

# Plots

## Trades by exchanges

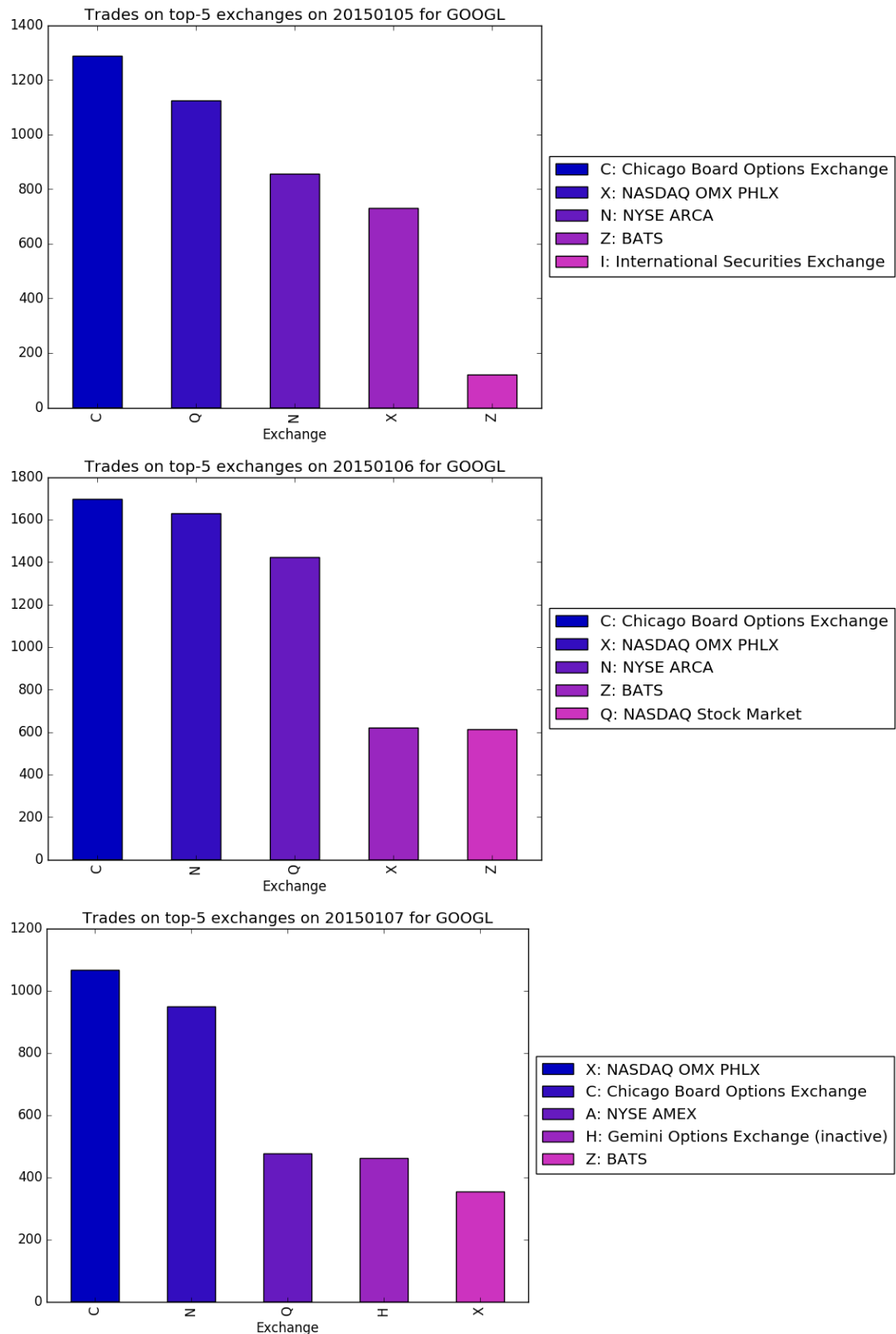


Figure 1: Top-5 exchanges by the number of trades

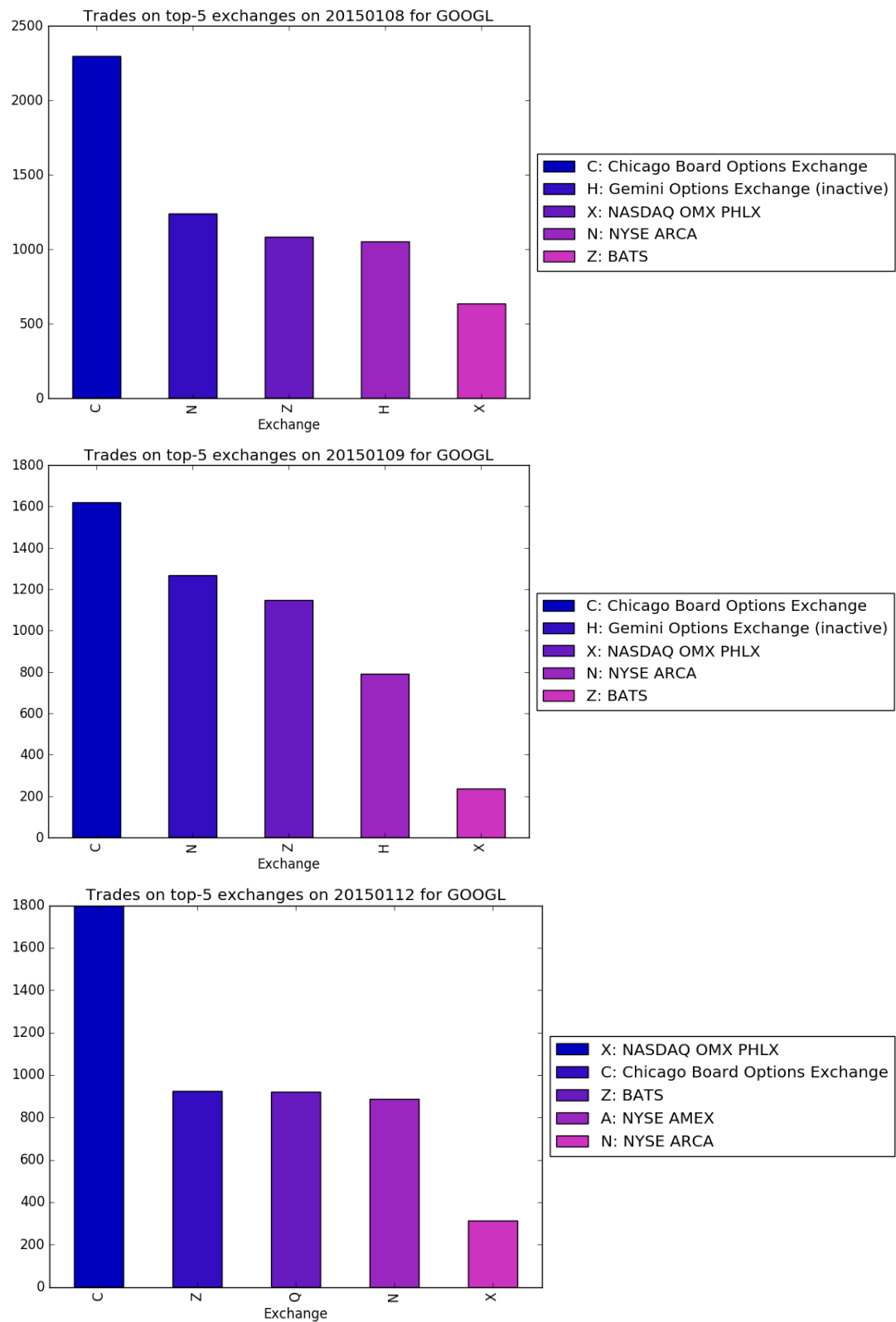


Figure 2: Top-5 exchanges by the number of trades

## Bid/Ask/Trade plots

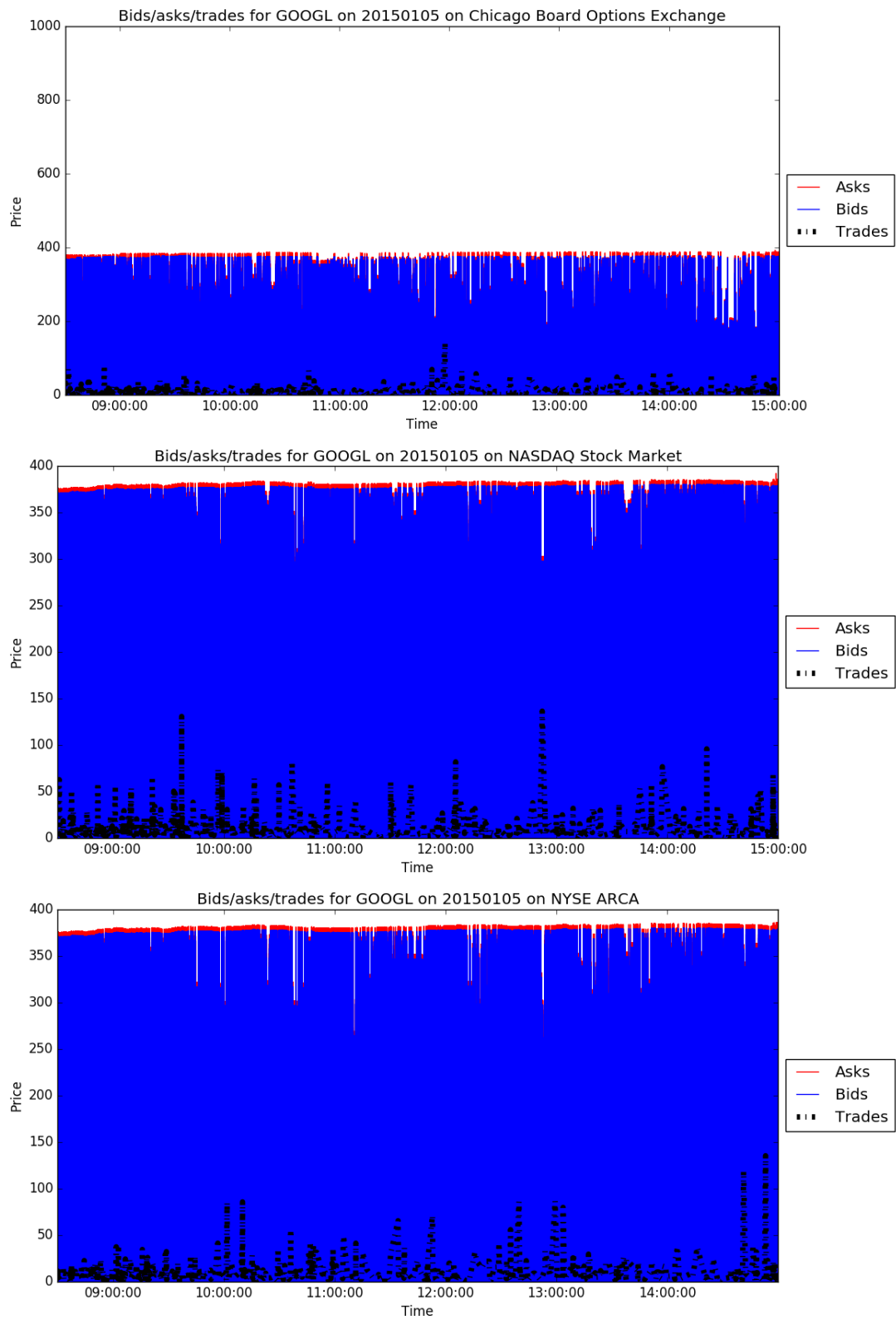


Figure 3: Bids/asks/trades for GOOGL on top-3 exchanges on 20150105

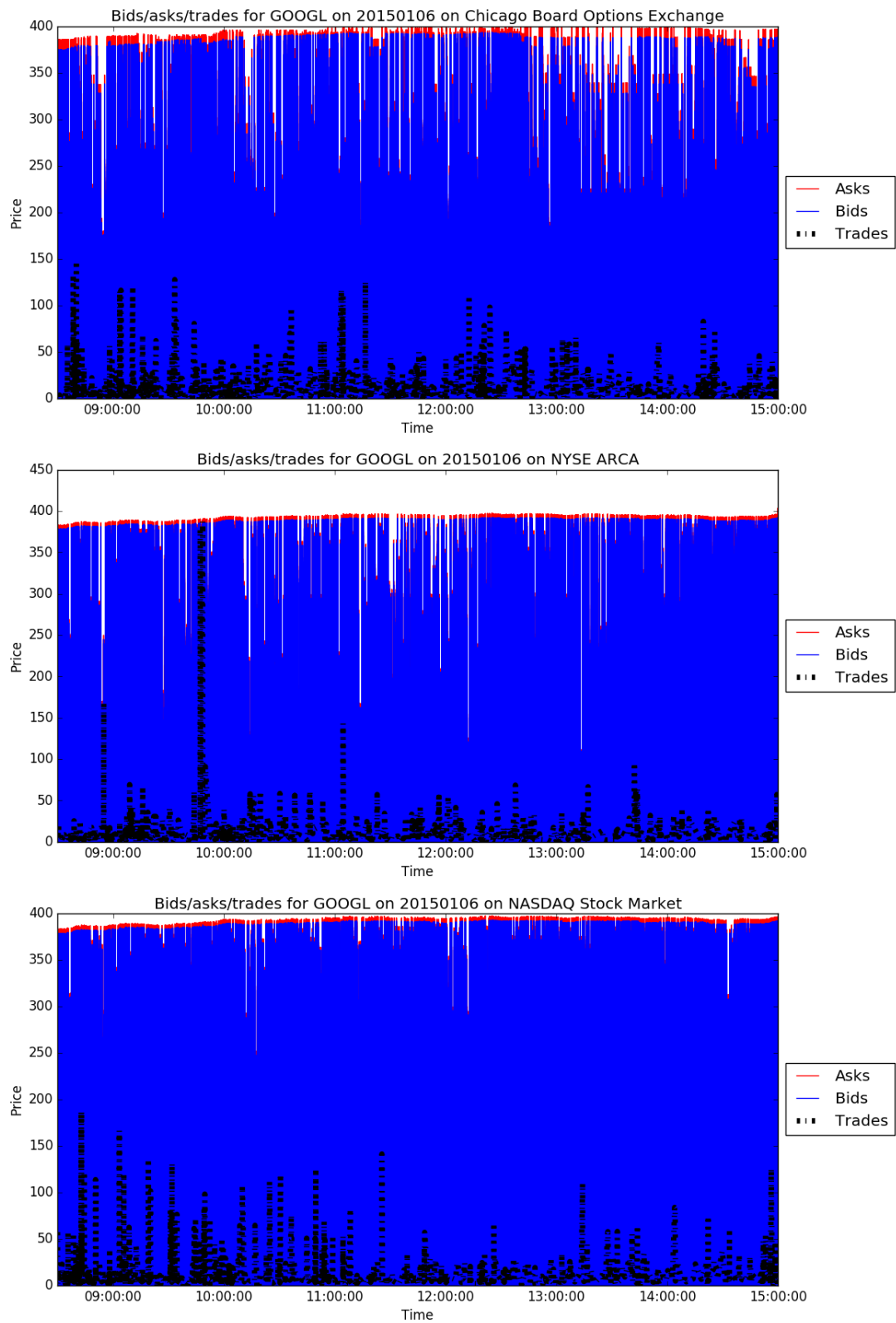


Figure 4: Bids/asks/trades for GOOGL on top-3 exchanges on 20150106

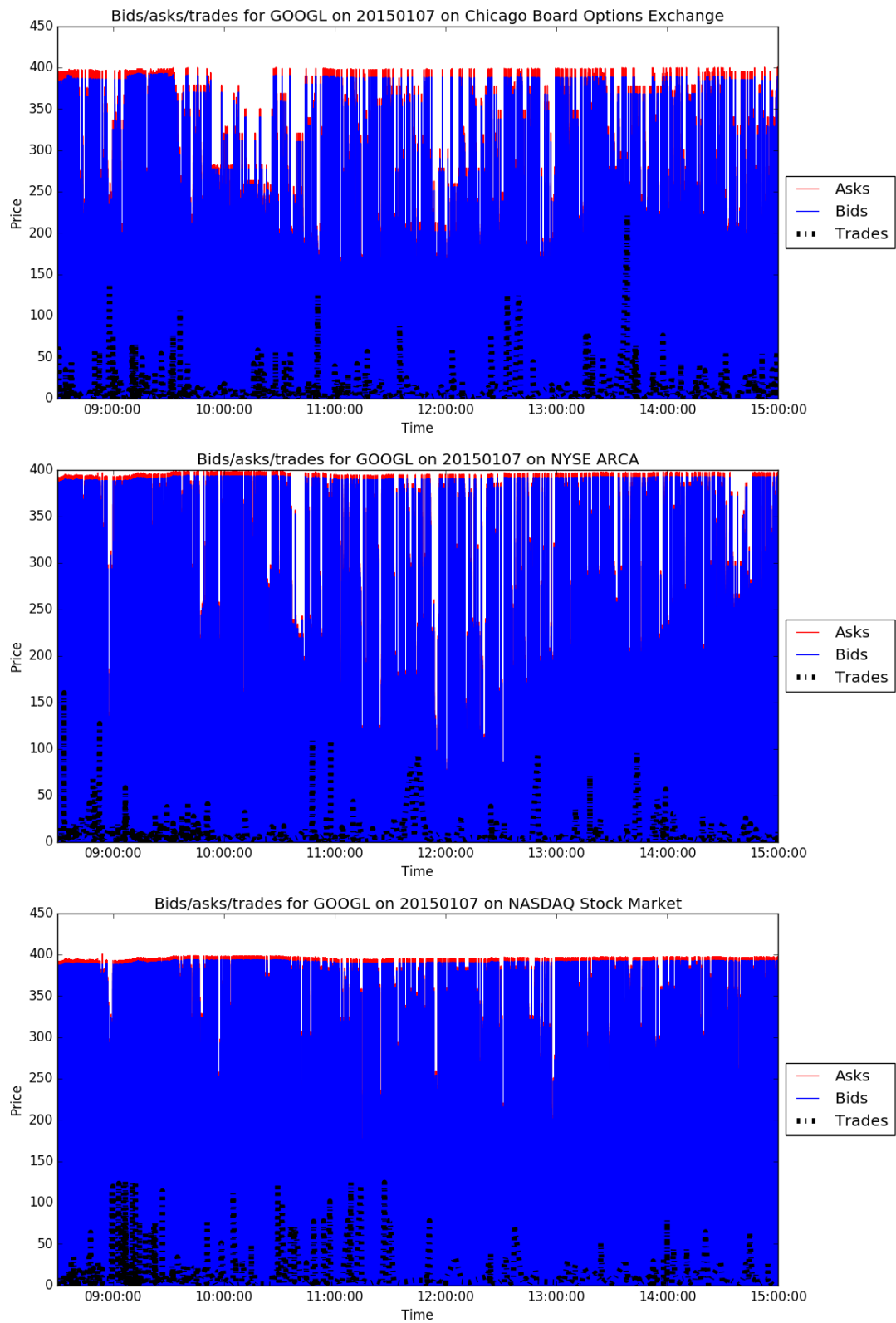


Figure 5: Bids/asks/trades for GOOGL on top-3 exchanges on 20150107

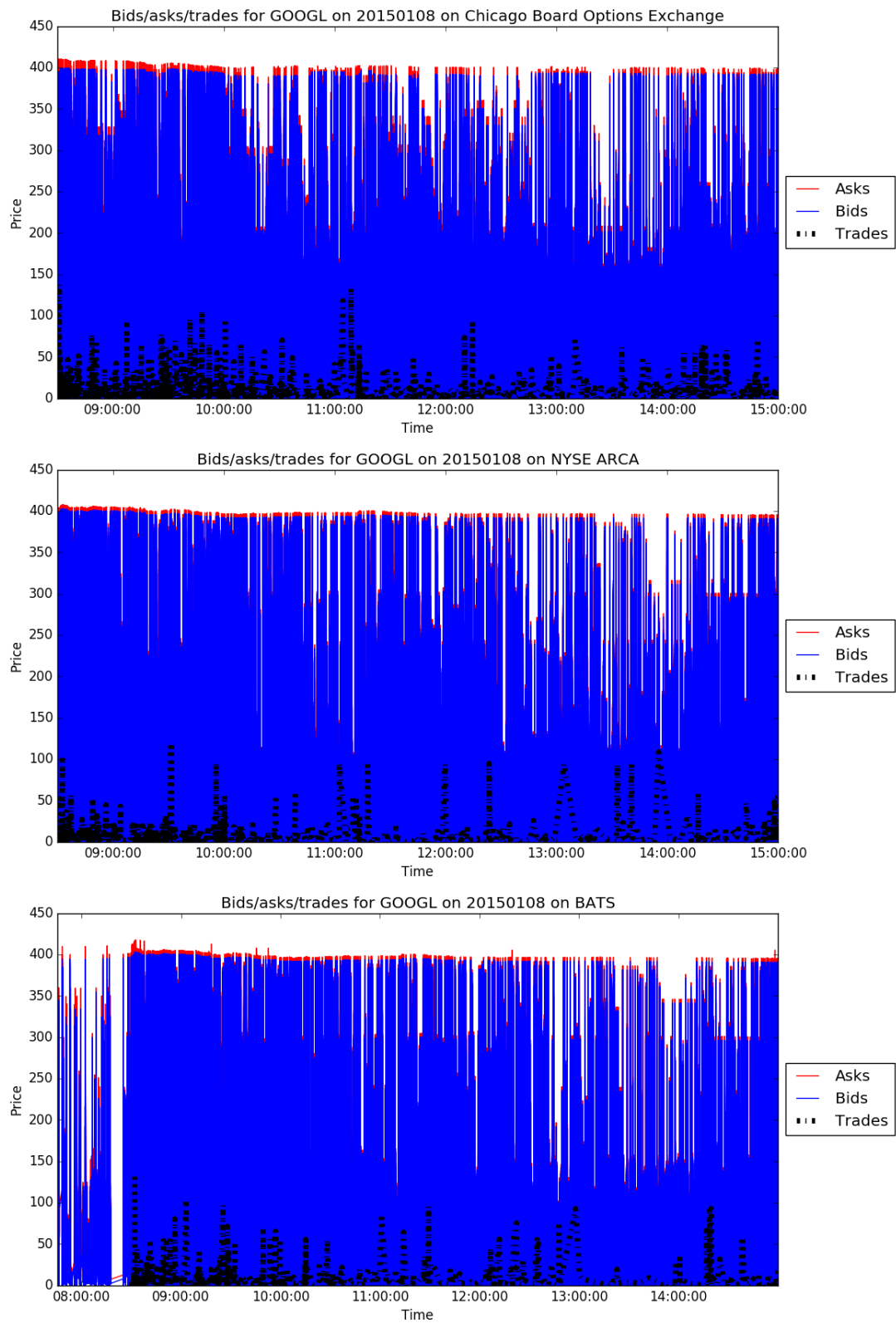


Figure 6: Bids/asks/trades for GOOGL on top-3 exchanges on 20150108

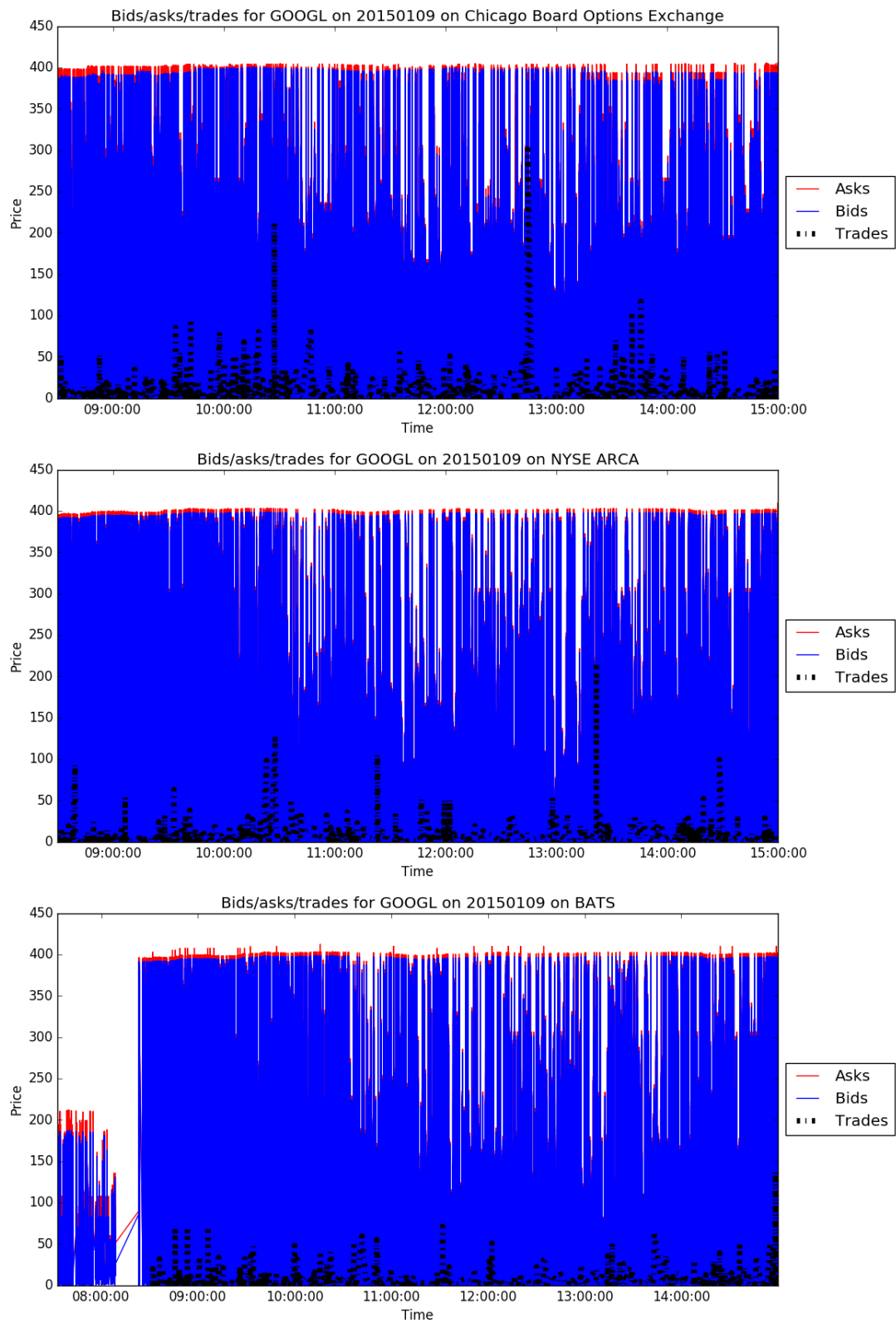


Figure 7: Bids/asks/trades for GOOGL on top-3 exchanges on 20150109

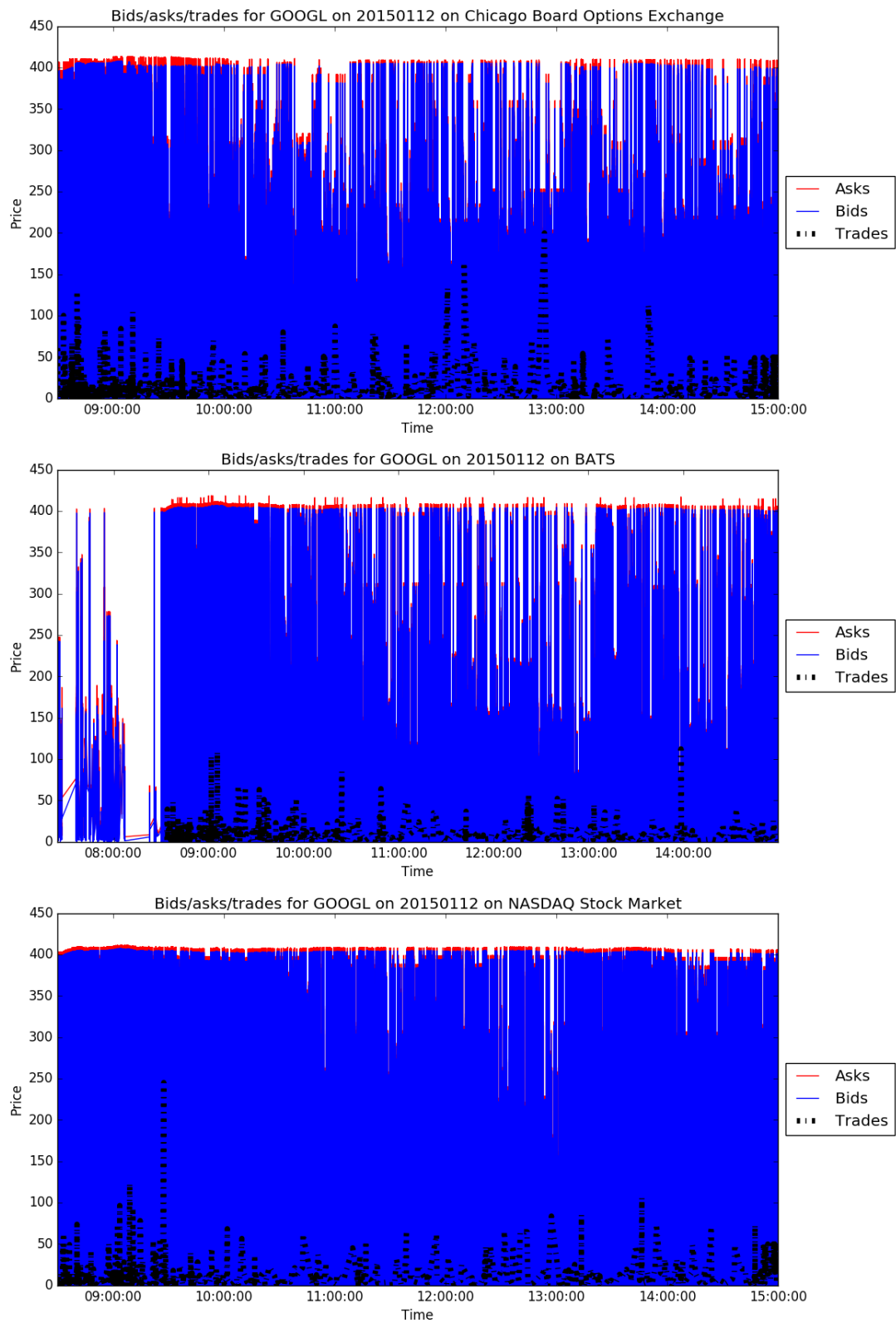


Figure 8: Bids/asks/trades for GOOGL on top-3 exchanges on 20150112



## Exercise prices/time-to-maturity plots

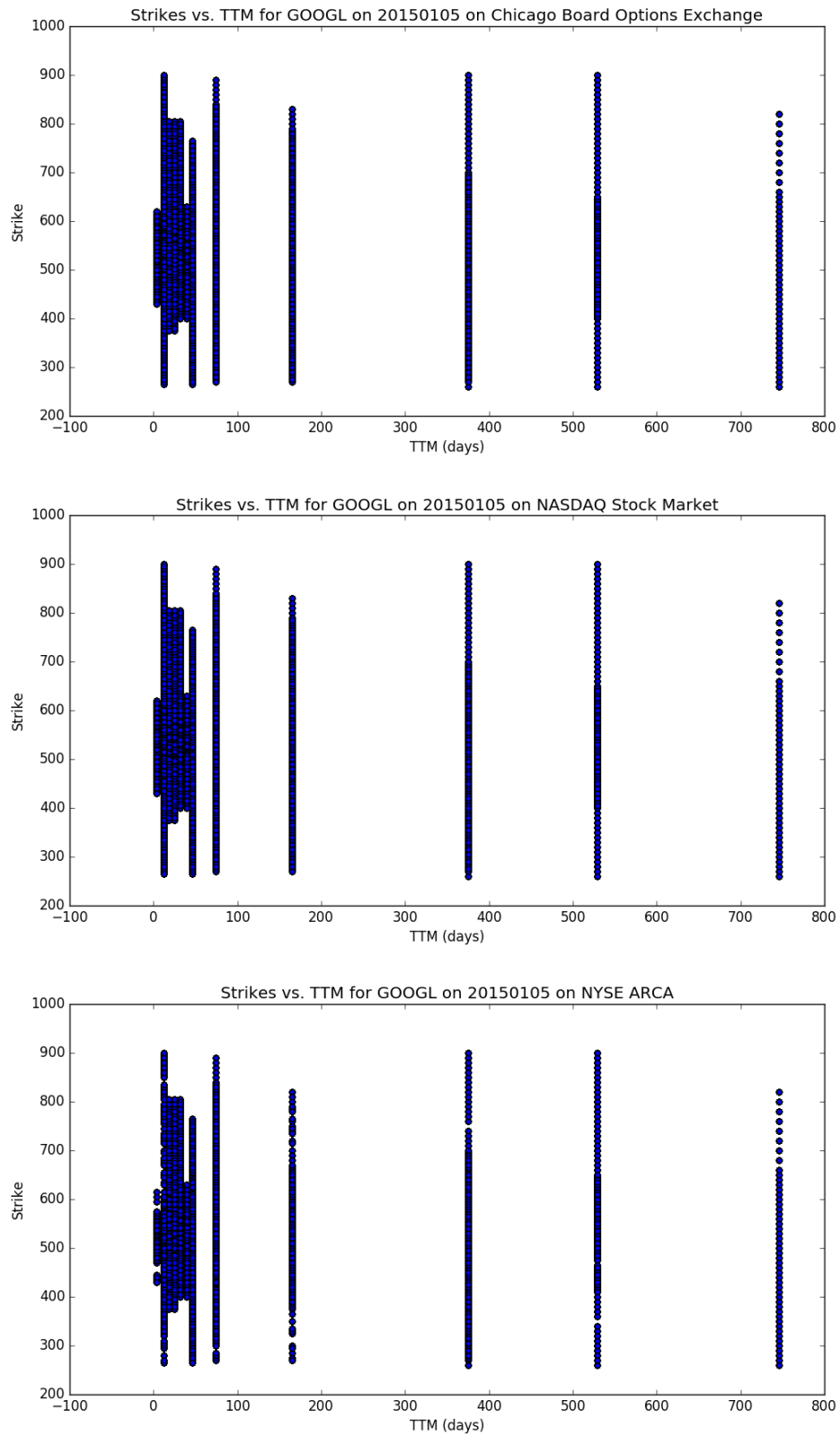


Figure 9: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150105

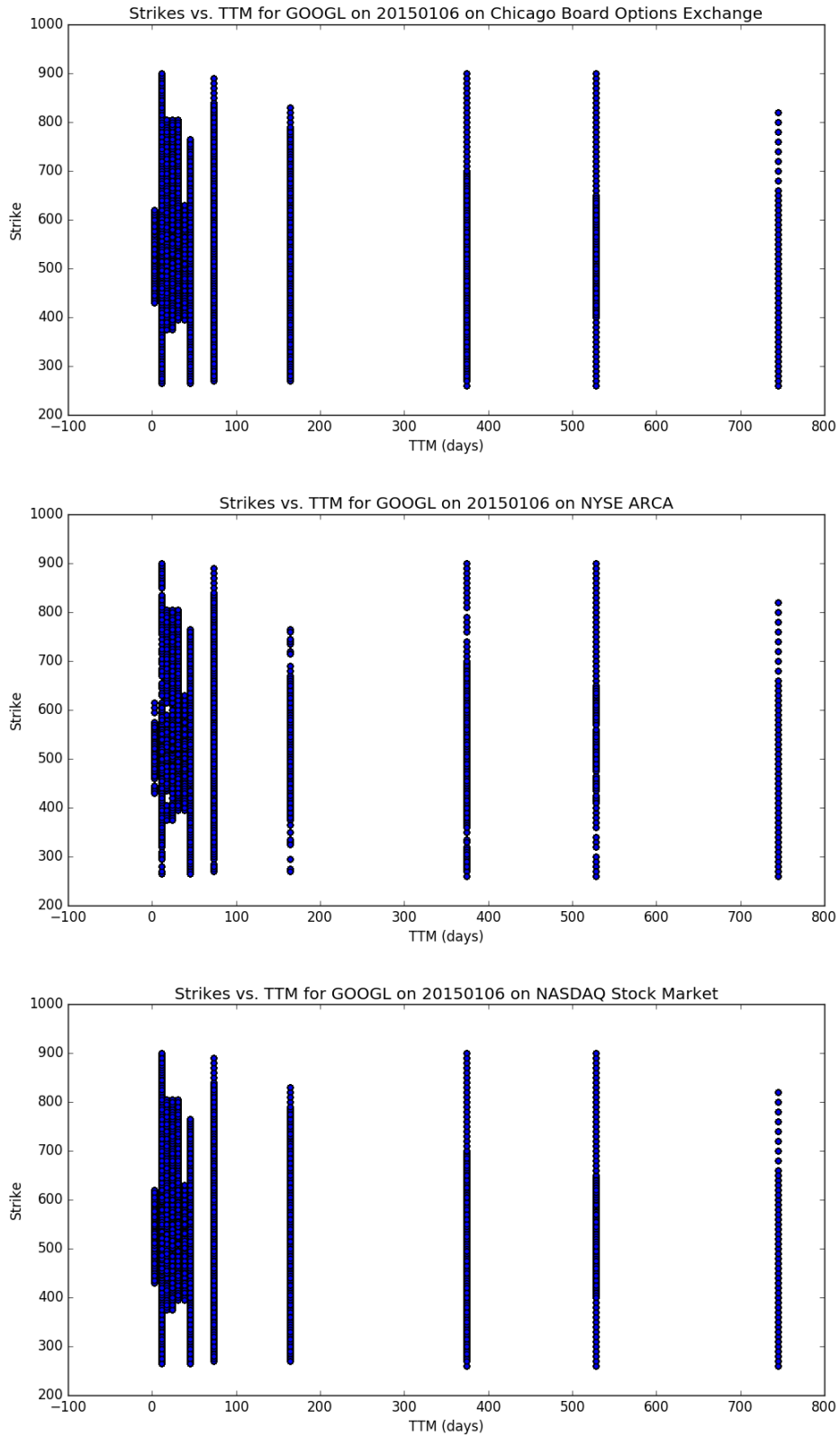


Figure 10: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150106

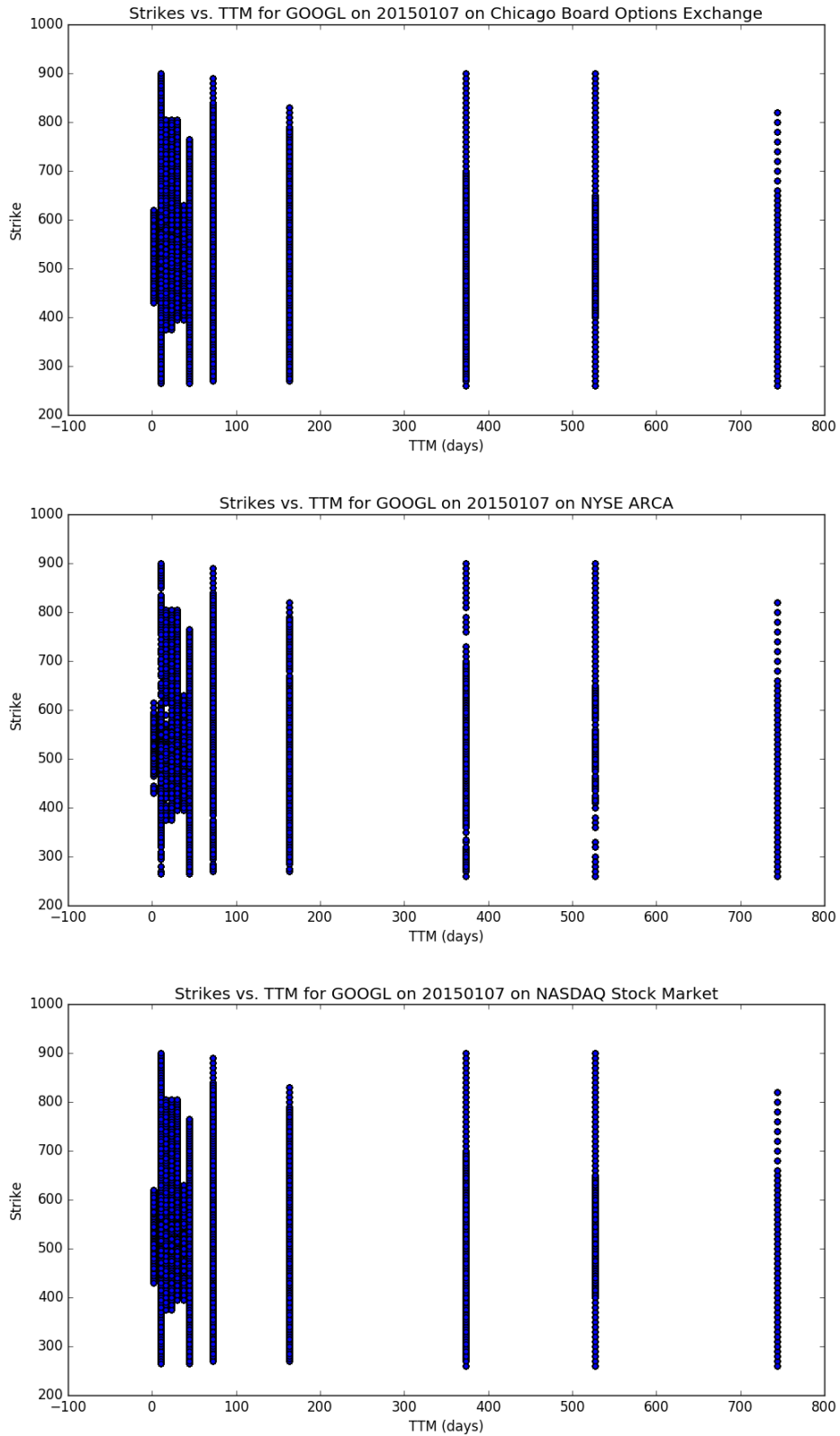


Figure 11: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150107

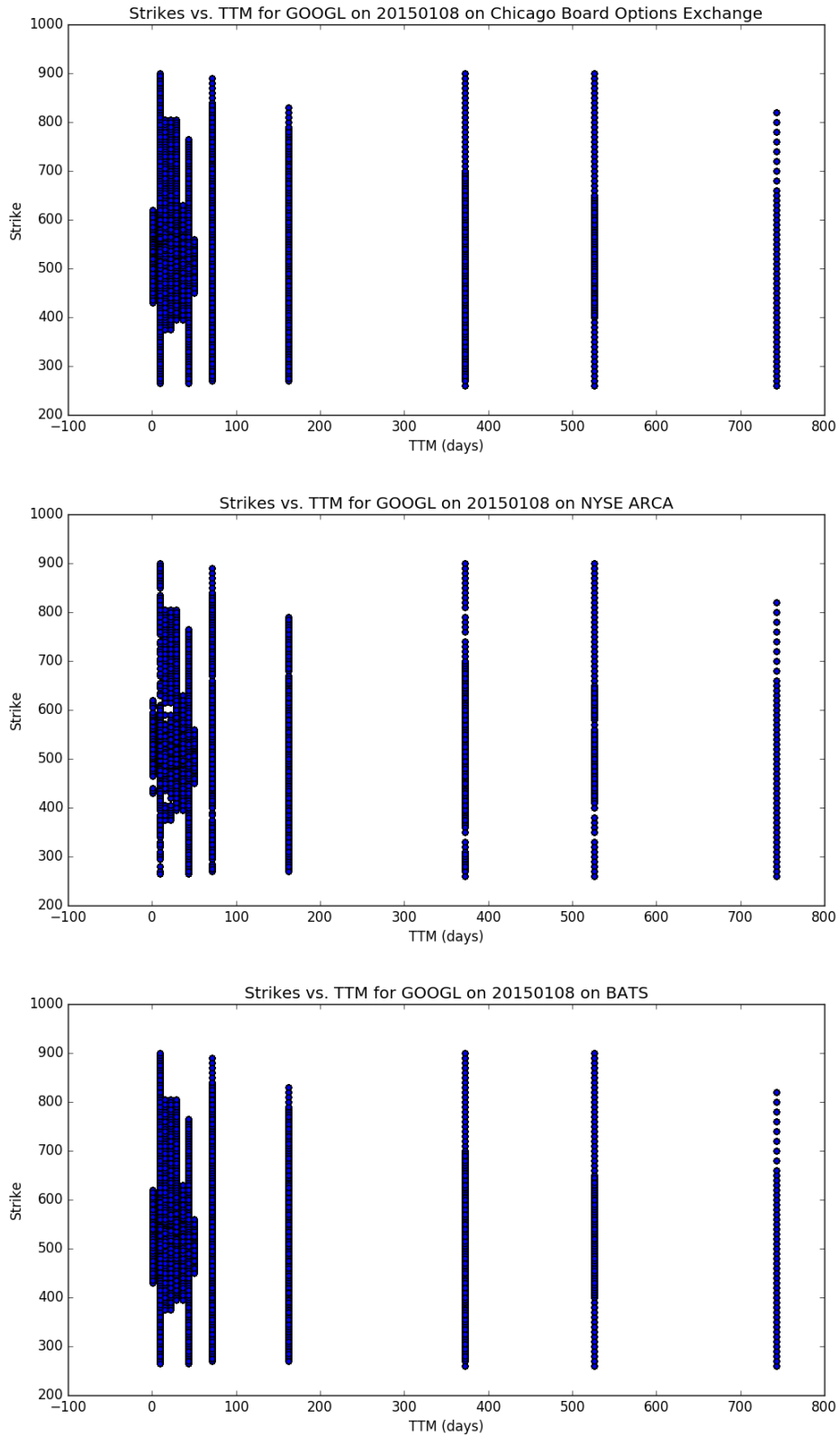


Figure 12: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150108

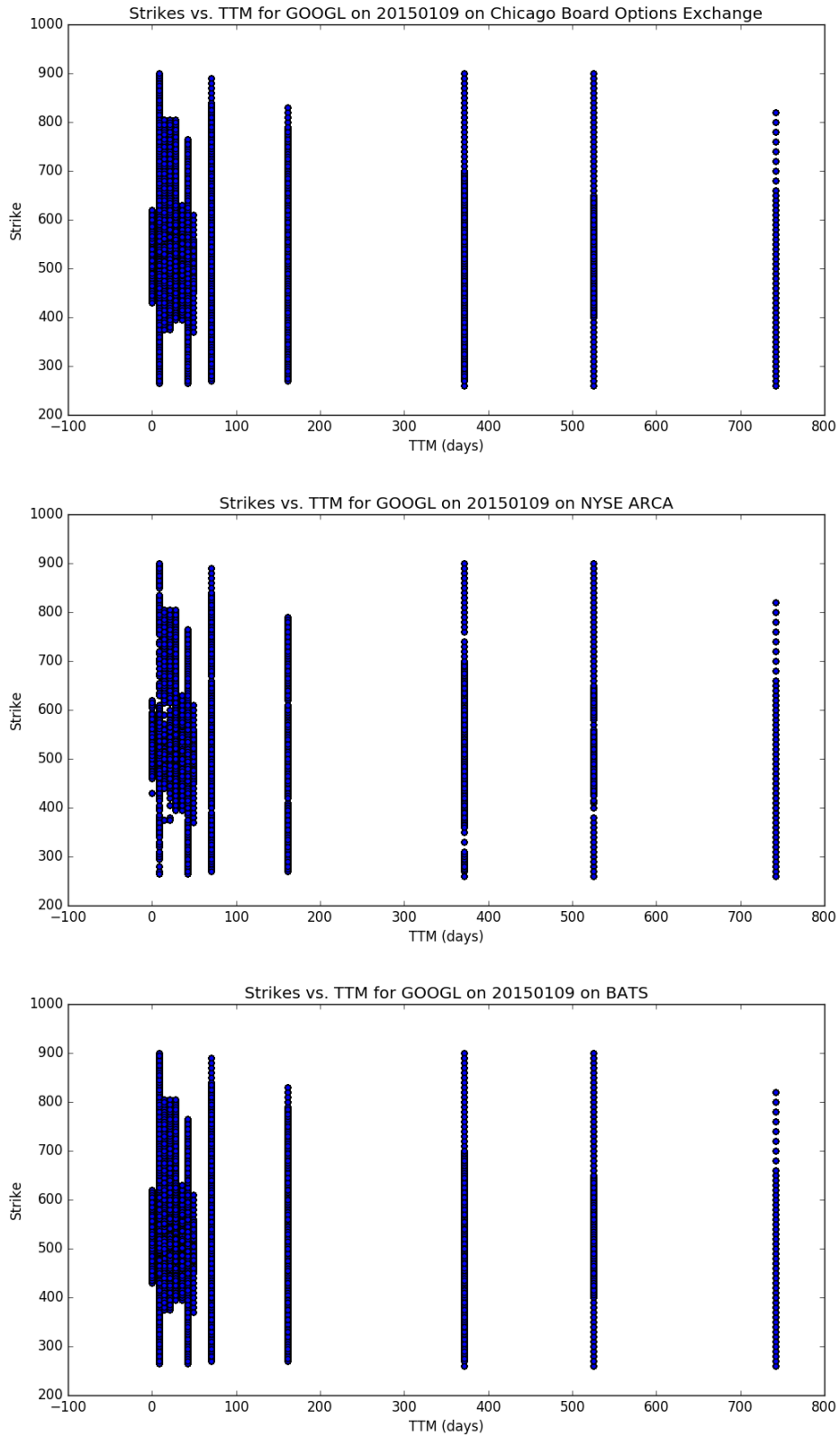


Figure 13: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150109

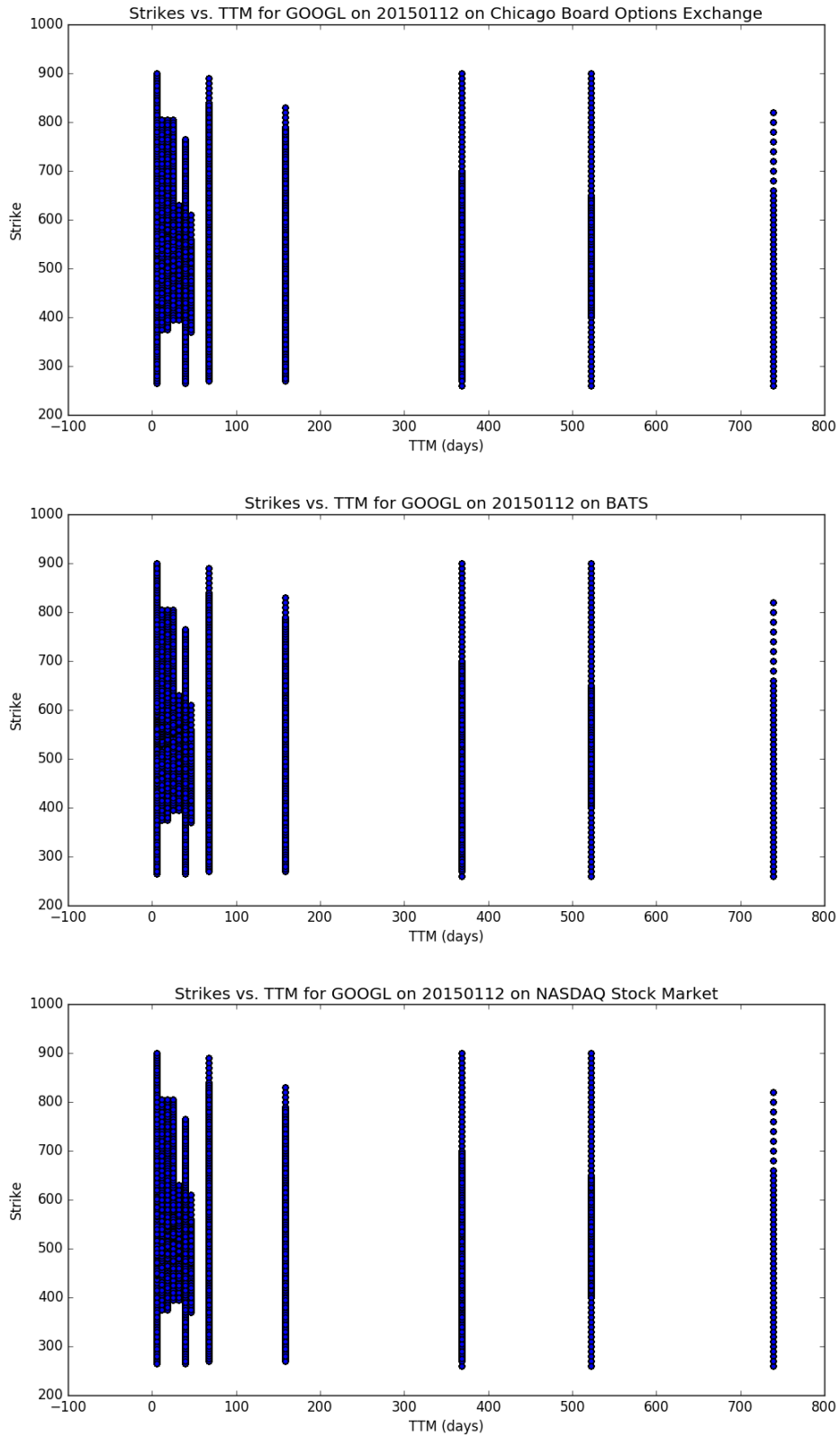


Figure 14: Strikes vs. TTM for GOOGL on top-3 exchanges on 20150112

## Spreads' plots

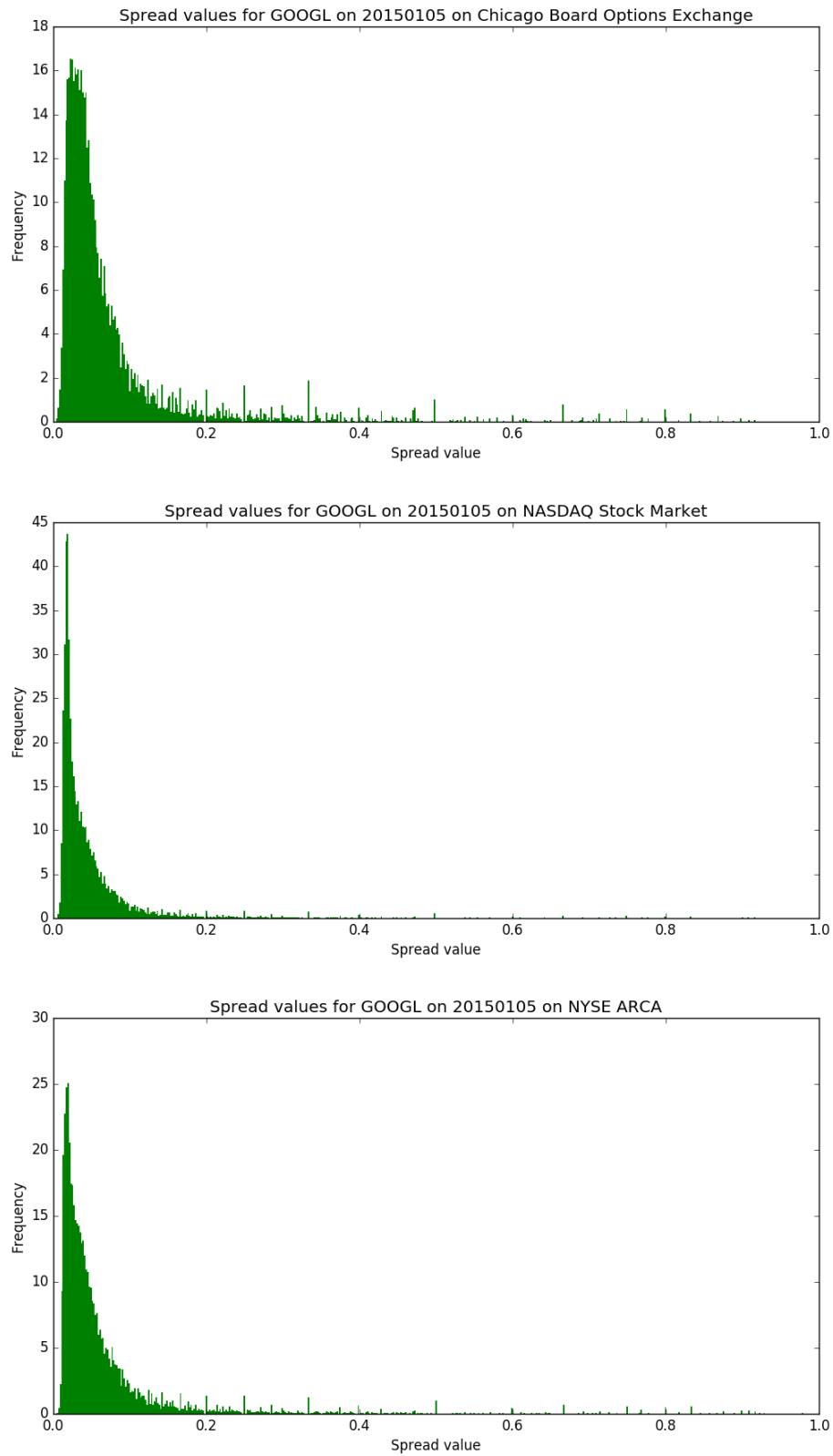


Figure 15: Spreads' frequencies on top-3 exchanges on 20150105

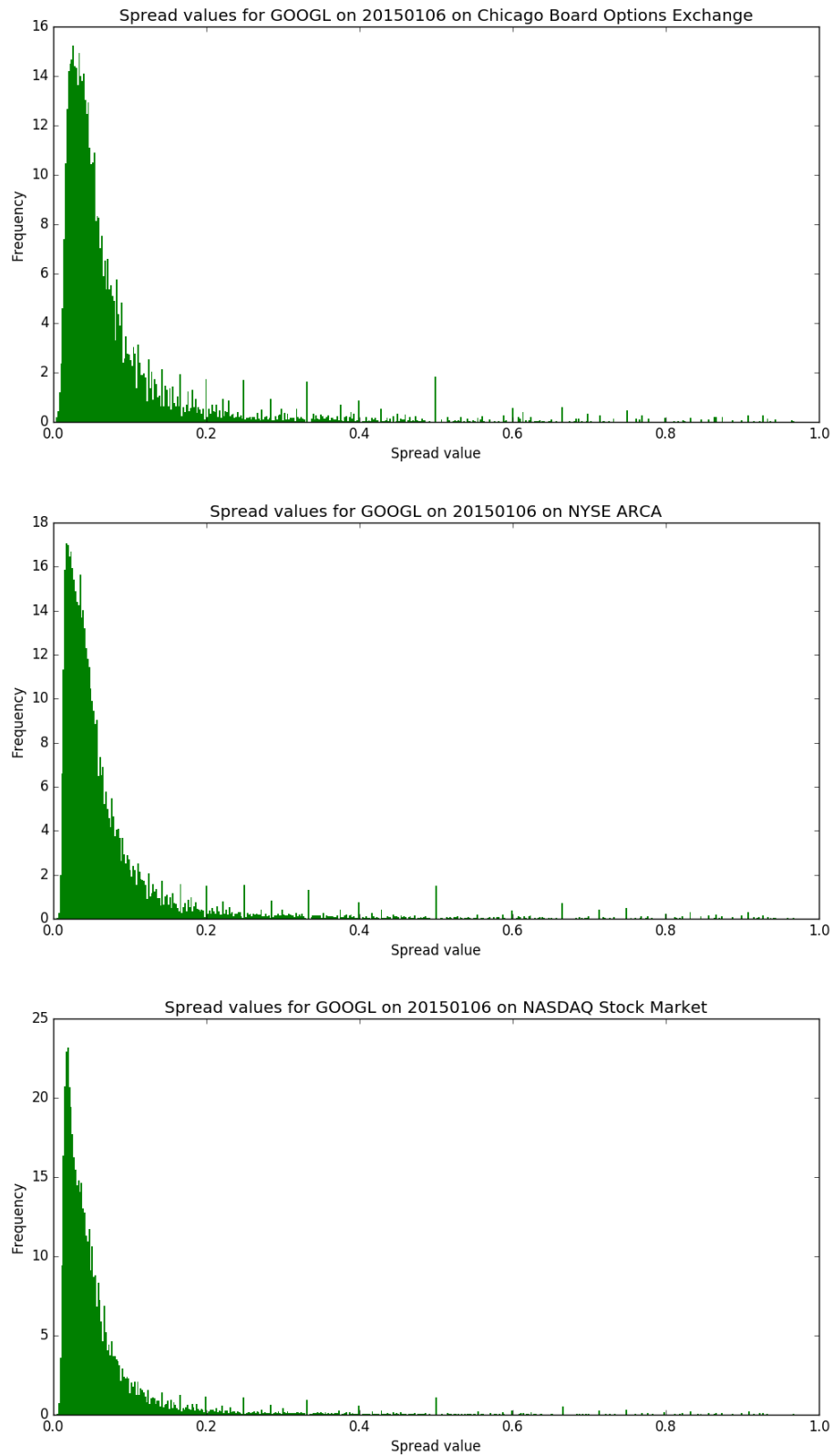


Figure 16: Spreads' frequencies on top-3 exchanges on 20150106



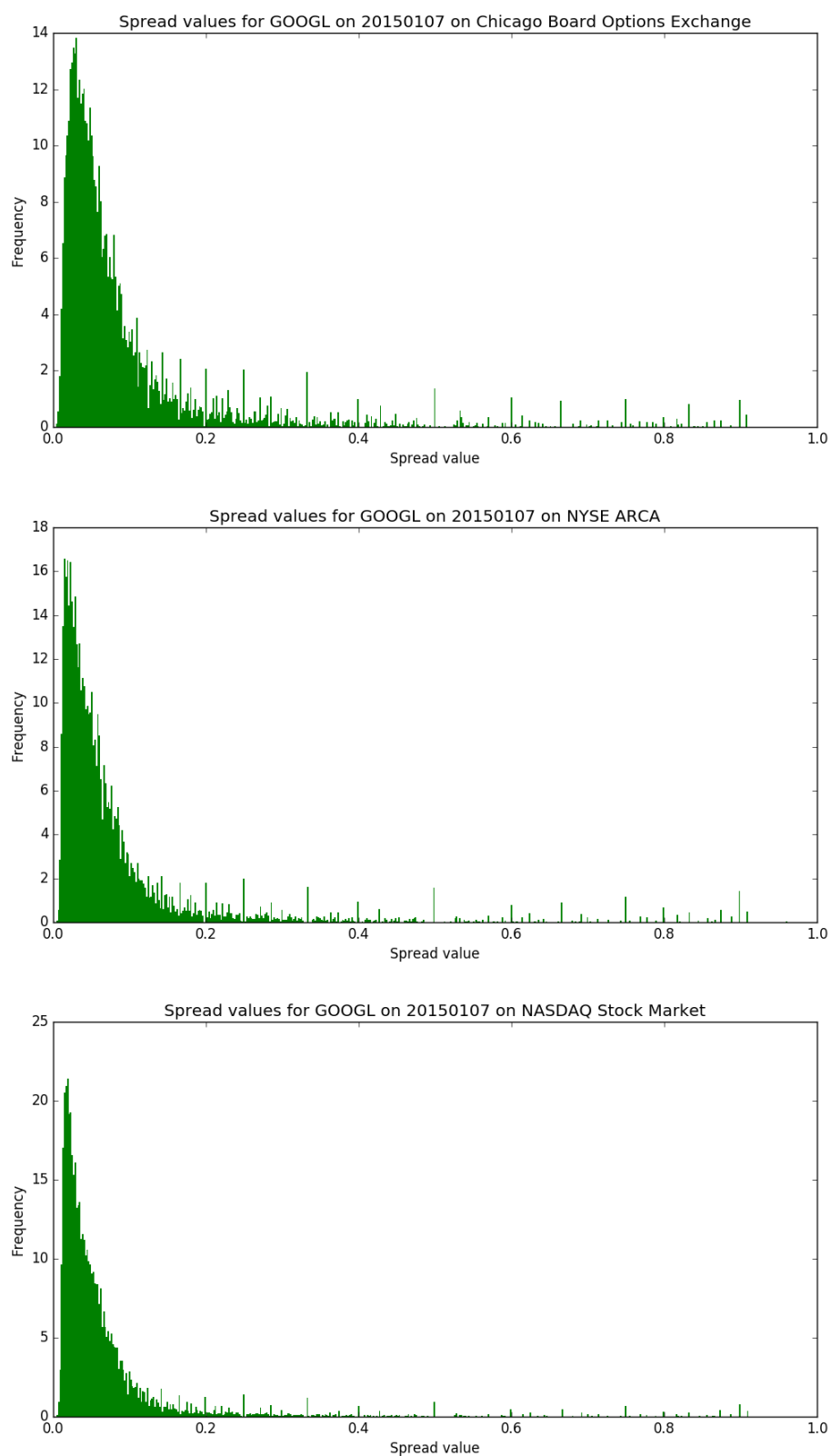


Figure 17: Spreads' frequencies on top-3 exchanges on 20150107

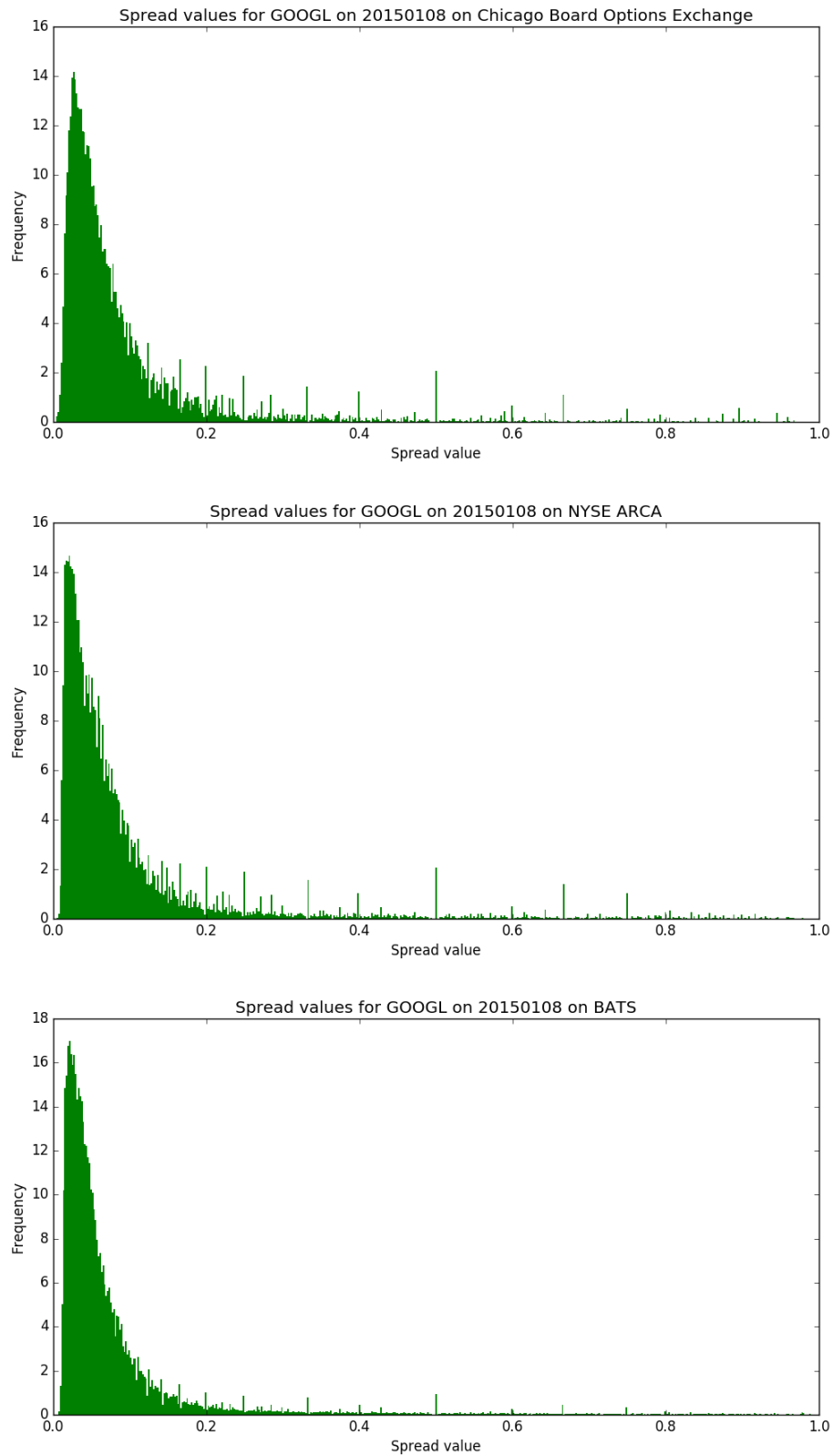


Figure 18: Spreads' frequencies on top-3 exchanges on 20150108

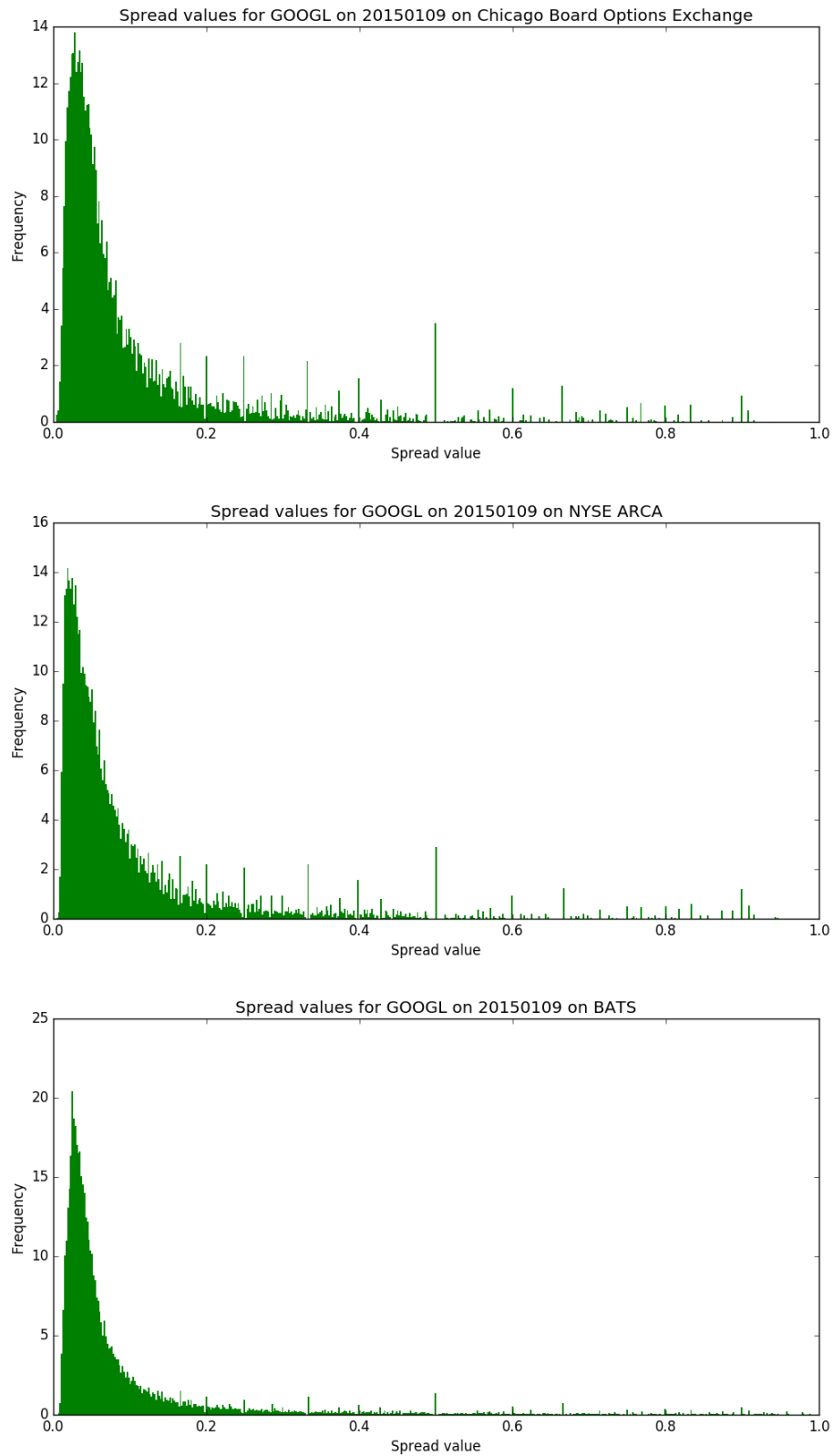


Figure 19: Spreads' frequencies on top-3 exchanges on 20150109

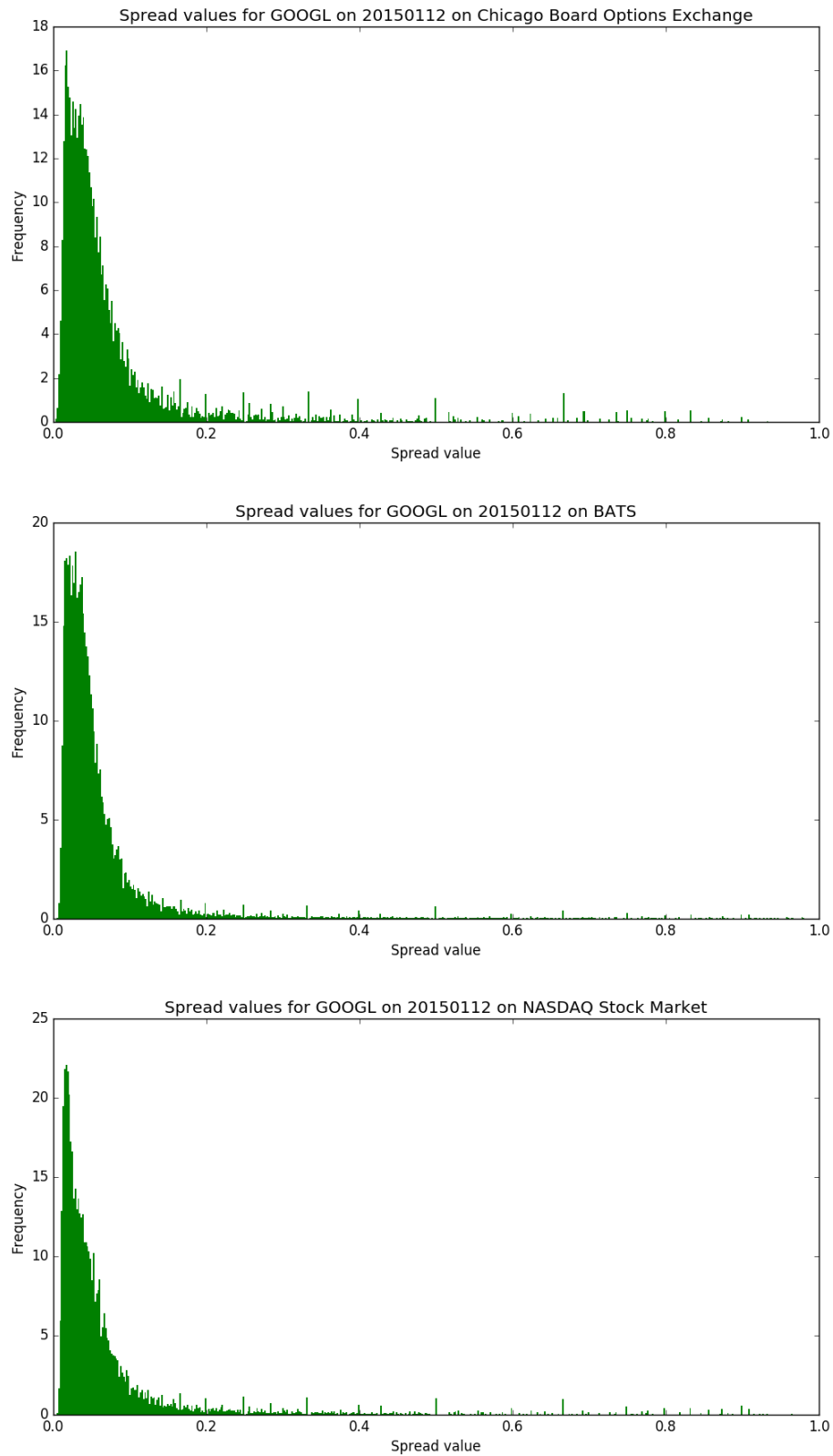


Figure 20: Spreads' frequencies on top-3 exchanges on 20150112

## Tables

Table 1: Total and "unknown" trades for GOOGL on top-3 exchanges in 20150105-20150109

Total and "unknown" trades	Dates and exchanges														
	20150105			20150106			20150107			20150108			20150109		
	C	Q	N	C	N	Q	C	N	Q	C	N	Z	C	N	Z
<b>Total trades</b>	1287	1131	936	1696	1631	1424	1066	979	714	2295	1384	1217	1619	1296	1154
<b>Total "unknown"</b>	440	133	32	553	48	184	349	33	130	792	41	44	574	38	32
<b>"Unknown" in-spread</b>	494	136	36	612	53	189	372	34	140	857	45	44	627	38	32

Where C: Chicago Board Options Exchange; N: NYSE ARCA; Q: Nasdaq Stock Market; Z: BATS

Sector (GICS)	Asset class	Ticker	Name	Industry (GICS)	Benchmark Index	Average records
Energy	Equity	SLB	Schlumberger Ltd	Energy Equipment & Services	None	41,659,809
	Equity	XOM	Exxon Mobil Corporation	Oil, Gas & Consumable Fuels	None	31,764,056
	Equity	EOG	EOG Resources, Inc.	Oil, Gas & Consumable Fuels	None	29,941,239
	Equity/ETF	XLE	Energy Select Sector SPDR Fund	None	S&P Energy Select Sector Index	42,901,922
Materials	Equity	DD	E. I. du Pont de Nemours and Co	Chemicals	None	16,301,850
	Equity	DOW	Dow Chemical Company	Chemicals	None	16,238,706
	Equity	CF	CF Industries Holdings, Inc.	Chemicals	None	15,494,562
	Equity/ETF	GDX	Market Vectors Gold Miners ETF	None	NYSE Arca Gold Miners Index	13,527,517
Industrials	Equity	AAL	American Airlines Group Inc.	Airlines	None	31,525,836
	Equity	UAL	United Continental Holdings, Inc.	Airlines	None	29,193,107
	Equity	CAT	Caterpillar Inc.	Machinery	None	28,459,135
	Equity/ETF	DIA	Market Vectors Gold Miners ETF	None	NYSE Arca Gold Miners Index	76,716,528
Consumer Discretionary	Equity	NFLX	Netflix, Inc.	Internet & Direct Marketing Retail	None	162,216,253
	Equity	PCLN	Priceline Group Inc.	Internet & Direct Marketing Retail	None	148,892,976
	Equity	AMZN	Amazon.com, Inc.	Internet & Direct Marketing Retail	None	101,380,130
	Equity/ETF	XLY	Consumer Discretionary Select Sector SPDR Fund	None	S&P Consumer Discretionary Select Sector Index	13,672,321
Consumer Staples	Equity	GMCR	Keurig Green Mountain Inc.	Food, Beverage & Tobacco	None	24,557,930
	Equity	PG	Procter & Gamble Company	Household Products	None	22,194,052
	Equity	WMT	Wal-Mart Stores, Inc.	Food & Staples Retailing	None	20,171,655
	Equity/ETF	XLP	Consumer Staples Select Sector SPDR Fund	None	S&P Consumer Staples Select Sector Index	5,517,801
Health Care	Equity	GILD	Gilead Sciences, Inc.	Biotechnology	None	29,564,276
	Equity	REGN	Regeneron Pharmaceuticals, Inc.	Biotechnology	None	29,204,332
	Equity	CELG	Celgene Corporation	Biotechnology	None	26,413,751
	Equity/ETF	IBB	iShares Nasdaq Biotechnology ETF	None	NASDAQ Biotechnology Index	15,668,374
Financials	Equity	JPM	JPMorgan Chase & Co.	Banks	None	32,209,032
	Equity	C	Citigroup Inc.	Banks	None	30,164,324
	Equity	BAC	Bank of America Corporation	Banks	None	24,726,836
	Equity/ETF	SPY	SPDR S&P 500 ETF	None	S&P 500 Index	520,689,872
Information Technology	Equity	AAPL	Apple Inc.	Technology Hardware, Storage & Peripherals	None	226,935,960
	Equity	FB	Facebook Inc.	Internet Software & Services	None	133,854,399
	Equity	GOOGL	Alphabet Inc.	Internet Software & Services	None	76,206,127
	Equity/ETF	XLK	Technology Select Sector SPDR Fund	None	S&P Technology Select Sector Index	6,963,341
Telecommunication Services	Equity	VZ	Verizon Communications Inc. & Co.	Diversified Telecommunication Services	None	16,966,549
	Equity	T	AT&T Inc.	Diversified Telecommunication Services	None	14,622,558
	Equity	TMUS	T-Mobile US, Inc.	Wireless Telecommunication Services	None	3,618,531
	Equity/ETF	IYZ	iShares US Telecommunications ETF	None	Dow Jones U.S. Select Telecommunications Index	49,677
Utilities	Equity	SO	Southern Company	Electric Utilities	None	2,213,670
	Equity	EXC	Exelon Corporation	Electric Utilities	None	2,071,096
	Equity	DUK	Duke Energy Corporation	Electric Utilities	None	1,880,464
	Equity/ETF	XLU	Utilities Select Sector SPDR Fund	None	S&P Utilities Select Sector Index	10,149,562
Real Estate	Equity	AMT	American Tower Corporation	Equity Real Estate Investment Trusts (REITs)	None	3,186,942
	Equity	SPG	Simon Property Group, Inc.	Equity Real Estate Investment Trusts (REITs)	None	2,423,846
	Equity	WY	Weyerhaeuser Co.	Equity Real Estate Investment Trusts (REITs)	None	1,579,319
	Equity/ETF	DRN	Direxion Daily MSCI Real Est Bull 3X ETF	None	MSCI US REIT Index	1,253,319

Table 2: Most traded underlying assets in the OPRA database (aggregation by UNDER\_SEC\_SYM); classification by GICS; all months

Objective	Ticker	ETP Type	Name	Benchmark Index	Average records
Alternative Investments	VXX	ETN	iPath S&P 500 VIX Short-Term Futures ETN	S&P 500 VIX Short-Term Futures Index	97,596,922
Asia	ASHR	ETF	Deutsche X-trackers Harvest CSI 300 China A-Shares ETF	CSI 300 Index	1,467,296
Fixed Income	TTT	ETF	ProShares UltraPro Short 20+ Year Trs	ICE U.S. Treasury 20+ Year Bond Index	168,901
Currency	EUO	ETF	ProShares UltraShort Euro	EUR/USD exchange rate	774,408
Emerging Markets	BZQ	ETF	ProShares UltraShort MSCI Brazil Capped	MSCI Brazil 25/50 Index	1,080,226
Europe	EPV	ETF	ProShares UltraShort FTSE Europe	FTSE Developed Europe Index	498,954
Large-Cap	UPRO	ETF	ProShares UltraPro S&P500	S&P 500 Index	10,469,367
Mixed Asset	UVXY	ETF	ProShares Ultra VIX Short-Term Futures	S&P 500 VIX Short-Term Futures Index	57,785,059

Table 3: Most traded underlying ETPs in the OPRA database (aggregation by UNDER\_SEC\_SYM) by trading objectives