

Comparative Analysis of NYSE and NASDAQ Operations Strategy

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Abstract

In this paper we discuss how companies can access the general public in order to raise money for their businesses and the resulting set of competitive strategies among exchanges, focusing specifically on operations strategies. Here we focus on one specific strategy – operations strategy, and we will see that a carefully designed operations strategy can have a significant impact on the success of the exchange business and the clientele it attracts.

Keywords

Operations Strategy

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Introduction

In this paper we discuss how companies can access the general public in order to raise money for their businesses and the resulting set of competitive strategies among exchanges, focusing specifically on operations strategies. This process of raising capital involves the concept of listing the company at an exchange, which requires that the company satisfies requirements that vary exchange to exchange. The business of running an exchange is highly profitable, which results in a considerable number of exchanges that compete for global listing business. In order to maintain competitive advantage and preserve and gain market share, exchanges can choose from a variety of strategies. In this analysis we focus on one specific strategy – operations strategy, and we will see that a carefully designed operations strategy can have a significant impact on the success of the exchange business and the clientele it attracts.

The structure of the paper is the following: to set up the context, we start with an analysis of the industry of exchanges and the description of all the relevant actors. We then proceed with a

deep dive into two major competitors operating in the United States—the New York Stock Exchange (NYSE) and the National Association of Securities Dealers (NASDAQ). This helps us set up for the following section, where we can see how NYSE and NASDAQ specifically position themselves and use their operations strategy against each other. Finally, we conclude the analysis with the key takeaways on how a company should approach the decision of choosing which exchange to raise capital at. We close the paper by outlining future work direction on this topic.

1. Industry Background

1.1 Stock Market

A stock market, equity market or share market is the aggregation of buyers and sellers of stocks; these may include securities listed on a stock exchange and those traded privately.

The stock market is one of the most important ways for companies to raise money, along with debt markets which are generally more imposing but do not trade publicly. This allows businesses to be publicly traded, and raise additional financial capital for expansion by selling shares of ownership of the company in a public market. The liquidity that an exchange affords the investors enables their holders to quickly and easily sell securities.

1.2 Market Participants

Market participants include individual retail investors, institutional investors such as mutual funds, banks, insurance companies and hedge funds, and also publicly traded corporations trading in their own shares. Some studies have suggested that institutional investors and corporations trading in their own shares generally receive higher risk-adjusted returns than retail investors.

A few decades ago, worldwide, buyers and sellers were individual investors, such as wealthy businessmen, usually with long family histories to particular corporations. Over time, markets have become more "institutionalized"; buyers and sellers are largely institutions (e.g., pension funds, insurance companies, mutual funds, index funds, exchange-

traded funds, hedge funds, investor groups, banks and various other financial institutions).

The rise of the institutional investor has brought with it some improvements in market operations. There has been a gradual tendency for "fixed" (and exorbitant) fees being reduced for all investors, partly from falling administration costs but also assisted by large institutions challenging brokers' oligopolistic approach to setting standardized fees.

1.3 Stock Exchange

Stock exchange is a place or organization by which stock traders can trade stocks. Companies may want to get their stock listed on a stock exchange. Other stocks may be traded "over the counter" (OTC), that is, through a dealer. A large company will usually have its stock listed on many exchanges across the world.

1.4 Major Competitors

As can be seen here, NYSE and NASDAQ are the two largest stock exchanges in the world by market capitalization:

Table 1. Top 5 Stock Exchanges by Market Cap

Rank	Exchange	Region
1	NYSE	USA
2	NASDAQ	USA
3	London Stock Exchange	UK/Europe
4	Japan Stock Exchange	Japan
5	Shanghai Stock Exchange	China

1.4.1 NYSE

The New York Stock Exchange (NYSE) is an American stock exchange located at 11 Wall Street, Lower Manhattan, New York City, New York. It is by far the world's largest stock exchange by market capitalization of its listed companies. The NYSE is owned by Intercontinental Exchange, an American holding company it also lists (NYSE: ICE). Previously, it was part of NYSE Euronext (NYX), which was formed by the NYSE's 2007 merger with the fully electronic stock exchange Euronext. NYSE and Euronext now operate as divisions of Intercontinental Exchange.

1.4.2 NASDAQ

The NASDAQ Stock Market (National Association of Securities Dealers Automated Quotations) commonly known as the NASDAQ is an American stock exchange. It is the second-largest exchange in the world by market capitalization, behind only the New York Stock Exchange. The exchange platform is owned by The NASDAQ OMX Group, which also owns the OMX stock market network and several other US stock and options exchanges.

2. Organizational Differences

2.1 Transaction Location

On NYSE, all trades occur in a physical place, on the trading floor in New York City. Nasdaq, on the other hand, is not located in a physical trading floor but on a telecommunications network. Trading takes place directly between investors and their buyers/sellers who are the market makers through an elaborate system of companies electronically connected to one another. Due to this we consider Nasdaq to be a dealer's market while NYSE to be an auction market.

2.2 Transaction Flow Control

As mentioned previously, the exchange needs an entity that is at the intersection where buyers and sellers meet. This entity deal with exchange problems and in turn make it possible for their markets to work. On NASDAQ, this entity is known as the market maker who transacts with buyers and sellers to keep the flow of trading going. On NYSE, the entity is called the specialist who is in charge of matching up buyers and sellers. The role of those 2 entities are technically different. Market maker creates a market for a security (provides market liquidity) while specialist merely facilitates the market. However, their duty is similar that they try to ensure smooth and orderly markets for clients.

2.3 Perception and Cost

NASDAQ is generally known as a high tech market, attracting many internet/electronics companies. Accordingly, the stocks listed here are considered to be more volatile and growth oriented. NYSE com-

panies are perceived to be better established with many of the blue chip firms and various stable and established companies listing there.

2.4 Listing Mechanics

2.4.1 NYSE

To be listed on the NYSE, a company must submit a request along with the following: a list of corporate bylaws, five years of annual shareholder reports, copies of the company's stock or bond certificates, the current year's Form 10-K, a proposed schedule of expected stock distribution, and a proxy statement from the current year's annual shareholder meeting. Moreover, the company is required to meet the following guidelines:

- Must issue at least 1.1 million shares to at least 400 shareholders.
- Market value of public shares must be at least \$40 million, with a minimum share price of \$4.
- Must have \$10 million in aggregate pre-tax earnings for the last three fiscal years, including \$2 million in most recent year. If this requirement cannot be met, the company can also apply based on a global market capitalization of at least \$500 million, with revenues of at least \$100 million in the last year, and no negative cash flow in the three most recent years. The company can also be listed based on revenues of at least \$75 million in the last fiscal year.

The entry fee to list stocks on the NYSE is up to \$250,000. Yearly fees are based on the number of shares listed and are capped at \$500,000.

2.4.2 NASDAQ

In order for a security to be listed on the NASDAQ, a company must submit an application and meet the following initial requirements:

- Must have a minimum of 1,250,000 publicly traded shares, with a regular bid price of at least \$4.

- Must have at least three market makers for its stock.
- Must meet stringent government standards.
- Must either have aggregate pre-tax earnings in the past three years of at least \$11 million, in two years at least \$2.2 million, and no one year with a net loss, or a minimum aggregate cash flow of at least \$27.5 million for the past three years, with market capitalization over the last 12 months of at least \$550 million, with revenues at least \$110 million. If a company has an average market capitalization over the last 12 months of at least \$850 million and revenues over the last year of at least \$90 million, it can also be listed.

The entry fee companies must pay to list stocks on the NASDAQ exchange is \$50,000 to \$75,000. Yearly fees are usually around \$27,500.

2.5 Discussion

Listings fees are very profitable for the NASDAQ and NYSE. In 2011, the NASDAQ made \$372 million, or roughly 22% of all its revenue, from listing fees and similar corporate services. For the NYSE, listing fees and similar corporate services accounted for 17% of its 2011 revenue, or \$446 million.

Whether a stock trades on the NASDAQ or the NYSE is not necessarily a critical factor for investors when they are deciding on stocks to invest in. However, because both exchanges are perceived differently, the decision to list on a particular exchange is an important one for many companies. A company's decision to list on a particular exchange is also affected by the listing costs and requirements set by each individual exchange. As can be seen from the more stringent requirement in NYSE above, we can understand why the growth-type stocks (companies with less initial capital) would be found on the NASDAQ exchange.

2.6 Public vs. Private

Prior to March 8, 2006, the final major difference between these two exchanges was their type of ownership: the NASDAQ exchange was listed as a

publicly-traded corporation, while the NYSE was private. This all changed in March 2006 when the NYSE went public after being a not-for-profit exchange for nearly 214 years. Most of the time, we think of the NASDAQ and NYSE as markets or exchanges, but these entities are both actual businesses providing a service to earn a profit for shareholders.

3. Analysis

3.1 Listing and IPO

3.1.1 Issue

As mentioned previously, the main role of an exchange is to raise capital for various companies. An exchange acts as an intermediary between the company demand for capital and market participant supply of capital. Similar with traditional business, there is a cost associated with the misfit between supply and demand. If the company supply too few stocks in the offerings, it might not be sufficient to satisfy the market participant demand causing the offering to be oversubscribed and vice versa. This also reduces the amount of capital raised in the offerings which might hinder the company expansion capability.

The cost of listing and ongoing annual cost is driven by the organization price tier structure which is a function of capital and shares raised. An additional complication in case of NASDAQ is their tiered pricing, which has two tiers: (1) NASDAQ Global Select and Global Markets, and (2) NASDAQ Capital Market.

The current fee structure for NASDAQ is shown in the following figures:

- NASDAQ Global Select and Global Markets:
 - Entry fees: [Table 2](#)
 - Annual fees: [Table 3](#)
- NASDAQ Capital Market:
 - Entry fees: [Table 4](#)
 - Annual fees: [Table 5](#)

The current fee structure for NASDAQ is shown in the following figures:

- Entry fees: [Table 6](#)
- Annual fees: [Table 7](#)

Table 2. NASDAQ Global Select and Global Markets Entry Fees

Total Shares	Entry Fee
Up to 30 million	\$125,000
30+ to 50 million	\$150,000
50+ to 100 million	\$200,000
Over 100 million	\$225,000

Table 3. NASDAQ Global Select and Global Markets Annual Fees

Total Shares	Annual Fee
Up to 10 million	\$45,000
10+ to 50 million	\$55,000
50+ to 75 million	\$75,000
75+ to 100 million	\$100,000
100+ to 125 million	\$125,000
125+ to 150 million	\$135,000
Over 150 million	\$155,000

Table 4. NASDAQ Capital Market Entry Fees

Total Shares	Entry Fee
Up to 15 million	\$50,000
Over 15 million	\$75,000

3.1.2 Hypothesis/Analysis

Total Cost of Listing. We argue that the current pricing structure creates a natural self selection in which it is natural for technology/growth company to prefer listing on NASDAQ vs. NYSE. As a proxy, we first look at the average market capitalization of NASDAQ companies vs. NYSE companies. As of 2015, average market capitalization of NYSE companies is 8.924B while average market capitalization of NASDAQ companies is 2.931B

Table 5. NASDAQ Capital Market Annual Fees

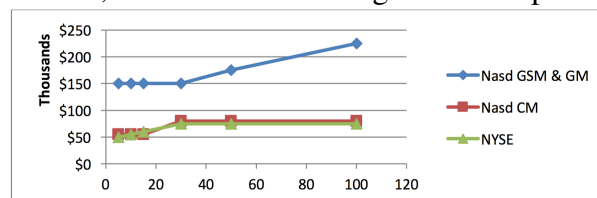
Total Shares	Annual Fee
Up to 10 million	\$42,000
10+ to 50 million	\$55,000
Over 50 million	\$75,000

Table 6. NYSE Entry Fees

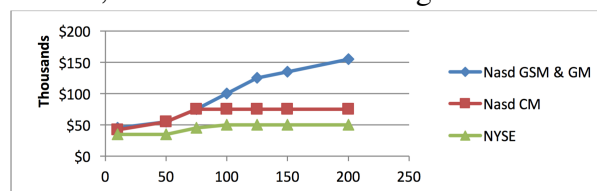
Total Shares	Entry Fee
Up to 5 million	\$50,000
5+ to 10 million	\$55,000
10+ to 15 million	\$60,000
Over 15 million	\$75,000

which is consistent with NASDAQ having smaller growth technology companies as most of its base customers.

Assuming the par value of the stock to be constant, we can take a look at the entry fees and annual fees on NASDAQ and NYSE purely as a function of number of shares outstanding. Looking at the entry fees for listing on NASDAQ (various classifications) and NYSE, we find the following relationship:



Looking at the annual fee charged by NASDAQ and NYSE, we can see the following:



It is obvious that from listing perspective (keeping share price constant) that it is more costly to

Table 7. NYSE Annual Fees

Total Shares	Annual Fee
Up to 50 million	\$35,000
50+ to 75 million	\$45,000
Over 75 million	\$50,000

list on NASDAQ compared with NYSE. Thus, even though NASDAQ presents a lower barrier of entry for a company to qualify for listing, they charge them significantly more to list and subsequently continue to be listed on an ongoing basis. Companies in US tend to be not dual-listed in multiple exchanges and there is no issue of switching cost since it is very rare for a company to switch its listing from one exchange to another. Once an exchange manages to enlist the company to list in its exchange, it has its business for life unless it decided to go back to private or it went out of business.

Number of Shares to Offer. The second issue we will look at is how many shares a company should supply in order to meet the demand. This is a simplification of the problem since the demand is obviously a function of the price as well and an oversupply will create a new equilibrium for new higher demand with lower price point. This analysis is done purely on fixing the price point of the share. Pricing tiers also creates a boundary condition where there is a jump between an overage and underage cost we move between tiers. We argue that this will creates a tendency to offer up to the price tier and not beyond. We use the Newsvendor model here and look at the underage and overage cost here. Since all exchanges have similar tier structure, we will take NASD GSM and GM entry fees as an example and generalize the findings to all exchanges. Assume the fixed share price point to be X . $C_u = X$ for all shares offered. $C_o = 0$ for all shares, except at

Table 8. NASDAQ C_o Analysis

Shares Offered	C_o
30	150,000
50	175,000
100	225,000

This implies that Critical Ratio will be 1 for almost all *SharesOffered* unless for those boundary conditions above where *CriticalRatio* will be very small (close to 0, assuming $X \ll C_o$). Unfortunately, the demand function is not known in

advance. Depending on where the mean of the demand function lies in the interval, it will be optimal to offer shares up to the boundary conditions. For instance, if we know that the demand function will have a mean of 35M shares, it will be optimal based on the *Newsvendor model* to offer up to 50M shares (assuming no price impact of such offerings). Similarly if the demand function will have a mean of 10M, it will be optimal based on the Newsvendor Model to offer up to 30M shares.

3.2 Transaction Costs

3.2.1 Issue

Transaction costs associated with trading securities can have a non-negligible impact on portfolio return. Transaction costs include explicit costs (commissions, fees, and taxes), market maker spread (difference between the bid and the ask), market impact (price impact due to lack of liquidity when trading a large order), and opportunity cost (effective cost of price movements before the trade occurs).

[1] and [2] propose a methodology that is relevant for our discussion of NYSE and NASDAQ trading costs.

Quoted Spread. The first metric is called *the Quoted Spread*, which is the simplest measure of trading cost is the quoted spread (QS), which is defined as the difference between the bid and ask prices:

$$QS_{it} = 100 * (Ask_{it} - Bid_{it}) / (2 * M_{it}) \quad (1)$$

where Ask_{it} and Bid_{it} are the posted ask price and bid price for security i at time t , respectively, and M_{it} , the quote midpoint or mean of Ask_{it} and Bid_{it} , is a proxy for the true underlying security value.

Effective Spread. The second metric is called *the Effective Spread*, which is defined as:

$$ES_{it} = 100 * D_{it} * (P_{it} - V_{it}) / V_{it} \quad (2)$$

where P_{it} is the transaction price for security i at time t , D_{it} is an indicator variable that equals one for customer buy orders and negative one for customer sell orders, and V_{it} is an observable proxy for the

true underlying value of security i at time t . The effective spread is based on the deviation between the execution price and the true underlying value of the security, and can be viewed as an estimate of the execution cost actually paid by the trader and the gross revenue earned by the liquidity provider.

Price Impact of the Trade. The third metric is the *Price Impact of the Trade* defined as:

$$PI_{it} = 100 * D_{it} * (V_{it+n} - V_{it}) / V_{it} \quad (3)$$

where V_{it+n} denotes the security's true underlying value n periods after the transaction. The price adjustment from V_{it} to V_{it+n} reflects the markets' assessment of the private information conveyed by the trade.

Realized Spread. The fourth and final metric is called the *Realized Spread*, which is defined as:

$$RS_{it} = 100 * D_{it} * (P_{it} - V_{it+n}) / V_{it} = ES_{it} - PI_{it} \quad (4)$$

3.2.2 Hypothesis/Analysis

Empirical Observation. As you can see in Table 9, quoted half-spreads average 0.575% on the NYSE and 0.820% on NASDAQ. For the large firm sample, quoted NASDAQ half-spreads are, on average, only 12.4 basis points wider (0.445% vs. 0.321%). For medium and small sized firms, the cross-exchange differentials in average quoted half-spreads widen to 67.9 and 61.7 basis points, respectively. Each of these differentials is statistically significant. The observation that the cross-exchange differential in quoted half-spreads is greater for small and medium firms that for large firms calls into question the reasoning that NASDAQ has a comparative advantage in making markets for smaller firms.

Table 10 shows that Effective half spreads for trades in small and medium sized NASDAQ firms are substantially greater than for trades in size-matched NYSE firms is evidence against the reasoning that the NASDAQ market structure is relatively efficient for market-making in smaller firms: for medium companies, the differential is 45.7 basis

Table 9. Quoted Half-Spreads on NYSE and NASDAQ (%)

Firm Size	NYSE	NASDAQ
All	0.575	0.820
Large	0.321	0.445
Medium	0.796	1.475
Small	1.900	2.517

points (1.043% vs. 0.586%), while for small companies effective half-spreads are 53.9 basis points (1.941% vs. 1.402%) larger on NASDAQ.

Table 10. Effective Half-Spreads (all trades) (%)

Firm Size	NYSE	NASDAQ
All	0.394	0.433
Large	0.239	0.320
Medium	0.586	1.043
Small	1.402	1.941

Bullwhip Effect. The rise of institutional investors such as mutual funds, brokerage and hedge fund also creates an additional layer of complexity from a supply chain perspective as it creates an additional layer from the end customers who is looking to invest and the market maker on NASDAQ / specialist in NYSE. Demand variability from the customer level are relatively stable as they usually buy/sell stocks due to a certain predictable events: life/death, liability payment, and payroll. As we move closer towards the supplier in the exchange, the demand variability increases similar to a bullwhip effect.

Trade allocation on NASDAQ is usually done on a pro-rate allocation by the market makers. In order to get trade allocated to the them, the market maker effectively needs to quote at a higher size (than the actual desired supply) in order to get the proper allocation. This could potentially cause them to overfill their supply, i.e. they could transact in a larger size than they are prepared to handle risk-wise. To reduce this risk, they would widen the spread of their bid-ask offerings so in the case of such events, they would be compensated more for the risk they are undertaking.

Trade allocation in NYSE is done by the specialist by directly matching the supply demand flow. In other words, the specialists did not incur the risk / cost of holding the security. This allows them to post a tighter bid ask spread.

In order to handle the increased demand variability, market maker on NASDAQ (on top of the effect above), they would widen their bid ask spread even more to accommodate higher volatility in demand. This effect is much less pronounced in NYSE since the specialist are often afforded better information given their location on the floor and thus closer proximity to the institutional brokers. This allows them to obtain a better estimate for the stock demand and provide a tighter bid ask spread. These are the causes of the empirical result observed above.

4. Recommendations

NASDAQ and NYSE have maintained the status quo of duopoly for years now. They manage to do that effectively by staying complementary to one another. NASDAQ have approached their operational approach by effectively creating a lower barrier of entry compared with NYSE to qualify for listing. This is attractive for smaller growth technology companies which comprises a majority of their customer base.

Regardless of the NASDAQ classification of companies, the cost of raising financial capital through NASDAQ and subsequently maintaining their status and trading is significantly higher on NASDAQ. Trading spread is an important aspect of capital structure management as well since corporations can conduct buybacks in the future.

Cost of listings and annual fee associated with NASDAQ is significantly higher on NASDAQ. This is effectively reflecting the risk premium that NASDAQ incurs for listing a smaller growth (and thus more volatile and less financially stable) companies.

Holding the par-value of the shares constant, we can also show that operationally, it is optimal to raise more shares through NASDAQ rather than NYSE. If we relax the par value argument and hold the capital raised constant, this effectively makes the optimal share value in NYSE to be higher.

Transaction costs should be an important factor when a firm is deciding where to list. We saw that the effective cost of trading is actually higher on NASDAQ, so a firm should evaluate the total cost of listing on each exchange, and make a decision that takes all stakeholders into consideration.

5. Conclusion

In conclusion, to decide where a firm should raise their capital, one effectively needs to realize at what life cycle the firm actually is. For a financially strong large company it makes more sense to list on NYSE due to the prestige, low trading cost and lower listing and management fee. The reverse holds true for smaller growth company. It needs to be noted that in US cross listing and exchange listing switching is quite rare and costly so the company needs to reflect their long term view of the company trajectory in deciding where to go for listing.

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