The curious case of changes in trading dynamics when firms switch from NYSE to Nasdaq

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This version: May 30, 2014

Abstract

Voluntarily switching trading location from NYSE to Nasdaq is a recent phenomenon with only 34 companies having made the switch since the first firm in 2000. This paper examines the effects on market liquidity and trading activity of these companies to determine if the move alters the trading dynamics and is consistent with the stated objectives of the move. We find that trading volume increases significantly, however, trading costs are also higher due to less competition among the liquidity providers of the moving stocks and price bumps in the new listing location, suggesting the move may result in a trade-off between higher shares traded and worse liquidity. This finding is inconsistent with companies' self-reported rationale for switching, namely reduced transaction costs and increased liquidity.

JEL Classification: G10, G15, G18

Keywords: trading costs, exchange listing, NYSE, Nasdaq.

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1. Introduction

The first voluntary shift from NYSE to Nasdaq began with Aeroflex Corporation in 2000, while previously the only moves between exchanges had been in the direction from Nasdaq to NYSE when firms became large enough to transition to qualify for NYSE listing. From the onset, research has disagreed on the benefits of moving to Nasdaq from NYSE. Kalay and Portniaguina (2001) find an abnormal positive return when Aeroflex moved, combined with subsequent lower bid-ask spreads and an increase in volume. In contrast, Pruitt, Van Ness and Van Ness (2002) report increases in the bid-ask spread and a reduction in the number of trades. Regardless of the metrics deployed in the first studies, the sample size of one firm limits the relevance and applicability of these early findings. More than a decade later, more companies have made the switch from the NYSE to Nasdaq providing an opportunity to examine the trading costs and liquidity effects over a larger population.

The costs involved in a transfer of listing between exchanges is not trivial and many companies publicly disclosure their rationale for switching. Over half of the companies moving from NYSE to Nasdaq indicate they moved to Nasdaq to obtain reduced trading costs and improvements in liquidity. The second most popular reason is to use the Nasdaq trading platform, suggesting the infrastructure was more important.

The trading environment has changed significantly since the first voluntary switch to Nasdaq in 2000, with high frequency traders increasingly involved in trading and influencing trading dynamics. In this paper, we therefore focus on the most recent time period (2008-2012) and examine the trading dynamics for firms that voluntarily move from the NYSE to Nasdaq to identify whether liquidity metrics are affected by the move and to resolve the mixed results in earlier research.

Closest to our work is Tse and Devos (2004), who examine companies that move from Amex to Nasdaq in the earlier 1998-2000 period. Our work differs from Tse and Devos (2004) since we consider a more recent set of companies that switch exchanges from the NYSE to Nasdaq and including the Global Financial Crisis. In addition, we use the national best bid and ask quotes prevailing the second prior to the trade to estimate intraday market quality measurements, which offers more accurate liquidity estimates than Tse and Devos, who use quotes originating from the Amex only. Furthermore, they examine the change in spreads, volatility and trade size around 20 trading days before and after the companies switch exchanges, while we examine the changes in spreads, price impact, and trading volume over a much longer period to capture the long-term effect of the switch. We also apply event study method with 5-14 day windows around the switch dates to capture the short-term effect of the movement.

The earlier research used a simple comparison of the average market quality measures between the pre-period and post-period (for example: Tse and Devos (2004), Kalay and Portniaguina (2001)). Thus any change may be due to an endogenous change in the market and not necessarily the trading location. We estimate the pairwise difference in the market quality proxies between the company that moves exchanges and a matched stock. Thus, our paper captures any commonality effects that are likely to be significant during the Global Financial Crisis, which is included in the sample period. The paper is also extended by using fixed effect difference-in-difference regressions to control for time-variation in the matching variables and any effect due to volatility or share price.

We find that in the short term, the stock exchange movement is associated with higher transaction cost, indicated by wider effective spreads following the exchange switch. However, there is no significant change in realized spreads instantaneously after the stocks

move. In the long run, effective spreads increase consistently with the finding in short-run, but realized spreads are also higher. The findings imply that the stock movements do not affect competition degree among liquidity providers of moving stocks relative to the alike control stocks immediately after the move, but degrade the competition in longer-term, leading increased profits for those remaining liquidity suppliers for the moving stocks. We find some evidence about higher 5-minute price impact of trades following the switch in listing location in both short-term and long-term that indicates a boost in moving stock price in the new listing exchange. Trading volume of the moving stocks is not affected in short-term, but significantly increase in long-run.

The paper proceeds as follows. Section 2 examines the rationale for the decision to switch to Nasdaq. Section 3 describes the data and methodology. Results are in Section 4 and Section 5 concludes.

2. Why did firms switch to Nasdaq?

Following the move by Aeroflex in 2000, the perception of Nasdaq as a technology-centric stock exchange helped to foster an attraction for technology firms or those firms that wanted to be perceived as technology orientated. While the first move occurred at the height of the internet bubble, subsequent switching did not necessarily correspond with enthusiasm about technology. Table 1 presents the reported reasons for the change of listing locations, as stated in the press announcing the company movements.

Approximately half of the companies indicated that an improvement in cost efficiencies and liquidity was the reason for the move to Nasdaq. The advantage of the Nasdaq trading platform was the second most popular reason for making the switch. The remaining reasons disclosed by firms include Nasdaq being the leading exchange for

technology companies, as well as there being higher visibility on Nasdaq, and increased trading volume on Nasdaq.

The competitive nature of the two main US exchanges may also be partially to blame for the switching since each exchange was active in trying to obtain new listings (IPOs) as well as attract companies from other exchanges.

<INSERT Table 1 HERE>

3. Data and methodology

All of the companies that voluntarily moved from the NYSE to Nasdaq from January 2008[1] to December 2012 are included in the sample. Stocks are required to have at least 20 trading days around the switching date, therefore only one firm is excluded (Goodyear Tire & Rubber Company), because the transfer occurred on December 18, 2012 and data in 2013 is not available. The final sample of firms includes 34 firms.

All intraday trades and quotes between 9:30am and 4:00pm are obtained from the NYSE Trades and Quotes (TAQ) database. The data filter process follows Bessembinder (1999). The national best bid and ask quotes prevailing the second prior to the trade are used to estimate intraday market quality measurements. A panel data analysis approach is used for the long-term analysis while an event study approach using different time windows is used for the short-term analysis.

A matched control sample of firms is selected where the matched firm did not move during the period. Davies and Kim (2009) show that the best matching practice to test for the difference in transaction costs is to match firms one-on-one based on market capitalization and stock prices. In order to select the match, a distance metric DD is estimated as follows:

[1] In our sample, the earliest moving date for the NYSE-Nasdaq companies was 28th April 2008 (C A Inc).

$$DD_{Ai} = \frac{\left|MCap_{Ai} - MCap_{Aj}\right|}{MCap_{Ai} + MCap_{Aj}} + \frac{\left|P_{Ai} - P_{Aj}\right|}{P_{Ai} + P_{Aj}},$$

where $MCap_{Ai}$ is market capitalization of stock i listed in the exchange A; P_{Ai} is closing trade price of stock i listed in the exchange A; A is the original stock exchange of stock i, which is NYSE in this study.

Each moving stock i is matched with a non-movement common stock j that is listed on the same exchange A before the movement of the company, and has the smallest distance DD_{Ai} measure. The distance measure is calculated based on market value and stock price at the beginning of the sample period as at December 2007 following Davies and Kim (2009) and Beber and Pagano (2013)[2]. For each moving stock and matched firms, we obtain all trade and quote information from TAQ during the period from January 2008 to December 2012. This market quality estimation dataset is matched with market capitalization data, which is obtained from the Centre for Research in Security Prices (CRSP).

<INSERT Table 2 HERE >

Table 2 illustrates the success of the matching procedure by reporting the mean and median of market capitalization and share price for the company that switches exchanges and the matched stocks. There is no statistical difference between the two samples when examining market capitalization, stock price and the number of share outstanding.

Effective spread, realized spread and price impact of trades are used to measure transaction costs, liquidity providers' earning and the permanent impact of trades. For each

[2] We include only stocks, which trade every month during the 5 years of our sample period.

stock *i* at time *t*, we calculate round-trip dollar and percentage effective spreads, 5-minute realized spread and 5-minute price impact as follows:

$$eff\_spd_{it} = 2\left|P_{it} - M_{it}\right|,$$

$$rel\_eff\_spd_{it} = \frac{eff\_spd_{it}}{M_{it}},$$

$$real\_spd\_05m_{it} = 2\left|P_{it} - M_{it+5\min}\right|,$$

$$rel\_real\_spd\_05m_{it} = \frac{real\_spd\_05m_{it}}{M_{it}},$$

$$markimp05m_{it} = eff\_spd_{it} - real\_spd\_05m_{it},$$

$$rel\_markimp05m_{it} = \frac{markimp05m_{it}}{M_{it}},$$

where for each stock i at time t, eff_spd_{it} is dollar effective spread, $rel\_eff\_spd_{it}$ is relative effective spread, $real\_spd\_05m_{it}$ is dollar 5-minute realized spread, $rel\_real\_spd\_05m_{it}$ is relative 5-minute realized spread, $markimp05m_{it}$ is dollar 5-minute price impact of trade, $rel\_markimp05m_{it}$ is relative 5-minute price impact of trade, P_{it} is the trade price of stock *i* at time *t*; M_{it} is the quote midpoint prevailing at the time of the trade. A stock-day spreads and price impact measure is derived by taking trade value-weighted average effective, realized spreads and price impact of trades on all trades[3], respectively.

Daily trading volume for each stock-day (TRADE_VOL) is the total number of shares traded in the day for each stock. Intraday volatility (VOLATILITY) is calculated following Boehmer, Jones and Zhang (2013), using the proportional intraday range as follows:

[3] For robustness check, we also estimate volume-weighted average effective, volume-weighted realized spreads and volume-weighted price impact. The results are identical as presented in this paper.

$$VOLA_{it} = \frac{P_{it}^{\max} - P_{it}^{\min}}{VWAP_{it}}$$

where $P_{it}^{\max}$, $P_{it}^{\min}$ and $VWAP_{it}$ are the highest, lowest trade prices and volume-weighted average trade price of stock i in day t , respectively.

<INSERT Table 3 HERE >

Table 3 reports summary statistics of sample and matching firms using daily measures for the full sample. For each moving stock and its match, a time-series average of trading activity and market quality is calculated over the period of January 2008 – December 2012, then cross-sectional means are derived for each proxy. The table shows that over the five years, the firms that moved to Nasdaq have a higher number of trades, higher trading volume, higher trading value and lower standard deviations than their matched firms that remained on the NYSE. The minimum and maximum trading volume of the moving firms is about 19,000 and 28 million shares, while the range for these variables for the matching stocks is much wider from about 1,000 to 23 million shares. The market quality proxies report the opposite direction with effective spreads, realized spreads and trade price impacts all with much higher magnitudes and larger standard deviations for the firms that moved to Nasdaq compared to their matching stocks. These differences suggest that the change in listing location does vary between the two samples of stocks. We caution that these results may reflect endogenous features of the stock therefore we refine the testing further with more narrow comparisons.

Our overall strategy is to identify the effect of the listing location changes on a particular liquidity and trading activity proxy by comparing the moving stocks with its matches during the time before the stock switches exchanges versus the subsequent periods.

The earlier research compares liquidity of the moving companies between the periods before and after the stock switches. Thus, the reported changes in liquidity in the earlier literature may be due to concomitant country-specific events or macroeconomic policies that should affect all stocks, not due to the stock market switches. For instance: deterioration in transaction cost documented following the change in listing location for a stock moving from the NYSE to Nasdaq might also occur if the company would have stayed in the NYSE as result of simultaneous country-specific events. Hence, it is not be attributed to the change in exchange listing. Using a control sample of matched stocks, our research design overcomes the concomitant effect by examining the alteration of the difference in liquidity between a moving stock with its matched stocks after the exchange movement. A pairwise difference in each liquidity proxy and trading volume is constructed by the liquidity proxy of a moving stock less its matched stock on a given day. A univariate analysis is deployed using both a parametric t-test and a non-parametric Wilcoxon signed-rank test to examine whether there are any changes in means and medians of the pairwise differences in the trading volume and liquidity measures around dates the firms moved between exchanges. For instance: an increase in the pairwise difference in transaction cost, indicates that transaction cost of the moving stocks increases larger or falls less than transaction cost of its matches does, which implies worse liquidity for the moving shares.

A multivariate analysis is used with a difference-to-difference approach to control for determinants of changes in the investigated measures. We follow Boehmer, Jones and Zhang (2013) to estimate the following fixed-effect model:

$$Y_{it} = \alpha_t + \beta D_{it} + \gamma X_{it} + \varepsilon_{it}$$

where for a matched pair of a moving stock i in day t, Y_{it} is alternative market quality and trading activity measures for the moving firm's shares less the measured quantity of the same proxy for its matched company's shares. α_t is a day-specific effect for day t. D_{it} is an indicator variable set equal to zero before the movement and one after that for stock i and its matched stock on day t. X_{it} is a set of pairwise differences between the moving stocks and its matched stocks for the following control variables including daily volume (TRADE_VOL), market capitalization (Market Cap), price volatility (VOLATILITY), the daily volume-weighted average share price (VWAP). The daily volume as control variable will be dropped in the regressions for this as a dependent variable.

The matched pair difference-in-difference estimation allows us to capture any market-wide changes potentially affecting the liquidity measures, which may be attributed to the movement between exchanges. All our regressions include time fixed effects to take into account the commonality in returns or liquidity, which is vital during the investigated period due to the worldwide uncertainty and shortage of liquidity (see Beber and Pagano (2013)). Statistical inference is conducted using the Rogers (1993) standard errors, which are clustered by stocks, and hence are robust to both heteroscedasticity and correlation within the matched pair of stocks.

4. Results

4.1 Long-term effects on liquidity & trading activity:

<INSERT Table 4 HERE>

Table 4 reports the changes in means and medians of pairwise differences in daily trading volume, effective spreads, realized spreads and price impact in dollar and basis points scaled by daily trade value. The moving date of each moving stock is defined as day 0. The Preperiod is from January 1, 2008 to day -1. The Postperiod is from day +1 to December 31, 2012. Difference is the change in Means and Medians from Postperiod to Preperiod in Column 4 and Column 8, respectively.

The table shows the average of matched pair difference in relative effective spread significantly increase by 14.1 basis points in the Postperiod. The median test provides a similar result of a 0.995 basis points statistically significantly rise. This finding suggests the companies that move from NYSE to Nasdaq incur higher transaction costs after switching. The average relative realized spread differentials also experience a huge increase in the Postperiod from 7.4 basis points to 20.4 basis points with t-statistics of 2.43, showing a statistically significant change. In contrast, the median of pairwise difference in relative realized spreads show a fall from 5.7 basis points in the NYSE to 1.9 basis points in the Nasdaq with Wilcoxon-statistics of 122.5, implying a lower revenue for liquidity providers after the stock moves to the Nasdaq. No significant changes in the pairwise difference in trading volume are identified between the two periods.

Overall, the results imply that moving from the NYSE to Nasdaq worsens the liquidity of the moving companies compared with its matching stocks listed in the NYSE in the same period, reflected by relatively higher transaction costs and relatively higher average realized spread, although the median relative realized spread declines. The movement does not have any long-term impact on trading volume of the stocks that moved from the NYSE to Nasdaq.

<INSERT Table 5 HERE>

Table 5 reports the results of the difference-in-difference regression of different forms of market quality and trading activity on the set of control variables. The fixed day-effect dummy variables are omitted in the table to save space. Consistent with the univariate analysis, the relative effective spread and the realized spread both increase significantly. In particular, table 5 shows that the stock movement increases the average pairwise differences in transaction costs of the moving firms by 9.8 basis points. The liquidity providers of the moving stocks on average earn 6.26 basis points relatively higher trading revenue than those of the matching firms. The average pairwise differences in dollar effective spread and average pairwise differences in dollar realized spread also see a rise of $0.025 and $0.0135, respectively, in the Postperiod. Both increases are highly statistically significant. Price impact of trade shows an increase as well: the listing location change is associated with a statistically significant $0.0063 increase in the dollar price impact, although this effect is not statistically significant in the relative measure. Overall, the results suggest that there is less competition among the liquidity suppliers of the stocks in the new listing location, with increased trading profits for those providing liquidity, leading to higher transaction cost for the moving companies after the exchange movement.

The last row of table 5 reports that the change in listing locations boosts the average daily shares traded for the moving stocks by 130.6 compared with its match listed in the NYSE over the same period, which is statistically significant. Overall, the results are consistent with the univariate analysis, which suggest that in long term, the companies that move suffer higher trading cost due to less competition among the liquidity providers for

these stocks after switching to the Nasdaq. This expense is a trade-off of higher trading volume in long run for the moving stocks.

4.2 Short-term effects on liquidity & trading activity:

We examine the short-run impact of the listing location changes for the moving companies on liquidity and trading activity using 5[4]-trading-day-windows around the movement dates. The moving date of each stock is defined as trading day 0. The Preperiod is from trading day -5 to trading day -1. Two consecutive 5-trading-day windows following the moving dates are considered to see the dynamic changes toward the long-run effect. Postperiod1 is from trading day +1 to trading day +5. Postperiod 2 is from trading day +6 to trading day +10.

<INSERT Table 6 HERE>

Table 6 reports the changes in means and medians of daily trading volume, effective spreads, realized spreads and price impact in dollar and basis points scaled by daily trade value by comparing the moving stocks and the control stocks. The average of pairwise differences in relative effective spreads is 1.9 basis points in the five-day Preperiod, increases to 11.1 basis points in the first five-day Postperiod 1 with t-statistics of 2.65 (see row 3, Panel A), and keeps increasing to 16.3 basis points with t-statistics of 2.4 (see row 3, Panel B) in the second five-day period (Postperiod 2). The medians of this measure in Postperiod1 and Postperiod2 are 1.1 and 0.797 basis points, respectively (see row 3 in Panel A and B), which are significantly higher than in Preperiod, but show a decreasing rate of the change compared to

[4] We use +/- 5 to +/- 14 trading day windows for the short-run analysis. The results are statistically identical, showing that our results are not driven by the time window selections.

the means. The dollar effective spread pairwise differential has a median of $1.1 in the Preperiod and reaches $29.7 in Postperiod 1 while slightly declining to $16.4 in Postperiod 2 but both post-event medians of the dollar proxy are significantly higher than the pre-event. These findings suggest the change in listing location worsens liquidity in short-term and the higher impact on the average transaction cost in the second post-period, which is consistent with our finding of the long-term effect of the movement in Section 3.1. In contrast to the long-term effect, the pairwise differences in both realized spread proxies do not statistically significantly increase in short-run. This suggests that the liquidity providers of the moving stocks does not earn more compared to those of the NYSE-listed matches shortly after the stocks are delisted in the NYSE. We do not find statistical evidence of the change in daily volume and price impact of trades for the moving companies in the short-term after their movement dates, either.

Generally, the univariate analysis shows that the companies that move to Nasdaq have to pay higher transaction costs in the short-term and tend to also pay higher in the longer-term. The change in listing location does not help these companies increase trading volume in short-run. However, in contrary to the long-run effect, there is no vibrant evidence about a reduction in competition between liquidity suppliers for the moving stocks instantaneously following the stock exchange movements.

<INSERT Table 7 HERE>

Table 7 presents the impact of the exchange movement on liquidity and daily trading volume of moving stocks after controlling for the time-specific effect and other determinants of the corresponding proxies. The estimations in Table 7 are consistent with the univariate analyses. The coefficient on the movement dummy *D* is 114.03 and 9.79 for dollar effective

spread and relative effective spreads, and both are statistically significant from zero at the 0.1% level. The estimates suggest that the stock switches are associated with $0.0114 wider or 0.79 basis points larger effective spreads for the moving stocks. Price impact shows an increase of 4.84 basis points significantly at the 5% level, associated with the movement of the stock exchange as well. The coefficient on the movement dummies in the regressions of realized spreads is not statistically significant, implying that the listing exchange switches do not affect the short-run trading profits of liquidity suppliers for the moving stocks. An analogous effect is documented on trading volume, shown by the insignificant coefficient on the movement dummy in the trading volume regression (the last row in Table 7).

5. Conclusion

We document increases in the effective spread and the realized spread for firms that move from NYSE to Nasdaq. We find no increase in the volume of trading in short-term, but higher number of the moving shares traded in long-term when liquidity providers of these stocks earn substantially higher profits from trading, indicating that the improvement in trading volume is at the expense of worse liquidity measured by effective spreads, realized spreads and 5-minute price impact of trades.

While we fail to find a compelling trading cost reason for switch from NYSE to Nasdaq, there may be other reasons for companies to move. The companies themselves state additional objectives beyond liquidity and transaction costs such as increased visibility and link to similar technology companies. Barberis, Shleifer and Wurgler (2005) suggest that some companies' comovement may be linked to investors that perceive the company to be in the same 'habitat'.

The increases in costs are problematic when companies try to justify the move to Nasdaq since investors may be negatively affected by these increased costs. While this finding seems counter-intuitive, it may be relevant as a future line of research since more subtle metrics may improve for some investors. In fact, perhaps short-term trading costs are irrelevant for long-term investors and the move to a higher cost market may actually remove more volatile traders. While we are left with some questions, we are able to resolve the earlier conflicting findings about trading costs after a move from NYSE to Nasdaq.

References

Barberis, Nicholas, Andrei Shleifer, and Jeffrey Wurgler, 2005, Comovement, *Journal of Financial Economics* 75, 283-317.

Beber, Alessandro, and Marco Pagano, 2013, Short-selling bans around the world: Evidence from the 2007–09 crisis, *The Journal of Finance* 68, 343-381.

Bessembinder, Hendrik, 1999, Trade execution costs on nasdaq and the nyse: A post-reform comparison, *Journal of Financial and Quantitative Analysis* 34, 387-407.

Boehmer, Ekkehart, Charles M. Jones, and Xiaoyan Zhang, 2013, Shackling short sellers: The 2008 shorting ban, *Review of Financial Studies* 26, 1363-1400.

Davies, Ryan J., and Sang Soo Kim, 2009, Using matched samples to test for differences in trade execution costs, *Journal of Financial Markets* 12, 173-202.

Kalay, Avner, and Evgenia Portniaguina, 2001, Swimming against the tides:: The case of aeroflex move from nyse to nasdaq, *Journal of Financial Markets* 4, 261-267.

Pruitt, Stephen W., Bonnie F. Van Ness, and Robert A. Van Ness, 2002, The first of many? The microstructure effects of aeroflex corporation's move from the nyse to the nasdaq, *Journal of Applied Finance* 12, 46.

Rogers, William, 1993, Regression standard errors in clustered samples, *Stata Technical Bulletin* 13, 19-23.

Tse, Yiuman, and Erik Devos, 2004, Trading costs, investor recognition and market response: An analysis of firms that move from the amex (nasdaq) to nasdaq (amex), *Journal of Banking & Finance* 28, 63-83.

Table 1: Reasons listed companies moved to Nasdaq as self-reported

Table 1 presents the reasons for the change of listing locations of 34 companies, which moved from the NYSE to Nasdaq in the period of 2008-2012. The reasons are shown as reported in the press announcing the company movements. Of the 34 companies, 31 reported a rationale for moving. Reasons are not mutually exclusive as some companies provided multiple reasons.

	Number of firms	Percentage of sample
Greater cost efficiencies and improve liquidity	16	47.06
Advantages of Nasdaq trading platform	13	38.24
Nasdaq being the leading exchange for technology companies	3	8.82
Higher visibility	2	5.88
Increase Trading Volume	1	2.94
Others and None stated	6	17.65

Table 2. Matching Statistics for the moving firms from the NYSE to Nasdaq and its matches

The table presents a comparison of the 34 moving firms with 34 matched firms using without replacement methods. Matches require the same listing exchange with the moving firms before the movements. The match then minimizes the sum of absolute percentage deviation in December 2007 market capitalization and price. We present the mean and median for the moving and match firms, and provide p-values for the differences between moving and match firms. MCap is market capitalization in thousands USD; PRC is stock price; SHROUT is the number of share outstandings in thousands.

	Means			Statistics		Medians			Statistics	
Variables	Match	Moving	Difference	t	p-value (t-test)	Match	Moving	Difference	z	p-value (Wilcoxon)
MCap	10722772	9972447.7	-750324.7	-0.24	0.81	5599840.7	4882312.9	-717527.7	-0.36	0.72
PRC	29.021396	38.232826	9.21143	0.58	0.56	22.450001	21.29	-1.160001	-0.41	0.68
SHROUT	394007.6	350418.3	-43589.3	-0.39	0.7	170467	163687.5	-6779.5	-0.33	0.74

Table 3. Descriptive Statistics for the moving NYSE-Nasdaq companies and its matches over the period of January 2008 – December 2012

The table reports the summary statistic of the large sample over the period of January 2008 – December 2012 for the moving and matching stocks. For each stock, we calculate time-series average over the investigated period, then estimate cross-sectional means for each proxy.

	Firms NYSE to Nasdaq					Matching Firms NYSE to Nasdaq				
Variables	#Firms	Min	Max	Mean	Std	#Firms	Min	Max	Mean	Std
Number of trades	34	60.5	8228	3468.5	2466	34	7.6	9284.8	3136.4	2847.7
Daily trading volume (shares)	34	19167.2	28612174	4280057.9	5614090.7	34	1057	23530564	4042421.6	5732770.9
Daily trading value ($)	34	155940.8	337821641	82762758	91563362	34	39347.1	440276191	77989400	113389463
Trade Value Weighted Effective Spread ($)	34	98.7	3217.2	396.8	642.3	34	93	2870.3	312.7	510.9
Trade Value Weighted Relative Effective Spread (bsp)	34	4	233.7	36	58.6	34	4.2	179.1	23.3	34
Trade Value Weighted Realized Spread ($)	34	163.8	11896.3	1129.5	1997.6	34	167.4	6666.4	939.6	1164
Trade Value Weighted Relative Realized Spread (bsp)	34	21.1	222.4	61.6	50.7	34	23	186.6	47.9	28.1
Trade Value Weighted Price Impact ($)	34	-9835.1	-57.7	-772.2	1628	34	-5418.2	-18.5	-659.9	950.6
Trade Value Weighted Relative Price Impact (bsp)	34	-57.6	-9.7	-29.7	10.1	34	-51	-5.9	-26.3	12.5
Value Weighted Average Price	34	1.7	283.8	27.1	47	34	2.7	180.9	25.5	32.7
Relative range-based Volatility	34	0.02	0.07	0.04	0.01	34	0.02	0.06	0.03	0.01
Market Capitalization ($ million)	34	0.06	51.8	8.4	11.4	34	0.06	64.3	9.8	15.2

Table 4. Univariate analysis for spreads components and trading volume for the pairwise difference – Long-term effect

This table presents the changes in means and medians of daily trading volume, effective spreads, realized spreads and price impact in dollar and basis points scaled by daily trade value. The moving date of each moving stock is defined as day 0. So the Preperiod is from 01 Jan 2008 to trading day -1. The Postperiod is from trading day +1 to 31 December 2012. Difference is the change in Means and Medians from Postperiod to Preperiod in Column 4 and Column 8, respectively. The t-tests and Wilcoxon signed rank tests examine whether the difference in the pairwise difference means and medians, respectively are equal to zero. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

	Means				Medians			
Variables	Preperiod	Postperiod	Difference	t-Statistics	Preperiod	Postperiod	Difference	Wilcoxon
Daily trading volume (shares)	-433418.2	848365.2	1281783.4	1.88	50767.5	167521.8	116754.3	102.50
Trade Value Weighted Effective Spread ($1/10000)	34.6	235.6	201	1.72	-1	10.6	11.585	108.50
Trade Value Weighted Relative Effective Spread (bsp)	4.9	19	14.1	2.28*	-0.4	0.595	0.995	121.50*
Trade Value Weighted Realized Spread ($1/10000)	391.7	335.2	-56.5	-0.17	-50.3	53.1	103.4	74.50
Trade Value Weighted Relative Realized Spread (bsp)	7.4	20.4	13	2.43*	5.7	1.9	-3.8	122.50*
Trade Value Weighted Price Impact ($1/10000)	-337	-135.4	201.6	0.68	26.1	-26.7	-52.8	-51.50
Trade Value Weighted Relative Price Impact (bsp)	-2.1	-4.8	-2.6	-0.81	0.489	-0.11	-0.599	-30.50

Table 5. Multivariate Analysis of Spreads, Price Impact and trading volume for the pairwise difference of the moving and matching companies – Long-term effect

The table reports the results of the regression of the following fixed effect model:

$$Y_{it} = \propto_t + \beta D_{it} + \gamma X_{it} + \varepsilon_{it}$$

where Y_{it} is various market quality proxies and trading activity for the moving firm less the measured quantity of the same proxy for its matched company. $\alpha_t$is a time fixed effect for day t. D_{it} is an indicator variable set equal to zero before the movement and one after that for stock i and its matched stock on day t . X_{it} is a set of pairwise differences between the moving stocks and its matched stocks for the following control variables including dollar daily volume (trade_vol), market capitalization (Market Cap), price volatility (Volatility), the daily volume-weighted average share price (VWAP). tvw_eff_spd, refers to dollar effective spreads. tvw_rel_eff_spd refers to relative effective spread. tvw_real_spd_05m is dollar realized spread. tvw_rel_real_spd_05m is relative realized spread. tvw_markimp05m is dollar 5-minute price impact. tvw_rel_markimp05m is relative 5-minute price impact. All of these components of spreads are scaled by trade value. The absolute measure of spreads and price impact are multiplied by 10^4 for presentation purpose.
* Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Dependent Variable	D	trade_vol	vwap	Volatility	Market Cap	Adj R-Square
tvw_eff_spd	258.45***	-0.02***	8.62***	1459.66***	0.03***	0.43
	(22.0)	(-3.8)	(21.3)	(3.66)	(3.83)	
tvw_rel_eff_spd	9.83***	-0.00***	0.02***	283.73***	-0.00**	0.34
	(17.5)	(-8.9)	(4.35)	(11.4)	(-3.1)	
tvw_real_spd_05m	135.53***	0.07***	43.70***	8334.11***	-0.06*	0.52
	(8.36)	(9.07)	(23.4)	(16.2)	(-2.2)	
tvw_rel_real_spd_05m	6.26***	-0.00	0.01	940.78***	-0.00	0.52
	(13.0)	(-.75)	(1.74)	(36.8)	(-1.4)	
tvw_markimp05m	63.54***	-0.09***	-35.68***	-6628.03***	0.08**	0.51
	(4.71)	(-14)	(-20)	(-17)	(2.84)	
tvw_rel_markimp05m	0.59	-0.00***	0.00	-647.40***	-0.00	0.41
	(1.77)	(-9.9)	(0.34)	(-38)	(-1.4)	
trade_vol	130.64***		1.53***	4421.37***	-0.34***	0.44
	(18.6)		(12.5)	(19.4)	(-17)	

Table 6. Univariate analysis for spreads components and trading volume for the pairwise difference sample – Short-term effect

This table presents the changes in means and medians of daily trading volume, effective spreads, realized spreads and price impact in dollar and basis points scaled by daily trade value. The moving date of each moving stock is defined as trading day 0. So the Preperiod is from trading day -5 to -1. The Postperiod 1 is from trading day +1 to + 5. Postperiod 2 is from trading day + 6 to + 10. Difference is the change in Means and Medians from Postperiod 1 and Postperiod 2 to Preperiod in Panel A and B, respectively. The t-tests and Wilcoxon signed rank tests examine whether the difference in the pairwise difference means and medians, respectively are equal to zero. * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

	Means				Medians			
Variables	Preperiod	Postperiod	Difference	t-Statistics	Preperiod	Postperiod	Difference	Wilcoxon
Panel A: Preperiod vs Postperiod 1								
Daily trading volume (shares)	633714.5	527998.9	-105715.6	-0.26	174828	233340	58512	-14.50
Trade Value Weighted Effective Spread ($1/10000)	108.7	221	112.3	2.02	1.1	29.7	28.6	173.50**
Trade Value Weighted Relative Effective Spread (bsp)	1.9	11.1	9.1	2.65*	0.012	1.1	1.114	180.50**
Trade Value Weighted Realised Spread ($1/10000)	555.7	394.4	-161.4	-0.63	107.9	224.1	116.1	48.50
Trade Value Weighted Relative Realised Spread (bsp)	2.9	9.8	6.9	1.80	1.3	8.3	7	105.50
Trade Value Weighted Price Impact ($1/10000)	-432.5	-110.1	322.4	0.94	-32	-99.7	-67.7	-23.50
Trade Value Weighted Relative Price Impact (bsp)	-0.566	0.082	0.648	0.21	0.599	-0.507	-1.106	-52.50

	Means				Medians			
Variables	Preperiod	Postperiod	Difference	t-Statistics	Preperiod	Postperiod	Difference	Wilcoxon
Panel B: Preperiod vs Postperiod 2								
Daily trading volume (shares)	633714.5	220963.6	-412750.9	-0.63	174828	179601.5	4773.5	-24.50
Trade Value Weighted Effective Spread ($1/10000)	108.7	296.2	187.5	2.49*	1.1	16.4	15.2	121.50*
Trade Value Weighted Relative Effective Spread (bsp)	1.9	16.3	14.4	2.40*	0.012	0.797	0.786	144.50*
Trade Value Weighted Realised Spread ($1/10000)	555.7	624.6	68.9	0.49	107.9	127	19.1	32.50
Trade Value Weighted Relative Realised Spread (bsp)	2.9	14.7	11.9	1.70	1.3	5.6	4.3	60.50
Trade Value Weighted Price Impact ($1/10000)	-432.5	-295.9	136.6	1.09	-32	6.4	38.4	6.50
Trade Value Weighted Relative Price Impact (bsp)	-0.566	1.3	1.856	0.43	0.599	-0.029	-0.628	-11.50

Table 7. Multivariate Analysis of Spreads, Price Impact and trading volume for the pairwise difference of the moving and matching companies – Short-term effect

The table reports the results of the regression of the following fixed effect model:

$$Y_{it} = \propto_t + \beta D_{it} + \gamma X_{it} + \varepsilon_{it}$$

where Y_{it} is various market quality proxies and trading activity for the moving firm less the measured quantity of the same proxy for its matched company. α_t is a time fixed effect for day t. D_{it} is an indicator variable set equal to zero before the movement and one after that for stock i and its matched stock on day t. X_{it} is a set of pairwise differences between the moving stocks and its matched stocks for the following control variables including dollar daily volume (trade_vol), market capitalization (Market Cap), price volatility (Volatility), the daily volume-weighted average share price (VWAP). tvw_eff_spd refers to dollar effective spreads. tvw_rel_eff_spd refers to relative effective spread. tvw_real_spd_05m is dollar realized spread. tvw_rel_real_spd_05m is relative realized spread. tvw_markimp05m is dollar 5-minute price impact. tvw_rel_markimp05m is relative 5-minute price impact. The moving date of each moving stock is defined as trading day 0. The sample period is from trading day -5 to +10. All of these components of spreads are scaled by trade value. The absolute measure of spreads and price impact are multiplied by 10^4 for presentation purpose.
* Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Dependent Variable	D	trade_vol	vwap	Volatility	Market Cap	Adj R-Square
tvw_eff_spd	114.03**	-0.12*	6.98	4197.62*	-0.42	0.66
	(2.63)	(-2.2)	(0.49)	(2.58)	(-.85)	
tvw_rel_eff_spd	9.79***	-0.00	0.06	269.04**	0.00	0.57
	(4.15)	(-1.9)	(0.31)	(2.85)	(0.46)	
tvw_real_spd_05m	-130.23	-0.16	47.72	20579.86*	3.94	0.71
	(-.91)	(-1.5)	(0.50)	(2.37)	(1.55)	
tvw_rel_real_spd_05m	3.91	0.00	0.02	769.07***	0.02	0.65
	(1.37)	(0.00)	(0.06)	(6.46)	(1.01)	
tvw_markimp05m	252.58	0.03	-91.53	-17046.70*	-5.01	0.66
	(1.85)	(0.28)	(-1.1)	(-2.2)	(-2.0)	
tvw_rel_markimp05m	4.84*	-0.00	0.03	-514.23***	-0.01	0.55
	(2.01)	(-1.8)	(0.09)	(-5.6)	(-1.0)	
trade_vol	-51.05		-9.41*	3623.81***	0.44	0.76
	(-1.6)		(-2.6)	(4.56)	(1.32)	