1} + \varepsilon_{i,t}$$

where $Return_{i,t}$ and $Return_{i,t-1}$ are the average mark-to-market returns or round-trip performance for investor i in year *t* and year *t-1*. $SI_{i,t-1}$ is investor i's superstition index in year *t-1*, which is calculated as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year *t-1*. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year *t-1*. $Ln(N_{i,t-1})$ is the log of number of limit orders submitted by investor i in the previous year. $Disposition_{i,t-1}$ is the difference between the durations of losing and winning round-trip trades of investor i in year *t-1*, divided by their average. Mark-to-market return of limit (market) orders is the return under the assumption that the initiating limit (market) orders are covered at the closing price of a trading day. The round-trip daily profit and daily index return are calculated as the average round-trip profit or index return divided by the average round-trip duration for each investor. Results for the first and second stage regressions are separately reported in Panel A and Panel B. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Panel A (First Stage Regression): Regressing Superstition Index on Other Aspects of Investor Trading Skills

Independent	Mark-to-market Return of Limit Orders (%)			Mark-to-market Return of Market Orders (%)			Round-trip Performance	
Variable	Intraday	1-day	5-day	Intraday	1-day	5-day	Daily profit (TWD)	Daily index return (%)
$OrderSize_{i,t-1}$	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.040***	-0.040***	-0.039***	-0.034***	-0.034***	-0.034***	-0.039***	-0.039***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Ln(N_{i,t-1})$	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Disposition_{i,t-1}$	0.005***	0.005***	0.006***	0.006***	0.006***	0.006***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Return_{i,t-1}$	-0.010***	-0.002***	0.001	-0.000	-0.000	0.000	-0.000**	-0.000**
	(0.000)	(0.008)	(0.158)	(0.748)	(0.709)	(0.144)	(0.031)	(0.026)
Constant	0.069***	0.070***	0.071***	0.065***	0.065***	0.065***	0.070***	0.070***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	57,217	57,215	57,189	33,585	33,545	32,942	57,263	57,263
Adjusted R^2	0.017	0.017	0.017	0.015	0.015	0.015	0.016	0.016

Panel B (Second Stage Regression): Regressing Investment Performance on Residual Superstition Index

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day	Mark-to-market Return of Market Orders (%) Intraday	1-day	5-day	Round-trip Performance Daily profit (TWD)	Daily index return (%)
$Residual\_SI_{i,t-1}$	-0.068***	-0.103***	-0.269***	-0.046	-0.176**	-0.206	-15,849.138	-1.270
	(0.000)	(0.001)	(0.000)	(0.232)	(0.026)	(0.195)	(0.145)	(0.147)
$OrderSize_{i,t-1}$	0.002***	0.001	-0.001	0.002	0.002	-0.001	-1,650.379	-0.114
	(0.007)	(0.565)	(0.518)	(0.124)	(0.331)	(0.774)	(0.187)	(0.241)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.038***	-0.077***	-0.162***	-0.047***	-0.107***	-0.133***	37,803.789	3.085
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.010)	(0.328)	(0.325)
$Ln(N_{i,t-1})$	0.010***	0.013***	0.007*	0.012***	0.017***	0.011	3,592.455	0.293
	(0.000)	(0.000)	(0.080)	(0.000)	(0.000)	(0.270)	(0.295)	(0.288)
$Disposition_{i,t-1}$	-0.024***	-0.034***	-0.023***	-0.023***	-0.040***	-0.040**	16,403.018	1.335
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.026)	(0.268)	(0.267)
$Return_{i,t-1}$	0.071***	0.032***	0.025***	0.011	0.002	0.013	0.632***	0.640***
	(0.000)	(0.000)	(0.000)	(0.254)	(0.864)	(0.205)	(0.000)	(0.001)
Constant	-0.049***	-0.084***	-0.046*	-0.048***	-0.058*	-0.066	-3,393.385	-0.327
	(0.000)	(0.000)	(0.078)	(0.001)	(0.059)	(0.287)	(0.461)	(0.358)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	56,968	56,963	56,824	25,723	25,673	24,962	56,830	56,830
Adjusted R^2	0.029	0.010	0.014	0.006	0.005	0.003	0.000	0.000

Table AVIII. A Placebo Test: Pseudo Superstition Index and Investment Performance of Individual Investors– Regression Analysis

In this table we report the parameter estimates for the following panel regression:

$$Return_{i,t} = \alpha + \beta_1 SI_{i,t-1} + \beta_2 OrderSize_{i,t-1} + \beta_3 SubRatio_{0\ and\ 5,i,t-1} + \beta_4 Ln(N_{i,t-1}) + \beta_5\ Disposition_{i,t-1} + \beta_6 Return_{i,t-1} + \varepsilon_{i,t}$$

where $Return_{i,t}$ and $Return_{i,t-1}$ are the average mark-to-market returns or round-trip performance for investor i in year t and year t-*1*. $SI_{i,t-1}$ is investor i's pseudo superstition index in year t-*1*, calculated as the difference between limit order submission ratios at "7" and "3." In each year, we calculate the investor's submission ratio at "7" as the number of limit orders submitted at prices ending with "7" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "3" is calculated in a similar fashion. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year t-*1*. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year t-*1*. $Ln(N_{i,t-1})$ is the log of number of limit orders submitted by investor i in the previous year. $Disposition_{i,t-1}$ is the difference between the durations of losing and winning round-trip trades of investor i in year t-*1*, divided by their average. Mark-to-market return of limit (market) orders is the return under the assumption that the initiating limit (market) orders are covered at the closing price of a trading day. The round-trip daily profit and daily index return are calculated as the average round-trip profit or index return divided by the average round-trip duration for each investor. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Independent Variable	Mark-to-market Return of Limit Orders (%)			Mark-to-market Return of Market Orders (%)			Round-trip Performance	
	Intraday	1-day	5-day	Intraday	1-day	5-day	Daily profit (TWD)	Daily index return (%)
$SI_{i,t-1}$	-0.015	0.034	0.176	-0.060	0.113	0.067	4,739.201	0.237
	(0.580)	(0.542)	(0.130)	(0.397)	(0.413)	(0.819)	(0.258)	(0.478)
$OrderSize_{i,t-1}$	0.002***	-0.001	-0.004**	0.002	0.003	-0.003	-1,029.776	-0.055
	(0.000)	(0.521)	(0.039)	(0.174)	(0.149)	(0.591)	(0.123)	(0.231)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.039***	-0.083***	-0.163***	-0.044***	-0.118***	-0.204***	-752.143	-0.066
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.433)	(0.358)
$Ln(N_{i,t-1})$	0.011***	0.017***	0.017***	0.011***	0.022***	0.025**	966.223**	0.078***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.021)	(0.016)	(0.008)
$Disposition_{i,t-1}$	-0.019***	-0.048***	-0.139***	-0.019***	-0.058***	-0.145***	-4,654.303***	-0.384***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Return_{i,t-1}$	0.091***	0.027***	0.026***	0.019*	0.007	0.008	0.550***	0.540***
	(0.000)	(0.002)	(0.001)	(0.092)	(0.527)	(0.483)	(0.002)	(0.004)
Constant	-0.061***	-0.097***	-0.045	-0.047***	-0.073**	-0.074	-638.298	-0.103
	(0.000)	(0.000)	(0.105)	(0.004)	(0.036)	(0.286)	(0.774)	(0.485)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	46,741	46,737	46,648	21,323	21,280	20,685	46,815	46,815
Adjusted R^2	0.032	0.014	0.024	0.005	0.006	0.006	0.084	0.089

Table AIX. Individual Investors' Superstition Index and Investment Performance – Lucky vs. Unlucky Side

In this table we report the parameter estimates for the following panel regression:

$$Return_{i,t} = \alpha + \beta_1 SI_{i,t-1} + \beta_2 OrderSize_{i,t-1} + \beta_3 SubRatio_{0\ and\ 5,i,t-1} + \beta_4 Ln(N_{i,t-1}) + \beta_5\ Disposition_{i,t-1} + \beta_6 Return_{i,t-1} + \varepsilon_{i,t}$$

where $Return_{i,t}$ and $Return_{i,t-1}$ are the average mark-to-market returns or round-trip performance for investor i in year t and year *t-1*. $SI_{i,t-1}$ is the lucky or unlucky part of investor i's superstition index in year *t-1*. In Panel A, we consider the lucky part of superstition index by calculating $SI_{i,t-1}$ as the difference between limit order submission ratios at "8" and "3" for investor i in year *t-1*. In Panel B, we consider the unlucky part of superstition index by calculating $SI_{i,t-1}$ as the difference between limit order submission ratios at "3" and "4" for investor i in year *t-1*. The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratios at "3" and"4" are calculated in a similar fashion. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year *t-1*. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year *t-1*. $Ln(N_{i,t-1})$ is the log of number of limit orders submitted by investor i in the previous year. $Disposition_{i,t-1}$ is the difference between the durations of losing and winning round-trip trades of investor i in year *t-1*, divided by their average. Mark-to-market return of limit (market) orders is the return under the assumption that the initiating limit (market) orders are covered at the closing price of a trading day. The round-trip daily profit and daily index return are calculated as the average round-trip profit or index return divided by the average round-trip duration for each investor. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Panel A: Lucky Part of the Superstition Index

Independent	Mark-to-market Return of Limit Orders (%)			Mark-to-market Return of Market Orders (%)			Round-trip Performance	
Variable	Intraday	1-day	5-day	Intraday	1-day	5-day	Daily profit (TWD)	Daily index return (%)
$SubRatio_{8,i,t-1} - SubRatio_{3,i,t-1}$	-0.063***	-0.061*	-0.180**	-0.040	-0.092	-0.272	-39,311.340	-3.264
	(0.000)	(0.075)	(0.011)	(0.356)	(0.293)	(0.139)	(0.306)	(0.293)
$OrderSize_{i,t-1}$	0.002***	0.001	-0.001	0.001	0.002	-0.003	-1,643.621	-0.114
	(0.000)	(0.539)	(0.557)	(0.249)	(0.445)	(0.555)	(0.205)	(0.258)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.046***	-0.083***	-0.172***	-0.049***	-0.127***	-0.178***	48,620.242	3.956
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.326)	(0.324)
$Ln(N_{i,t-1})$	0.011***	0.015***	0.011**	0.013***	0.019***	0.017	2,999.263	0.246
	(0.000)	(0.000)	(0.013)	(0.000)	(0.000)	(0.108)	(0.286)	(0.276)
$Disposition_{i,t-1}$	-0.023***	-0.033***	-0.028***	-0.024***	-0.042***	-0.038**	18,960.959	1.539
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.048)	(0.268)	(0.268)
$Return_{i,t-1}$	0.082***	0.031***	0.028***	0.015	0.002	0.011	0.660***	0.667***
	(0.000)	(0.000)	(0.000)	(0.146)	(0.883)	(0.308)	(0.000)	(0.001)
Constant	-0.052***	-0.091***	-0.054*	-0.047***	-0.053	-0.070	-1,638.501	-0.186
	(0.000)	(0.000)	(0.053)	(0.002)	(0.105)	(0.294)	(0.580)	(0.385)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	51,836	51,832	51,709	23,349	23,303	22,646	51,756	51,756
Adjusted R^2	0.030	0.010	0.014	0.006	0.004	0.003	0.000	0.000

Panel B: Unlucky Part of the Superstition Index

Independent Variable	Mark-to-market Return of Limit Orders (%)			Mark-to-market Return of Market Orders (%)			Round-trip Performance	
	Intraday	1-day	5-day	Intraday	1-day	5-day	Daily profit (TWD)	Daily index return (%)
$SubRatio_{3,i,t-1} - SubRatio_{4,i,t-1}$	-0.013	-0.084*	-0.248**	-0.024	-0.033	-0.034	-5,608.824	-0.374
	(0.562)	(0.075)	(0.014)	(0.684)	(0.802)	(0.900)	(0.136)	(0.151)
$OrderSize_{i,t-1}$	0.002***	-0.000	-0.003	0.002	0.003	-0.002	-883.853	-0.046
	(0.000)	(0.792)	(0.107)	(0.128)	(0.166)	(0.709)	(0.183)	(0.314)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.040***	-0.078***	-0.160***	-0.047***	-0.119***	-0.150***	-528.127	-0.054
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.559)	(0.410)
$Ln(N_{i,t-1})$	0.011***	0.015***	0.017***	0.011***	0.019***	0.018*	831.421**	0.068**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.078)	(0.023)	(0.011)
$Disposition_{i,t-1}$	-0.020***	-0.047***	-0.136***	-0.018***	-0.054***	-0.147***	-4,539.066***	-0.375***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Return_{i,t-1}$	0.081***	0.025***	0.020***	0.017*	0.005	0.010	0.531***	0.522***
	(0.000)	(0.001)	(0.004)	(0.083)	(0.673)	(0.364)	(0.001)	(0.004)
Constant	-0.056***	-0.088***	-0.048*	-0.043***	-0.057*	-0.065	-212.111	-0.062
	(0.000)	(0.000)	(0.073)	(0.005)	(0.087)	(0.330)	(0.918)	(0.652)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	50,763	50,759	50,657	23,177	23,132	22,489	50,843	50,843
Adjusted R^2	0.031	0.014	0.023	0.005	0.006	0.006	0.081	0.085

Table AX. Individual Investors' Pseudo-Superstition Index, Market Return, and the Buy Ratio and Buy-sell Ratio – Quintile Analysis

In this table we report the Buy Ratio and Buy-sell Ratio for individual investors with various pseudo-superstition indices and under different market returns. We first sort individual investors into quintiles by the pseudo superstition index in one year. Investors in quintile 5 (Q5) of the pseudo-superstitious index are the most pseudo superstitious. We then sort the trading days of the next year into quintiles based on the daily market returns. Market returns on trading days in Quintile-5 (M5) are the highest. We then compute the average Buy Ratio and average Buy-Sell Ratio of each product (MXF or TXF orders that expire in one month, two months, three months, six months, nine months, or one year) for the investors in each pseudo superstitious quintile and market return quintile. We define $SI_{i,t-1}$ as the difference between limit order submission ratios at "7" and "3" for investor i in year t-1. We calculate the investor's submission ratio at "7" as the number of limit orders submitted at prices ending with "7" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "3" is calculated in a similar fashion. The Buy Ratio is calculated as the number of buy contracts (taking long positions) scaled by total number of executed contracts. We calculate the Buy-sell Ratio as the difference between the numbers of buy and sell contracts, divided by their average. Both limit and market orders are included in the calculation of Buy Ratio and Buy-sell Ratio. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. The Satterthwaite p-value assumes unequal variances of investor performance in quintiles 1 and 5. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Panel A: Buy Ratio

Quintile Ranks of	Quintile Ranks of Pseudo $SI_{i,t-1}$						
Market Returns	Q1	Q2	Q3	Q4	Q5	Diff (Q5-Q1)	p-value
M1	0.705	0.679	0.673	0.668	0.698	-0.007	0.369
M2	0.628	0.613	0.616	0.608	0.626	-0.002	0.261
M3	0.587	0.578	0.579	0.573	0.579	-0.008	0.352
M4	0.552	0.553	0.553	0.548	0.546	-0.007	0.256
M5	0.529	0.537	0.544	0.535	0.526	-0.003	0.165
Diff (M5-M1)	-0.176***	-0.142***	-0.129***	-0.133***	-0.172***		
p-value	0.000	0.000	0.000	0.000	0.000		

Panel B: Buy-Sell Ratio

Quintile Ranks of Market Returns	Quintile Ranks of Pseudo $SI_{i,t-1}$ Q1	Q2	Q3	Q4	Q5	Diff (Q5-Q1)	p-value
M1	0.820	0.717	0.691	0.670	0.792	-0.028	0.103
M2	0.513	0.452	0.463	0.430	0.504	-0.009	0.261
M3	0.347	0.312	0.318	0.292	0.315	-0.033	0.105
M4	0.209	0.212	0.214	0.193	0.182	-0.027	0.101
M5	0.117	0.149	0.176	0.138	0.106	-0.012	0.165
Diff (M5-M1)	-0.702***	-0.568***	-0.515***	-0.532***	-0.686***		
p-value	0.000	0.000	0.000	0.000	0.000		

o-Table AXI. Individual Investors' Time-to-Execution/Time-to-Cancellation and Investment Performance

In this table we report the parameter estimates for the following panel regression:

$$Return_{i,t} = \alpha + \beta_1 TimeToExecutio\square_{i,t} (or\ TimeToCancellation_{i,t}) + \beta_2 OrderSize_{i,t-1} + \beta_3 SubRatio_{0\ and\ 5,i,t-1} + \beta_4 Ln(N_{i,t-1}) + \beta_5\ Disposition_{i,t-1} + \beta_6 Return_{i,t-1} + \varepsilon_{i,t}$$

where $Return_{i,t}$ and $Return_{i,t-1}$ are the average mark-to-market returns or round-trip performance for investor i in year t and year *t-1*. $TimeToExecution_{i,t}$ is the interval from order submission to execution for executed limit orders for investor i in year t. $TimeToCancellation_{i,t}$ is the interval from submission to cancellation for orders that are submitted and then deleted by investor i in year t. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor i in year *t-1*. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor i's submission ratios at prices ending with "0" and "5" in year *t-1*. $Ln(N_{i,t-1})$ is the log of number of limit orders submitted by investor i in the previous year. $Disposition_{i,t-1}$ is the difference between the durations of losing and winning round-trip trades of investor i in year *t-1*, divided by their average. Mark-to-market return of limit (market) orders is the return under the assumption that the initiating limit (market) orders are covered at the closing price of a trading day. The round-trip daily profit and daily index return are calculated as the average round-trip profit or index return divided by the average round-trip duration for each investor. Standard errors are adjusted for heteroskedasticity. To ensure a reasonable magnitude of the superstition index, we require that investors submit at least 10 limit orders in each of two consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Panel A. Time-to-Execution

Independent Variable	Mark-to-market Return of Limit Orders (%) Intraday	1-day	5-day	Mark-to-market Return of Market Orders (%) Intraday	1-day	5-day	Round-trip Performance: Daily profit (TWD)	Daily index return (%)
$TimeToExecution_{i,t}$	-0.029***	-0.038***	-0.043***	-0.019***	-0.021**	-0.006	-17,251.539	-1.390
	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.716)	(0.307)	(0.310)
$OrderSize_{i,t-1}$	0.001**	0.000	-0.002	0.002	0.002	-0.001	-1,711.001	-0.119
	(0.011)	(0.665)	(0.477)	(0.125)	(0.338)	(0.790)	(0.190)	(0.244)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.020***	-0.052***	-0.134***	-0.033***	-0.092***	-0.125**	48,778.242	3.970
	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)	(0.018)	(0.324)	(0.322)
$Ln(N_{i,t-1})$	0.010***	0.013***	0.007*	0.012***	0.017***	0.010	3,507.781	0.286
	(0.000)	(0.000)	(0.086)	(0.000)	(0.001)	(0.286)	(0.296)	(0.289)
$Disposition_{i,-1}$	-0.021***	-0.030***	-0.018**	-0.021***	-0.038***	-0.040**	18,288.088	1.487
	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.027)	(0.272)	(0.272)
$Return_{i,t-1}$	0.064***	0.030***	0.025***	0.010	0.002	0.012	0.636***	0.644***
	(0.000)	(0.000)	(0.000)	(0.258)	(0.860)	(0.210)	(0.000)	(0.001)
Constant	-0.045***	-0.078***	-0.039	-0.044***	-0.053*	-0.065	-124.241	-0.064
	(0.000)	(0.000)	(0.136)	(0.002)	(0.082)	(0.293)	(0.957)	(0.686)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	56,952	56,947	56,808	25,735	25,685	24,974	56,843	56,843
Adjusted R^2	0.034	0.012	0.015	0.007	0.005	0.003	0.000	0.000

Panel B. Time-to-Cancellation

Independent Variable	Mark-to-market Return of Limit Orders (%)			Mark-to-market Return of Market Orders (%)			Round-trip Performance	
	Intraday	1-day	5-day	Intraday	1-day	5-day	Daily profit (TWD)	Daily index return (%)
$TimeToCancellation_{i,t}$	-0.008***	-0.011***	-0.011***	-0.006***	-0.013***	-0.024***	38.063	0.006
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.847)	(0.706)
$OrderSize_{i,t-1}$	0.001**	0.000	-0.001	0.002*	0.002	-0.001	-772.719	-0.039
	(0.017)	(0.718)	(0.523)	(0.079)	(0.304)	(0.837)	(0.287)	(0.445)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.032***	-0.066***	-0.148***	-0.037***	-0.082***	-0.079	-1,430.179	-0.095
	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.139)	(0.168)	(0.203)
$Ln(N_{i,t-1})$	0.009***	0.011***	0.004	0.010***	0.013***	0.004	161.475	0.016
	(0.000)	(0.000)	(0.358)	(0.000)	(0.007)	(0.644)	(0.683)	(0.611)
$Disposition_{i,t-1}$	-0.022***	-0.031***	-0.020***	-0.020***	-0.034***	-0.030*	1,363.819*	0.118*
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.097)	(0.068)	(0.078)
$Return_{i,t-1}$	0.066***	0.029***	0.023***	0.009	0.001	0.009	0.562***	0.575***
	(0.000)	(0.000)	(0.000)	(0.315)	(0.957)	(0.373)	(0.001)	(0.003)
Constant	-0.036***	-0.062***	-0.019	-0.031**	-0.028	-0.022	1,322.681	0.041
	(0.000)	(0.000)	(0.485)	(0.033)	(0.371)	(0.733)	(0.526)	(0.771)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	55,372	55,367	55,234	25,271	25,223	24,521	55,312	55,312
Adjusted R^2	0.032	0.011	0.014	0.006	0.004	0.003	0.071	0.078

Appendix Table AXII. Investors' Learning and Superstition

In this table we report the parameter estimates from the following regression for individual investors:

$$\begin{aligned}SI_{i,t} - SI_{i,t-1} = \alpha &+ \beta_1 Ln(N_{i,t-k}) + \beta_2 Return_{8,i,t-1} + \beta_3 Return_{4,i,t-1} + \beta_4 Return_{other,i,t-1} \\ &+ \beta_5 Return_{market,i,t-1} + \beta_6 SI_{i,t-1} + \beta_7 OrderSize_{i,t-1} + \beta_8 SubRatio_{0\ and\ 5,i,t-1} \\ &+ \beta_9 Disposition_{i,t-1} + \varepsilon_{i,t}\end{aligned}$$

where $SI_{i,t}$ and $SI_{i,t-1}$ are the superstition indices for investor *i* in years *t* and *t-1*, and are calculated as the difference between limit order submission ratios at "8" and "4" in each year. We calculate the investor's submission ratio at "8" as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. $Ln(N_{i,t-k})$ is the log of the number of limit orders submitted by investor *i* in year *t-k* (k is an integer that ranges from 1 to 3). $Return_{8,i,t-1}$ is the mark-to-market intraday return of limit orders submitted by investor *i* at prices ending with "8" in year *t-1*. $Return_{4,i,t-1}$ is the mark-to-market intraday return of limit orders submitted by investor *i* at prices ending with "4" in year *t-1*. $Return_{others,i,t-1}$ is the mark-to-market intraday return of limit orders submitted by investor *i* at prices ending with other numbers in year *t-1*. $Return_{market,i,t-1}$ is the mark-to-market intraday return of market orders submitted by investor *i* in year *t-1*. $OrderSize_{i,t-1}$ is the average number of contracts per limit order submitted by investor *i* in year *t-1*. $SubRatio_{0\ and\ 5,i,t-1}$ is the sum of investor *i*'s submission ratios at prices ending with "0" and "5" in year *t-1*. $Disposition_{i,t-1}$ is the disposition effect, which is calculated as the difference between the durations of losing and winning round-trip trades of investor *i* in year *t-1*, divided by their average. We express the superstition index in percentage. In models 1 and 4, we require that investors submit at least 10 limit orders in each of the two consecutive years. Standard errors are adjusted for heteroskedasticity. In models 2 and 5, we require that investors must submit at least 10 limit orders in each of three consecutive years. In models 3 and 6, we require that investors submit at least 10 limit orders in each of four consecutive years. *, **, and *** indicate significance levels of 0.1, 0.05, and 0.01, respectively.

Independent	$SI_{i,t} - SI_{i,t-1}$ (%)					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
$Ln(N_{i,t-1})$	-0.096***			-0.188***		
	(0.000)			(0.000)		
$Ln(N_{i,t-2})$		-0.075***			-0.093***	
		(0.003)			(0.009)	
$Ln(N_{i,t-3})$			0.001			-0.082
			(0.976)			(0.127)
$Return_{8,i,t-1}$ (%)				-0.103	-0.111	-0.133
				(0.343)	(0.306)	(0.478)
$Return_{4,i,t-1}$ (%)				-0.052	-0.055	-0.002
				(0.602)	(0.577)	(0.989)
$Return_{other,i,t-1}$ (%)				-0.767**	-0.858***	-0.692
				(0.018)	(0.008)	(0.185)
$Return_{market,i,t-1}$ (%)				0.032	0.020	0.075
				(0.772)	(0.856)	(0.683)
$SI_{i,t-1}$ (%)	-0.434***	-0.434***	-0.391***	-0.333***	-0.333***	-0.270***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$OrderSize_{i,t-1}$	-0.047***	-0.049***	-0.035**	-0.013	-0.019	-0.023
	(0.000)	(0.000)	(0.031)	(0.293)	(0.125)	(0.173)
$SubRatio_{0\ and\ 5,i,t-1}$	-0.932***	-0.884***	-1.512***	-0.017	0.044	-0.832**
	(0.000)	(0.000)	(0.000)	(0.940)	(0.844)	(0.011)
$Disposition_{i,t-1}$	0.279***	0.276***	0.340***	0.207***	0.196***	0.204*
	(0.000)	(0.000)	(0.000)	(0.003)	(0.005)	(0.060)
Constant	2.785***	2.634***	2.392***	2.274***	1.677***	2.050***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56,260	56,260	24,388	22,298	22,298	9,404
r2_a	0.168	0.168	0.153	0.090	0.089	0.069

Figure A1. Limit Order Submission Ratios on Various Days of the Month

In this figure, we report the proportion of limit orders submitted by investors on various dates in the month. The submission ratio is calculated as the number of limit orders submitted on each date of the month divided by the total number of limit orders submitted in the month. We report the figures separately for individual investors, domestic institutions, and Qualified Foreign Institutional Investors (QFIIs.)

Figure A1.A. Individual Investors

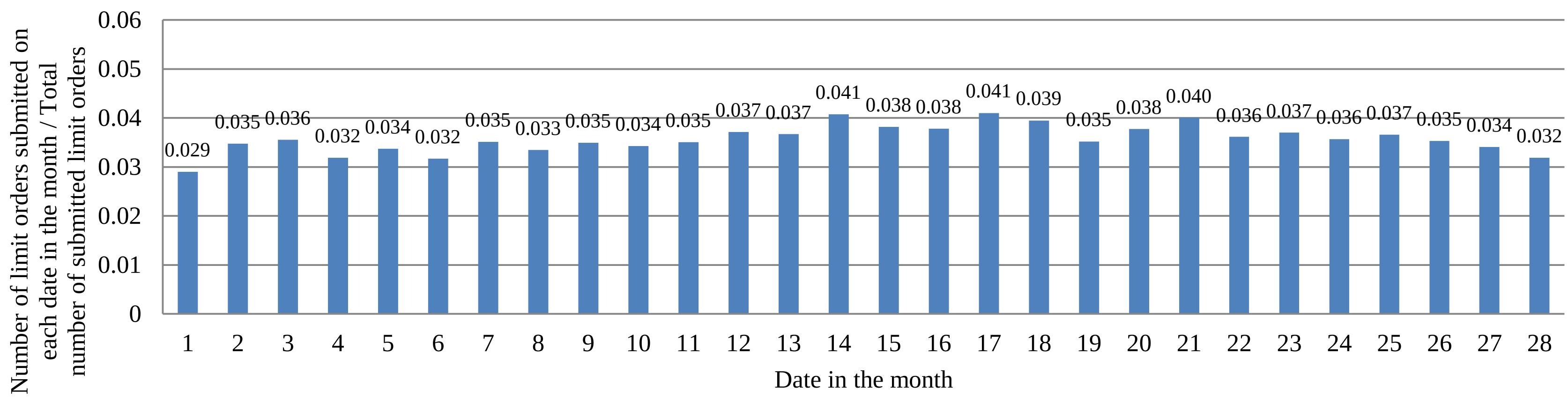

Figure A1.B. Domestic Institutions

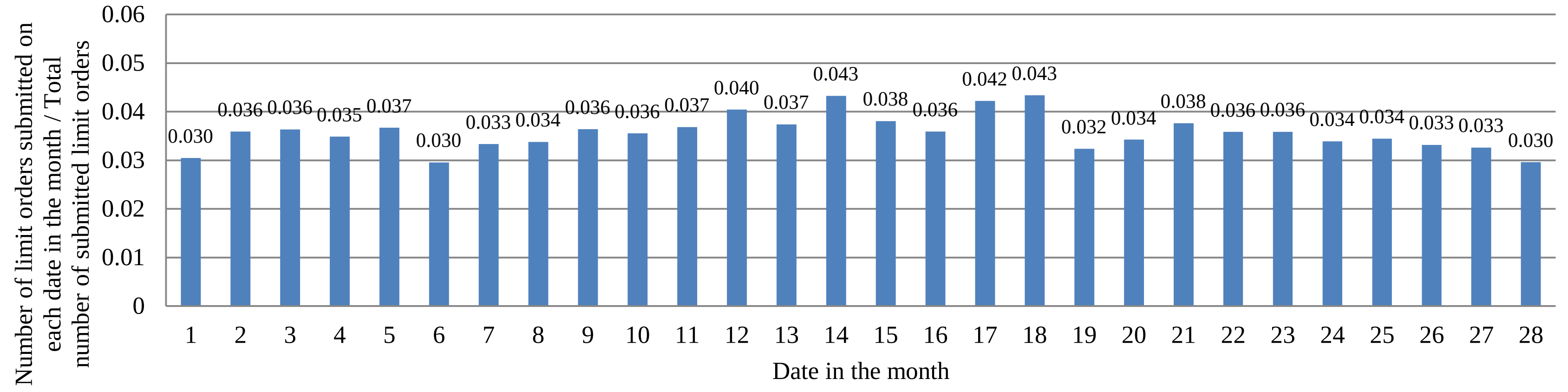

Figure A1.C. Qualified Foreign Institutional Investors

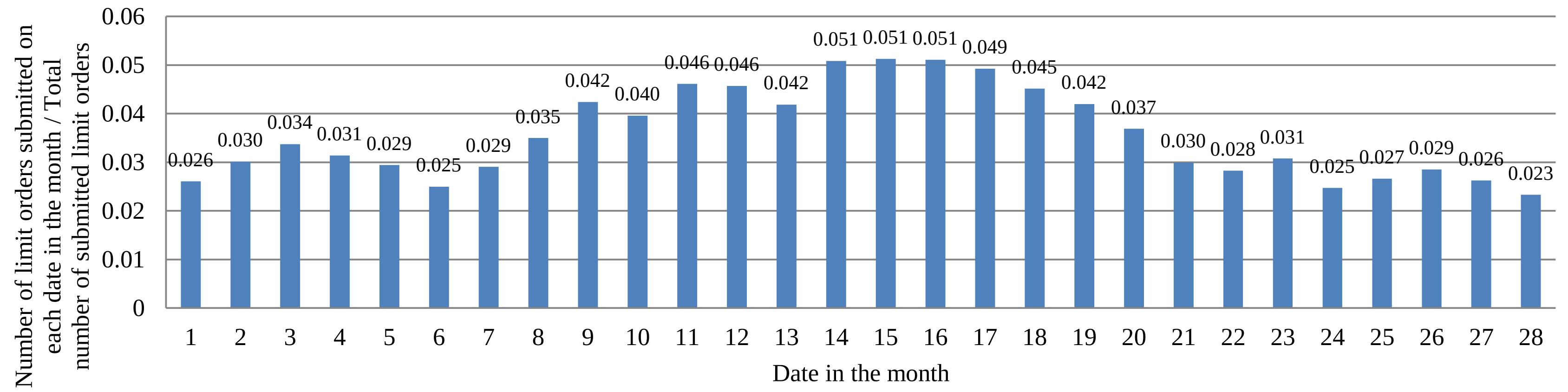

Figure A2. Limit Order Submission Ratios at Various Prices for Limit Buy Orders

In this figure, we report the proportion of limit buy orders submitted by investors at prices ending with “X” (X is an integer ranging from 0 to 9). The submission ratio is calculated as the number of limit buy orders submitted at "X" divided by the total number of submitted limit buy orders. We report the figures separately for individual investors, domestic institutions, and Qualified Foreign Institutional Investors (QFIIs.)

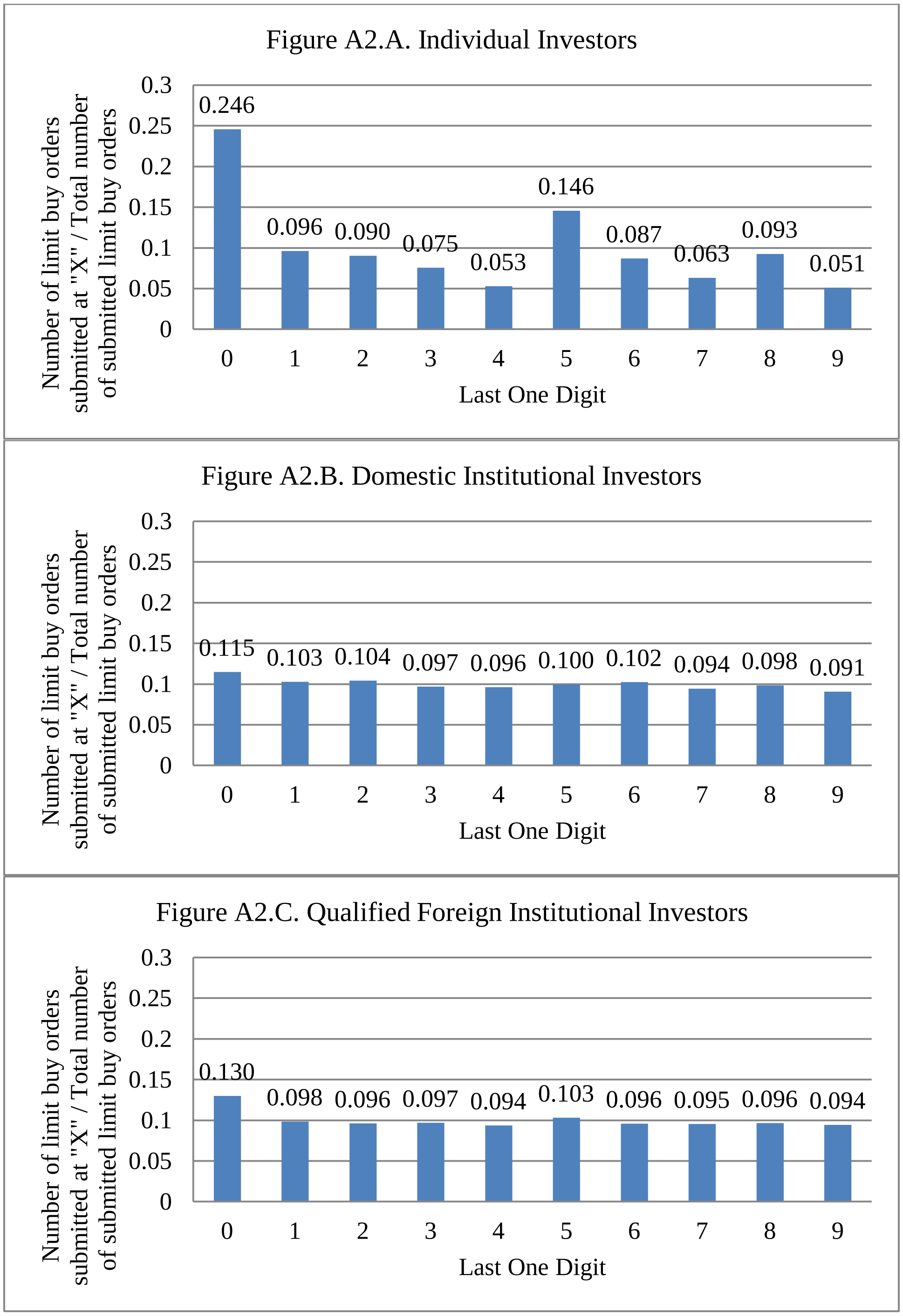

Figure A3. Limit Order Submission Ratios at Various Prices for Limit Sell Orders

In this figure, we report the proportion of limit sell orders submitted by investors at prices ending with "X" (X is an integer ranging from 0 to 9). The submission ratio is calculated as the number of limit sell orders submitted at "X" divided by the total number of submitted limit sell orders. We report the figures separately for individual investors, domestic institutions, and Qualified Foreign Institutional Investors (QFIIs.)

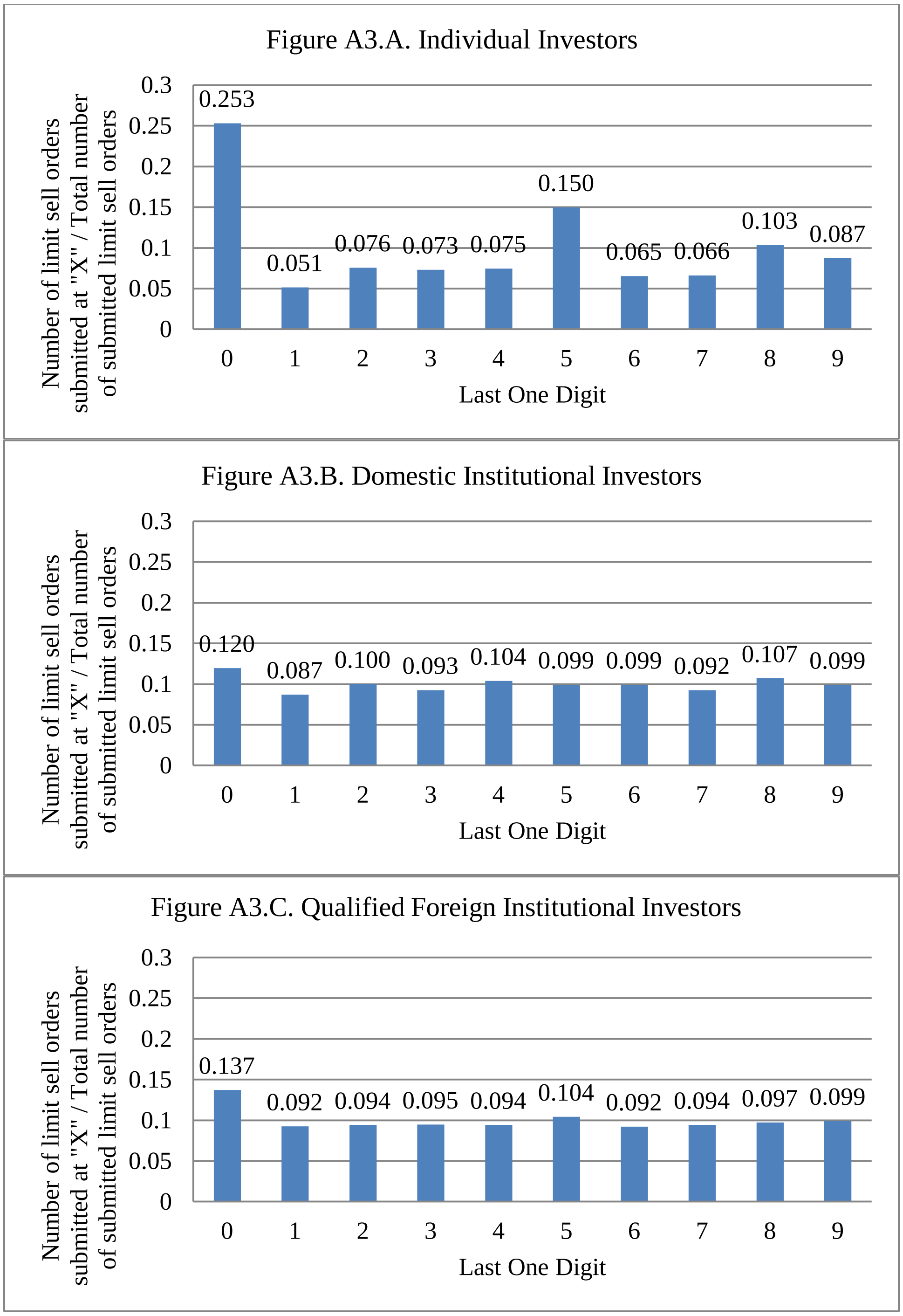

Figure A4. Superstition and Intraday Returns of Limit Orders Submitted at "X"

In this figure, we sort investors into quintiles by the superstition index in one year, and plot the mark-to-market return of limit orders submitted at prices ending with "X" in the subsequent year (X is an integer ranging from 0 to 9). Quintile-5 (Q5) investors are more superstitious. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. Mark-to-market intraday return is the difference between the trade price and the daily closing price divided by the trade price. Results for individual investors, domestic institutions, and Qualified Foreign Institutional Investors (QFIIs) are reported separately.

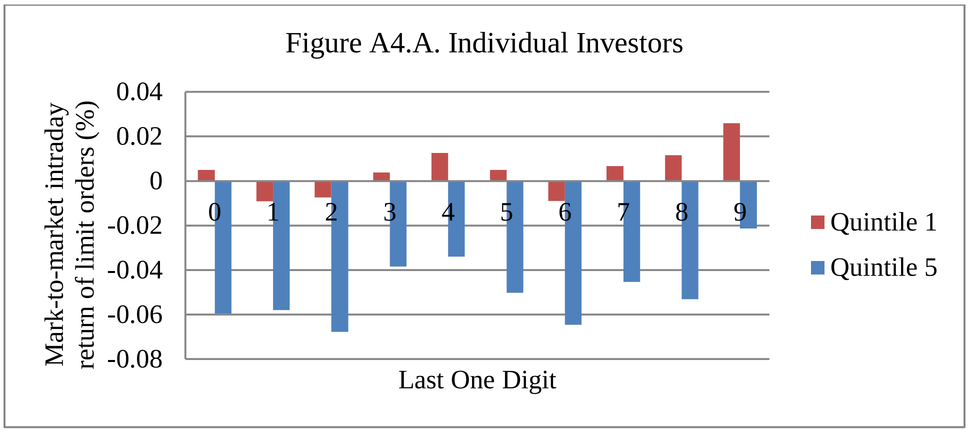

Figure A4.A. Individual Investors

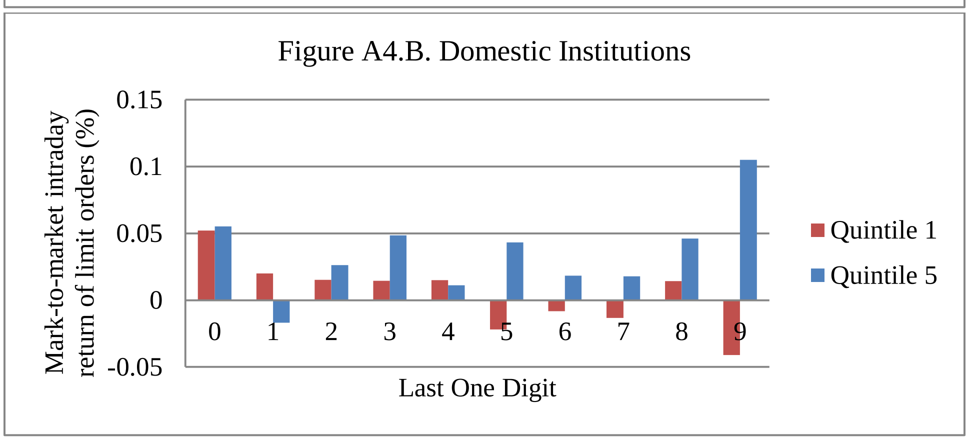

Figure A4.B. Domestic Institutions

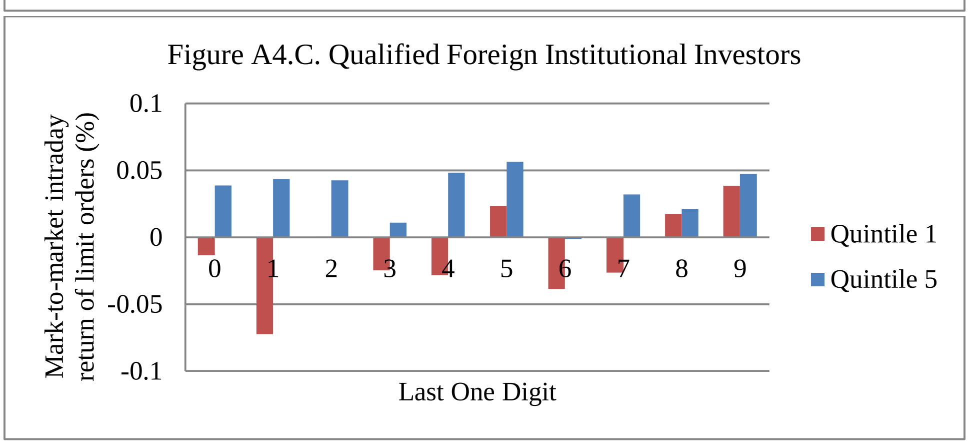

Figure A4.C. Qualified Foreign Institutional Investors

Figure A5. Intraday Returns of Institutional Investors When They Pick Up Limit Orders Submitted by Individual Investors at "X"

In this figure, we plot the returns of institutional investors when they pick up the limit orders submitted by individual investors. We first sort individual investors into quintiles by the superstition index in one year, and group their limit orders in the subsequent year into ten groups according to the last digit of limit order prices. The Quintile-5 individual investors are the most superstitious. We then identify the individual limit orders that are picked up by institutional investors. The intraday mark-to-market returns of institutional investors are calculated separately for those orders that have picked up the limit orders submitted by the Quintile-5 and Quintile-1 individual investors, and for each of the last one digit. In each year, we calculate the superstition index for each investor as the difference between limit order submission ratios at "8" and "4." The submission ratio at "8" of an investor is calculated as the number of limit orders submitted at prices ending with "8" divided by the total number of limit orders submitted at all prices within a year. The submission ratio at "4" is calculated in a similar fashion. Mark-to-market intraday return of institutional investors is the difference between the trade price and the daily closing price divided by the trade price. Results for domestic institutions and Qualified Foreign Institutional Investors (QFIIs) are shown in figures A5.A and A5.B, respectively.