Internet Appendix

to

"Time Variation in Liquidity: The Role of Market-Maker Inventories and Revenues" *

This internet appendix presents supplemental analyses and results to the main tables in "Time Variation in Liquidity: The Role of Market Maker Inventories and Revenues". We include overview statistics on NYSE specialist participation rates and NYSE market share. The additional results include two controls. In the regression analysis, we use dollar effective spreads as a dependent variable instead of percentage effective spreads. We also include selected Vector Autoregression results.

Table of Contents

Table IA.I
NYSE Specialist Participation Rate, 1994–2004

The following graph shows specialist participation rates over our sample period. Specialist participation actually rose over much of our sample. The ending rate (in 2004) is about the same as the beginning rate (mid-1990s). We discuss the participation rate in footnote 9 of the paper. The widely reported decline in specialist participation rates occurs mainly around the phase-in of the NYSE's Hybrid market, two years after our sample period ends.

NYSE Specialist Participation Rate: 1994 – 2004
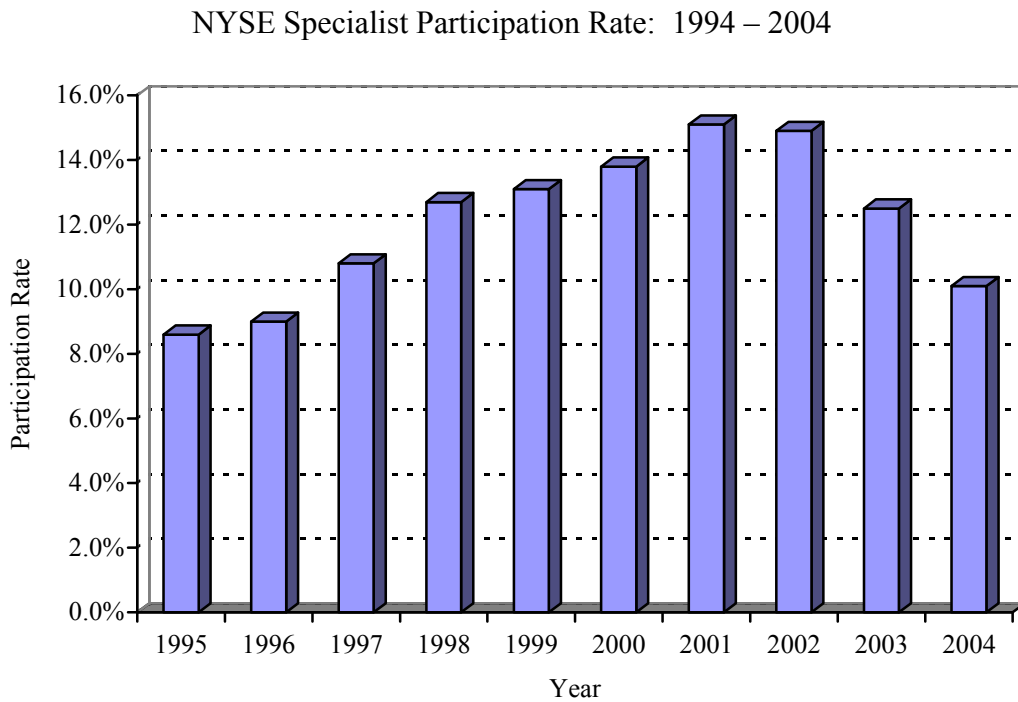
Source: www.nyxdata.com

Table IA.II
NYSE Market Share, 1994–2003

The following graph shows the NYSE market share, which is quite stable around 80% during our sample period.   The graph stops in 2003 because the NYSE changed its market share reporting, providing only combined NYSE and ARCA market share numbers beginning in 2004.

NYSE Market Share: 1994 – 2003
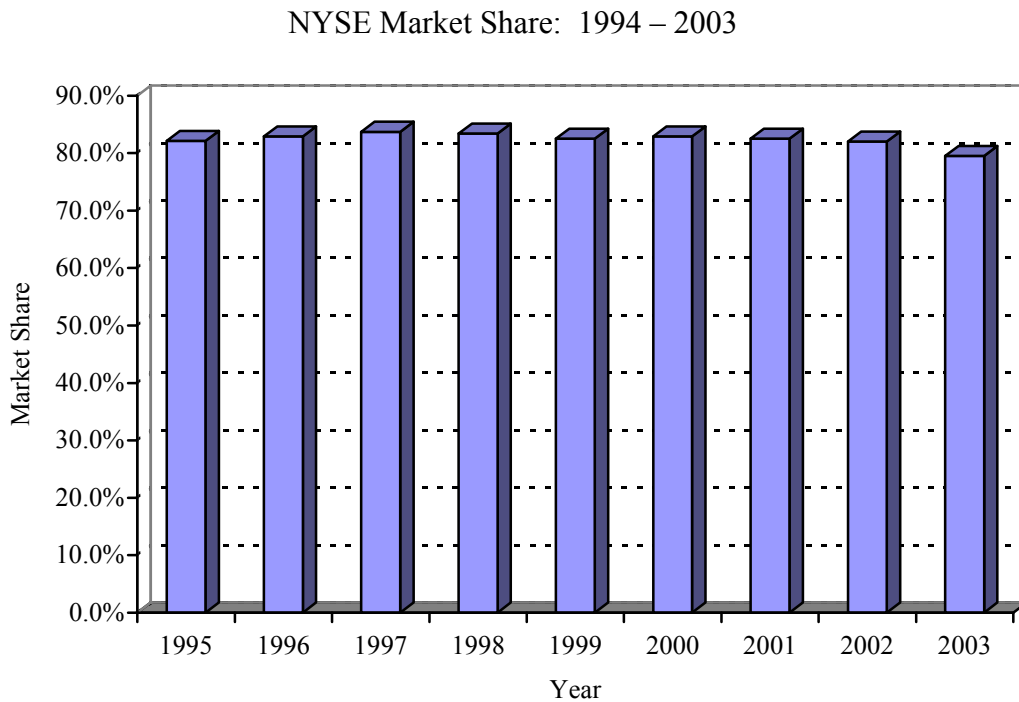
Source: www.nyxdata.com

Table IA.III
Aggregate specialist inventories and revenues and future market liquidity (dollar spreads)

This table can be compared with Table II in the main text. Time-series regressions are performed on daily data from 1994 to 2004. The dependent variable is the value-weighted dollar effective spread on day t relative to its average value during the interval $[t–10, t–6]$. Spreads are calculated analogously to the percentage spreads in the text but are measured in cents, $Spr(\$)_{m,t}$. Variables are defined in Tables I and II of the text. All coefficients are multiplied by 10^3. t-statistics are in brackets and are based on Newey-West standard errors with 10 lags.

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-15.58	-15.79	-17.15	-90.03	-55.55	-14.76	-6.42
	[1.27]	[1.34]	[1.45]	[3.88]	[2.70]	[0.70]	[0.30]
RevGr$_{m,t-1}$	-2.94						
	[1.92]						
RevInv$_{m,t-1}$		-13.01	-12.99			-8.09	-7.72
		[6.53]	[6.53]			[3.26]	[3.11]
RevInv_Lo$_{m,t-1}$			-8.00				-10.29
			[1.08]				[1.52]
RevTr$_{m,t-1}$		0.27	0.29			-0.69	-0.73
		[0.27]	[0.30]			[0.69]	[0.75]
RevTr_Lo$_{m,t-1}$			-1.27				-1.26
			[1.46]				[1.07]
Inv$_{m,t-1}$				36.99	6.72	-1.17	-10.37
				[2.95]	[0.49]	[0.11]	[0.75]
Inv_Hi$_{m,t-1}$					30.91		9.85
					[3.11]		[1.02]
Ret$_{m,t-1}$						29.77	32.78
						[0.78]	[0.87]
VarRet$_{m,t}$						126.17	129.39
						[3.50]	[3.66]
Observations	2760	2760	2760	2760	2760	2760	2760
R^2	0.013	0.058	0.060	0.013	0.019	0.088	0.092

Table IA.IV
Selected Vector Autoregression Results

The following graphs show orthogonalized impulse response functions (IRFs) from a daily vector autoregression (VAR) with five lags on detrended aggregate market proportional effective spreads (*SPR*), value-weighted market returns (r_m), return volatility as measured by absolute market returns ($|r_m|$), specialist trading revenues from inventory held intraday or overnight (*RTR* and *ITR*, respectively, as defined in Appendix B), and the absolute value of aggregate specialist inventories (*Inv*). The spread measure, *SPR*, begins with the proportional effective spread $ES(\%)_{m,t}$ from Appendix A and takes out a piecewise linear time trend for each of the four regimes. Two orderings are provided to confirm that the results are similar if the whole shock to inventories and revenues is considered or just the component of the shock that is orthogonal to returns and volatility. We show only the impulse responses of spreads (to shocks to each of the six variables). The 95% confidence intervals are bounded by the light grey (or red) lines.

Ordering #1. The first ordering is: specialist inventory (*Inv*), revenues from inventories held overnight (*ITR*), revenues from intraday round trips (*RTR*), absolute market returns ($|r_m|$), value-weighted market returns (r_m), and detrended effective spreads (*SPR*). Shocks to specialist inventories and shocks to revenues from overnight inventories both affect spreads for at least the next two weeks.
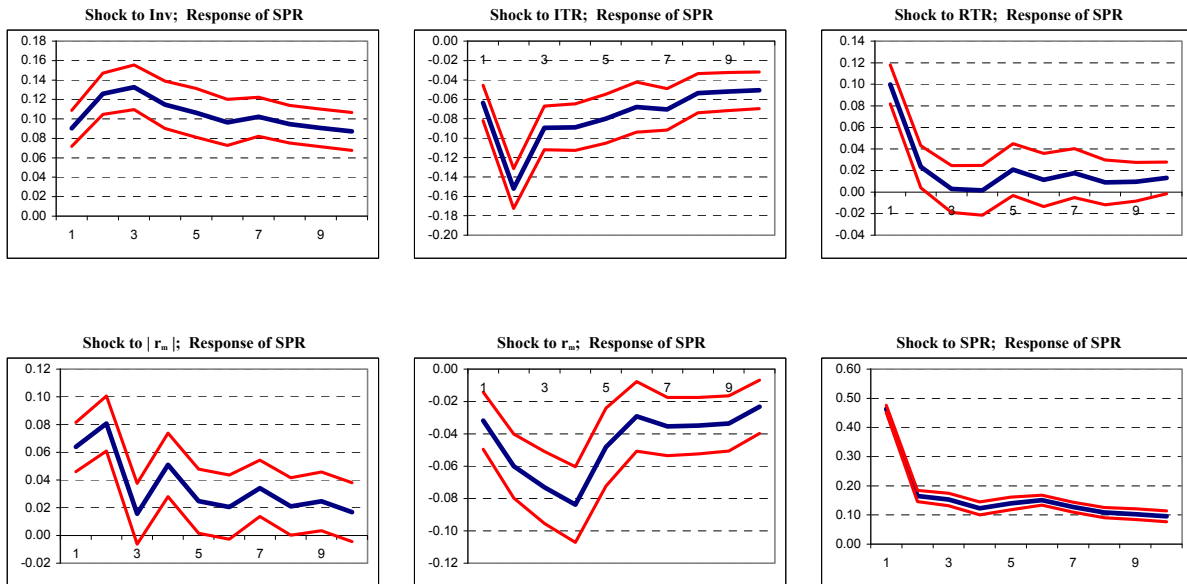
Ordering #2. We also consider a second ordering that controls for other effects by putting our inventory and revenue measures after volatility and market returns. This means that we consider the response of spreads to the part of an inventory or revenue shock that is orthogonal to return volatility and/or market-level returns. The ordering is: return volatility as measured by absolute market returns ($|r_m|$), value-weighted market returns (r_m), inventories (*Inv*), revenues from inventories held overnight (*ITR*), intraday round-trip trading revenues (*RTR*), and detrended effective spreads (*SPR*). Inventory effects are weaker under this specification than in Ordering #1, but are still reliably present, especially a week or so after the initial shock. Revenues from overnight inventories continue to have very strong effects over multiple weeks.

5
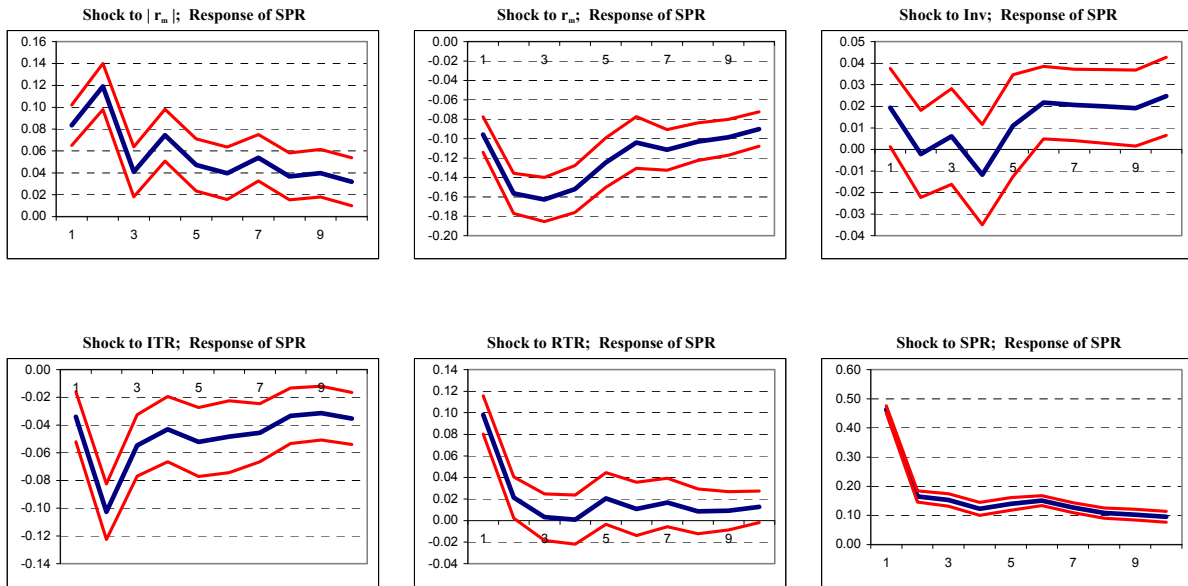
Table IA.V
Specialist firm inventories and revenues and future liquidity (dollar spreads)

Table contains cross-sectional averages of time-series regressions estimated for each specialist firm, which can be compared with Table IV in the main text. Variables are calculated using the stocks assigned to a given specialist firm. The dependent variable is the value-weighted (dollar???) effective spread on day t relative to its average value during the interval $[t–10, t–6]$. Spreads are calculated analogously to the percentage spreads in the text but are measured in cents. Variables are defined in Tables III and IV of the text. All coefficients are multiplied by 10^3. t-statistics are in brackets and account for both time-series and cross-sectional correlation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-8.39	-8.36	-8.11	-43.77	-45.15	-13.86	-24.44
	[0.74]	[0.76]	[0.73]	[2.94]	[2.90]	[1.09]	[1.85]
$RevGr_{f,t-1}$	-345.79						
	[6.53]						
$RevInv_{f,t-1}$		-572.34	-519.15			-446.73	-379.97
		[4.93]	[5.00]			[3.19]	[2.82]
$RevInv\_Lo_{f,t-1}$			-726.02				-695.99
			[3.80]				[3.81]
$RevTr_{f,t-1}$		118.58	58.69			-13.51	-38.98
		[0.59]	[0.29]			[0.06]	[0.16]
$RevTr\_Lo_{f,t-1}$			1,540.82				2,283.42
			[0.33]				[0.48]
$Inv_{f,t-1}$				400.39	-2,565.59	921.48	981.02
				[0.50]	[0.79]	[1.37]	[0.77]
$Inv\_Hi_{f,t-1}$					2,780.63		-256.30
					[1.07]		[0.24]
$Ret_{f,t-1}$						7.43	8.03
						[0.40]	[0.44]
$VarRet_{f,t}$						196.58	195.41
						[3.66]	[3.56]
Specialist firms	124	124	124	124	124	124	124
Average R^2	0.012	0.030	0.047	0.014	0.017	0.080	0.099