

The logo for Batalha, featuring the word "BATALHA" in a bold, sans-serif font with a trademark symbol (TM) to the upper right of the letter "A". The text is white and is centered within a dark blue rectangular background.

BATALHA™

Investment Case

BMF Bovespa (BVMF3)

Share Price – Background

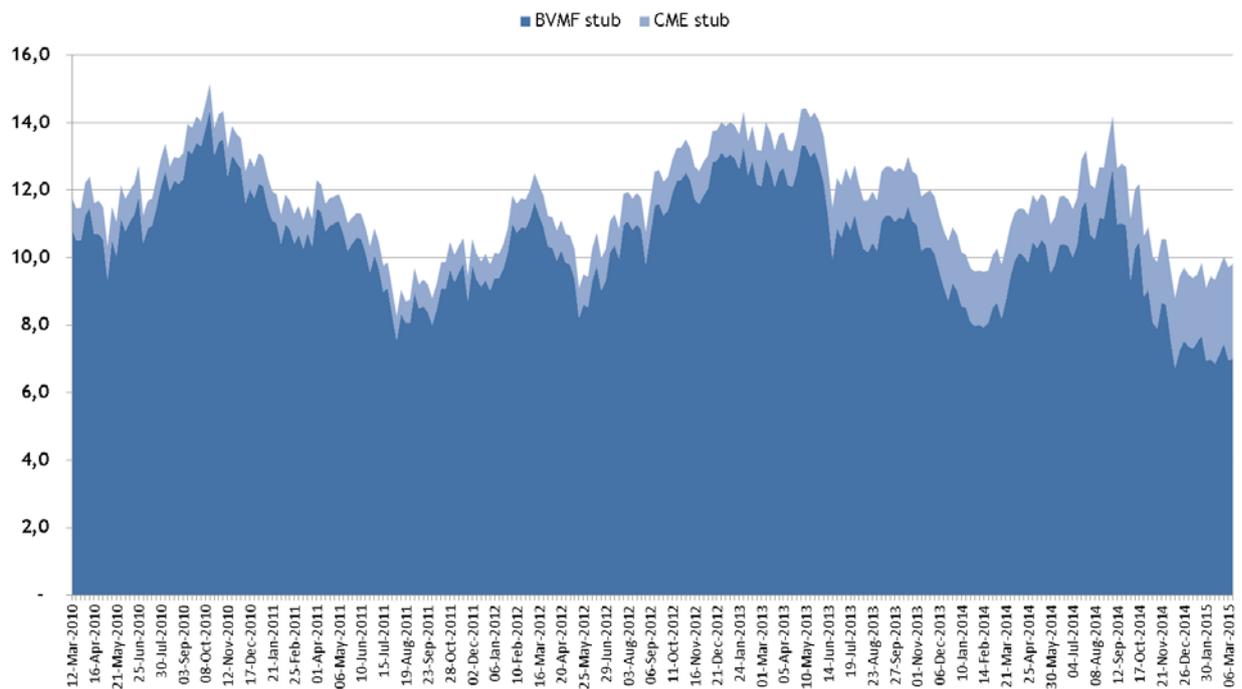
At first glance, BMF Bovespa share price has gone nowhere over the last five years. It traded at R\$11 in early 2010; it now trades at roughly R\$9, 5 (excluding dividends). That alone probably would not merit BVMF as an opportunity.

Nevertheless, BVMF core business, comprised of its equities (Bovespa) and derivatives exchanges (BMF) and its central counterparty and CSD businesses, is trading at a six-year low.

To understand why, we need to look at BVMF's share price as having two separate components. Within each BMVF3 there are 0, 0092 shares of CME, an investment stake BVMF's management acquired in two steps (2008 and 2010). As CME's stock price appreciated along with the American stock market and the real devalued against the USD over the past years, this stake has increased in value fourfold. In October 2010, out of BVMF'S R\$14, 4 stock price, the CME stake represented less than 75 cents per share. BVMF's core businesses, then, were worth R\$13, 7 share.

Currently, out of BVMF3 R\$ 9, 5 stock price, the CME stub is worth around R\$3 per share. Consequently, all of BMVF's businesses are worth around R\$6, 5 per share. That's more than a 50% fall. Current stock price implies an enterprise value of roughly R\$11, 5 billion for a company that generates approximately R\$1, 3 billion in free cash flow to equity.

CHART: Share Price (BMF core business “stub” and CME stake decoupled)



Source: Batalha

Recommended Transaction

The CME stake now accounts for roughly 28% of BMF Bovespa market cap. But, we want to be long the higher quality, cheaper BVMF core business and avoid CME all together.

When we exclude the CME stake and adjust free cash flow to a sustainable, normalized metric, BVMF3 is trading at a 9x free cash flow multiple. This is a way below average market multiple for a business of higher than average quality.

To own solely the BVMF stub, the equivalent CME market cap embedded on BVMF has to be shorted. BMF Bovespa owns 16,670 thousand CME shares, and there are 1.8 billion BVMF3 shares. Hence, in each share of BVMF there are 0,0092 shares of CME. For each 100 shares long on BVMF3, one CME share will be held short.

Business Overview

Financial exchanges possess attractive unit economics. Revenue is recorded every time a transaction is made. However, because of the fixed-cost nature of the business, costs are not incurred in every trade. Usually, the company makes investments in infrastructure and technology (software and systems) upfront, and its cost is later spread out in the millions of transaction that take place. Additional transactions within the system occur at virtually zero marginal cost. So, while revenues end up as a small percentage of the transacted volume (usually a few bps), profit per trade is abnormally high. This cost structure allows incumbent financial exchanges to operate with significant economies of scale over potential entrants and dark pools.

Because it also operates a clearinghouse, trades open at BVMF are also closed there. This allows BVMF to book both trading and post-trading fees whenever a transaction occurs. As a central counterparty, it earns interest on cash and securities held as collateral. In this light, we view financial exchanges that do not have clearing capabilities, such as Nasdaq and LSE, as less attractive business models.

Moreover, unlike most global financial exchanges, BVMF operates both a cash and derivatives exchange. Because of this, its volumes tend to be less cyclical and more resilient to financial shocks as adverse scenarios tend to boost demand for protection and certain financial derivatives. Despite the huge volatility Brazilian markets have experienced over the past years, volumes have remained much more stable.

Trading and post-trading fees account for roughly 80% of total revenues, almost evenly split between the cash (Bovespa) and derivatives segments (BMF). The remaining 20% of revenues are made up of vendors and market access fees, licensing of indexes, securities lending and so forth.

The business requires a healthy dose of technology, scale, and regulatory expertise, but limited CAPEX and working capital. Nevertheless, BVMF's management took advantage of a quasi-monopoly structure enjoyed over the last years to strategically position the company ahead of regulatory and market demands, substantially strengthening its competitive position. It underwent a seven-year R\$ 1,5 billion capex program in infrastructure and technology (average of 12% of sales), including the construction of a new data center, the start of a new trading platform, and the launch of new products, such as ETFs, fixed income and over the counter derivatives. Currently, these offerings represent a small piece of the overall business but may become significant growth drivers as the Brazilian market matures.

Because of the above mentioned reasons, BMF Bovespa has been a true cash cow over the years, with both high returns on (ROIC and CROIC) and of capital (dividends and buybacks). We believe the business is highly entrenched by the possession of competitive advantages, which has been widened by actions taken by management over the last years.

Therefore, we believe the recent price fall represents a good entry point to acquire a business with excellent characteristics at an attractive valuation.

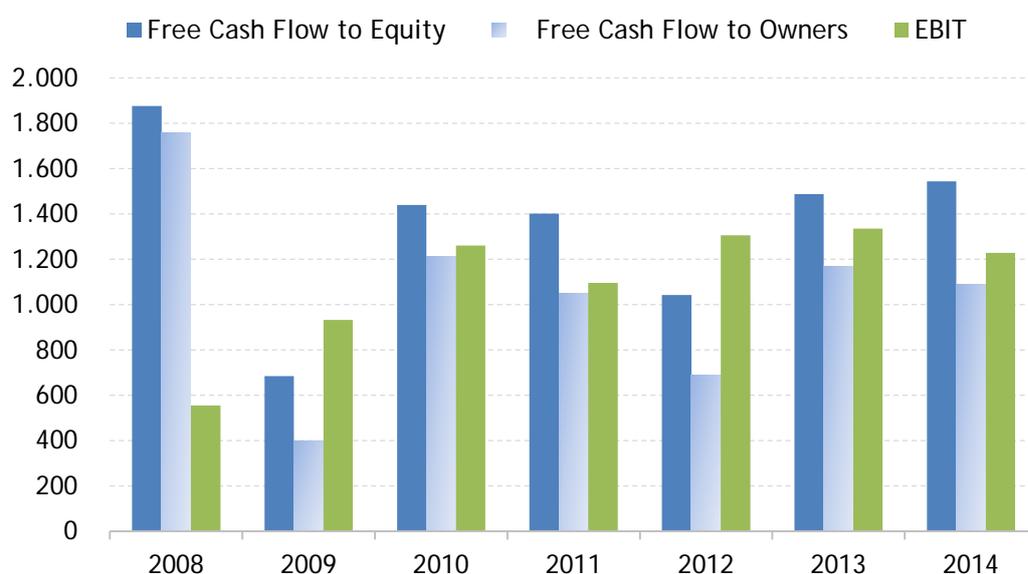
Profitability & Cash Flow Generation – a true cash cow

BVMF has been immensely profitable and has generated a lot of cash over the last few years. Despite one dip in 2009, cash flow has remained high and stable.

Usually, both EBIT and EBITDA are poor proxies for cash flow; we use cash flow figures instead. On BVMF's case, though, cash flow has tracked or even surpassed EBIT on a yearly basis, because: (i) it earns interest income on both net cash balances and on collateral posted as margin, (ii) working capital is negative, and (iii) income taxes have been shielded by goodwill amortization.

We have made several adjustments to reported cash flow from operations. For our own Free Cash Flow to Owners figures we deduct our estimate for Maintenance Capex (MCX) and the benefit of the goodwill amortization. For Free Cash Flow to Equity, we add back the tax benefit but deduct both MCX and Growth Capex.

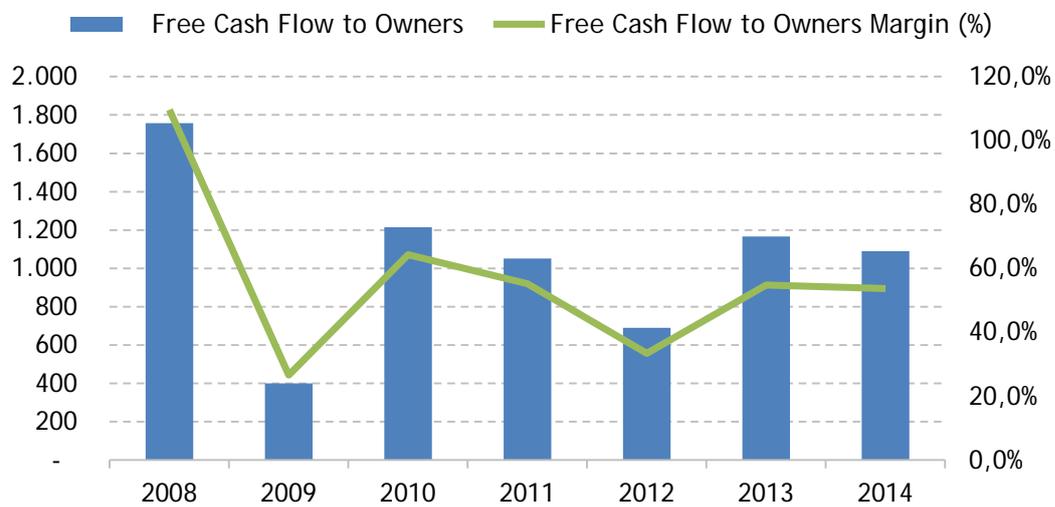
CHART: Cash Flow Generation (BRL millions)



Source: Batalha, Factset

Average Free cash flow to owner's margin is an impressive 57%. It is one of the highest free cash flow margins we have ever come across.

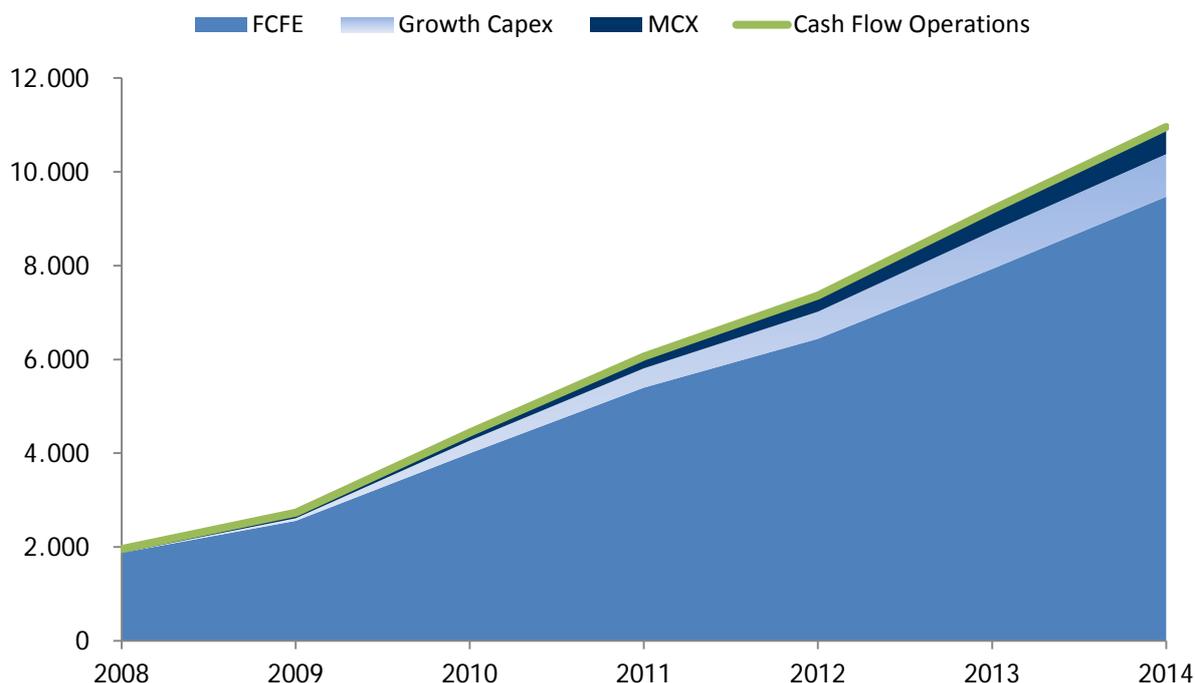
CHART: Free Cash Flow Margin (BRL millions)



Source: Batalha, Factset

A cumulative picture adds up the yearly figures. Total Cash Flow from operations from 2008-2014 is an impressive R\$ 11 billion. Capex amounts to R\$ 1,5 billion, which leaves Free Cash Flow to Equity at R\$ 9,5 billion.

CHART: Cumulative Cash Flow 2008-2014 (BRL millions)



Source: Batalha, Factset

We use our adjusted cash flow metric to calculate CROIC. Again, CROIC is higher than ROIC because free cash flow is bigger than NOPAT (EBIT minus tax rate). Nevertheless, before calculating returns, some adjustments have to be made in the denominator (Invested Capital) to reach a more accurate picture of returns on capital.

TABLE: Invested Capital Adjustments

Total Assets	Comments
(-) Current Liabilities	Includes collateral received
(-) Excess cash	Restricted cash removed from cash balance
(-) Goodwill	Non-operational asset
(-) CME Stake	Investment; need to subtract dividends received from Cash Flow
= Invested Capital	Adjusted Invested Capital

Source: Batalha

Traditionally, when adjusting for invested capital, current and other liabilities are excluded since these are third party sources of capital. On the case of BVMF, collateral posted as margin has to be deducted as well.

The company has a sizable cash balance of R\$ 2, 2 billion. Usually, analysts apply a 2 or 3% of sales requirement for operating needs, which, in BVMF's , would amount to R\$ 40-60 million. However, due to its central counterparty business, BVMF has to post a portion of its cash (over R\$ 1 billion) as part of the safeguard mechanism (which we will discuss further ahead). The use of this cash is, thus, restricted, and we count it here as operational.

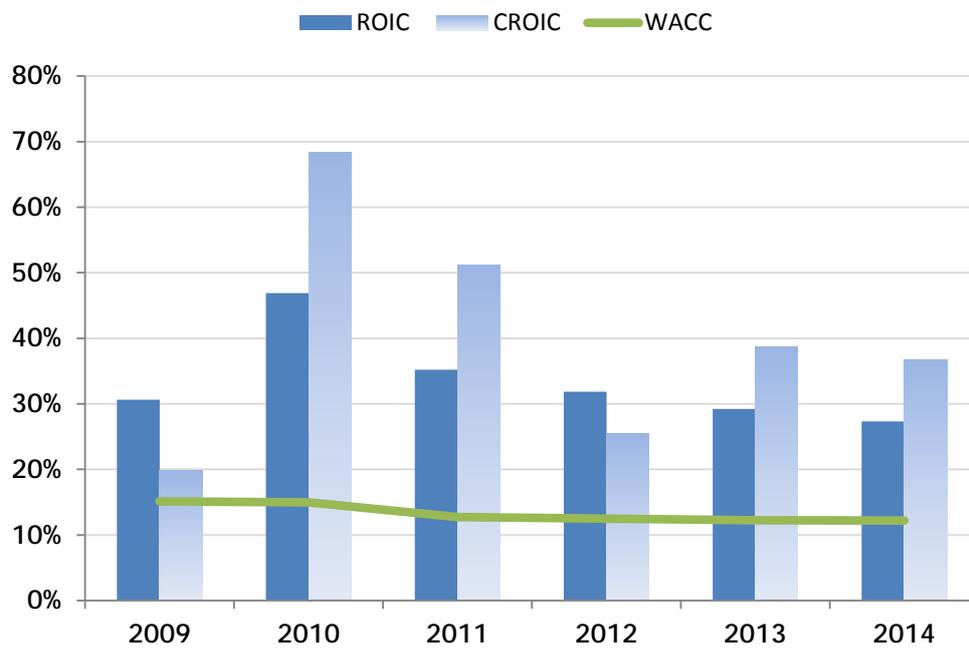
Also, we remove goodwill. It is a non-operational figure that has not been created as a result of an acquisition. If shareholders had paid for this goodwill, though, its amount would have to be remunerated.

Finally, we also exclude the 5% CME stake from the denominator. This stake is an investment that is not used to generate cash flow operations at BVMF. However, to maintain parity, dividends received from the CME stake (roughly R\$160 million last year) have to be removed from the numerator.

Consequently, once we have made those changes, both ROIC metrics are radically different than those available on financial content providers (Economica, Bloomberg, and Factset).

Importantly, both metrics shows returns in great excess over the cost of capital (WACC). There is no question both the cash flow profitability and the high returns on capital are sign of a business who enjoys high barriers to entry and that's why it is paramount to understand the business model and its competitive threats.

CHART: CROIC & ROIC 2008-2014 (%)



Source: Batalha, Factset

The business

How BMF Bovespa Came to Be

Bovespa has its roots in 1890 with the foundation of Bolsa Livre. During the following decades, a number of regional exchanges were opened to trade securities. Technological demands were almost non-existent at the time, and barriers to entry much lower. In the 1960s, it changed its name to Bolsa de Valores de São Paulo. On this decade it was also mutualized, a regimen that remained until its demutualization and IPO in 2007. Before that, in 2000, Bovespa integrated all the remaining eight Brazilian stock exchanges, and became the only active stock exchange in Brazil.

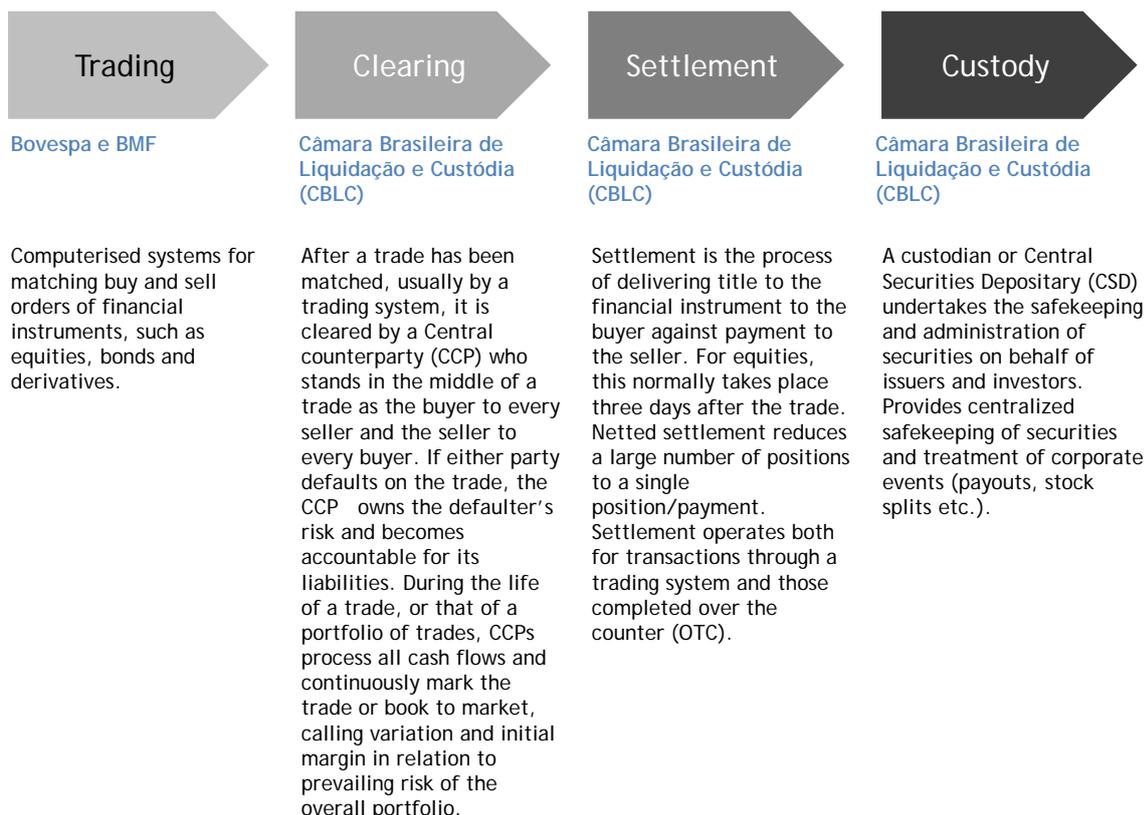
BMF dates back to 1986, as a futures exchange. It merges with Bolsa de Mercadorias de São Paulo, and consolidates itself as the most important derivatives hub in Brazil, four years later. In 2002, it incorporates Bolsa de Mercadorias. In addition, it acquires the largest clearinghouse in Brazil, CBLC, in the same year. It was also demutualized in 2007 just before its IPO.

In 2008, with one year as publically listed entities, BMF and Bovespa merged, creating a diversified (equities and derivatives) exchange, integrated with a CCP (Clearing) and CSD (Custodian) facilities.

In essence, BMF Bovespa is one hundred years in the making. It is the result of the merger and consolidation of all exchanges and clearinghouses in Brazil over the last century.

Financial Market Infrastructure

BVMF operates an integrated financial market infrastructure, with both trading and post-trading facilities. The bulk of its business is to provide trade and post trade (clearing, settlement and custody) execution on both cash equities and derivatives. Importantly, it is the monopoly provider of these services in Brazil.

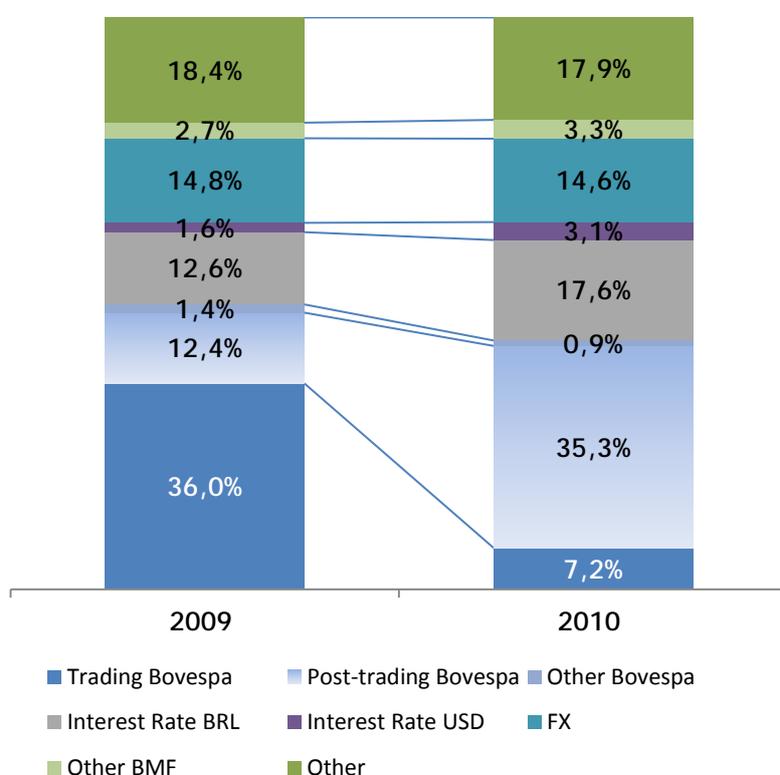


Source: LSE

Revenues Breakdown

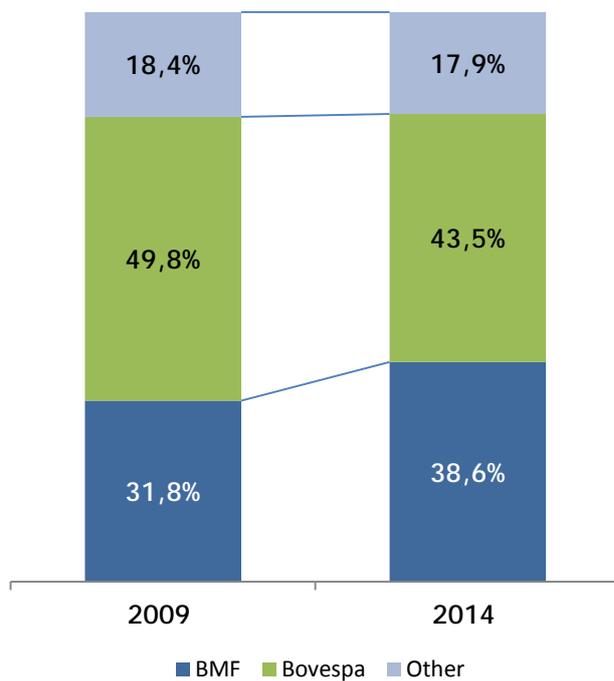
With cost reductions passed on to investors on the cash equities segment, Bovespa trading fees have lost considerable share, from 36% in 2010 to 7% today. Notably, some products on the derivatives segment have gained share; interest rate contracts in BRL and USD represent more than 20% of revenues. A breakdown between trading and post-trading at the BMF segment is not provided.

CHART: Revenue by line (% of total)



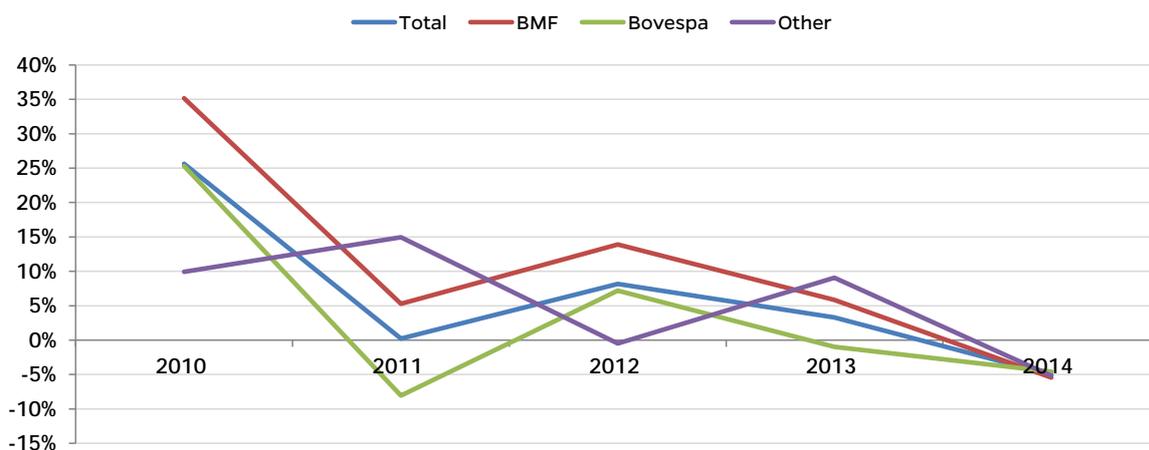
As a result, the derivatives segment (BMF) has gained revenue share and now accounts for roughly 39% of sales. When we add derivatives (options and futures) traded on stocks and indices, derivatives now represent around 44% of total revenues and cash equities 38%.

CHART: Revenue breakdown by segment



Year over year growth rates show there is cyclicality in the business. Other revenues, which include securities lending and custody services, tends to be counter cyclical. Nevertheless, last year all revenues had negative growth.

CHART: Revenue year over year growth



Competitive Landscape

Evolution of Business Models

Financial exchanges business models have undergone distinct business model phases over the last four decades. For great part of the 19th century exchanges operated like public utilities, and served a purpose to service investors, predominately individuals that required trade execution to either speculate or hedge their bets.

At the time, trading in equities was dominated by exchanges with manual trading floors. Because of the lack of technology and efficient means of communication, trading was mostly local. Thus, most major American cities had their own exchanges (Chicago, Philadelphia, Los Angeles, New York among others). Similarly, many state capitals had their own in Brazil.

In the 70s, an important shift in investor profile primarily from individuals to institutions began to take place. From there onwards, the old public utility model began to fade. Exchanges adopted a more market oriented approach, competing for volumes and transaction fees.

This period lasted, in the US and most developed markets, from 1970 to 1990, when many exchanges were demutualized and finally assumed a for-profit status (In Brazil, demutualization of BMF and Bovespa would only materialize in 2007).

The market for equities began to change dramatically by a shift in market structure from primarily manual trading to a market structure based on automated trading. Trading floors became increasingly obsolete, as technology allowed buyers and sellers from distant places to trade at the same place. With that, investors and speculators alike were drawn to the biggest, most liquid venues. Transaction costs drove significantly lower, as a result of increasing economies of scale,

enabled by higher trading volumes and the evolution in technology for generating, routing, and executing orders.

Eventually, many exchanges went public, and their focus, once purely as a public utility became to generate profits and shareholder returns. Soon enough, exchanges started to expand internationally and innovate on the array of services and products to cater to new investors.

TABLE: Evolution of Business Models

<i>Time period</i>	<i>Phase</i>	<i>Clientele needs and exchange initiatives</i>	<i>Main characteristics of securities trading</i>
1 Prior to 1970	Public utility	Stable.	Fixed commissions.
2 1970–90	Competitive	Exchanges undergoing Big Bang and other changes.	Flexible commissions, declining transaction costs, growth of third market trading.
3 1990–2005	Demutualization and for-profit status	Demutualize, shift to for-profit status.	Growing mobility and diversity of clientele. Growth in rival ECNs. Focus on trading speed and anonymity.
4 2005 onward	Consolidation	Use of mergers and acquisitions, and alliances.	Fragmentation of equity trading. Growing role of debt and derivative trading, algorithmic trading.

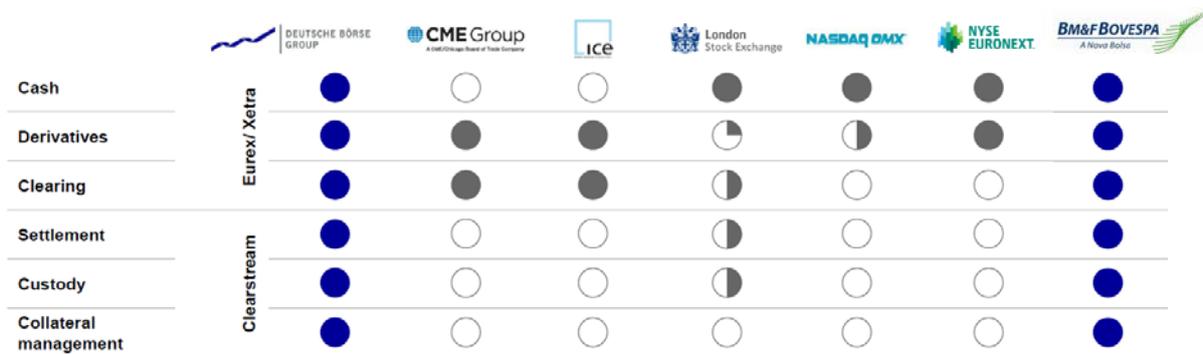
Source: Financial Exchanges, A Comparative Approach (2011)

In the last ten years, different business models have emerged as a result of consolidation, regulatory, technological, and structural changes. Now, business models usually revolve around product scope (cash equities and derivatives), degree of integration (trading and post-trading), and geographical presence (local and global).

- **Exchanges:** trading venues that provide a marketplace and infrastructure to match buy and sell orders. In addition, provide market data, licensing of indexes, and listing capabilities. Can be single asset (cash or derivatives) or multi-asset (cash and derivatives). Example: Nasdaq and Euronext
- **CCPs:** provide post-trading services to exchanges and other trading venues. CCP can also be single or multi-asset. Example: Euroclear, LCH Clearnet

- **Single asset semi-integrated:** a single asset exchange (usually a derivatives one) with some degree of post-trading integration (clearing). Settlement and custody provided by another party.
Example: CME and ICE
- **Multi-asset vertically integrated:** a fully integrated FMI, with trading and post-trading (CCP and CSD), including a cash and derivatives exchange. Example: BVMF, DB, SGX, ASX, BME, HKEX

FIGURE: Types of Business Models



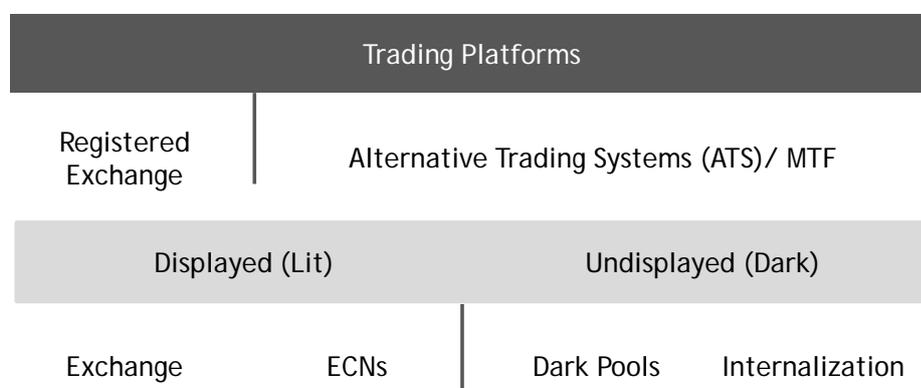
Source: Deutsche Borse Group, presentation to investors

Types of Trading Venues

Not all trading venues are created equal, and it is important to distinguish the different types of platforms that compete for trade flow.

There are two broad types of trading centers: those that display quotations in the consolidated quotation data that is widely distributed to the public – registered exchanges and ECNs, or lit markets and two types of undisplayed trading centers – dark pools and broker-dealers that execute trades internally.

FIGURE: Trading Venues Types (US and abroad)



Source: SEC, Batalha

Registered exchanges

Despite the enormous market changes over the past decades, registered exchanges remain the predominant trading venues. Exchanges provide, among other services, trade execution, market data, and listing capabilities.

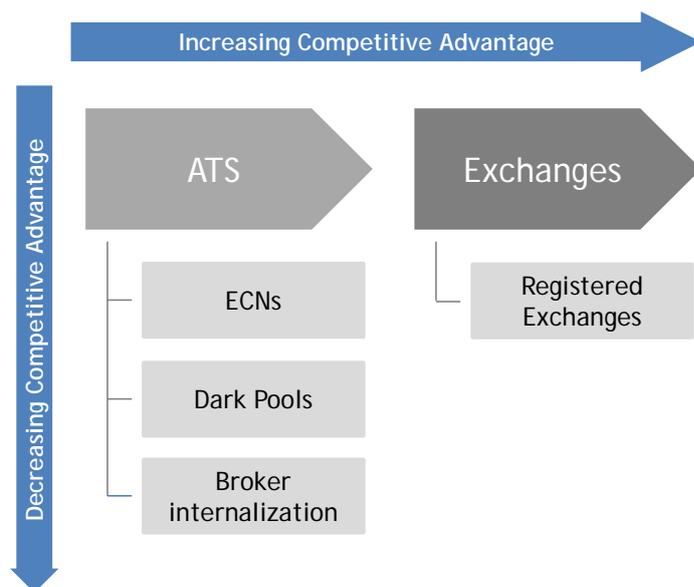
With the arrival of competing automated venues for order flow, registered exchanges have invested heavily in low-latency order responses and executions. Many exchanges also offer co-location services that enable exchange customers to place their servers in close proximity to the exchange's matching engine.

In addition, many exchanges have adopted a “maker-taker” pricing model in an effort to attract liquidity providers. Under this model, non-marketable, resting orders that offer (make) liquidity at a particular price receive a liquidity rebate if they are executed, while incoming orders that execute against (take) the liquidity of resting orders are charged an access fee.

Unlike other trading venues types, registered exchange play self-regulatory responsibility role for their members. In Brazil, market supervision is carried out by BSM (Bovespa Supervisão de Mercados S.A). Another important distinction is that exchanges must file their proposed rule changes for approval with their respective Securities Commissions and disclose trading services and transactions fees. Because of the higher fixed costs required to comply with its responsibilities, scale economies are greater at exchanges compared to ATS.

In addition, exchanges concentrate most of the market liquidity, enjoying network effects over less liquid pools. Finally, exchanges require government licenses that restrict the number of competitors at the exchange level.

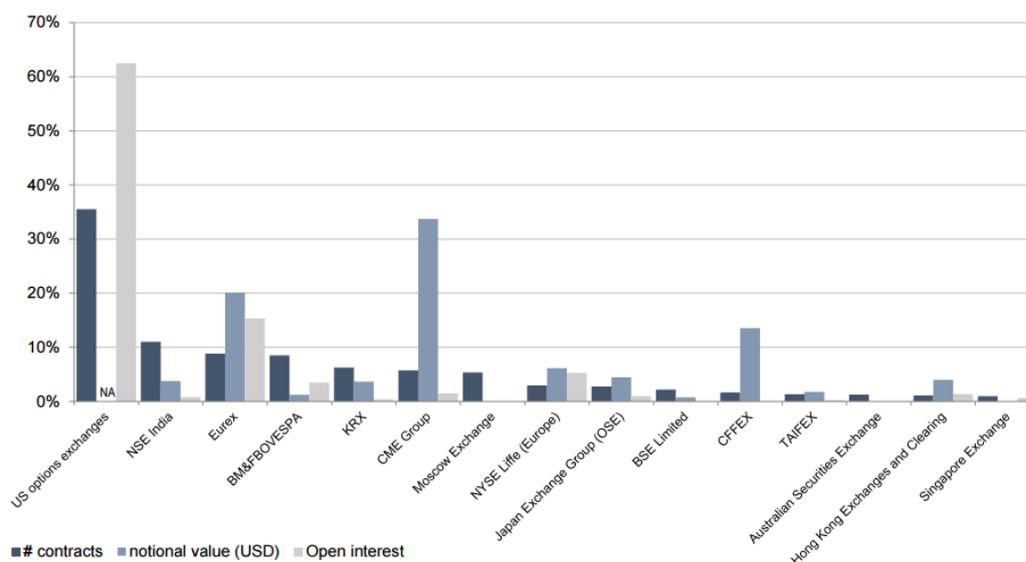
FIGURE: Trading Venues Competitive Advantage



Source: Batalha

Importantly, in contrast to equities exchanges, competition in derivatives ones appears to be more limited, especially in futures, currencies, and commodities contracts. These exchanges often carve out some niches and offer highly specialized contracts in terms of asset type, quantity, different expiry dates, and even type of delivery (physical or cash). London Metals Exchange, for example, is the largest market in options and futures contracts on base and other metals. Some contracts in certain metals are only found there, so that's where the liquidity is.

CHART: Share of Exchanges/ Derivatives (% of total)



Source: World Federation of Exchanges/IOMA Derivatives Market Survey 2013

ECNs (Electronic Communication Networks)

ECNs provide services analog to those offered by registered exchanges, and their orders are also included in the consolidated quotation data.

ECNs appeared prominently in the US during the nineties, providing a cheap, automated alternative to most registered exchanges. Two of these ECNs, Island and Archipelago, later merged with Nasdaq and NYSE, respectively.

In the US, they are classified and regulated as alternative trading systems (ATS). The equivalent term under the European legislation (MiFID) is multilateral trading facility (MTF). In the US, while there are 11 registered exchanges, there are roughly 45 alternative trading systems.

Occasionally, ECNs will file for exchange status with SEC or respective commissions. First, the exchange status allows it to compete for new listings. Also, the regulatory approval means that investors with charters that oblige them to trade on registered stock exchanges can now use the new trading platform.

Direct Edge was one ECN that filed for exchange status in May 2009. The SEC officially approved the exchange applications for its ECN trading systems, EDGA and EDGX, as two registered national securities exchanges a year later.

Moreover, the SEC has the right to require that a relevant ATS register as an exchange when this ATS exceeds certain volume levels. Under Regulation ATS, this threshold is usually five percent of trading volume in all the securities the ATS trades (Norman S. Poser, 2007).

However, ATS below this threshold have only few requirements: (1) file with the SEC a notice of operation and quarterly reports, (2) maintain records, including audit trails of transactions, and (3) refrain from using the words “exchange”, “stock market”, or similar words in its name (Norman S. Poser, 2007).

Dark Pools

Dark pools are ATSS that, in contrast to ECNs, do not provide their best-priced orders for inclusion in the consolidated quotation data. In general, dark pools offer trading services to institutional investors that

seek to execute large block trades with as little as market impact as possible. Prices and parties involved in a trade are only disclosed after the trade takes place.

Because Dark Pools lack self-regulatory responsibilities and require less infrastructure, they demand lower fixed costs. Hence, the number of competitor's on undisplayed market proliferated over the past decade. In the US alone, there are over 30 dark pools. Most of these pools are broker-dealer owned, such as Goldman Sachs' Sigma X and Credit Suisse's Cross Finder. There are, however, independent dark pools, such as Liquidnet and ITG Posit.

Recently, some exchanges have decided to compete for dark trading flow, and have created their own dark pools to allow their clients the benefits of anonymity and non-display of orders while offering an exchange "infrastructure".

FIGURE: Dark Pools Ownership

Independent	Broker-dealer owned	Exchange-owned
<ul style="list-style-type: none"> ▪ Insinet ▪ Liquidnet ▪ ITG Posit ▪ RiverCross Securities ▪ SmartPool 	<ul style="list-style-type: none"> ▪ Credit Suisse - CrossFinder ▪ Deutsche Bank - Global Markets - DBA (Europe), SuperX ATS (U.S.) ▪ Fidelity Capital Markets ▪ GETCO - GETMatched ▪ Goldman Sach - SIGMA X ▪ Merrill Lynch - Instinct-X ▪ Morgan Stanley - NightVision 	<ul style="list-style-type: none"> ▪ International Securities Exchange ▪ NYSE Euronext ▪ BATS Trading ▪ Turquoise

Source: Company websites, Batalha

Broker Deal internalization

The other type of undisplayed trading center is a non-ATS broker-dealer that internally executes trades, whether as agent or principal.

Notably, many broker-dealers may submit orders to exchanges or ECNs, which then are included in the consolidated quotation data. The

internalized executions of broker-dealers, however, primarily reflect liquidity that is not included in the consolidated quotation data. Broker-dealer internalization accordingly should be classified as undisplayed liquidity.

Besides the different trading types, within the securities markets trading is usually where there is more competition the greatest number of competitors. As we will see next, most market structures have post-trading closed for competition, with usually one service provider undertaking the role of CCP and CSD, due to structural and business reasons.

Sources of Competitive Advantage in Financial Market Infrastructures

When we see these kinds of returns on invested capital the first question we ask: Are the cash flows protected from competition? What barriers to entry are in place to sustain those levels?

Over the past few years, CVM has promoted the debate regarding changes in the Brazilian regulatory framework, including the introduction of competition. It commissioned a study with Oxera, held public debates with market participants, and made some changes in Brazil's market structure.

Economies of Scale

Economies of scale is the ability to spread out fixed costs (management, P&D, rent, marketing etc.) over a greater number of products/ transactions. However, scale advantage is only achieved when an incumbent has a relative big size in comparison to its total market. Also, the greater fixed costs are in comparison to total costs, the stronger the scale effect.

Switching Costs

Switching costs arises when there is a money, time, and effort triggered by the end of a relationship (Bruce Greenwald, 2001). This is specially the case in financial markets, where any abrupt interruption of service or loss of productivity from the migration of to a new technology/ service may result in losses. Such costs are heightened when infrastructure, people, and process are already interwoven with the current solution provider. Usually, the benefits of the migration have to be in order of magnitude to entice a customer to make the move.

Network effects

The larger the network, the more useful and valuable it is for its users. In the context of exchanges, network effects are manifested mainly

through liquidity. The most liquid venues attract more investors. More investors generate more liquidity, which in turn pulls in more investors.

Government protection/ regulation

The securities markets is a heavily regulated and scrutinized industry. Usually, any financial market infrastructure (exchange, CCP, and CSD) requires an operating license and has to comply with strict industry and regulation guidelines. As a result, regulation imposed by government securities agencies increases fixed costs and often creates competitive advantages for established players.

Government protection can also inhibit competition. For instance, in Brazil, a registered exchange is the only marketplace allowed for trading. Other trading center formats, such as dark pools and broker internalization, are not allowed to operate under the current Brazilian securities regulatory framework. However, in the US, there are four types of trading venues allowed to operate in the NMS (National Markets System), with different degrees of regulatory scrutiny.

Nevertheless, the SEC and other securities commissions have continuously implemented and updated regulations to increase transparency and level the playing field.

Other claimed sources of competitive advantages

With the migration to automated trading, based on extreme high volumes and speed, proprietary trading technology has been lauded by exchanges as a source of competitive advantage. Although some trading platforms display extreme low latencies and huge order processing capacity, it is hard to defend that most of these technologies are not replicable. In the late 90s, a programmer named Josh Levine, almost single handedly built the most sophisticated trading system up to that point. Island, one of the first ECNs, would become a major growing force, disputing order flows, with more speed at a fraction of the cost, with both NYSE and Nasdaq. It merged with Instinet in 2002, and was subsequently acquired by Nasdaq in 2005. If

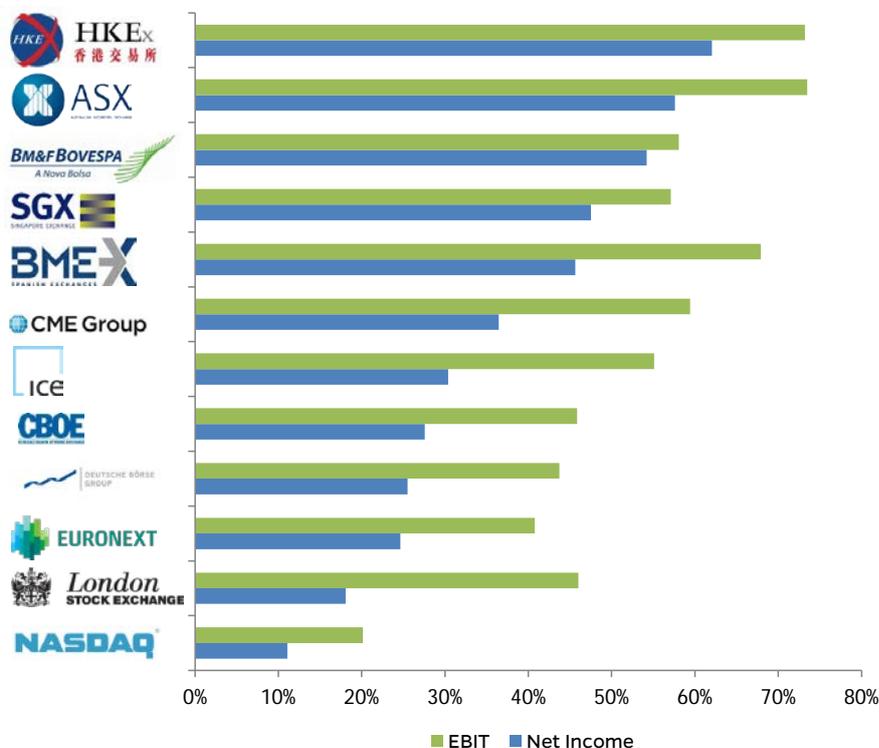
anything, progress in technology and automation has lowered not increased barriers to entry.

Nevertheless, technology infrastructure in the form of state-of-the-art data centers, with co-location facilities, due to its fixed-cost nature, does create economies of scale.

To a lesser extent, learning curve stemming from local market knowledge can create difficulties to a potential entrant. Indeed, there are varying degrees of market structures around the world, with different trading and post-trading rules. In Brazil, for instance, each transaction is done at the final beneficial owner level. However, there's always the possibility that a foreign entrant can customize its original trading platform, with the help of local market experts and software engineers, to local needs and regulation.

Nevertheless, all in, this is an industry marked by barriers to entry, as high market shares and profit margins, in most markets, can attest.

CHART: Five-year Average Profit Margins (%)

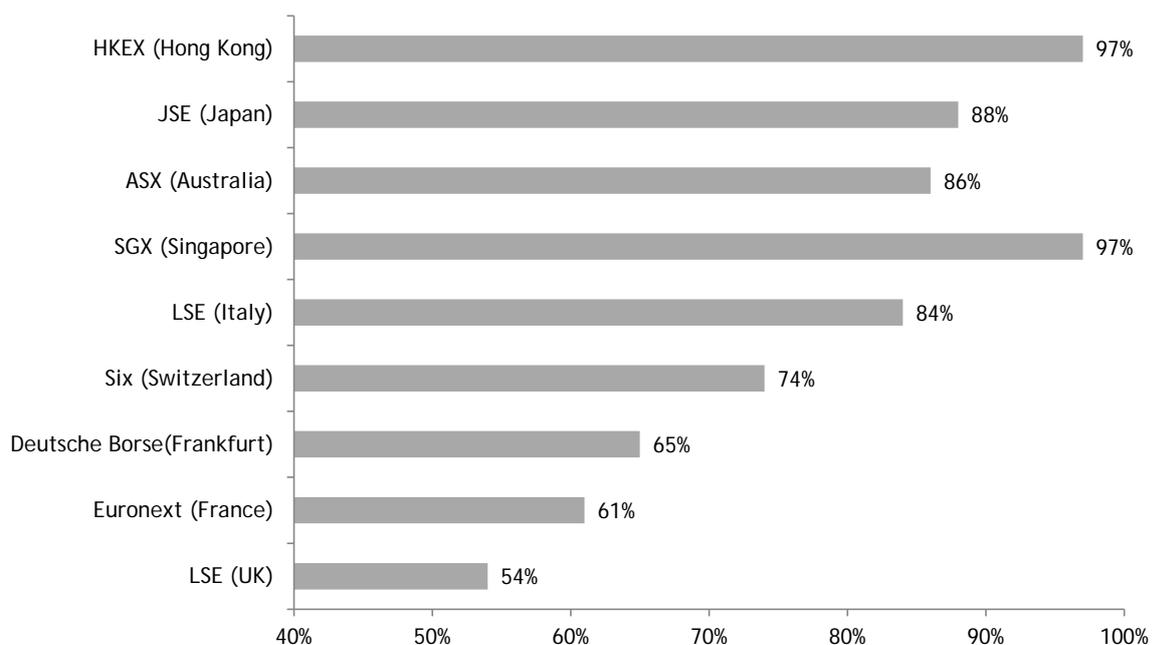


Source: Batalha, Factset

Usually, when scale economies work in tandem with one or more source of competitive advantages, competitive advantages possessed by incumbents can be difficult to overtake. When this is the case, incumbent's market share tends to be concentrated and relatively stable. In the case of exchanges, incumbents scale advantage is protected by network effects, because liquidity acts as a magnet that prevents investors from defecting to another venue. Switching costs and government protection also keep users within incumbent's system, protecting market share and scale.

Consequently, most securities markets over the world end up exhibiting monopolist or duopolistic characteristics (chart below). In the UK and Australia, for example, two highly developed capital markets, LSE (London Stock Exchange) and ASX have over 54% and 85% of market shares, respectively. When Bovespa had competing trading venues in Brazil, during the nineties, it had close to a 90% market share. In process of entry in trading markets, entrants have achieved 3-15% market share, in most instances we have observed.

CHART: Incumbent Market Shares – traded volumes (lit and dark Markets)



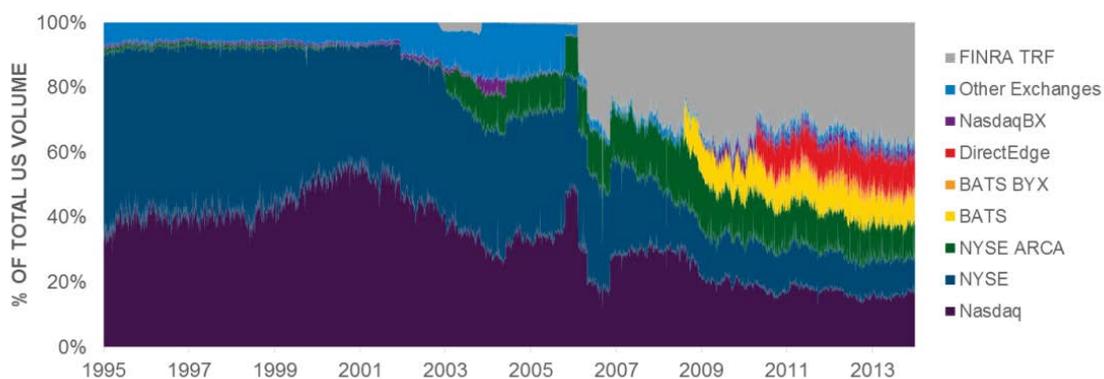
Source: BATS Global markets, company websites

However, in markets with abundant liquidity, such as the United States, even smaller venues may cover their fixed costs, because a fraction of market share permits they achieve a minimum efficient scale of operation.

Dark pools, backed up by the likes of Goldman Sachs, Credit Suisse, and Citi gained traction in the US market, but stabilized. Combined, they represent approximately 15% of market share. However, growing volumes in the US stock market and its gigantic scale has allowed ATSS (Alternative Trading Systems) grow out of nowhere ten years ago to nearly 40% market share today.

However, over 60% of trading cash equities market share is still in the hands of just four financial exchanges (NYSE, Nasdaq, BATS, and Direct Edge).

CHART: US Equity Share Over Time

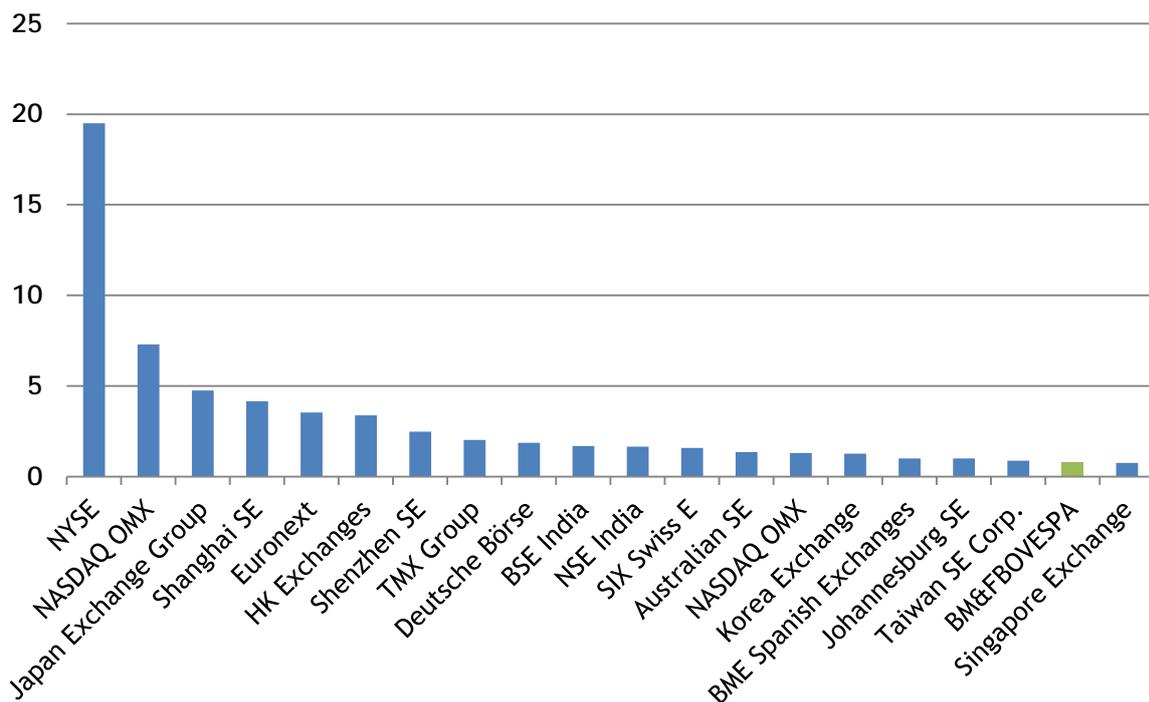


Source: Blackrock, US EQUITY MARKET STRUCTURE: AN INVESTOR PERSPECTIVE (April 2014)

Thus, scale is crucial. If the target market is small and incumbent's barriers are present, the few market share points conquered by the entrant are probably insufficient to cover its fixed costs.

Enter Brazil. Despite the size of its economy, currently ranked 7th in the world, Brazil's capital markets are more timid on a number of different metrics. Both market capitalization and number of listed companies barely make it to the top 20, as of 2014.

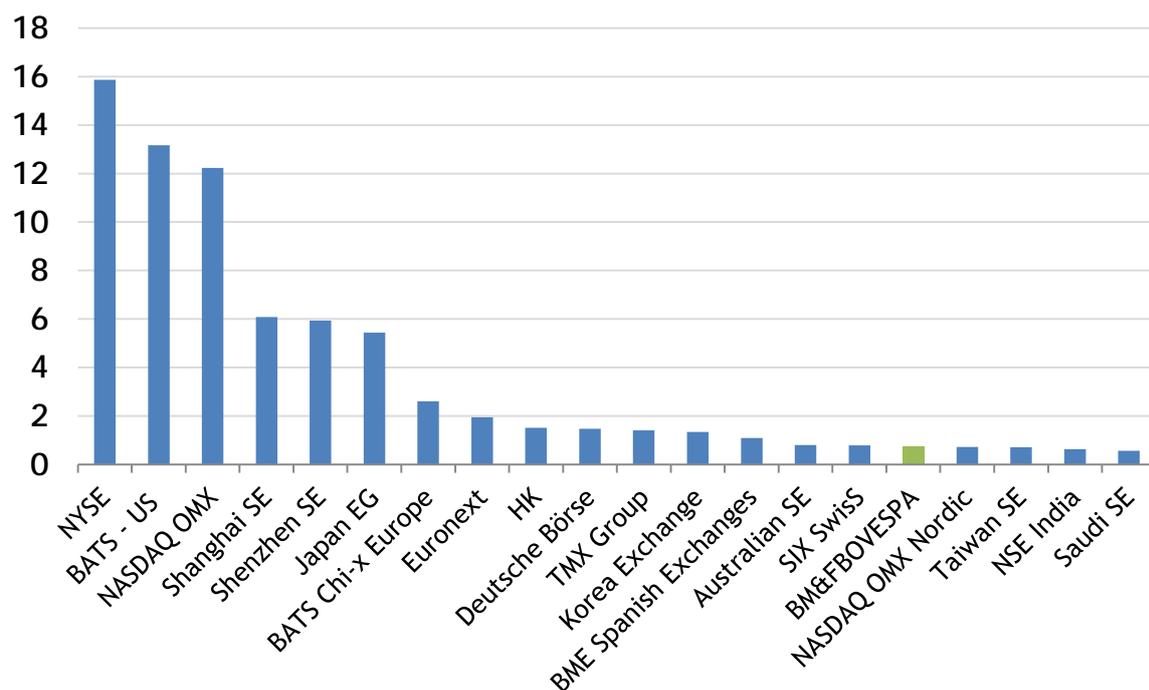
FIGURE: Domestic Market Capitalization (USD trillions)



Source: World Federation of Exchanges database

Traded volumes, a critical number to assess the feasibility of a new competitor, present only a slightly better picture

FIGURE: Value of Share trading (USD trillions)



Source: World Federation of Exchanges database

The above volume figures excludes off-exchange trading (alternative trading systems), which is quite relevant in many markets. In some cases, off-exchange liquidity can reach up to 40% of all traded volumes. In this light, Bovespa volumes would be even smaller compared to other markets.

For instance, in the US, secondary market traded volumes are around 100 times greater than Brazil's; an entrant which captures a 1 market share manages a volumes as big as Brazil's. Conversely, an entrant that captures 10% of the Brazilian market would have the equivalent of a 0,1% American market share. As one would expect, the number of exchanges and trading venues is directly linked with value of traded volumes.

Another striking example can be obtained by simply looking at the amount of trading fees in Brazil. The revenue pool from equities trading amounted to a modest R\$ 160 million, or approximately US\$ 50 million, in 2014. This pool would likely shrink, if fee competition takes places. For instance, an entrant that gains a 20% market share would likely end up with US\$8-10 million in annual revenues, on our estimates. Given the fixed cost nature of this business we see this scale as a far cry from the required breakeven.

Competitive Advantages by Market Segment

However, some segments are less susceptible to competition than others. Furthermore, the above mentioned sources of competitive advantages are not uniformly distributed across the trading, clearing and custody segments. More important than simply identifying the sources of competitive advantages at work in FMIs is to examine competitive forces and advantages in the context of each of the segments within the financial market infrastructure and how they interact with one another.

Trading

Exchanges enjoy high entry barriers. In fact, economies of scale, network effects, switching costs, and some degree of government regulation are usually at work, making exchanges defensible businesses. But, some of these competitive advantages have weakened over the years, due to technological and regulatory changes, and therefore it is at the trading segment that intense competition in the securities market takes place.

Securities trading is predominantly a fixed costs based industry. Regardless of the volume it handles, a trading venue has high fixed costs in infrastructure and overhead, to support its administrative, technological, and regulatory needs. Because they spread out fixed costs among a far larger number of transactions, incumbents exhibit an overwhelming unit cost advantage over other competitors. In fact, scale economies is the primary reason financial exchanges over the world tend to exhibit monopoly/ duopoly characteristics.

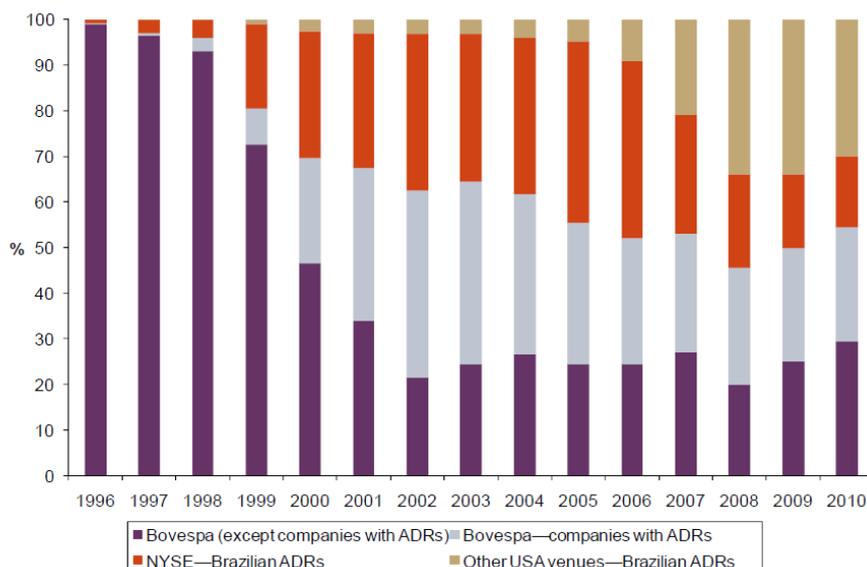
Also, incumbents display network effects, as investors are drawn to the most liquid venues. In the secondary market, in which investors trade securities with other investors, market participants prefer to transact in deeply liquid pools, where there are both more buyers and sellers. Thinly traded markets have less information content and tend to have wider bid and ask spreads. As the saying goes, liquidity begets liquidity (Greenwald, 2011). Additionally, incumbents retain network effects on

the primary market, where investors buy securities directly from issuers. Because an incumbent exchange has higher liquidity and participants, companies, ETF sponsors, and REITs will prefer to list or sell their securities on public offerings there. At the same time, because the range of securities offered at the incumbent exchange is greater, that's where investors will do most of their trading, on a virtuous loop that reinforces the effect.

Notwithstanding, new technologies and changes in market structure have lowered barriers to entry. First, technology advances have substantially reduced the amount of upfront costs required for the establishment of a trading platform. Second, the migration from a market structure from manual to electronic trading has introduced new alternative trading venues competing for order flow with traditional exchanges. This has allowed the birth of niche, specialized venues that cater to certain type of investors or orders. As a result, a greater number of venues types and competitors have surfaced.

Stock trading has another weak spot; it faces competition from international exchanges through ADRs programs. Currently, investors can trade over fifty Brazilian stocks off-Bovespa.

CHART: Share of Trading



Source: Oxera report (June 2012)

CCPs (Central Counterparty Clearing House)

Both exchanges and CCPs are volume based businesses that share the same fixed costs characteristic. But under the hood, their business models and market structures bare no resemblance. This has positive implications for barriers to entry and competition for incumbent CCPs.

Central counterparty clearing is also high fixed cost business model that lends to high economies of scale. The higher the volume of trades a CCP clears and settles, the lower its unit costs are. Therefore, incumbents CCPs usually enjoy lower average unit costs over potential entrants because they benefit from higher trading flow from trading venues.

Furthermore, whereas at the trading level, exchanges take no risk and act solely as a marketplace for investors, CCPs are exposed to the liquidity and credit risk of its clearing members and their clients. Put simply, CCPs are responsible for the clearing of all trades. When a party on a transaction defaults, CCPs resort on different layers of safeguards to ensure the trade is cleared through a mechanism known as default waterfall. Margin posted as collateral by the defaulting party is usually the first line of defense, but the CCP's own capital and net worth are ultimately at stake. One misconception is that the CCP contribution role to the default waterfall is to bail out defaulting members. Rather, its funds are seen as skin in the game, a way to incentivize proper risk management by the CCP. While the exchange business model demands a state of the art infrastructure to match buy and sell orders in a cheap and efficient manner, the CCP one requires robust risk management and capital adequacy.

CHART: Default Waterfall



Source: BMV Bovespa

Nevertheless, in many cases, the amount a CCP pledges as a safeguard is greater than it has invested capital in fixed assets, which makes CCPs both more capital-intensive and riskier than a trading platform alone.

Because of this, some players and market structures will evolve to avoid competition in post-trading all together, as is the case in the US, where stock exchanges have given up clearing, settlement, and custody functions. Cash Equities clearing in over hundred trading venues (including broker internalization) is done by the user-owned NSCC.

In Europe, central counterparty clearing has a healthy dose of competition. Both Brazil and Australia have privately owned CCPs vertically integrated with the incumbent, and access to post-trading is limited due to structural (size of the market), strategic, and regulatory reasons. To this end, it is important to understand the role CCPs play in financial markets.

After a trade is completed, a CCP steps in as a buyer for each seller and a seller to each buyer, acting as principal on both sides of the trade. The basic premise of the central counterparty model is to reduce the risk a member defaults on its transaction obligations with another

member. To mitigate this risk, CCPs: (i) provide the netting of multiple buy and sell orders to reduce the number of transactions to be settled, (ii) require collateral from members, (iii) adjust margin balances against changes in asset prices, (iv) monitor the financial health of its clearing members, and (v) set up and manage a default fund.

In times of stress, the proper functioning of CCPs is crucial to help manage systemic risks. If a large clearing member defaults and the CCP funds are insufficient to honor all the outstanding trades, a CCP may find itself insolvent. Consequently, other clearing members with open positions will fail to receive cash or securities in full. Financial risk can spread exponentially.

Competition for post-trading services can also lead to race to bottom. Race to bottom occurs when competing CCPs require less collateral, or accept less liquid collateral to be posted as margin, so they can attract more customers, potentially increasing the fragility within the system. Another source of risk arises when CCP operate stand alone and do not interoperate. This occurs when an investor at a CCP can execute a trade with another investor who has chosen as its counterparty another CCP. If there is no operational link between them, a CCP can end up exposed to the risk-management and credit worthiness of another central counterparty and its members.

From the standpoint of regulators and users, the benefits of competition through lower post-trading fees are countered by the duplication of fixed costs and perhaps increased riskiness in the market. Because CCPs play a vital role in financial markets, market regulators are often wary of introducing and promoting competition in post-trading.

Even in Europe, where competition at the CCP level is more pronounced, the market leading CCPs, Euroclear, Clearstream, and LCH Clearnet have a disproportionate share of the revenues and profits, taking advantage of barriers to entry stemming from economies of scale, network effects, and switching costs. As a matter of fact, the management of many trading venues in Europe believes there isn't enough flow to subsidize a large number of CCPs and three or four pan-European, high volume, multi-asset class CCPs is what the European market can accommodate (**Ghosh**).

Overall, entry barriers are stronger at the CCP level compared to the trading segment. It is no surprise that the number of competitors in post-trading is usually significantly lower than in trading.

FIGURE: Financial Market Infrastructure Competitive Advantage



Source: Batalha

CSDs (Central Securities Depository)

For post-trading services, the role of competition remains more limited, particularly in terms of central securities depository (CSD) services. To ensure that the number of shares owned at any one time matches the number of shares that exist, the primary CSD function, of keeping dematerialised securities in book entry form, tends to be a monopoly function for each specific security.

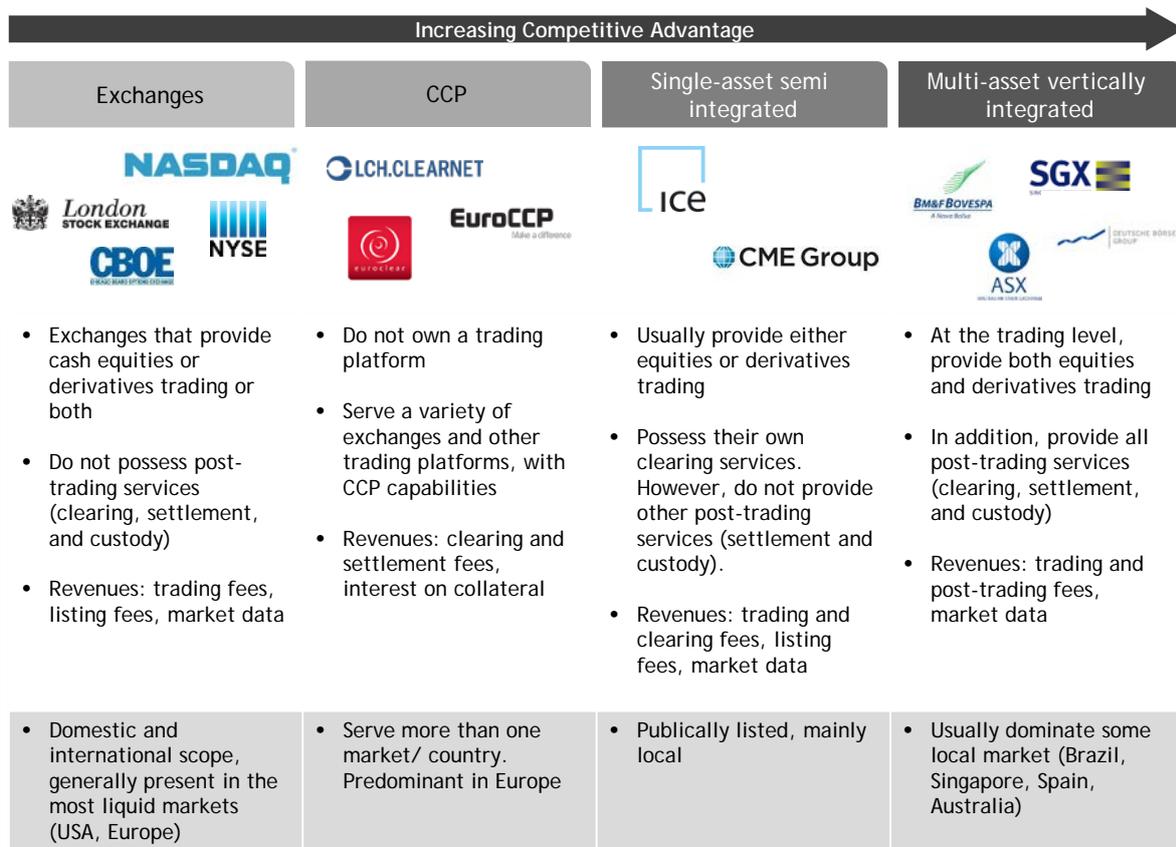
For an even more clear explanation than ours, we quote a report from Oxera, commissioned by CVM in 2012:

Where securities have been dematerialised, physical certificates do not exist. Instead, the ownership of securities is tracked through book entries at a depository, usually maintained and managed electronically. In the case of Brazil, book entry at the depository is at the final beneficial owner level. Therefore, in the Brazilian system, when stocks are bought and sold across an exchange, the CSD transfers the security directly from the account of the previous owner to the account of the new owner, with a transmission in the opposite direction of money.

Because it is important to ensure that the number of shares owned at any one time matches the number of shares that exist, this primary CSD function (of keeping dematerialised securities in book entry form) tends to be a monopoly function for each specific security.

Only after we have described the sources of competitive advantages present in financial market structures, how they manifest themselves in each of the segments, and where they are more robust (post-trading), we can finally assess the strength of the different business models.

FIGURE: Competitive Strength by Business Model



Source: Batalha

Competitive Entry Scenarios

Because of BVMF's vertically-integrated model and monopoly over trading and pre-trading capabilities, competition from an entrant could, at least in principle, actually take different forms. The main scenarios are discussed below.

Scenario 1 – competition at the trading level

Faced with BVMF's integrated incumbent structure, potential entrants, such as BATS and Direct Edge (before their merger), had been pushing CVM for an "open access" model to BVMF's clearing and custodian facilities. This model allows a new exchange to compete with BVMF at the trading level, while outsourcing its post-trade activities to BVMF, without the need to incur costs to build its own CCP and CSD capabilities. Last year, CVM finally opened up the possibility that BVMF might have to open access to its clearing and settlement capabilities to third parties. In theory, this has lowered the requirements, both financial and regulatory, for the establishment of a new entrant at the trading level.

Nevertheless, the impact of such competition on BVMF is usually overestimated. First, equity trading fees currently represent only 7% of BVMF's total revenues. For example, if an entrant were to capture 20% of Brazilian market share within a few years, which is somewhat aggressive taking similar experiences in other markets worldwide, this would represent a small 1,4% loss in revenues, all other income lines constant.

Second, BVMF has sticky customers in the form of switching costs. A new trading venue would require both upfront investments and an increase in fixed costs as a result of operating an additional exchange. In fact, when Bolsa do Rio was still active in the nineties, the duplication of fixed costs was brokers' number one complain. In addition, brokers' infrastructure and processes are already compatible with BVMF, from front end to back end. For instance, traders use the terminal provided by BVMF itself to send their orders. Also, BVMF's SINACOR, which

offers middle and back-office solutions, is used by 95% of broker dealers. In sum, BVMF's customers are captive in the form of high switching costs in more than one way.

Third, as a response to a potential entrant, BVMF could take advantage of its size and lower cost structure to match or even undercut trading fees. While this would marginally hurt BVMF's financial results it would seriously impair the entrant's bottom line.

If BVMF offers the same transaction fees and quality of services, most brokers will be reluctant to incur the switching costs associated with a new exchange.

Additionally, the open access model could have yet another, usually overlooked impact. Ironically, because it reduces the amount of fixed costs necessary for competitors to enter the trading segment, it lowers entry barriers not one but many potential entrants. This, in turn, could lead to a cannibalization of the trading segment, with many trading exchanges competing for order flow, while perhaps increasing the value of the post-trading segment, where BVMF would still have a monopoly.

In fact, for BVMF, the loss of trading fees could be partially or fully recovered by increased post-trading revenues. Australia, a market where competition at the trading segment has been recently introduced, serves as an interesting example. In late 2011, Chi-x entered the trading market to compete with ASX, after the Australian SEC authorized a new trading venue to use ASX's CCP/ CSD capabilities. Since then, Chi-x has gained around 10% of trading volume market share. Nevertheless, ASX'S financial results have not deteriorated. On the contrary, sales and EBIT have grown, and so has cash flow from operations over the period.

TABLE: ASX Financials 2011-2014 (Australian dollars in millions)

	2011	2012	2013	2014
Revenues	611,66	604,10	611,20	646,20
EBITDA	462,61	446,90	455,60	488,80
Cash Flow	381,10	327,00	366,60	424,90
EBITDA Margin (%)	76%	74%	75%	76%

Source: Batalha

Perhaps, for the above mentioned reasons, BATS Direct Edge seems to have backed away on its plan. Currently, there is only one application for an exchange license under review by CVM, filled by ATS (a consortium between ATS Brasil and NYSE) in June 2013. ATS has publically announced it will focus on equities trading.

Scenario 2 - An exchange with a Clearinghouse

Alternatively, an entrant could opt to establish a more integrated model, that is, with both an exchange (trading) and a clearinghouse (post-trading).

This model would pose both some advantages and disadvantages for the entrant. On one hand, it would be able to clear trades that take place in its exchange, and therefore, be less dependent on BVMF services and pricing. A few obstacles would mount, on the other.

First, fears of systemic risks, arising from a malfunctioning central counterparty risk management process, could lead CVM to prohibit or defer the entry of a new CCP. When Australian authorities were faced with this same scenario, they chose to open up competition only at the trading level, and opted to maintain post-trading monopoly under ASX. CVM has taken a step in this direction, opening BVMF's post-trading infrastructure to third parties.

But let's assume that CVM comes around and allows the trading exchange to operate its central counterparty in Brazil. Because of the higher initial investments (to build the CCP) and fixed costs of

operating both an exchange and a CCP, the entrant would have to handle higher volumes of trading and market share, compared to operating an exchange alone, in order to be able to operate profitably.

However, BVMF's CCP would benefit from the trade flow from its incumbent equities (Bovespa) and derivatives (BVMF) exchanges; its post-trading (clearing and settlement) unit costs, spread out among a large number of transactions, end up significantly lower. Barriers to entry from economies of scale, thus, would probably be magnified, not weakened, on this scenario.

A pattern also starts to become clear, in the case of financial market infrastructures, vertical integration leads to mutual reinforcement of competitive advantages enjoyed by incumbents.

Another, self-reinforcing, competitive advantage would stem out of scale economics. BVMF'S recurrent cost of system and platform upgrades will usually be diluted out among a larger number of customers/ transactions. Ultimately, an entrant can eventually struggle to keep up with innovation and regulatory demands.

To reduce its initial investment and financial risk, the trading venue could try to attract an owner and operator for the CCP piece (such as UK's Clearnet). Because managing a CCP is not their bread and butter, this would also make more operational sense, as some of the potential entrant exchanges (BATS, and ATS) do not operate central counterparty capabilities in their home markets. In return, though, it could guarantee the clearing and settlement of its trading business. But, as we have argued, volumes from the new trading venue alone are probably insufficient to cover the CCP's fixed costs; the CCP entrant would have to pursue trading originated at both Bovespa and BMF.

The rational competitive response from the incumbent, on this case, is not to link its exchanges with the new CCP, in order to shield its trading flow from post-trading competition. In market structures with competition at the CCP level, such as in Europe, trading venues chose who they want to clear with, both for economic and strategic reasons.

Despite the lack of competitors, BVMF has preemptively strengthened its post-trading positioning. It has combined its four CCPs (equities, derivatives, FX and fixed income) into one, after four years of development and R\$200 million in capex. Single asset clearing has given way to a multi-asset risk management framework that gives users the ability to cross-margin (On the day BM&FBOVESPA Clearing House started operating, approximately R\$ 20 billion were freed up as collateral). This integrated multi-asset CCP has resulted in a reduction of fixed costs and better value proposition for its members.

Additionally, BMVF is very flexible in the types of financial instruments it accepts as collateral, further strengthening its CCP position. Singapore's SGX, for example, accepts only cash as collateral. Because of both higher capital efficiency (lower margin requirements) and higher collateral flexibility, BVMF'S clearing members and their customers are likely to remain captive.

A myriad of other competitive advantages would be manifested. There is a greater number of clearing members in the incumbent CCP (network effects), enhancing its value to its users, which can clear and settle the bulk of their transactions with other members without the need to incur upfront investments and duplicated fixed costs from creating an additional operational link with the entrant central counterparty (switching costs).

Since competitive strategy is never static, actions taken by one player may trigger. On this case, we have to ask what would be incumbent's reaction. Again, we would expect that BVMF would muscle in with extremely low fees in order to impair the financial condition of the entrant. Probably, it would undercut clearing fees in the type of asset the new CCP has more volumes, in order to magnify the damage.

With the current volumes traded in Brazil, and recent reinforcement of BVMF's competitive position at the CCP level, this scenario seems, at the moment, unlikely.

Scenario 3 - A Fully-integrated model

BATS, a perennial potential entrant, has claimed that also this model would bring few cost advantages over the current market structure, and ideally, a fully integrated model should be pursued. To be clear, this entails a settlement and custody facility on top of an exchange and a CCP. It is definitely the one with both the greatest risk for BVMF and potential greatest reward for the entrant. Although, for the latter, by far with the biggest challenges and risk.

Fixed costs grow the further away you integrate. Because know the entrant has to support an exchange, a CCP, and a custodian facility, it needs even higher volumes (and market share) to achieve a minimum efficient scale to support those same higher fixed costs. The entrant, then, would need to scale up quickly; either market participants would have to switch or volumes traded in Brazil would have to grow fast. But here all BVMF's competitive advantages, from exchange to CSD, would be working in concert. And when economies of scale (high fixed costs) are coupled with network effects the process of entry is severely impacted. For this reason, most markets are not liquid enough to permit more than one exchange operate profitably (with a minimum efficient scale).

Entrants obviously recognize scale is crucial. While CVM analysis its license application, ATS Brazil has been trying to lure liquidity providers (such as banks and asset managers) with equity incentives in its holding company so they can guarantee minimum trading volumes in exchange for a piece of the business. Furthermore, it is planning to implement market-taker orders to attract high frequency traders seeking rebates by providing market liquidity.

Furthermore, while BVMF was investing huge sums into its infrastructure, volumes traded in Brazil stalled, further diminishing the attractiveness of the market for competitors.

Consequently, and perhaps counter-intuitively, high growing volumes are one of BVMF's biggest risks because they could allow entrant exchange to achievement of a minimum efficient scale in Brazil.

Other competitive strategy comments

Overall, the value proposition of a new stock exchange in Brazil seems quite low. The most obvious potential benefit of competition would be lower transaction costs. In Brazil, however, post-trading fees account for over 80% of the all-in transactions costs. Hence, a single trading platform solution is unlikely to have much impact, especially considering the other costs involved with the duplication of fixed costs and regulatory oversight.

Furthermore, an exchange value's proposition is broader than costs alone: it includes product range, multi-assets offering, clearing capabilities and capital efficiency. In this light, will customers be able to fulfill their orders in a less liquid pool? With lower bid and ask spreads?

Nevertheless, no matter how high the barriers, as they are in BVMF's case, there are no assurances competition will be kept forever at bay.

The main source of competitive risk would be the arrival of a reckless competitor, willing to sustain losses, derived from an inferior competitive position, indefinitely. While that seems unlikely, capitalist forces often allow for NPV negative projects, with no perspective to generate cash over the short and medium term, to get funded in one way or another. Other projects, NPV positive on a discounted cash flow model, usually attained by both underestimating incumbent's competitive advantages and overestimating growth, could attract potential suitors (for an obvious proof, look no further than Eike Batista's projects). But the message here is simple, if an entrant were to take such a stance, impact on BVFM's results could be substantial.

But, given the challenges we have discussed in the above scenarios, we view scenario one as the most likely. Also, competition is usually introduced or fiercer at the trading level, if one takes most experiences

in global markets. Even though, it is arguable if there is enough liquidity and incentives for a new exchange at this point.

Perhaps, a dark pool would be a more adequate entrant for a market of Brazil's size. But the Brazilian market is known for its stability and transparency, and we are unsure if CVM is inclined to allow opaque trading venues in Brazil. Recurrently, CVM regulators have argued their primary goal is market stability (Alves, 2012).

Dark pools have come into the public spotlight after Michael Lewis' Flash Boys book pictured them on unfavorable lens. Recent allegations of fraud in some of these pools have not helped. Last June, Barclays was fined by the SEC for misrepresenting information to certain types of investors and how it prioritized customer orders. Also, the same SEC imposed a \$12 million fine on UBS for violations at its dark pool.

As their importance has grown, so has regulatory interest. SEC is now working on rules to increase dark pool disclosures and may test a rule requiring that trades take place on public exchanges unless a significantly better price is offered elsewhere. In addition to the US, countries such as Australia and Canada are leaning towards stricter regulation and controls of such trading pools.

On the other hand, dark pools have forced exchanges to reduce fees and increase quality of services. And it seems there are investors who want to trade anonymously over these private exchanges. So, if done properly in Brazil, some competition could be introduced.

However, CVM is known for being a conservative, risk-averse institution. Given the recent developments with these type of trading venues, our best guess is, and we can only speculate, that CVM will wait a few years longer to see how international experience with these trading venues play out before making any relevant changes in the Brazilian market structure.

Even then, BVMF could launch its own dark pool to compete for undisplayed trading flow, as many exchanges abroad have done,

perhaps at a fraction a new entrant would have to invest (since systems and infrastructure are already in place).

All told, BVMF seems better positioned than it was a few years ago. It seems management has anticipated the endgame, and acted to reinforce what were already strong competitive advantages present in financial market infrastructures. First, it raised the fixed costs asset base required for an entrant to establish itself in Brazil through large capital reinvestments in the business. Second, it reinforced network effects by bringing all clearings and its members together into a single CCP and introducing new financial products on its exchanges. Finally, it has simplified brokers processes and cost structure by integrating systems and back office, thereby, raising switching costs.

TABLE: Reinforcing Competitive Advantages

Source of Competitive Advantage	Optimal Reinforcing Strategy	What BVMF has done
Economies of Scale	Raise fixed costs	New data center, New trading platform
Network effects	Broaden Network	Integration of CCPs, launch of new trading products
Switching Costs	Increase complexity, enhance products	Multi-asset framework, cross-margining, eliminate duplication of fixed costs and process (BMF and Bovespa)

Source: Batalha

Financial Strength: solid balance sheet and cash flow generation

We view a solid balance sheet and the capacity to generate operational cash as akin to a healthy immune system. It gives a business the ability to avoid contagion during financial crisis, fight off takeover bids, and the option to grow and acquire other business. There are several metrics we look at, preferably different than those commonly used by the market.

We avoid the use of EBITDA and EBITDA leverage and coverage ratios, such as Net Debt/ EBITDA. It is usually a poor proxy for cash flow once taxes, interest, working capital and capex are taken into account.

We pay especial attention to sustainable operational cash flow generation, and often come up with our estimate of maintenance capex. This way we can separate current and future growth opportunities. In addition, we expense (deduct) cash flow from operations if a company grants options as part of SOPs. These plans are treated as non-cash but will either mean further dilution to shareholders or a real cash outflow when the company buy-backs stocks in the open market to offset this dilution (a lot of buy-back programs are anti-dilution in disguise). Moreover, interest paid is subtracted from CFO, despite the fact IFRS allows interest to be included in CFO, Cash flow from Investing, and Cash Flow from financing.

BVMF not only generates abundant cash but also has limited leverage on its Balance Sheet. The only debt is a bond issued in 2010 to acquire 5% of CME (Chicago Mercantile Exchange). This bond is due in 2019 and pays a 5, 5% coupon.

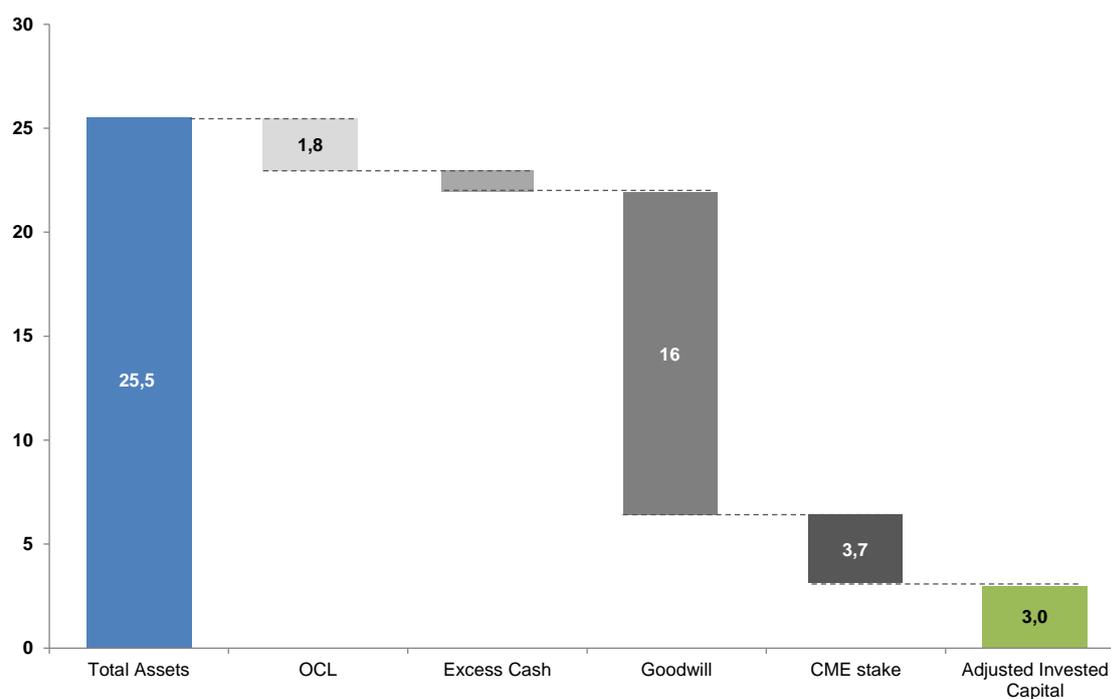
Also, the company has and generates cash far in excess of operating and financing needs. As we have previously shown, working capital needs are minimum and CAPEX is trending down, not up.

CHART: Liquidity and Coverage ratios

	2009	2010	2011	2012	2013	2014
CFO/ Interest Expense	22,0	52,8	23,8	17,2	21,1	17,9
CFO/ Capex	8,3	6,4	7,7	5,3	5,6	8,7
Current Ratio	2,4	1,8	1,2	2,2	1,6	1,5
Quick Ratio	2,4	1,8	1,2	2,2	1,6	1,5
Cash Ratio	2,3	1,7	1,1	2,0	1,5	1,3
Cash & ST Inv/Current Assets	1,0	0,9	0,9	0,9	0,9	0,9
CFO/Current Liabilities (%)	0,7	1,2	0,9	0,8	0,7	1,0

Source: Batalha

CHART: Adjusted Invested Capital



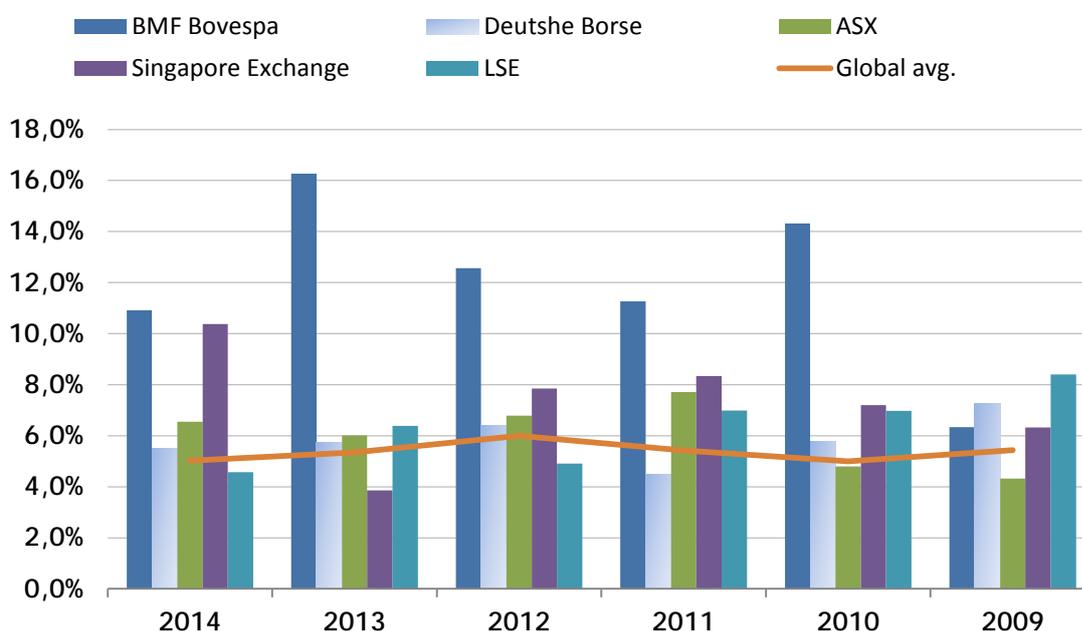
Source: Batalha

Superb capital allocation has strengthened BVMF competitive position

Since the merger in 2008, management hasn't rested on its laurels. Despite becoming a de facto monopoly, BVMF management has acted as if it had competition in Brazil.

Post-merger, management spiked Capex from R\$ 30 million per year to an average run rate of R\$ 215 million. In fact, BVMF underwent the largest CAPEX among global financial exchanges for five consecutive years. It overinvested all major financial exchanges as measured by CAPEX as a % of sales over the period, by a large margin. Whereas its peer group invested on average 5% of sales, BVMF invested roughly 12% per year.

CHART: CAPEX as a % of Revenues



Source: Financial Statements, Factset, Batalha

Over the last seven years alone, BVMF invested R\$ 1,5 billion into technology and infrastructure, with the goal of both improving its overall value proposition (security, latency, efficiency and costs) and

adapting to regulatory needs. In the process, it has substantially raised the bar for potential new entrants.

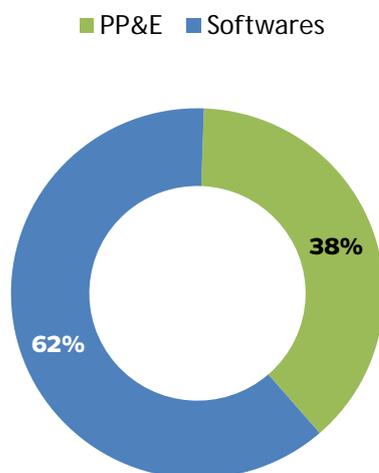
TABLE: CAPEX 2008-2014 (R\$ millions)

	2008	2009	2010	2011	2012	2013	2014
PP&E	31,6	63,0	163,6	41,0	65,5	127,9	53,3
Softwares	7,8	28,8	107,2	168,6	191,8	216,8	167,1
Total	39,5	91,8	270,8	209,6	257,3	344,7	220,4

Source: BMF Bovespa, Batalha

Moreover, as we have argued, the company resembles an automated, electronic-based marketplace. As a matter of fact, around 65% of capex was deployed in software and systems, and the remaining 35%, in PP&E.

CHART: CAPEX breakdown 2008-2014 (R\$ millions)



Source: BMF Bovespa, Batalha

We expect CAPEX to converge to more moderate (maintenance) levels going forward as great part of these investments, including the new data center, the upgrade to the Puma trading system, and the integration of the clearing houses should bear fruit for many years to come.

Importantly, management has taken steps one would normally expect only as a result from intense competition. It increased the scope of products, the quality of services rendered, and reduced transaction fees. Furthermore, it has invested in products that are still in their infancy in Brazil, for which payback will take time. Finally, It developed a state of the art trading system, along CME, and has integrates its four clearing houses.

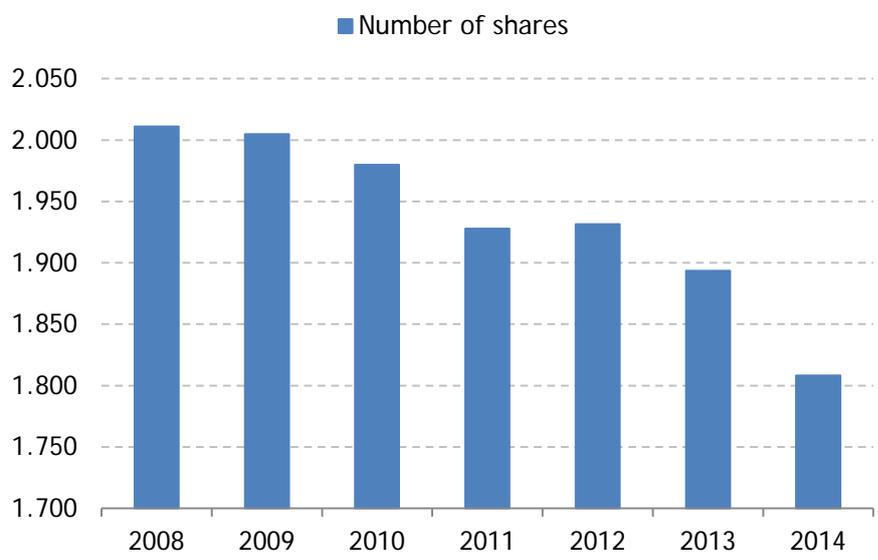
TABLE: Major CAPEX initiatives 2008-2014

Main Investment Programs
New Data Center
Clearings integration
CME stake acquisition
Puma Trading System

Source: Batalha

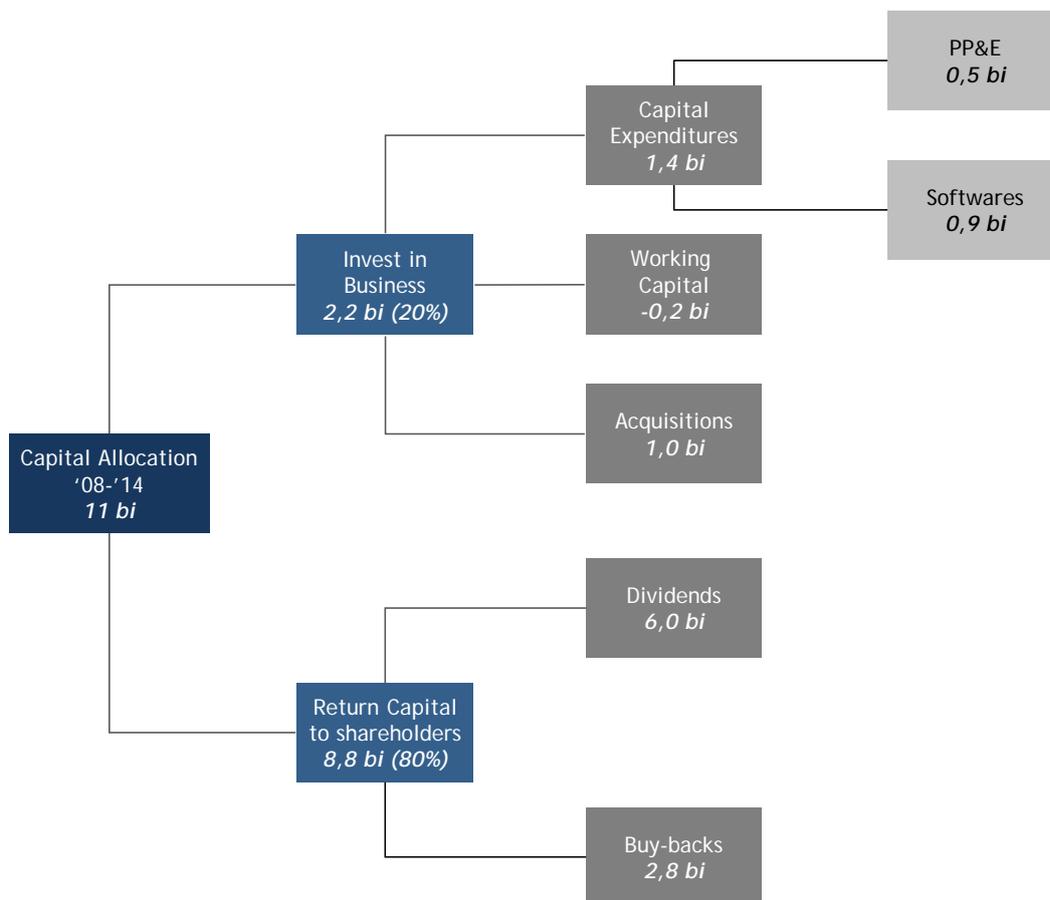
In addition, cash generated was mostly returned back to shareholders, either via dividends or buybacks. Dividend pay-out has averaged 80% of Net Income. Also, the company has bought back more than 10% of the shares outstanding over the past five years.

CHART: Number of Shares (millions)



Only one acquisition was made over this period, and paid off nicely. It purchased a 5% stake in CME, which has almost tripled in value in five years. Full capital allocation policy is broken down below.

CHART: BMF Bovespa Capital Allocation Policy 2008-2014



Source: BMF Bovespa Financial Statements, Batalha Analysis

Notably, management has also successfully controlled costs during a high inflationary environment. Overhead and administrative costs have grown 1% per year, whilst inflation grew at a 6% pace over the same period.

The business has negative working capital. On the current assets side, it requires neither inventory nor receivables. On the current liabilities one, the company has a relatively small payables account and an often carries a large collateral for transactions account. This latter account represents cash and other securities received as collateral for clearing

and settlement purposes. Interest and earnings earned on these assets are a source of income to BVMF, a float of sorts.

In sum, BVMF management spent the eight years building a sound, high-quality, and entrenched business model. It has preemptively invested in value accretive initiatives that have widened BVMF's moat. This is not easy to come by.

A monopolist trading at a deeply discounted valuation

For a business of quality, BVMF seems materially undervalued. When stripped of the CME stake and its net cash position, the BVMF core business is trading at a way below average multiple compared to the overall Market as well as financial market structures (FMIs) abroad. In addition, it is cheap on an absolute basis.

- The BVMF stub is trading at a 11% free cash flow yield (a 9x multiple)
- Based on FCF yield BVMF is currently cheaper than 97% of the time
- Base BVMF stub case 70% upside (R\$ 11,1/ share)
- Cheap optionality on perpetuity value
- Expected after-tax IRR with a 2017 exit is 25% (with CME short leg)
- On a relative basis, BVMF3 should trade at least at a 18x cash flow multiple

First, when assessing sustainable cash flow on a going rate it is crucial to acknowledge that the tax benefit derived from the goodwill amortization will disappear in two years. Assuming that profitability remains high (our case) taxes paid out will spike to around R\$500 million per year. This is the single biggest adjustment but not the only one.

Second, we adjust CAPEX figures going to avoid treating the last five years of massive capital investments as a recurring figure. As we have shown, no other FMI has invested so aggressively over this period and we estimate that in another five years this figure will trend down to moderate levels.

Furthermore, we removed changes in working capital from our valuation. The collateral balance received for margin purposes fluctuates immensely and is impossible to forecast. In addition, this capital will eventually be given back to clearing members once their

trades are closed and is dubious that we would apply a valuation multiple on such cash source. Nevertheless, this float does add value by means of financial interest income received by BVMF on a part of these balances.

Finally, we adjust cash flow from operations by subtracting an estimated expense of anti-dilutive share buybacks. As we noted previously, stock options are treated as non-cash but once exercised translate into an increased share count, diluting current shareholders. To avoid this dilution and a resulting fall in EPS companies will engage in buybacks to offset this dilutive effect. Hence, stock option programs do represent a cash outflow before equity holders.

Once these adjustments have been made, we come up with a R\$1,2 billion in sustainable free cash flow to equity figure.

Discounted the net cash position and the CME stake, BVMF current EV is R\$ 10,8 billion. Hence, the 11% free cash flow yield.

TABLE: BVMF stub Enterprise Value

'000		
R\$/ share	\$	9,30
# shares outstanding		1.808.178
Market Cap	\$	16.816.055
+ cash & equiv.	\$	2.117.000
- debt	\$	1.619.123
= EV	\$	16.318.178
- CME 5% stake (as of 12/02)	\$	5.109.546
BVMF stub enterprise value	\$	11.208.632

Source: Batalha Analysis

Also, we calculated LTM free cash flow yield on a monthly basis for the last six years. At 11% FCF yield, BVMF's stub is cheaper than 97% of the time. The only time it was cheaper was during February-March of 09 in the midst of the financial crisis.

To reach our base case price per share we use our sustainable cash flow figure. Our WACC is somewhat lower than we could also perceive as consensus. Since we adjust invested capital and book value for goodwill, the equity weight on the WACC equation plummets from 90% to roughly 50%.

Additionally, we provision about R\$1 per share as a tax settlement with Receita Federal regarding the ongoing goodwill amortization dispute. Conservatively, we reach at a R\$11/ share base case (discounted the CME stake).

TABLE: BVMF stub base share price

<i>2017 exit</i>		Notes
Enterprise Value	\$ 20.000.000	<i>equivalent to 16,6x free cash flow</i>
- NPV Goodwill fine	\$ 1.700.000	<i>assumes bvmf loses case; npv of expected agreement with RF</i>
+ net debt	\$ 497.877	<i>current Net Debt doesn't change</i>
+ CME stake	\$ -	
= equity value	\$ 18.797.877	
# shares outstanding '17	1.695.886	<i>-3% buy-back yield over next two years</i>
R\$/ share	\$ 11,1	

Source: Batalha Analysis

Assuming two years for exit, after-tax IRR is 25.4%.

TABLE: Expected after-tax IRR

Investment projected cash flow

25/02/2015	-6,5
10/05/2015	0,11
10/08/2015	0,11
10/11/2015	0,11
10/02/2016	0,11
10/05/2016	0,11
10/08/2016	0,11
10/11/2016	0,11
10/02/2017	0,11
10/05/2017	9,5
IRR	25,4%

Source: Batalha Analysis

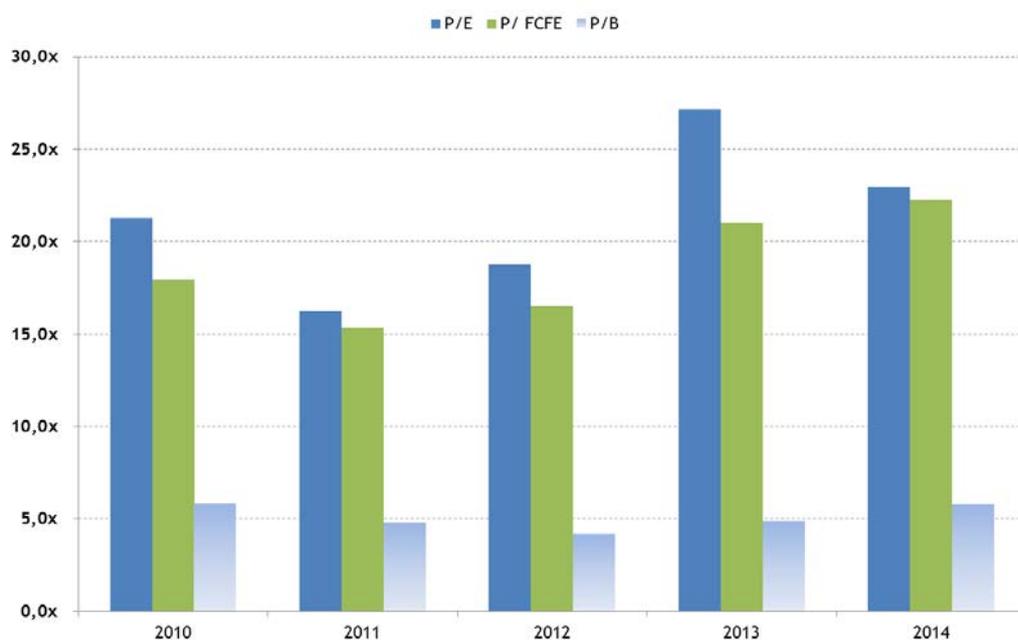
On most valuation exercises, the perpetuity value dominates short and medium term present value cash flows. Generally, short and medium term projections account for 20-30% of the NPV whereas 70-80% of the value is on the perpetuity.

Surprisingly, BVMF's current market value is roughly equivalent to our 10-year cash flow expectations discounted back to the present. In other words, at today's share price we are getting the perpetuity mostly for free. Importantly, we have argued that BVMF's vertical monopoly has a wide and widening moat characteristic, which gives us some degree of comfort returns on capital and cash flow generation post 10 year will continue to add value.

In contrast, what we usually come across are businesses without competitive advantages where most of the value lies in the perpetuity. In such cases, there is a great chance competitive positioning will have eroded over time and such value will fail to materialize. We don't like to prepay for something we feel is not going to happen. We do, however, appreciate getting for free something there is a good chance to happen.

On a relative basis, BVMF appears also materially cheap. As we have shown, financial exchanges and the like are usually entrenched businesses that produce high margin and high returns on capital. Consequently, they often trade at large premiums to the overall equity markets, both in Brazil and abroad.

CHART: Valuation Multiples 2010-2014



Source: Batalha Analysis

BVMF is the cheapest FMI in the globe despite having one of the most robust business models. Given its vertically integrated business model and both an equity and derivatives exchange, BVMF would warrants at least a 18x time cash flow multiple, on par with comparables. If that were the case, the stub would be worth around R\$13/ share and BVMF3 roughly R\$15,8/ share.

CHART: Price to FCFE Multiples 2010-2014

	2010	2011	2012	2013	2014	Average
BMF Bovespa	16,9x	11,9x	20,7x	11,8x	9,7x	14,2x
Hong Kong Exchange	37,1x	26,9x	25,9x	36,2x	50,7x	35,3x
Deutsche Borse	11,1x	10,8x	13,1x	15,8x	16,9x	13,5x
Australian Exchange	13,5x	15,9x	18,3x	17,9x	18,0x	16,7x
Singapore Exchange	23,7x	27,1x	22,6x	18,9x	25,4x	23,6x
Borsa Mercantil Espanhc	9,7x	12,3x	12,3x	16,7x	16,0x	13,4x
CME	17,9x	13,6x	15,7x	22,7x	25,9x	19,2x
ICE	17,3x	13,6x	13,0x	32,1x	19,5x	19,1x
Nasdaq	12,3x	7,6x	8,5x	14,9x	15,2x	11,7x
CBOE	19,7x	13,4x	15,1x	23,2x	25,5x	19,4x
P/FCFE	17,9x	15,3x	16,5x	21,0x	22,3x	18,6x

CHART: Price to Earnings Multiples 2010-2014

	2010	2011	2012	2013	2014	Average
BMF Bovespa	23,0x	18,2x	25,2x	19,6x	18,4x	20,9x
Hong Kong Exchange	37,7x	26,2x	35,2x	32,7x	38,7x	34,1x
Deutsche Borse	23,0x	9,4x	13,4x	23,2x	14,3x	16,7x
Australian Exchange	15,3x	15,1x	15,4x	16,9x	18,0x	16,1x
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P/E	21,3x	16,2x	18,8x	27,2x	23,0x	21,3x

CHART: Price to Book Multiples 2010-2014

	2010	2011	2012	2013	2014	Average
BMF Bovespa	1,3x	1,0x	1,4x	1,1x	0,9x	1,1x
Hong Kong Exchange	21,9x	14,6x	8,7x	7,5x	9,6x	12,5x
Deutsche Borse	3,3x	2,7x	2,9x	3,7x	3,2x	3,1x
Australian Exchange	1,7x	1,8x	1,7x	1,9x	1,9x	1,8x
Singapore Exchange	9,7x	9,8x	8,1x	8,5x	8,1x	8,8x
Borsa Mercantil Espanhc	3,3x	4,0x	3,7x	5,9x	7,7x	4,9x
CME	1,1x	0,7x	0,8x	1,2x	1,4x	1,1x
ICE	3,1x	2,8x	2,5x	2,1x	2,0x	2,5x
Nasdaq	0,9x	0,9x	0,8x	1,1x	1,4x	1,0x
CBOE	11,7x	9,7x	10,8x	15,8x	21,3x	13,9x
P/B	5,8x	4,8x	4,1x	4,9x	5,8x	5,1x

Source: Batalha Analysis

Growth drivers

Embedded Operational Leverage

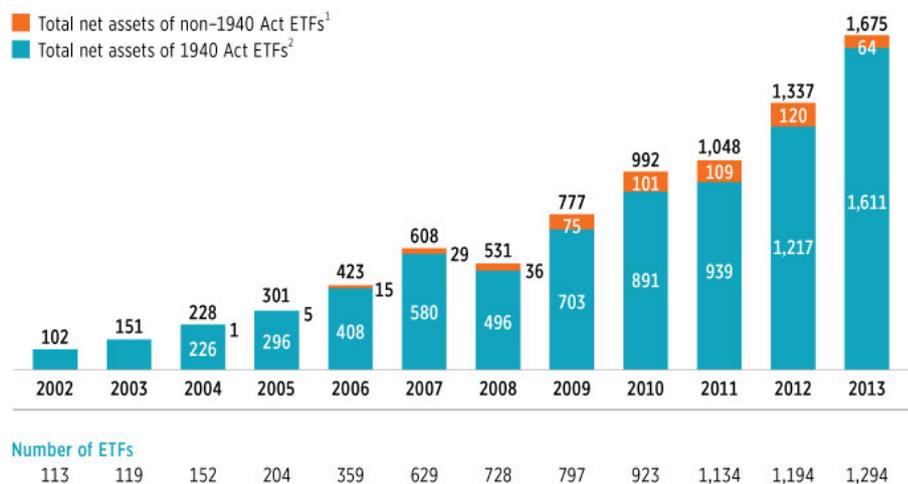
Furthermore, this is a pure fixed cost business (operational leverage); Swings in mood and volatility can and do impact traded volumes; when revenues do pick up, the operational leverage embedded will translate directly to higher earnings and cash flow.

Structural

Brazil has the seventh largest mutual fund industry in the world with nearly a trillion dollars under management. However, it has 16 exchange traded funds (ETFs) with less than a US\$1 billion in AUMs.

There has been an irreversible transition from mutual funds to exchange trade funds abroad. In the US, ETFs have exploded both in number and volumes. Total assets are approaching US\$ 2 trillions. Number of ETS has grown more than tenfold over the 2002-2013 period.

CHART: Total Net Assets and Number of ETFs



Source: ICI Factbook (2013)

Brazil has been late to adopt, but eventually will. This migration could result in expressive volume gains for Bovespa given the scale of current assets under management held by funds in Brazil.

New products/ high growing revenue lines

BVMF has proactively invested in new technologies and product launches to foster the development of new growth opportunities within Brazil.

Some of these new products include BDR programs, OTC contracts, FII's, and ETFs on the Bovespa side. Also, with CME it is double listed contracts.

Acquisitions/ JVs

The downside of a monopoly is, unless the incumbent chases growth outside its turf, its market share has nowhere can only go down. While BVMF could leverage its regional position through acquisitions to capture other markets, this comes with its own sets of risks, and such a strategy must be carefully planned and executed in order to add value.

Risks

In Franchise businesses, those that possess high quality business with markets shares and returns on capital, competition is the main source of risk. Losing an incumbent status, over any industry, has proven to be a horrible strategy. That's why we devoted the majority part of our research efforts and investment thesis identifying what are the types of market structures and business models, the sources of competitive advantages, competitive strength by segment and business model, and finally, hypothetically role playing some entry scenarios and tracking BVMF's management's preemptive reinforcement strategies.

Source or risk	Damage	Defense
Competition	Damage on BVMF's Franchise. Main source of risk. Please see Competitive Landscape section	Reinforcement of competitive advantages
Systemic/ Market risk	System or process failures, especially on the CCP piece that could lead to losses on BVMF capital base	Strict risk management and capital adequacy
Income Taxes/ Fine	BVMF has been notified by Receita Federal regarding amortization of goodwill created in the merger	Contest aggressively

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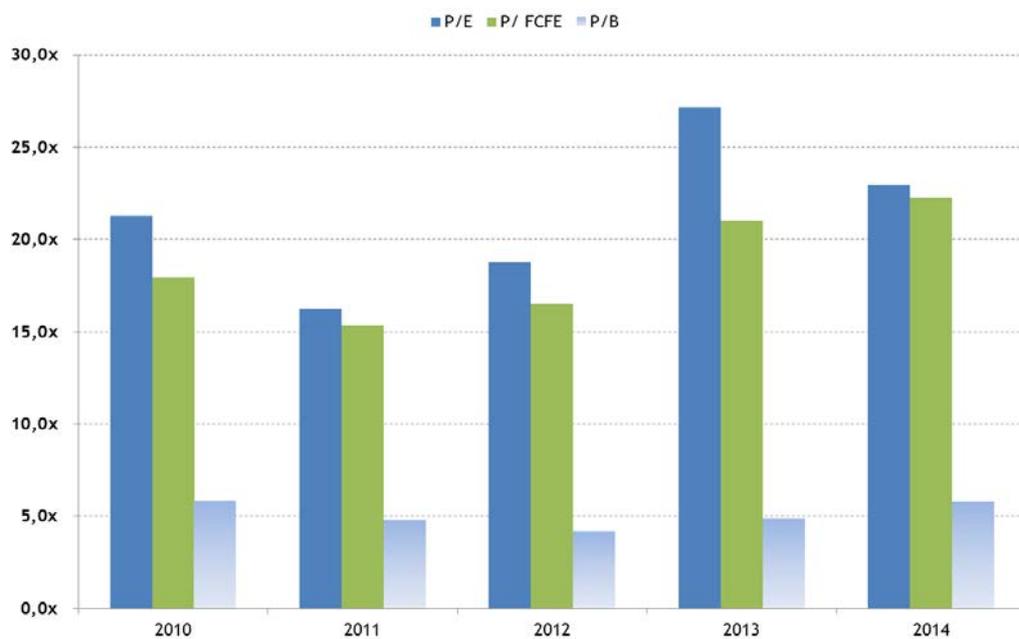
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CHART: Price to Book Multiples 2010-2014

	2010	2011	2012	2013	2014	Average
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Hong Kong Exchange	21,9x	14,6x	8,7x	7,5x	9,6x	12,5x
Deutsche Borse	3,3x	2,7x	2,9x	3,7x	3,2x	3,1x
Australian Exchange	1,7x	1,8x	1,7x	1,9x	1,9x	1,8x
Singapore Exchange	9,7x	9,8x	8,1x	8,5x	8,1x	8,8x
Borsa Mercantil Espanhc	3,3x	4,0x	3,7x	5,9x	7,7x	4,9x
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ICE	3,1x	2,8x	2,5x	2,1x	2,0x	2,5x
Nasdaq	0,9x	0,9x	0,8x	1,1x	1,4x	1,0x
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P/B	5,8x	4,8x	4,1x	4,9x	5,8x	5,1x

Source: Batalha Analysis

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