Working with bid and offer quotes on TAQ.

The TAQ (Trade and Quote) database is the primary source of historical trade and quote data for US equities. It is updated monthly, with a lag of several months.

TAQ is a close transcript of the real-time data flowing from the Consolidated Quote System (CQS) and the Consolidated Trade System (CTS). These are systems run by the Consolidated Tape Association (CTA), an industry consortium that, for the present at least, functions as the primary aggregator of trade and quote data from diverse market centers.

General remarks about the CQ file.

- The CQ file covers most activity in major US market centers. It does not cover non-US market centers, nor does it cover activity between 6pm and 7am (?).

- A record in the CQ file represents a quote update originating in one of the market centers.

- The record generally establishes the best bid and offer (BBO) prevailing in the market center.

- Normally, a quote from a market center is regarded as firm and valid until superceded by a new quote from the center.

  An exception occurs when the market center wishes to indicate that it is withdrawing or canceling its quote and is not posting another quote.

- At present this is indicated by posting a bid of one penny and an offer that is approximately twice the previous day's close.

- A CQ record does not establish a comprehensive market-wide "national" best bid and offer (NBBO).

  If we want to know what the NBBO was at a particular instant, we need to look back and determine the most recent bids and offers posted by all market centers. Then we take the highest bid and the lowest offer.

- The CQ file does not necessarily indicate the most timely data available to market participants.

  For example, when the best bid on the Island ECN changes, Island's subscribers are notified by an electronic link directly from Island. Island also sends the update to the CTA, which then disseminates it further. This latter route is more circuitous and presumably slower.

Here are some specific examples.

An NYSE-listed stock: IBM on July 7, 2003

Note 1. The "T" exchange symbol represents Nasdaq. Nasdaq quotes are set only by market makers, who are identified by the "mmid" field. The "CAES" mmid is not a specific market maker, but is instead a consolidated entry that comprises participating market makers and ECNs. It is generally a good indication of the BBO prevailing away from the exchanges. (These remarks are valid for exchange-listed stocks only.)

time	bid	ofr	bidsiz	ofrsiz	mode	ex	mmid	spread	Comment
9:30:03	0.00	0.00	0	0	12	C		0.00	
9:30:03	83.46	85.46	4	4	12	T	BRUT	2.00	See note 1. supra.
9:30:03	83.46	85.46	4	4	12	T	CAES	2.00	
9:30:06	82.90	85.00	5	10	12	M		2.10	
9:30:07	84.10	88.10	2	4	12	X		4.00	
9:30:07	84.10	85.00	2	8	12	X		0.90	
9:30:08	0.01	0.00	1	0	12	C		-0.01	
9:30:08	0.01	999.00	1	1	12	C		998.99	
9:30:13	84.70	84.95	100	400	10	N		0.25	NYSE opening quote
9:30:13	84.64	84.88	15	2	12	B		0.24	
9:30:14	84.60	85.00	1	10	12	M		0.40	
9:30:14	84.65	999.00	1	1	12	C		914.35	Bid without
9:30:14	84.65	85.00	1	1	12	C		0.35	
9:30:14	84.52	84.95	5	15	12	P		0.43	
9:30:14	84.65	85.00	1	1	12	T	MADF	0.35	
9:30:14	84.65	85.00	1	1	12	T	CAES	0.35	
9:30:14	84.30	85.00	1	1	12	C		0.70	
9:30:14	84.30	84.89	1	1	12	C		0.59	
9:30:14	84.52	84.95	10	15	12	P		0.43	
9:30:14	84.50	84.90	1	9	12	T	TRIM	0.40	
9:30:14	84.65	84.90	1	9	12	T	CAES	0.25	
9:30:15	84.52	84.95	20	15	12	P		0.43	
9:30:15	84.30	84.89	1	1	12	T	MADF	0.59	
9:30:15	84.50	84.89	1	1	12	T	CAES	0.39	
9:30:15	84.52	84.95	30	15	12	P		0.43	
9:30:15	84.52	84.95	40	15	12	P		0.43	
9:30:17	84.71	84.94	1	1	12	N		0.23	
9:30:17	83.70	85.95	1	1	12	T	SWST	2.25	
9:30:17	83.70	85.88	1	1	12	T	SWST	2.18	
9:30:17	84.61	85.00	1	10	12	M		0.39	

time	bid	ofr	bidsiz	ofrsiz	mode	ex	mmid	spread	Comment
9:30:18	84.47	84.95	10	15	12	P		0.48	
9:30:18	84.64	84.90	15	18	12	B		0.26	
9:30:18	84.50	85.15	1	1	12	T	SBSH	0.65	
9:30:18	84.50	84.89	2	1	12	T	CAES	0.39	
9:30:18	84.31	84.89	1	1	12	C		0.58	
9:30:18	83.71	85.88	1	1	12	T	SWST	2.17	
9:30:18	84.31	84.89	1	1	12	T	MADF	0.58	
9:30:19	84.31	84.99	1	1	12	C		0.68	
9:30:20	84.31	84.99	1	1	12	T	MADF	0.68	
9:30:20	84.50	84.90	2	9	12	T	CAES	0.40	
9:30:21	84.61	85.00	40	10	12	M		0.39	
9:30:23	84.71	84.76	15	7	12	N		0.05	NYSE quotes narrow within less than a minute
9:30:24	84.74	84.76	2	7	12	N		0.02	
9:30:25	84.01	84.99	1	1	12	C		0.98	
9:30:25	84.01	84.89	1	1	12	C		0.88	
9:30:25	84.01	84.89	1	1	12	T	MADF	0.88	
9:30:25	84.50	84.89	2	1	12	T	CAES	0.39	
9:30:25	84.31	84.89	1	1	12	C		0.58	
9:30:25	84.31	84.89	1	1	12	T	MADF	0.58	
9:30:26	84.74	84.76	2	1	12	N		0.02	
9:30:26	84.34	84.89	1	1	12	T	MADF	0.55	
9:30:26	84.34	84.89	1	1	12	C		0.55	
9:30:26	84.74	84.76	2	3	12	N		0.02	
9:30:27	84.74	84.76	2	1	12	N		0.02	
9:30:27	84.59	84.89	1	1	12	C		0.30	
9:30:28	84.74	84.76	1	1	12	N		0.02	
9:30:31	84.76	84.80	2	1	12	N		0.04	
9:30:31	84.76	84.80	13	1	12	N		0.04	
9:30:32	84.36	84.89	1	1	12	T	MADF	0.53	
9:30:34	84.76	84.80	1	1	12	N		0.04	
9:30:35	78.48	91.18	1	1	12	T	TMBR	12.70	
9:30:39	84.76	84.90	1	1	12	N		0.14	
9:30:43	84.76	84.89	4	32	12	N		0.13	
9:30:44	84.76	84.89	3	32	12	N		0.13	
9:30:44	84.80	84.90	9	9	12	T	TRIM	0.10	
9:30:44	84.80	84.89	9	1	12	T	CAES	0.09	
9:30:45	84.80	84.90	9	9	12	T	TRIM	0.10	

time	bid	ofr	bidsiz	ofrsiz	mode	ex	mmid	spread	Comment
9:30:45	84.76	84.89	1	1	12	N		0.13	
9:30:47	80.00	89.00	1	1	12	T	SWST	9.00	
9:30:50	84.76	84.91	1	1	12	N		0.15	
9:30:52	84.50	84.90	1	9	12	T	TRIM	0.40	
9:30:52	84.50	84.89	2	1	12	T	CAES	0.39	
9:30:54	84.80	84.90	9	9	12	T	TRIM	0.10	
9:30:54	84.80	84.89	9	1	12	T	CAES	0.09	

Other notes

- Historically, for exchange-listed stocks, the listing exchange generally posts the most meaningful quotes.

  Most of the other market centers have been quasi-dealers who would set a wide posted quote, but would then execute trades either at the NBBO or slightly better.

Over time, however, these market centers have become more aggressive. In some securities (notably the ETFs) the most aggressive quotes are frequently found on the ECN's (which would show up in CAES).

A Nasdaq-listed stock: MSFT on July 7, 2003

The "T" exchange symbol for a Nasdaq-listed stock contains the BBO over all Nasdaq market makers. Nasdaq also provides (in the SuperMontage system) an object called the automatic display facility (ADF, exchange symbol "D"). Most ECN quotes are posted via the ADF.

time	bid	ofr	bidsiz	ofrsiz	mode	ex	spread	Comment
7:30:47	26.48	26.49	10	9	12	T	0.01	
7:35:25	27.00	26.49	10	9	12	T	-0.51	Crossed market
7:36:32	27.05	26.49	1	9	12	T	-0.56	
7:36:49	27.00	26.49	11	9	12	T	-0.51	
7:43:34	27.00	26.49	11	8	12	T	-0.51	
7:43:42	27.00	26.49	12	8	12	T	-0.51	
7:44:51	27.20	26.49	10	8	12	T	-0.71	
7:44:51	27.30	26.49	10	8	12	T	-0.81	
7:45:15	27.30	26.49	5	8	12	T	-0.81	
7:45:31	27.30	26.49	10	8	12	T	-0.81	
7:45:32	27.20	26.49	10	8	12	T	-0.71	
7:57:11	27.20	26.49	20	8	12	T	-0.71	
7:57:18	27.20	26.49	10	8	12	T	-0.71	
7:59:28	27.24	26.49	10	8	12	T	-0.75	
8:00:00	27.10	27.21	5	5	12	P	0.11	
8:00:00	27.18	27.21	10	5	12	P	0.03	
8:00:00	27.18	27.20	10	10	12	P	0.02	
8:00:01	27.15	27.19	17	3	12	D	0.04	
8:00:04	27.20	26.49	110	8	12	T	-0.71	
8:00:11	27.15	27.20	17	10	12	D	0.05	
8:00:12	27.18	27.20	10	8	12	P	0.02	
8:00:12	27.17	0.00	2	0	12	C	-27.17	Nothing on offer side ("bid without")
8:00:12	27.17	27.20	2	5	12	C	0.03	
8:00:20	27.18	27.25	10	2	12	P	0.07	
8:00:21	27.17	27.20	2	3	12	C	0.03	

MSFT on July 7, 2003 (near the open).

time	bid	ofr	bidsiz	ofrsiz	mode	ex	spread
9:30:01	26.99	27.00	4	9	12	T	0.01
9:30:01	26.00	28.00	100	100	12	A	2.00
9:30:01	27.00	27.01	101	31	12	P	0.01
9:30:01	26.96	27.01	13	31	12	P	0.05
9:30:01	26.99	27.00	88	633	12	D	0.01
9:30:01	27.00	27.03	14	50	12	C	0.03
9:30:01	26.96	27.00	13	18	12	P	0.04
9:30:01	26.99	27.00	4	7	12	T	0.01
9:30:01	26.99	27.00	4	1	12	T	0.01
9:30:01	26.98	27.00	7	18	12	P	0.02
…							
9:30:07	26.99	27.01	58	8	12	D	0.02
9:30:07	26.99	27.00	2	30	12	P	0.01
9:30:07	26.99	27.00	2	27	12	P	0.01
9:30:07	26.98	27.00	53	27	12	P	0.02
9:30:07	27.01	27.02	1	50	12	D	0.01
9:30:07	26.97	27.04	41	4	12	C	0.07
9:30:07	26.98	27.00	53	37	12	P	0.02
9:30:07	1.00	100.00	1	1	12	A	99.00
9:30:07	26.98	27.00	53	45	12	P	0.02
9:30:07	26.98	27.00	53	25	12	P	0.02
9:30:07	26.98	27.00	53	17	12	P	0.02
9:30:07	26.98	27.04	10	4	12	C	0.06
9:30:07	26.99	27.02	50	58	12	D	0.03
9:30:07	26.01	28.00	100	100	12	A	1.99
9:30:07	26.98	27.00	53	57	12	P	0.02
…							
9:30:09	26.98	26.99	53	3	12	P	0.01
9:30:09	26.98	26.99	61	3	12	P	0.01
9:30:09	26.98	26.99	46	3	12	P	0.01
9:30:09	26.98	26.99	38	3	12	P	0.01
9:30:09	25.05	29.00	5	5	12	M	3.95
9:30:09	26.98	26.99	58	3	12	P	0.01
9:30:09	26.98	26.99	58	2	12	P	0.01
9:30:09	26.99	27.00	27	69	12	D	0.01
9:30:09	26.98	27.00	58	74	12	P	0.02

Some general rules for computing average spreads:

- Use only quotes posted between 9:30 and 16:00.

- Try to get away with using only the primary market quotes. Use only 'N' quotes for IBM. Use only the "T" quotes for Nasdaq.

  What will get lost here are more aggressive quotes posted by other market centers. The alternative, though, is forming a NBBO by tracking all market centers, as indicated above. This process is more complex and error-prone. In addition, for some securities, the NBBO will be locked or crossed.

- Filter the spreads for outliers.

- Time-weight average spreads. (One quote might be valid for one second, another for five minutes.)