Instituto Superior das Ciências do Trabalho e da Empresa

CORPORATE GOVERNANCE – DEMUTUALIZATION OF STOCK EXCHANGES; AN ANALYSIS OF ITS BENEFITS

Jaime Contreras de Passos Homem de Sá

Dissertation

Master in Finance

Tutor:

Prof. Doutor Sofia Brito Ramos, Assistant Professor of Finance, Finance Department

Maio 2009

Resumo

A realidade bolsista a que hoje assistimos é distinta daquela presenciada noutros tempos. Hoje, resultantes de inúmeros factores, dos quais enalteço o crescimento da concorrência, as bolsas de valores já não são estruturadas como entidades cooperativas. Presentemente, as bolsas são empresas que procuram e lucro e cujo capital é detido por accionistas. Esta nova estrutura veio como consequência do processo de desmutualização. Este processo mais não é que a introdução de um agente que maximiza valor. Há a introdução de um órgão governativo dentro da bolsa, assim como uma separação dos direitos de membros e accionistas. Desde a última década do século passado, o mundo económico tem presenciado um forte crescimento do processo de desmutualização, pelo que, intrigado, tentei analisar o cerne da questão e os seus benefícios. Para examinar, escolhi analisar quatro bolsas de realidades distintas: duas entidades Europeias, uma bolsa Norte Americana e outra Asiática. Após a análise, concluí que esta mudança de estrutura é promotora de valor, uma vez que, após a desmutualização, as receitas crescem, os custos tornam-se eficientes e, na generalidade, há um melhor desempenho geral de cada bolsa. Concluí também, que o efeito concorrência é negativo para o número de empresas listadas em cada bolsa. Contudo, após a desmutualização, esta tendência inverte-se. Outra das minhas conclusões prende-se com o facto de haver uma relação positiva entre melhores desempenhos da bolsa e maior volume the accionistas. Por último, concluí que o processo de desmutualização está também ligado a associações e aquisições entre bolsas.

Palavras – chave: Concorrência, Desmutualização, Valor, Desempenho

Classificações JEL: G15, N20

Summary

The stock exchange reality of today is very different to that one our ancestors experienced. Today, due to a variety of reasons, such as competitive pressures, stock exchanges are no longer structured as cooperative venues. Instead, today, trading venues are for-profit enterprises, whose capital is detained by external ownership. This new structure is a result of demutualization. Demutualization consists of the introduction of a residual claimant into the exchange – which maximizes the venues' value. Furthermore, demutualization is aligned with a structure change, which brings into the exchange a governing board and a separation of ownership and membership rights. Due to an exponential growth of this structure change in the mid 1990s, I was intrigued and, consequently, analysed the benefits of demutualization. Through an analysis of four distinct exchanges: two from Europe, one from North America and one from Asia, I objectively analyse a set of financial and volume indicators, and the evolution of ownership. Through this analysis, I conclude that demutualization is value-enhancing, in the sense that revenues increase, costs become efficient, and the overall performances of the sample exchanges seemingly improve. Moreover, I conclude that competitive pressures tend to reduce the volumes of listed companies in the exchange and, given demutualization, the trend is reversed. Through the analyses of the structure of ownership, I positively correlate the growth of the shareholder base to improved performances. Lastly, I link demutualization with mergers and acquisitions.

Key-words: Competition, Demutualization, Value-Enhancement, Performance

JEL Classification: G15, N20

Sumário Executivo

A desmutualização, no seu contexto das bolsas de valores mundiais, os seus motivos e os seus efeitos, é um tema ainda pouco explorado, apesar de já existir alguma literatura sobre o tema. É meu objectivo, através desta tese, analisar um conjunto de principais bolsas de valores e avaliar o que de facto levou à desmutualização das mesmas e quais os efeitos posteriores e os benefícios alavancados por este fenómeno.

De acordo com evidência histórica, as actividades bolsistas surgem no século 14, em formas mais rudimentares, onde os seus intervenientes procediam à compra e venda de dívidas bancárias. As necessidades dos investidores, bem como o crescente volume de oportunidades de negócio terão sido os factores influenciadores para a criação dos mesmos, enquanto outros motivos, tais como custos de operação reduzidos, terão sido o motivo para a sua manutenção neste formato de cooperativa. Em termos históricos, a primeira bolsa a ser oficialmente estabelecida foi a de Amesterdão, no século XVII, data a partir da qual assistimos à criação de mercados de bolsas baseados no modelo de cooperativas cujas operações eram, essencialmente, a compra e venda de dívidas bancárias, evoluindo mais tarde para mercados de acções, títulos bancários, entre outros instrumentos financeiros. Este modelo tinha como princípios base o elemento não lucrativo e a igualdade de votos entre os seus membros, e era mantido a nível local por uma regulamentação protectora, que por sua vez promovia o carácter monopolista de cada bolsa, onde os interesses individuais não permitiam maximizar os interesses comuns.

Este modelo de cooperativa e os seus princípios base mantiveram-se relativamente inalterados até ao século XX, altura em que as próprias economias mundiais começam a sofrer alterações para se adaptarem a uma era de expansão e, naturalmente, exigindo novas estruturas e modelos de negócio. Neste contexto a regulamentação altera, globalizando e alargando o espaço de actuação das bolsas locais, e introduzindo assim o efeito de concorrência nestes mercados. Surgem então os modelos de bolsas de valores conforme os conhecemos actualmente, separando os direitos de propriedade, retirando poder aos membros e introduzindo novos elementos na sua estrutura: um órgão gestor e decisor, com fins lucrativos e focado em potenciar o valor global da bolsa de valores. Ao mesmo tempo, a estrutura accionista das bolsas passou a integrar alguns clientes, garantindo assim um nível mínimo de operações para o seu futuro.

Estes novos modelos sofrem também uma alteração muito influenciadora no seu futuro: a introdução do factor tecnológico. Ao surgirem as redes de comunicação electrónica, verifica-se uma evolução exponencial na velocidade das transacções, devido aos efeitos de proximidade que as comunicações proporcionam, acompanhada de uma forte redução de custos das mesmas. Estes avanços tecnológicos verificados nos anos 90 foram catalisadores das reformas legislatórias e regulamentares. A desmutualização das bolsas de valores é considerada assim uma reposta à competitividade introduzida pelas redes de comunicação electrónicas e alterações na legislação dos mercados financeiros. Na sua generalidade, este movimento é percebido como sendo benéfico para o mercado em si, pelo aumento no fluxo e volume de transacções, que por sua vez aumentam as receitas.

Na compreensão dos motivos que induziram a desmutualização das bolsas de valores, considero que as redes de comunicações electrónicas foram o catalisador desta alteração estrutural das mesmas. No entanto, mais do que a concorrência que foi integrada nestes mercados tradicionalmente monopolistas, o que levou de facto à desmutualização foi um factor inerente a cada bolsa: a capacidade de enfrentar esta concorrência. Na sua maioria, as bolsas de valores não tiveram outra opção senão proceder à desmutualização de forma a prosseguir estratégias de benefício comum. Em 2004, nove dos dez principais players do mercado mundial tinham finalizado o processo de desmutualização, restando apenas a NYSE que conseguiu manter a sua estrutura tradicional até 2003. E, em conformidade com literaturas distintas, conseguiu adiar o processo porque teve a capacidade de se reestruturar internamente e criar estratégias inovadoras para fazer face à nova realidade.

A análise dos efeitos e os benefícios resultantes do processo de desmutualização avalia a correlação entre este último e a performance de quatro principais bolsas de valores, a de Hong Kong (HKSE), a de Londres (LSE), de Atenas (ATHEX) e a de Nova Iorque (NYSE).

Concluo que, na generalidade, em períodos subsequentes à desmutualização a eficiência das bolsas aumenta consideravelmente – constata-se um aumento nas receitas e uma redução nos custos operacionais. Verifica-se um aumento no rácio da margem operacional, o que comprova que estas bolsas tornam-se mais eficientes após a desmutualização. Apesar de ter inicialmente previsto uma queda no RoE, derivado de um maior crescimento dos capitais próprios em comparação com as receitas, o RoE aumenta em todos os casos, o que implica naturalmente uma optimização na performance das bolsas.

Em três dos quatro casos de referência, ocorre uma associação entre duas bolsas de valores no momento da desmutualização, o que para mim é indicativo de um futuro processo de aquisição, algo compreensível do ponto de vista de aumento de receitas e valor.

Para além dos efeitos e benefícios da desmutualização, tive oportunidade de avaliar um indicador adicional e concluir que existe também uma correlação entre a dimensão da estrutura accionista e a performance operacional destas bolsas. Uma estrutura accionista maior implica que o poder individual se encontra mais diluído e assim são adoptadas estratégias de bem comum, e não individual, que resultam numa operação mais eficiente.

De facto verifica-se que a desmutualização aumenta o valor de uma bolsa mas não resolve os seus problemas financeiros de base, conforme comprovado no caso da ATHEX onde após a desmutualização a bolsa regista um resultado líquido negativo.

Acredito que a minha tese poderá no futuro não só incorporar a mesma análise sobre um conjunto maior de casos de referência para maior sustentação dos argumentos, como também introduzir novos eixos de análise tais como concorrência e aquisições.

For my family and friends, who have helped me throughout my life.[1]

[1] I would like to thank Bernardo Lacerda and, specially, Sofia Brito Ramos for the helpful comments, guidance and discussions. I also acknowledge support from Fundação Ciência Tecnologia – PTDC/GES/65650/2006.

Index

1. INTRODUCTION 8

2. CORPORATE GOVERNANCE OF STOCK EXCHANGES 10

2.1 Historical Evidence 11
2.2 The conventional exchanges and their role until the end of the 20th century 12
2.3 Why are stock exchanges demutualizing? 16
2.4 The demutualized exchanges 21

3. DATA 23

3.1 Case Study 23
3.2 The historical nature of each sample exchange 26
3.3 Hypothesis 27

4. ANALYSIS 30

4.1 Financial indicators' analysis 30
4.2 Performance Analysis 39
4.3 Shareholders' Structure Analysis 42

5. CONCLUSIONS 46

1. Introduction

The evolution of the globe has dictated the evolutional aspects of trade. Today, we experience a more competitive economy, where agility and efficiency are core elements of any successful business. As a result, in the past decades, the stock exchange reality has experienced tumultuous changes. Stock exchanges, which traditionally were structured as cooperative, non-profit enterprises, are now owned by private capitals and, contrarily, seek profits. This structure change is denominated as Demutualization[2]. The Stockholm Stock Exchange was the first to demutualize, in 1993, constituting, at the time, the uniquely demutualized exchange in the world. Today, the ten largest exchanges in the world have demutualized and gone public (Exhibit A), indicating the scale of the phenomenon.

Given that this trend is very recent, there is very limited literature on the matter. Furthermore, there is a need to complement the results and analysis of previous investigations, since the first demutualization dates back to 1993, and thus, the availability of more data enriches the analysis. My motivations for the present investigation are clearly associated to the intriguing tendency of demutualization, and the limited literature concerning this trend.

The intent of my thesis is to analyse the benefits of demutualization. It is a fact that exchanges have demutualized, but the question is: why? What are its benefits? To test for this matter, I attempt to be the most objective possible, selecting a number of sample exchanges which operate in distinct realities. I apply the analysis to a set of four sample exchanges: two from Europe, one from North America and the other, from Asia. My thesis is innovative in the sense that it is one of the first researches that analyses the demutualization of the New York Stock Exchange. Moreover, given the stress which financial markets are now subjected to, due to the global economic crisis, I come to think the results of my investigation may be revealing.

Stock exchanges are undoubtedly important for the equilibrium of the financial system. They are a source of capital for all the listed firms and a form of investment for stakeholders, since they offer a wide variety of liquidity, especially with the modern electronic venues, which automatically match buy and sell orders. Consequently, enterprises may find a source of

[2] "Separation of ownership and membership" (Ramos, 2006b; 3)

finance in stock exchanges, in the sense that the latter enable an enterprise to finance itself, wholly or partially, through the process of share trade.[3] Accordingly, Levine and Zervos (1998) conclude that the banking and stock market industry provide important services for economic development.

Electronic Communication Networks (ECNs) are unequivocally one of the catalysts for the evolution of stock exchanges, bringing increased competition into the market. The other trigger for this evolution of stock exchanges was the elimination of regulatory barriers. Today, firms, once confined to national exchanges, can list themselves abroad. This openness is beneficial for many stakeholders, although not for the venue itself. Notice that before the regulatory changes, exchanges were promptly enjoying the financial benefits of a monopoly position. Furthermore, the members of these venues were too enjoying these monopolies, once this market positioning was assuring the cashy revenues for all of the operations of the exchange.

However, the environment changed and competition was materialized. Technological, low-cost exchanges came to foster competition for the traditional exchanges. Additionally, the traditional exchanges were not able to compete with new and agile venues, given that they had never experienced competition. As discussed by Aggarwal (2002), conventional cooperative exchanges did not have the agility and financial flexibility to exhaustively compete with the new trading venues. Furthermore, exchanges were unanimously structured as cooperative structures, which today present more costs than benefits.

The solution for the problem came in the mid 1990s, with the so-called demutualization process. Demutualization, which is the fragmentation of ownership and membership rights, implies a radical structure change: stock exchanges become for-profit enterprises with outside ownership. This structure change consists of the introduction of a governing body, which comes to maximize the venues' value – residual claimant[4]. As a result, the traditional members of the mutually owned exchanges could no longer apply their self-interest policies into the exchange. Hence, they continuously vetoed potential demutualizations.

---

[3] I indulge the importance of the securities' market.

[4] An agent "who would provide the right incentives to maximize exchange value as opposed to the members' individual profits" (Hazarika, 2005: 4).

However, due to a set of reasons, such as member heterogeneity and erosion of revenues, stock exchanges gradually converted into for-profit trading venues. The reasons for setting the business as a cooperative are numerous and varied, and we will discuss them, in the sense that, to fully understand demutualization, we first need to understand the traditional structure.

In line with the findings of Mendiola and O'Hara (2003), I conclude that demutualization is value-enhancing. Value enhancement can be acknowledged and tested in distinct ways; nevertheless, I look at the evolution of revenues, cost-efficiencies, volume-enhancement, and others. Moreover, I conclude that competition is eroding the exchanges' revenues, once the numbers of listed companies, in the sample exchanges, are decreasing in the moments prior to demutualization, as discussed by Hazarika (2005). On the other hand, I provide evidence that demutualization is not the solution for financially based problems. Demutualization comes to promote value, not to solve base problems.

I find that the improving performances of exchanges are positively related to a wider number of outside shareholders, since they manage to dilute the power of the predecessor members. A larger number of outside shareholders dilute the predecessor members' power, inhibiting the capacity of the latter to influence and implement self-interest policies into the exchange.

Lastly, I analyse the relationship between demutualization and mergers, once three of the four sample exchanges seemingly merge with other trading venues at the time of the structure change. Additionally, after their IPO, two of the sample exchanges acquire or merge with other venues; in line with the value-maximization policies brought into the exchange with the introduction of the residual claimant. This argument is also presented in the conclusions of Ramos (2006b).

The paper is structured in the following manner: section 2 essentially contextualizes the reader into the exchange reality, thoroughly explaining the motives for-cooperative and for-outside-ownership. Section 3 is related to the explanation of the case and consequent formulation of the hypothesis. Section 4 is uniquely dedicated to the analysis of the results. Finally, section 5, is where I present my concluding observations.

2. Corporate Governance of Stock Exchanges

2.1 Historical Evidence

Trading affairs have been common through the history of mankind. However, the idea of something related to the so called stock exchanges of today, dates back to eleven hundred, when the French *courtiers de change* were busy managing the "debts of agricultural communities on behalf of the banks" (Wikipedia, 2008). These Frenchmen were trading the debts of the agricultural populations, and therefore, they are considered to be the first brokers.

Nevertheless, the French *courtiers de change* are not theoretically considered the first players in the exchange industry. The first players were reported in Bruges, Belgium, in 1309, where several traders gathered at *Van der Boerse's* house to promote the exchange of several titles, generally, bank debts, which is closer to the reality of our era. This novelty industry, at that time, engaged several benefits for the economic venues and so rapidly expanded through Europe.

The Amsterdam Stock exchange, which dates back to 1602, was the first exchange to be officially established. However, at that time, there were already several 'unofficial' trading venues. Following Amsterdam, the world witnessed the emergence of several other stock exchanges, such as Paris and, later on, in the 18th century, the New York Stock Exchange.

The convenience of the mechanism, in the sense that it presented multiple business opportunities, made it successful. At first, the *bourses'* business objectives were related to the exchange of bank debts between traders, but gradually these objectives mutated. Later on in its history, the core business of the exchanges became the trade of stocks, issue and recovery of securities, financial instruments and other capital events, such as the payment of dividends and income.

The exchanges' structure, conversely, did not suffer many changes until the last decade of the 20th century, where a boiling economy demanded for new exchange structures. Let's say that, until the end of the nineteen hundreds, the stability of economies and a less globalized world promoted less competitiveness between exchanges and, therefore, the traditional cooperative structure was the optimal framework for stock exchanges. Due to historic and economic reasons, stock exchanges have been operated as cooperative venues, where members have equal voting rights and the organization is non-lucrative. Today, with the elimination of regulatory and trade barriers, and the materialization of competition, stock exchanges have convincingly opted for other enterprise structures - structures which promote profits, through the introduction of a residual claimant and, thus, engaging order flow and volume.

2.2 The conventional exchanges and their role until the end of the 20th century

"Traditionally, the stock exchange was primarily a physical location for trade. Trade was conducted in person and multiple securities were traded at the same location to maximise liquidity. (Hazarika, 2005: 2)" The core operations were strictly related to listing and membership fees, transactions, clearing and settlement services, and data dissemination. As the global economy evolved, the trade volumes experienced in exchanges were increasing at astonishing rates. Furthermore, the limited access to the trading floor - as a result of space constraints – enabled the members to impel higher brokerage commissions to the exchange users and a privileged view of the trading flow. This gave the stock exchange members market power and, consequently, they were able to extract monopoly rents from the venue. As a result of this phenomenon, more and more traders wanted to join the trading floor, but, in the majority of cases this was not possible, due to the high initial and annual fees to access the trading floor (Steil, 2002a). It is widely acknowledged that the greater the number of traders, the better the price discovery; which in turn motivated more brokers to join the trading venue (Lee, 1998).

The reasons for the exchanges to work in the form of cooperatives are diverse; historically and economically. As presented earlier, the primary exchanges worked as associations, where numerous traders grouped to exchange debts. If we look closer at the history of the London Stock Exchange (LSE), we can clearly see that it started as a form of association; when various members of the Royal Exchange were expelled and, as a result, grouped at *Jonathans' Coffee Shop* to exchange the debts they had in hand. Later on, in the beginning of the 19th century, the venue was officially established and regulated. More examples, such as the Amsterdam and Brussels stock exchanges, began as forms of associations which gradually established themselves as formal trading venues. Furthermore, throughout the 19th century, the law often obliged certain forms of enterprise, such as mutual insurance companies, to adopt a cooperative structure. However, the history of the structural formats of exchanges cannot alone explain why exchanges initially structured themselves as cooperative venues, especially due to the fact that similar enterprises – in a majority of cases, linked to the financial industry – opted for different forms of enterprise: outside ownership. In conclusion, the reasons for stock exchanges to form as cooperatives are purely economical and social.

Conventionally, stock exchanges were non-profit, quasi-governmental organizations. Hence, the members had to invest a portion of their profits for the venues' infrastructure requirements – technology and facilities. Furthermore, unlike the scenario of the New York Stock Exchange (NYSE), where the voting power of a member was a sum of the number of seats held, in most exchanges there was a one member one vote (OMOV) rule. In other words, in the common circumstances of a cooperative stock exchange, members could not sum up their seats to have more influence on the exchange – each member had one vote which was equal to the vote of any other member. Obviously, to agree upon a given issue, there needed to be a majority vote between the members.

This form of enterprise had many advantages and disadvantages; however, until recent findings, the benefits surpassed the costs of organizing as a cooperative. The first argument in favour of cooperative exchanges is undoubtedly the minimization of contracting costs. Shleifer and Vishny (1997) put forward an exhaustive analysis that demonstrates how a member structure can easily minimize contracting costs. The reduction of contracting costs is attained through the process of offering membership, as opposed to employment. This means that instead of the exchange hiring employees for the venue itself, it offers membership to an individual who then has to pay a fee and contribute a percentage of his profits to the exchange. As a result, the exchange not only minimizes contracting costs, but it also manages to find a source of revenue – via the fees and percentage over members' profits. In conclusion, the exchange was only the platform for change, as argued by Hazarika (2005).

It is clear that all of these arguments are correct when the membership is homogeneous. As discussed before, since each member had one vote (independently of his weight in the exchange), there was an inevitable need for a homogeneous environment – members needed to be compatible with each other. In that case, as discussed by Hansman (1988), the minimization of contracting costs would be an advantage for the exchange. The advantage would rapidly turn to become a cost if the members' interests were divergent; which is exactly what happened with the globalization of financial markets and co-existence of national and international traders in the same trading platforms. Take for example a large international bank and a small brokerage service firm where both could be members with the same voting rights. If each wants to maximise self profits, what happens is that the exchanges' overall potential is not being maximised, in the sense that each member tries to vote forth his own interests as opposed to the exchanges' common interest. Clearly, this is costly for the exchange and, as we will see in section 2.3, it was one of the reasons for the equitization of exchanges.

Due to the advantageous regulations and laws for stock exchanges, the venues were enjoying the benefits of detaining a monopoly position in the financial market. Hence, this central and privileged position enabled members to exploit its clients to the extent they wanted; there was no competition as, generally, there was only one exchange in each country. DiNoia (1998), leading on ideas from Hansman (1996), argues how members were exploiting the exchanges' users, as a result of the monopoly position. Due to pressures from the users - who constantly threatened to leave the exchange, in response to the exploitation from members -, the cooperative structure proved again to be optimal; customers were also offered membership. As a consequence of this customer-member-owned venue, all the parties were then enabled to balance self interests. The members were still able to protect their specialized services and reputation, whilst the users were able to avoid exploitation by members. These arguments are found in the papers of Hansman (1996), DiNoia (1998) and Pirrong (1999); however, they advocate for the importance of a homogeneous membership.

Hart and Moore (HM) (1996) also argue in favour of the mutual structure. They too restrict and condition benefits of a cooperative to the existence of homogeneity between members. HM's paper sharply explores the decision-making aspect of the exchange. They argue that the choice of parties who act on the exchange and the types of operations carried out by the venue are exclusively assigned to the owners of the venue. Hence, they conclude that both the mutual and outside ownership structures are inefficient; but for different reasons. They state that the outside ownerships' corporate governance is limited to the introduction of a residual claimant, who only wants to maximize the exchanges' value as opposed to maximising members' self profits. "Decision-making is focused on the marginal user - the analogy they draw upon is that one of the monopolist who inefficiently restricts supply to raise prices." [5] (Hazarika, 2005: 8) On the other hand, the mutual structure is inefficient too since "the views of the decisive voter are not necessarily those of the membership as a whole." (Hazarika, 2005: 8) Nevertheless, as HM agree that the membership of stock exchange is traditionally homogenous; the most adequate structure would then be the cooperative form of enterprise.

[5] Take the recent example of the 'Organization of the Petroleum Exporting Countries' (OPEP), who continuously restricts supply to raise the falling value of Petrol.

Another advantage of the mutual structure is the relationship-specific investments between the exchange and its users. Kongden (1998) and Macey and O'Hara (MOH) (1999) argue that the structure choice was related to the nature of the services provided by stock exchanges. MOH argued that only with a mutual structure is it possible to maximise the interests of both parties when planning relationship-specific investments. The operation consisted of a mutual investment; where the shares were provided by the customers and the services by the bourse. However, in the case of the structure not being a cooperative, each party could exploit the other, since they had "non-diversifiable investments in the relationship" (Mendiola and O'Hara, 2003: 5). Due to the possibility of exploitation, each party wanted to manage the exchange and, consequently, the best structure to reach the interests of both parties would inevitably be the cooperative form.

Hart and Moore (HM) (1996), in line with the arguments of Kongden (1998) and MOH (1999), discuss that the "cooperative structure is optimal when concentrated ownership gives non-shareholder constituencies too few rents to make relationship-specific investments" (Mendiola and O'Hara, 2003: 4). In other words, they argue that opposed to the members' self interests, in the case of the membership being homogeneous, there could be incentives to maximise the exchanges' value – introducing a residual claimant whose purpose would be to introduce policies in favour of the stock exchanges' interests as opposed to those of individual members. In the case of heterogeneity existing between members, HM argue that the most suitable structure would then be outside ownership, as I will later discuss in section 2.3.

On another line, Pirrong (1999) demonstrates, through economic modelling, that member heterogeneity can be the factor that promotes a mutual structure. He reveals through his model that member heterogeneity, in terms of brokerage costs, is the factor that motivates low-cost members to enforce a cooperative structure. "The model shows how the low-cost members can enforce a mutual structure through the threat of leaving the exchange, if the high-cost members vote for a for-profit venue (which would redirect profits away from the low-cost members)." (Hazarika, 2005: 8)

Despite all the preceding ideas, the fact is that today, a majority of the exchanges listed on the World Federation of Exchanges (WFE) are for-profit venues, with outside ownership and a governance board that exists to maximize the stock exchanges' value. Accordingly, the question that comes to mind is: why are exchanges around the globe undertaking new structures where ownership is separated from trading rights - demutualizing?

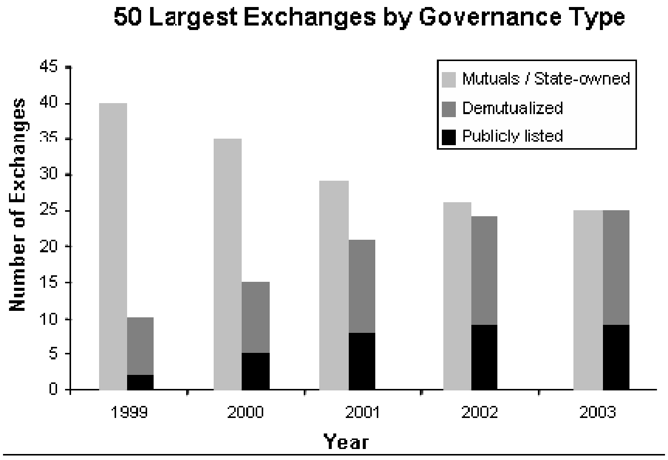


Fig. 1 Governance type of the 50 largest Exchanges in the world. Source: Serifsoy and Tyrell, 2006

2.3 Why are stock exchanges demutualizing?

During the 1990's, equity markets suffered tumultuous evolutions in the sense that it was an era of expansion. Business was revolutionized in numerous ways and trends were taking new directions. Take for example, the technological bubble that resulted from huge investor speculation; where intangible assets were highly overvalued in comparison to tangible assets. More specifically, look at the example were *Yahoo* was worth more than *Boeing,* a company whose assets are vast and tangible.

Looking at stock exchanges - whose performance depends of its listed companies' performance -, it was clear that these venues too, needed to have a structure reform. In particular, the mutual structure era had come to a solemn end with the emergence of new regulation and competition from other venues. Competition came from different angles but what I consider to have been the main trigger for legal competition between exchanges were ECNs. With the appearance of new technological venues, where liquidity was easily attainable and, consequently, transaction costs for customers were diminishing, investors were rapidly opting for these new exchanges. Given this set-up, the traditional exchanges were facing increasing competition and they could no longer enjoy their monopoly positions. Moreover, competition was downsizing the high revenue levels of traditional exchanges. As a result, traditional stock exchanges needed to introduce new variables to maximise their value. This resulted in the introduction of a residual claimant, which came as a result of demutualization. In other words, demutualization was the separation of ownership and membership rights, in the sense that with the introduction of a governing board (which represents the outside ownership), members could no longer maximise self-profits but, instead, they were driven to maximise the venues' potential. We could also argue that the growing heterogeneity between members was also a catalyst for the structure change, since members were no longer focusing on maximising the exchanges' value.

As presented before, Macey and O'Hara (MOH) (2002) too, discuss that the services offered by traditional exchanges are now readily available on electronic venues. As a consequence of this, competition takes on a central role and gradually erodes the revenues of the traditional stock exchanges. Moreover, together with the increase of competition, regulation also assumed new trends and removed barriers so as to promote technological exchanges. An example of this was the European Unions' Investment Service Directive (ISD) reforms, which came to enable companies to list abroad. As a consequence of this, and explored by Ramos (2006b), stocks were no longer enforced to be traded on a national venue only; an enterprise could list abroad, on an exchange of its choice. Therefore, the main international exchanges were now enjoying the barrier removal, whilst small national exchanges were struggling to level-off profits. Naturally, the technological and structural change involves a great volume of financial resources; hence, many small exchanges were questioning their future and survival. In an attempt to rapidly respond to this moving equilibrium, a vast number of small exchanges grouped to increase their competitive advantage with the international exchanges. Take the Euronext Stock Exchange as an example. Euronext initially established itself as the alliance of the Amsterdam, Brussels and Paris stock exchanges, in order to compete with international venues, such as LSE or NYSE.

The introduction of the Stock Exchange Automated Quotation - International (SEAQ-I) in the LSE is an example of the competitive threat posed by an ECN. SEAQ-I was an automated quote-driven system that enabled dealers in London to analyse the market of "block trades in European blue-chip companies" (Hazarika, 2005: 9). After its implementation in London, in 1986, most of the small traditional exchanges in Europe, such as Borsa Italiana (Milan), were experiencing a decrease in profits, directly linked to the reforms brought about by SEAQ-I. The ECN was actively fostering competition between exchanges and, to a certain extent it was threatening exchanges around Europe. Pagano (1998), through a set of discussions, shows us how the dealers in London were maximising their profits through SEAQ-I; they were constantly in contact with customers off the call auction, which in other European markets was not even legal, let alone an occurrence. Therefore, we can prematurely conclude that technology has promoted competition and, hence, ended the monopoly exchange era.[6]

Another benefit offered by the technological venues was the reduction of transaction costs. Mishkin and Strahan (1999), and Allen, McAndrews and Strahan (2002) discuss that technology triggered a reduction of transaction fees, which meant that exchange users were thus impelled to change the venue they did business with. This certainly was one of the causes that drove exchange members (brokers) to vote against demutualizations. Members came to see that the introduction of technology into exchanges was eroding their technical expertise. Furthermore, technology advances in the equity industry were the catalysts for reforms of regulatory barriers. As Nasdaqs' technological advances proved to be better for exchange users, the Securities Exchange Commission (SEC) rapidly reformed regulations in order to regulate technological bourses. As illustrated by Ramos (2006b), technology is usually the trigger for regulatory reforms. The author compares these regulatory reforms in the United States, to the Banking industries' reform that occurred in the United States earlier, which was catalysed by the introduction of ATMs.

On the other hand, users of traditional exchanges, who were members too, voted forth technology, once the tool was proving to be value-enhancing for the exchanges that adopted it. In spite of this, the heterogeneity between members and the consistent resistance of brokers regarding technology, since it eroded their individual profits, kept the venues in a stand-by mode. Large international banks, members of exchanges, were threatening to collude and leave the exchange if the brokers, who were members too, would not vote forth technology. In Amsterdam, the user-members of the exchange successfully managed to introduce technological trading tools and eliminate the costly trading-floor. Then again, as modelled by Mailath and Postlewaite (1990), "members could not be coerced to compel participation." (Hazarika, 2005: 10) Regarding this matter, Hart and Moore (1996) clearly conclude that in this scenario, stock exchanges are better off with outside ownership structures.

---

[6] Markets are now truly contestable and, therefore, monopolies can no longer enjoy their positions due to the threat posed by potential competition, assuming zero sunk costs and free entry and exit. Baumol, Panzar and Willig's (1982) theory of Contestable Markets

With the emergence of technological exchanges and demise of regulatory and national boundaries, the costs inherent to set up a trading venue diminished considerably; resulting in the evaporation of monopolistic stock exchanges. As a result of minor exchange start-up costs, new venues could set up operations with more ease, as opposed to the scenario where an exchange monopoly existed – abolishing any possibility for small venues to enter the market. As Aggarwal (2002) explains in her investigation, the mutual structure was not sufficiently flexible and financially agile to face competition and, consequently, the structure change came as a solution for this problem. Aggarwal (2002) demonstrated – through a set of examples -, how the traditional member structure exchanges were, generally, inert towards technological competition. As discussed previously, this inertia towards competition may have been caused by member heterogeneity (where the specialised brokers wanted to protect themselves against the technological era that came to substitute the intermediaries' role).

On another approach, Mendiola and O'Hara (MeOH) (2003) analysed whether demutualization was value-enhancing, or not. Through accounting, returns and risk-based measures, the authors managed to conclude that the corporate change in bourses' around the globe was value-enhancing. Furthermore, the authors show the reader that demutualization, although value-enhancing, is not problem-solving. Through the example of the Athens Stock Exchange (ASE), which I will analyse in my data (in section 4), the authors demonstrate that demutualization cannot solve problems inherent to some venues (i.e. demutualization comes to maximize the value of the venues and not magically solve its problems). In the same paper, MeOH (2003) also conclude that that "listed stock exchanges generally outperform both the stocks in their market and the IPOs listed on these exchanges." (Mendiola and O'Hara, 2003: 23) Additionally, the authors conclude that the "fraction of equity sold to outsiders" is positively linked with performance. MeOH argue that as the fraction of outside shareholders augments, the fraction of brokerage members on the exchanges' capital is diluted, therefore eliminating the problems linked to heterogeneity between members. In other words, with an increasing fraction of outside shareholders, exchanges were then enabled to approve strategies which were detrimental for broker-members but value-enhancing for the venue itself. DiNoia (1998) credibly argues how traditional exchanges' decision-making by members was consistently linked to self-profits, in opposition to the venues' potential maximization. Given this argument, DiNoia presents demutualization as the best residual claimant (value maximization) for the bourse. On the contrary, the performance of IPOs for non-exchange companies is negatively linked to the fraction of outside shareholders. Habib and Ljungqvist

(2001), Loughran and Ritter (2002), and Bradley and Jordan (2002) document how a greater fraction of shares sold to outsiders can be detrimental for the performance of non-exchange enterprises.

Hazarikas' (2005) papers' central idea focuses on the outcomes of demutualization, depending on the circumstance: competitive or non-competitive environments. The author sharply concludes that demutualization is an enhancer of volume or order flow. In either case – competition or no competition -, demutualization brings about a number of strategic differences to the bourse (such as lower transaction fees for users) which enable it to compete within the new era of technological exchanges and, as a consequence of this, trading volumes increase significantly. The difference between a scenario with competition or no competition lies in cost matters. The author shows, through a set of equations with mean-spread quotations, that in a competitive environment, the post demutualization transaction costs for the stock exchanges' users tend to fall, as a result of the strategies implemented with the introduction of the residual claimant. On the other hand, in an environment with no competition, within the short-run of demutualization occurring, costs tend to decrease as a result of strategies to attain higher trading volumes; however, as there is no competition, in the long-run, transaction costs for the customers tend to increase again. In other words, in the circumstance of no competition, the introduction of the residual claimant comes to lower transaction costs and thus, volume increases, but as there is no competition, members can promptly increase transaction costs again, once the order flow attained through the residual claimant will not abandon the exchange; there is no other venue to create competitive threats.

On the other hand, Steil (2002b) studies the effects of competition on the mutual structure exchanges – erosion of profits -, and the dilution of national membership as a results of the demise of regulation and national boundaries. Specifically, the author points out two central triggers for demutualization. Primarily, Steil (2002b) points out how members could no longer resist changes and, as a consequence of this, were keener towards demutualization. Secondly, the author highlights how the demise of national boundaries enabled international members to dilute the power of national members in bourses around the globe.

Ramos (2006b) adopts a completely different approach: the author concentrates her paper on the catalysts for the structure change and going public. Firstly, and in accordance with the conclusions of Perotti and Volpin (2004), the author shows us, with 109 exchange examples and probit models, that democracy is one of the triggers for demutualization. Through a consistent thread of ideas, the author supports her conclusion demonstrating that the greater the levels of democracy, the smaller the levels of lobbying in the political system, which as a result increases the contestability of markets – more competition for trading venues, which later is the catalyst for the structure change. Furthermore, Ramos concludes that the demutualized entities then go public in order to raise new capital[7] and finance acquisitions, as documented by Rosen, Smart and Zutter (2005) for the banking industry.

2.4 The demutualized exchanges

As we have previously evaluated, demutualization is the separation of trading and ownership rights; in practice, it diminishes the power of exchange members and, through a structure change, it introduces a new governing body into the exchanges' structure. Therefore, demutualization of stock exchanges comes as the response to growing competition from ECNs. Moreover, factors such as the demise of regulatory and national boundaries came to foster competition, which indulged the importance of a structure change in the traditional trading venues.

As reported by other authors: "demutualization separates trading and ownership rights, diversifying the exchanges' shareholder base." (Ramos, 2006b: 3) The outcome of this structure change for the venue itself is extremely beneficial, due to the fact that it increases trading volume and order flow. As a result, the profits of the exchange also increase. On the other hand, the members of the traditional mutual structure lost out immensely. Firstly, as they tried to resist demutualization, their revenues were continuously being eroded as a result of a more contestable market, where a monopoly could no longer enjoy its advantageous position due to the threats of competition. Secondly, with demutualization, members of the traditional exchanges also witnessed a loss of benefits: their power inside the exchange diminished as a result of the increasing foreign members and, later on, with the new outside members, whose fraction of capital gradually increased, diluting the power of the predecessor members. However, as put by Hazarika (2005) and Ramos (2006b), I too question how the NYSE was able to resist demutualization for such a prolonged period of time. At a first glance, in line with the arguments of Fleckner (2005), NYSE did not demutualize, in a certain way, because members managed to resist demutualization more than once. On the other hand,

---

[7] In line with the findings of Boehmer and Ljungqvist (2002) and Kim and Wiesbach (2005)

as discussed by Hazarika, the NYSE was sharply competing and getting ahead of the new era bourses and it implemented internal regulations, such as voting rights, that enabled the exchange to be not only competitive, but also the largest share dealer in the world. This example will be discussed more exhaustively later in this paper.

Interestingly, demutualization offers the exchange a number of benefits which undoubtedly outplay the mutual-member structure, one of which is the fact that demutualization, in a way, guarantees the future of certain trading volumes. This is why, with the demutualization, in line with the examples of Coase (1937), the bourse was enabled to offer ownership to customers and so, as these customers then became shareholders, they would never leave the exchange. In a way, this allocation of power and authority to some clients was a way to guarantee a certain volume of trades. Likewise, as shown before in this text, giving a fraction of capital to outsiders is correlated to better performances.

In this line of thought, Zingales (2000) and Rajan and Zingales (2001) too, discuss the importance of the customers' "monopsony power". Through a variety of examples the authors demonstrate that even with a structure change, the trading venues are still dependent on mutual incentives. This is due to the contestability of the market, which, although the members of stock exchanges can no longer exploit users, they still have to pay out incentives to the customers, in order to retain their trading volumes and investments.

In conclusion, exchanges were better suited with a cooperative structure when membership was homogeneous and markets were not contestable. However, with the increasing threat of competition fostered by ECNs, the markets became truly contestable and monopoly exchanges could no longer enjoy the benefits of being sole providers of the market. In addition, as technological trading venues started to evolve, it was implicit that national and regulatory barriers needed a reform. This reform came and increasingly promoted competition. On the other hand, the members of the exchanges were no longer homogeneous, with the large international banks wanting to shift towards technology and the broker-members resisting this tendency. Undoubtedly, the only cure for the problem and to redirect trading volume away from the new technological trading venues, was demutualization – separation of ownership and membership. With the introduction of a residual claimant, stock exchanges could promptly create strategies in order to fight competition and promote the value of the venue itself. However, the circumstances in which the exchanges demutualize –

competition or no competition environments – are crucially decisive in what respects the outcome, in the sense that only in a competitive environment can we witness the true results of demutualization. If there is no competition, ownership is indulged to re-raise the transaction costs for the bourses' users, similarly to the monopolistic situation.

3. Data

3.1 Case Study

Given the state of the art of the exchange structure, I was thoroughly intrigued with the benefits that demutualization brought about. As stated by Ramos (2006b), the number of demutualizing exchanges in the mid 90s is not comparable to those of the 21st century. In a survey conducted by the World Federation of Exchanges (WFE), in 2002, 63% of its members were non-mutual structures (i.e. demutualized exchanges), whilst in the mid 90s only a mere 10% of the members were for-profit venues. Along with these results, many authors discussed the benefits of for-profit structures and how, in the future, a majority of exchanges would be non-mutual. Furthermore, in 2004 already, 9 of the 10 largest operating stock exchanges were demutualized; only the NYSE constituted an exception. Moreover, in 2007, all of the 10 largest exchanges were demutualized venues (See Exhibit A). This data is somewhat indicative of the benefits demutualization poses.

Given these raw and introductory notes, we seemingly conclude that demutualization is necessarily the answer for competitive pressures in the exchange sector. Yet, we can put forward another question: if demutualization is beneficial for the exchange, why did the NYSE take such a long period to assume a for-profit structure? Mendiola and O'Hara (2003), and Hazarika (2005) discussed this matter and came to numerous conclusions. In accordance with the previous literature, I believe that demutualization is a response to competition, which surged with the technological trading venues and demise of regulatory and national barriers. As a result of this, if an exchange was capable of facing competition - as was the case of the NYSE - it did not need to demutualize. The NYSE intelligently thought out its strategies and adopted a culture that maximised the exchanges' value. This is, the members of the NYSE acted as the residual claimant of the venue, since their policies were value-enhancing for the exchange, as opposed to other realities - where the policies adopted aimed at the members' private profits. The strategies adopted included the pricing of seats, the voting rules and consistent competitive analysis. The exchange not only was the largest bourse in the world, but also the most dynamic and competition-aware one. If we closely look at the history of the venue, we can understand that the NYSE was thoroughly competing with its closer rival, Nasdaq. Every time the Nasdaq introduced new strategies into its business, the NYSE would immediately innovate and create strategies that surpassed Nasdaqs' competitive movements. Furthermore, in the years prior to demutualization, the NYSE was the single global trader to have a floor trading platform, which to a certain point was a competitive advantage for the venue. As a consequence of this, the exchanges' revenues were not eroding at unsustainable rates; volume was actually increasing – a fact that indulged members to resist demutualization. However, in 2006 the exchange did eventually demutualize, as a consequence of its obsolete and inefficient structure – it was losing its competitive nature. Thus, I come to believe that demutualization is indeed a response to competition.

Important players, such as LSE, demutualized much earlier than the NYSE, which raises another question: why did other international stock exchanges demutualize previously to the NYSE? I believe the answer is, once again, competition. Even thought the LSE, too, adopted competitive, value-enhancing strategies before its demutualization (with the reform of financial policies in the UK, in the 1980s), competitive pressures from other global venues were washing away the LSE's trading volumes. As a response to this, the exchange needed a residual claimant who would come to maximise its value and positively-enhance performance.

My study is strictly directed at the performance-demutualization relationship of stock exchanges. In other words, in accordance and line with the paper of Mendiola and O'Hara (2003), I postulate that demutualization is value-enhancing. As a result, I claim that demutualization is strictly related with better performances. To analyse this hypothesis, I use a set of financial, performance and ownership indicators which enable me to conclude on the outcomes of for-profit exchanges.

In order to make the study the least subjective possible, I use the data of four distinct sample exchanges. The data I use is from exchanges in Asia (Hong Kong Stock Exchange), Europe (London Stock Exchange and Hellenic Stock Exchange), and North America (New York Stock Exchange). The idea of including the Hellenic Exchange is to understand the principles of demutualization. Demutualization cannot solve problems related to basis financial structure

- as suggested by Mendiola and O'Hara (2003) -; the process is value-enhancing, not problem solving.

The financial ratios which I selected for the analysis are the following:

- Return on Assets (RoA), which is the quotient of operational profit and total assets, strictly answers how demutualization has affected the relationship between economical results and assets;
- Return on Equity (RoE), which is the relationship of net profit and equity, gives me a notion about the financial efficiency of the exchange, given demutualization;
- Profitability from Operations (PO): operational profit / total revenue, enables me to account for efficiency from operations;
- Asset Turnover (AT) – total revenues / total assets -, analyses the proportion of revenues in comparison to the exchanges' assets; which indirectly measures value-enhancement, too;
- Financial Leverage (FL): total liabilities / total assets. It enables me to analyse whether liabilities increase (in comparison to the assets) with the structure change, given that demutualization is a costly process.

To capture performance and distribution of ownership I analyse the evolution of listed companies and shareholder constituencies before and after demutualization. The evolution of volumes enables me to conclude about the aspect of volume enhancement as a response to demutualization. Furthermore, to ensure that the evolution of listed enterprises was not linked solely to evolutions of the market, I then set a comparison between the price quotation of the exchange itself and a quotation of the exchanges' underlying index, similar to MeOH (2003) study. This enables me to conclude whether or not volume-enhancement is a response to demutualization. On the other hand, relating the evolution of shareholders to the performance of the exchange enables me to conclude on the relationship between outsider shareholders and better performances of the venue, as suggested by Mendiola and O'Hara (2003).

The data used was collected throughout a number of sources. Primarily, I collected data aligned with listed enterprises and trading volumes on the WFE data source, which displays all the statistics related to its member exchanges. All the data used for the financial indicators – total revenues, operational profits, net profits, total assets, total equity and total liabilities –

was obtained in Reuters Knowledge; a source with a variety of data for numerous industries, including stock exchanges. To analyse price quotations and financial indicators I obtained the data on Bloomberg and Reuters Knowledge, too. For general information concerning each of the exchanges, I collected data from each exchanges' site and also Bloomberg and Reuters Knowledge.

3.2 The historical nature of each sample exchange

The historical nature of each exchange analysed in this paper, is important in the sense that it is explanative of some results we will further see in the analysis (section 4).

The Athens Stock exchange was the first, of the sample exchanges, to demutualize.[8] The venue dates back to 1876, when it established itself as a regulated cooperative exchange. In 1988, as a consequence of structural reforms, the exchange opened its membership to brokerage enterprises. During the 1990s, the role of the exchange was strictly linked with the regulation of its members' trades. As a consequence of the structural reforms, which also included moving to a private limited structure, in 2000 the Athens Stock Exchange became part of the Hellenic Exchanges SA (HELEX), which also merged with the Athens Derivatives Exchange (ADE). As a result, the demutualized Athens Exchange SA (ATHEX) was created in 2000, setting the track for its IPO, which came shortly after.

The Hong Kong Stock Exchange (HKSE) dates back to 1891, even though its first name was Association of Stockbrokers in Hong Kong. Throughout the 20th century, the HKSE merged with four national exchanges, as a result of financial reforms and securities markets' standardization. In the mid 90s, already due to the pressures from competition, the HKSE adopted a technological platform, denominated the Automatic Order Matching and Execution System (AMS). Along with the technological system, the exchange also attempted to promote volume growth through the diversification of products; in 1995, the HKSE incorporated a stock option market. Later, in 2000, the HKSE demutualized through a merger with the Hong Kong Futures Exchange, Ltd. and the Hong Kong Securities Clearing Company, Ltd, creating

[8] For historical contextualization, it is important to mention that the first exchange to demutualize, in the world, was the Stockholm Stock Exchange, in 1993. Later, the exchange went public and listed on itself. For informational aspects only, I refer that it merged with OM Stockholm, a technological company member of OM Gruppen.

the Hong Kong Exchanges and Clearing Limited (HKEx). The IPO of the exchange came shortly after the structure change in 2000.

The London Stock Exchange (LSE) dates back to the beginnings of the 19th century, when a number of brokers - who were expelled from the Royal Exchange due to rowdy behaviour - gathered at *Jonathan's Coffee Shop* to trade debts. After WWII, regional exchanges in England merged with the LSE, in order to create a sole and larger exchange. However, the most important reforms of the LSE came in 1986, with the so-called Big Bang. The deregulation of the exchange disabled many of the voting rights of members – in order to promote the venues' value, in opposition to members' private profits -, and promoted a better trading floor and off-floor venue. At this time, SEAQ-I was introduced, as part of a competitive strategy, which resulted in augmenting trade volumes. Yet, in 2000, the exchange made the decision to go public, and we hereby consider this date as its demutualization date. The effective IPO came shortly after, in July 2001. Later on, in 2007, again in response to competitive pressures and in order to capture a greater trade volume, the LSE bought the Italian exchange, Borsa Italiana. As a consequence of its value, the transaction demanded for great volumes of capital from the LSE.

The New York Stock Exchange (NYSE) traces its roots back to the 18th century; partially created to finance the revolutionary war. Nevertheless, it was in the 1800's that its significance grew exponentially. In 1886, the venue was already trading millions of shares per day. In spite of this, in October 1929, the Wall Street crash was a huge setback for a further evolution of the exchange; it took years for the venue to recover from the crash. As a consequence of this, regulations were adopted in order to avoid crashes and re-promote volume. In the last decade of the 20th century, technology and regulations' reforms brought about competition to the NYSE, resulting in consecutive attempts to demutualize the exchange. However, only in 2003 did the trader begin its process of demutualization. The completion of the process came through a merger with ArchaEx, in 2006 – creating the NYSE Group, Inc, whose IPO came shortly after. Further on, in 2007, as a result of a strategic operation, the NYSE merged with the Euronext exchange – which initially set up as a merger between some of Europe's exchanges (Amsterdam, Paris, and others, later on).

3.3 Hypothesis

Following the thoughts and arguments of the theories previously presented, I am now enabled to discuss my hypothesis.

As I expect the number of shareholders to increase, I believe it is implicit that the value of the equity of the exchanges will increase – in a sale of capital scenario. As equity increases, the value of the RoE will decrease, unless there is an increase in the net profits of the enterprise. On the other hand, as I expect profits to increase given demutualization, due to the introduction of a residual claimant in the exchange, I expect the RoE to remain constant. However, in the period right after demutualization, once the benefits of demutualization are not immediate, I expect the RoE to decrease.

As I expect better performances post demutualization, in line with other investigations (Mendiola and O'Hara, 2003), I believe the RoA and the Profitability from operations will increase. The RoA may happen to be constant, in the sense that, with demutualization - which may be the result of a merger - the asset volume of the exchange will increase and, consequently, the RoA may be constant, or increase only slightly. On the other hand, I expect value-enhancement strategies from a demutualized exchange and, therefore, more efficiency in the economical matter. In other words, I expect the Profitability from Operations to increase.

Asset turnover, in line with the prediction of escalating revenues – given the new for-profit structure -, is expected to increase. However, I point at the outset to the possibility of increasing assets, with the process of demutualization, which would inevitably determine a smaller growth of the Asset Turnover ratio.

Since in a majority of cases, demutualization is completed with a merger, this involves a great volume of capital. As a result, stock exchanges need financing and, hence, their liabilities tend to increase. In either one of our sample exchanges, there is a merger at the time of demutualization, or later, as is the case of the LSE (with the take over of the BI) and the NYSE (which merges with Euronext).

As demutualization is no more than the introduction of a residual claimant (or governance board), I expect the party to bring in strategies that increase the exchanges' value. Thus, to promote the value of the exchange, the party needs to promote its revenues, which can be observed in the volume of trades or listed enterprises. Therefore, I expect the number of listed firms to increase, post demutualization.

In line with the previous theory, demutualization is triggered by competition and the need to increase the value of the exchange. Consequently, in the periods prior to demutualization, we should expect the number of listed firms in each of the sample exchanges to decrease (erosion of revenues as a result of competition – contestable markets). On the other hand, and aligned with the previous hypothesis, given demutualization, I predict the number of listed firms will increase, as a consequence of value-enhancement strategies, such as decreasing transaction costs (as determined by Hazarika, 2005).

Following the reasoning of Mendiola and O'Hara (2003), I predict that the sample exchanges with more outsider shareholders are positively linked with better performances. As the traditional member structure is diluted, with the entrance of new shareholders, the power of the primary members to influence the exchanges' strategies is minor and, therefore, the strategies are now related to promoting the venues' value, in opposition to the promotion of members' self-profits; enhancing better performances of the bourse.

As discussed by Mendiola and O'Hara (2003), too, I predict that exchanges with financial base problems will not have better performances as a result of demutualization. I use the ATHEX as the sample for this hypothesis. The main concept which I want the reader to retain is that demutualization is value-enhancing, not problem solving, and therefore, financial base problems cannot be overcome simply with the mere structural change.

To summarize, after demutualization:
H1: RoE is more likely to be constant or decrease;
H2: RoA and Profitability from Operations will probably increase;
H3: Financial Leverage is most likely to increase;
H4: Asset Turnover is expected to be constant or rising;
H5: I expect an increasing number of listed firms in the moments post demutualization;
H6: I expect the number of listed firms to decrease in the periods prior to demutualization;
H7: More outsider shareholders are probably linked to better exchange performances;
H8: Demutualization is value-enhancing; not problem solving.

4. Analysis

4.1 Financial indicators' analysis

In this subsection I will analyse the evolution of the financial indexes, which I previously mentioned in subsection 3.1. For the analysis to be more transparent for the reader, I present a graph (with the evolution of all the indicators) for each of the sample exchanges. Yet, to further acquaint any doubts of the reader, I suggest the reader analyses Exhibits B, C, D and E (for further information on Cash Flows, Balance Sheets and Financial indicators of each sample exchange).

4.1.1 ATHEX

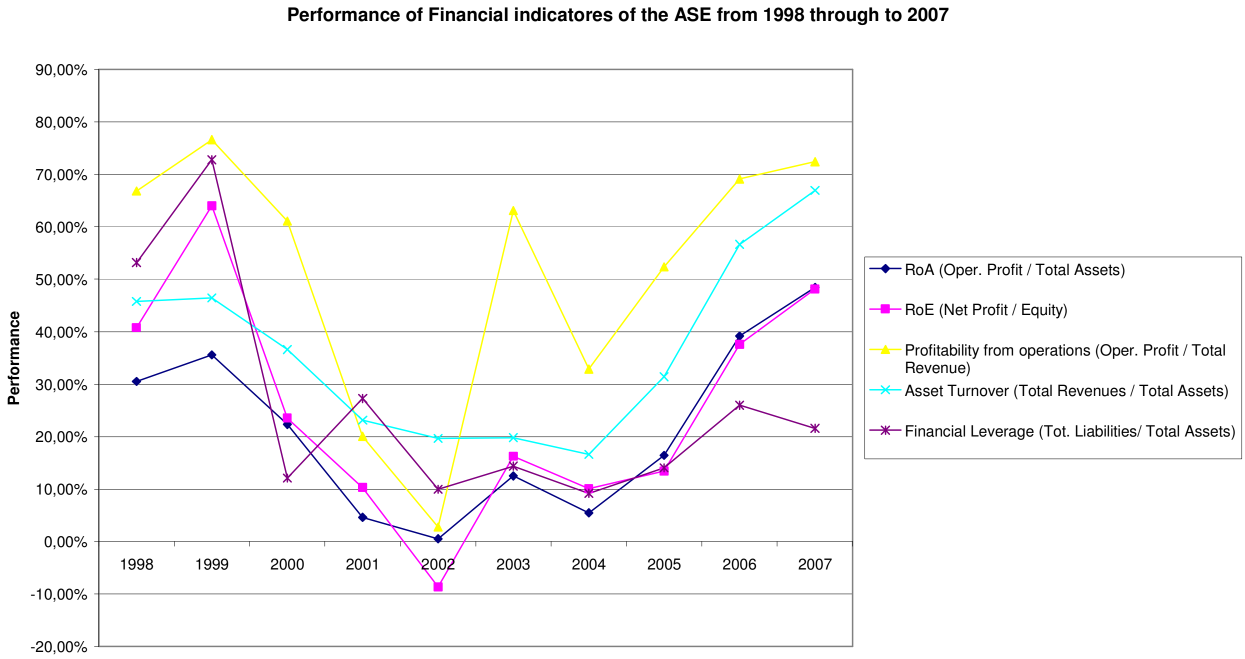


Fig. 2 Financial Indicators of the ATHEX

The data is confusing but, when analysing, we can gradually understand the trends. In a first observation, I clearly notice an overall peak in the period before demutualization (1999), which may be the result of the structure change announcement. However, I cannot assert that the reason for the peak in 1999 is due to an increase in the confidence levels of investors, resulting from the announcement of the structure change. Another general and primary observation is that all the financial indicators assume a fall tendency until 2002, which indicates that the effects of demutualization are not immediate (since demutualization was completed in 2000) - as predicted by myself. After 2002, although inconstant, all the ratios assume a growing tendency; fact that consolidates the prediction of mine, that demutualization is value-enhancing.

Concerning hypothesis 1 on the behaviour of the RoE, the first observation to make is that the RoE is rather inconsistent; it assumes a down drift until 2002 when the trend reverses. The fall tendency of the RoE is motivated by a significantly decreasing net profit (which assumes a negative value in 2002, 20,22M Euro; less 179% than in 2001). However, from the point of inflection onwards, the trend is positive; generally motivated by a recovering net profit and constant total assets.

In line with the drive of the net profit, the operational incomes' inflection point happens two moments given demutualization (2002). On the other hand, due to constant, or insignificantly growing total assets, in comparison to an increasing operational profit, the RoA assumes an increasing tendency, which comes to a peak in 2007. This peak is attained through a significant growth (43%) of the operational profit, in comparison to the mild growth of assets (16%). The PO is revealing similar tendencies to that of the RoA, but in more significant values. This may be the result of a cost-effective strategy. With the demutualization, a number of value-enhancement strategies are implemented, some of which are linked to cost efficiency, naturally decreasing operational costs. Therefore, I can comfortably claim that, with demutualization, the exchange is enabled to maintain higher levels of net income due to a more efficient management of operational costs, amongst other measures.

The percentage evolution of the revenues is analogous to that of the assets; however, the trend assumes more significant values - especially in 2005 and 2006, were the revenues register a growth of 21 and 60%, respectively, whilst the assets register a fall of 36% in 2005, and 11% in 2006. Evaluating the mean trend of the AT, I conclude the trend is positive from 2004 onwards (4 years post demutualization), as a result of growing revenues and decreasing assets.

Financial leverage, as I predicted, grows exponentially in the year prior to demutualization and then decreases gradually. The significant increase in 1999 is explained by the liability boost of 313%, in opposition to practically constant assets. As earlier suggested by me, this is the result of the merger between HELLEX and ADE, which involves a great volume of capital.

In conclusion, the general trend of the financial indicators enables me to conclude that a for-profit exchange is value-enhancing. On the other hand, I can also conclude that the increase in liabilities is linked to the merger situation, which, in a majority of cases, is linked to the process of demutualization. Furthermore, I came to conclude that the effects of demutualization are not immediate, in the sense that demutualization occurs in 2000 and the point of inflection of the negative tendencies only comes in 2002, after the dotcom bubble. Moreover, through this analysis, we see that demutualization is not the solution for the financial basis problems of the exchange (as discussed by Mendiola and O'Hara, 2003). As is obvious, in 2001 the ATHEX registers a negative net profit; a fact which is not expected from a financially healthy firm.

4.1.2 HKEx

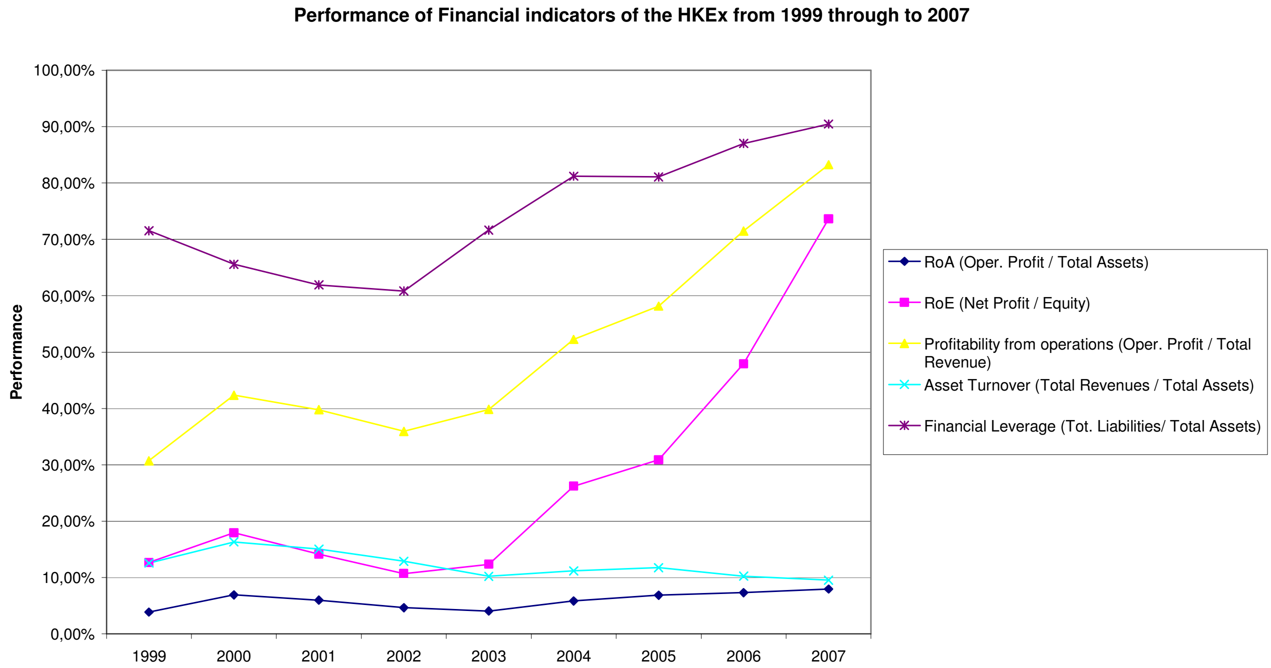


Fig. 3 Financial Indicators of the HKEx

Unlike the trends of the ATHEX, in the case of the HKEx, there is a general increase of the financial indicators (except for FL) up to the moment of demutualization. As of the moment of demutualization onwards, the distinct ratios assume different tendencies. In a first analysis, we can clearly see that the RoE, the PO and the FL ratio are increasing in the periods after demutualization. On the other hand, the RoA and AT indicators are rather constant, even though the RoA seems to follow a slight uphill tendency in the years following demutualization.

Throughout the analysis period, I denoted that the equity of the exchange remains rather constant, whilst the net profits vary from negative to positive growths. In the periods subsequent to demutualization (2001 and 2002), the net profits of the exchange grow negatively 15 and 21%, respectively. From 2002 onwards, RoE registers successive increases, as a results of better net incomes and, generally, constant equity, contradicting my hypothesis of constant or decreasing RoE's

Similar to the net profit tendency, the operational profits of the HKEx also have an inflection point in the second year after demutualization. This is, until 2002, the evolution of the operational income is negative, whereas from 2002 onwards, the drive is positive. This is a result of demutualization, since I believe the effects of the structure change are not instantaneous. On the other hand, the evolution of the total revenues is also similar but, in contrast, the volumes are much less significant. Take the year of 2003, for example, where operational profits grow 24%, as opposed to a smaller growth of 12% of the total revenues. This results in an increasing PO ratio, which leads me to the conclusion that demutualization is efficiency-enhancing, which later results in value-enhancement. The RoA, on the other hand, is rather insignificant, due to the fact that the evolutions and levels of both the operational profits and total assets are similar. However, the slight growth of the RoA from 2004 onwards indicates that demutualization is value-enhancing, once the economic profit is promoting values superior to those of the total assets.

Much like the RoA, the AT ratio is rather insignificant. The trend can be trivial but, nevertheless, important for our analysis. If we closely observe, we can see that the indicator assumes a negative drive. This is due to the fact that in certain moments, such as 2006 and 2007, the evolution of revenues is smaller than that of the assets. In summary, this indicator is inconclusive.

On the other hand, the FL ratio also assumes a tendency different to that predicted by me. Unlike the case of the ATHEX, the FL only seems to increase in the years after demutualization. Moreover, the assets of the exchange remain rather constant, until the period of 2006 and 2007, where they increase 76 and 117%, respectively. This is somewhat confusing, in the sense that during demutualization, the HKSE merged with other venues, therefore increasing the assets' levels. Moreover, due to the costs of the structural change, I expected the venue to increase its liabilities in order to finance the operation. This phenomenon did not happen; only in 2006 and 2007 did the liabilities increase exponentially (89 and 126%, respectively). However, the levels of this indicator are significantly high, indicating that there was a constant need of financing in the periods prior to and post demutualization. Furthermore, I can say that the decrease of the liabilities are a consequence of a financial settlement, given that the need for capital – for demutualization -, is over once the structure change is completed.

In conclusion, and mainly focusing on the profitability from operations ratio, I conclude that demutualization is efficiency and value enhancing. In other words, the strategies brought into the exchange with the introduction of a governance board are maximizing the venues' value. Therefore, demutualization is conclusively beneficial for the exchange. Moreover, I can also conclude that there is a need of extra capital to fund demutualization and, consequently, there is a need to increase liabilities. On the other hand, once the structure change is complete, the exchange gradually reduces the amount of liabilities, since there is no more need of excess capital.

4.1.3 LSE

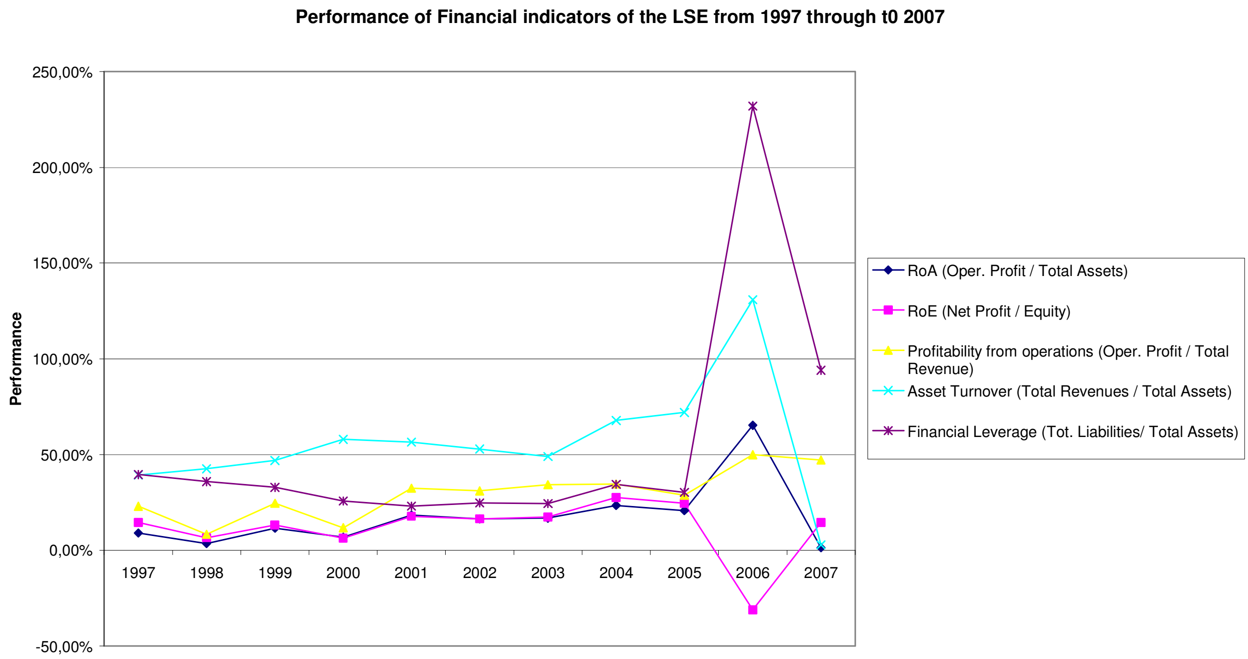


Fig. 4 Financial indicators of the LSE

Due to the fact that the LSE traces the roots of its demutualization back to the 1980s, with the Big Bang reforms, I expect the indicators to be less expressive – as was the case of the previous sample exchanges. This is, the exchange has adopted for-exchange policies since the

1980s and, therefore, I do not expect to see radical evolutions, but instead, consistent healthy values for each indicator.

Unlike the cases of the previously analysed sample exchanges, the LSE's financial indicators' trends are rather inconstant. However, I can refer that, in general, the indicators only assume inconstant drives until the moment of demutualization. From then onwards, the overall trend is positive, peaking in 2006, when the LSE took over the BI. This could lead to a preliminary conclusion on the positive linkage of demutualization and value-enhancement.

I could say that the net incomes of the LSE are rather consistent and generally increasing, except for 1998 and 2000, where the evolution of profits was negative (decreasing 48 and 53%, respectively). In contrast, I denote that the evolution of the equity is not constant and, especially in 2006, the trend assumes a rather significantly negative evolution. This results from a surprising negative equity, which I link to the takeover of the BI. As a result, the RoE assumes a placid uphill drive. However, in 2006, motivated by the negative equity, the value put forward to shareholders is significantly affected; resulting in a negative return of 31,09%.

In the case of the operational income too, the trend assumed is generally uphill, excepting 1998 and 2000, where the evolution is negative (decreasing 57 and 47%, respectively). On the other hand, in 2001 the operational profits' evolution peaks, with a growth of 201%, alike to the significant growth of 2006 (104%). These peaks may result from the IPO, in 2001, and take over of the BI, in 2006. Alternatively, the evolution of the total assets is rather constant, with the exception of 2007, where the assets boom, with a positive evolution of 7.225% (in consequence of the acquisition of the BI). As a result, the RoA is rather constant throughout the period analysed, for the exception of 2007 where it abruptly falls, in consequence of the booming assets. Moreover, the evolution of the revenues is fairly alike to that of the operational profit; resulting in a generally constant PO ratio. Furthermore, I can state that a PO ratio, which generally varies between the 20 and 40%, reflects a great amount of efficiency. This is, if the PO indicator is assuming high values, it means that the exchange is cost-efficient, in the sense that the revenues' absorption of economical costs is decreasing.

Due to a constant positive evolution from the total revenues, in comparison to the total assets, the AT ratio generally assumes a rising tendency. The only exception is in 2007, due to the previously mentioned asset boom. This indicates that demutualization is value-enhancing, since it is efficiently promoting the revenues. Moreover, the proportion of revenues is continuously surpassing the assets; a fact which is indicative of value maximization.

Liabilities, as I expected, grow exponentially (2.869%) in the moment of the BI's takeover. This is due to the fact that operation involves a surplus of capital and, consequently, the exchange needs external financing. Another important fact is that in 2006 too, probably related to the acquisition process, the equity of the LSE assumes a negative value, which is rather abnormal in my opinion. However, this is probably in line with a strategy for-acquisition of the BI.

The evolutions of each indicator are fairly constant, but their individual values are, in a majority of moments, rather appealing and value-enhancing. In other words, the evolutions of the financial ratios analysed are rather monotonous, but their percentage level is indicative of value-enhancement. Moreover, in the case of the LSE too, we can see that, with demutualization (2000), the strategies adopted by the exchange are value-enhancing, in the sense that the indicators reflect, amongst others, cost-efficiency strategies. Therefore, I hereby conclude that demutualization is promoting the maximization of the exchanges' value.

4.1.4 NYSE Euronext

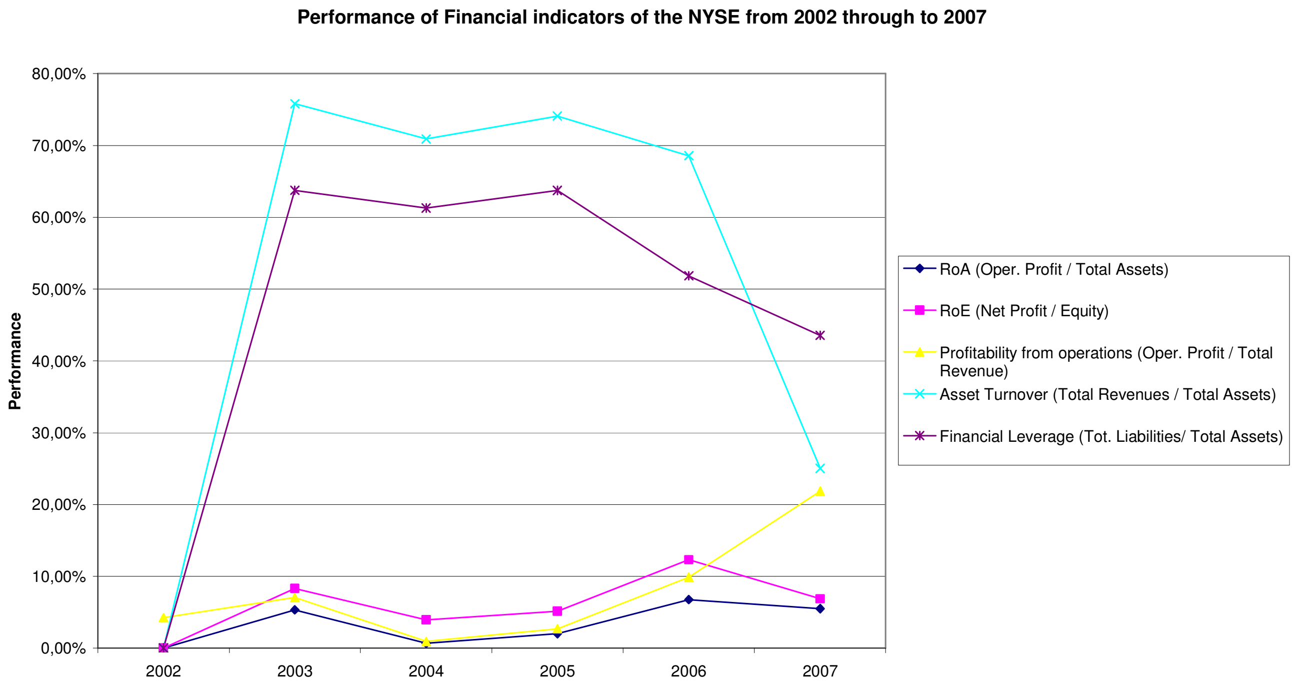


Fig. 5 Financial Indicators of the NYSE Euronext

In the case of the NYSE, I caution the reader for the limited amount of data. Once the exchange only completed its demutualization in 2006, and our data is up to 2007, the significance of the data is related to the behaviour prior to demutualization. Anyhow, the analysis is pertinent, in the sense that it enables me to analyse the behaviour pre-demutualization.

My first observation is that there is a point of inflection in 2004 (2 years before the completion of demutualization). From 2004 onwards, RoE, RoA and PO assume a clear positive drive, excepting 2007 (merger with Euronext). On the other hand, AT and FL peak in 2003 and remain rather constant for some years until 2007, where both indicators fall considerably. As you may acknowledge, these trends are coherent with the start and end of the demutualization process.

In the years preceding the demutualization process, shareholders of the NYSE were experiencing a relatively inconsistent return. Probably due to competition from other venues, the net profits of the exchange were assuming negative trends until the moment before demutualization. However, in 2006 and 2007 (periods of demutualization and merger with Euronext, respectively), net profits grew 400 and 214%, accordingly. This fact is significantly indicative of the benefits of the introduction of a residual claimant; maximisation of the exchanges' value. However, the equity of the NYSE was also assuming similar trends and, consequently, the evolutions of RoE in 2006 and 2007 are not explanative, contrary to the case of the net profits.

Along the same lines, the operational income assumes a rather inconstant trend but, in the year before the completion of demutualization (2005), the evolutions of the EBITDA are significantly positive; culminating with a peak-evolution in 2006, of 432%. As we know, the NYSE adopted different competitive strategies long before its demutualization completion, since its revenues were eroding. These operational profits' evolutions may be the result of the implemented strategies in 2003. The revenues too, assumed an uphill trend in the periods prior to demutualization; however, the evolutions (compared to operational profits) were minor; resulting in an augmenting PO ratio. This enables me to conclude that the efficiency of management was increasing since the start of demutualization until the completion of the process. The assets of the exchange were also assuming a positive drive, especially in 2007, with a boost of 379%, resulting from the merger with Euronext. As the evolutional trends of the assets were quite significant, the evolution of the RoA was quite mild, or inexpressive.

Furthermore, due to the previously described trends of assets and revenues of the NYSE, the AT indicator is rather expressive. In other words, the evolutions of the assets are more significant than those of the revenues, but the revenues are higher in value; hence, the expressiveness of the indicator. Nonetheless, the growth tendency of the AT ratio in 2003 and relatively constant drive from then onwards, indicates that as demutualization started, the strategies implemented by the management board were value-enhancing.

The FL ratio peaks in 2002 and maintains a high volume until the moment of the merger with Euronext. This indicates that the venue was increasing its liabilities in order to finance the transition to a for-profit structure and further merger. The decrease observed of the FL indicator in 2007 is resultant of the completion of the merger with Euronext; thus, the volume of liabilities is expected to decrease from that moment onwards.

In conclusion, as the venue initiates demutualization, all of its financial indicators assume positive drives. I therefore conclude that demutualization is value-enhancing, in the sense that the NYSE is consistently increasing its revenues, decreasing its costs and putting value forward to shareholders - increasing returns. However, to maintain these trends in the moment of demutualization is rather difficult, once there is a resulting increase of equity (due to a sale of capital), assets, and others. Moreover, the levels of liabilities also increased in the moments prior to the structural change, enabling me to conclude that demutualization is usually aligned to a merger, which involves excess finance.

4.1.5 Financial Indicators’ Conclusions

In an overall conclusion, having analysed all the sample exchanges, I can now state that demutualization is value-enhancing. Moreover, I believe the introduction of the residual claimant is maximising the value of the exchange, once the strategies implemented are also related to cost efficiency. These conclusions are consistently present in all the sample exchanges, especially clear with the PO indicator. From this indicator we see that, given or close to demutualization, the exchanges are not only increasing its revenues, but also reducing its costs. Therefore, the value of the company is being maximised. Furthermore, as expected by me, the volume of liabilities is positively linked to mergers or takeovers, which usually occur at the time of demutualization. Of the four sample exchanges, the LSE is the only exception towards a merger-demutualization scenario. That is, the LSE is the only venue that did not merge with another exchange at the time of demutualization. Yet, probably resultant of a value-enhancing strategy, the LSE bought the BI in 2006, as the NYSE merged with Euronext, in 2007 - promoting their revenues.

4.2 Performance Analysis

In this subsection I will analyse the evolution of the listed firms in each of the sample exchanges. The idea of this analysis is to understand whether or not, demutualization is volume-enhancing. As in the previous subsection, I will present a graph with the evolutions of the total listed companies (in each sample exchange). However, I suggest the reader analyses Exhibit F (domestic and foreign listings). To test for influences of the market, I look at the underlying indexes of each sample exchange. In other words, I look at the markets' movements in order to positively link the evolutions of listed companies to demutualization, and not the markets' drive.

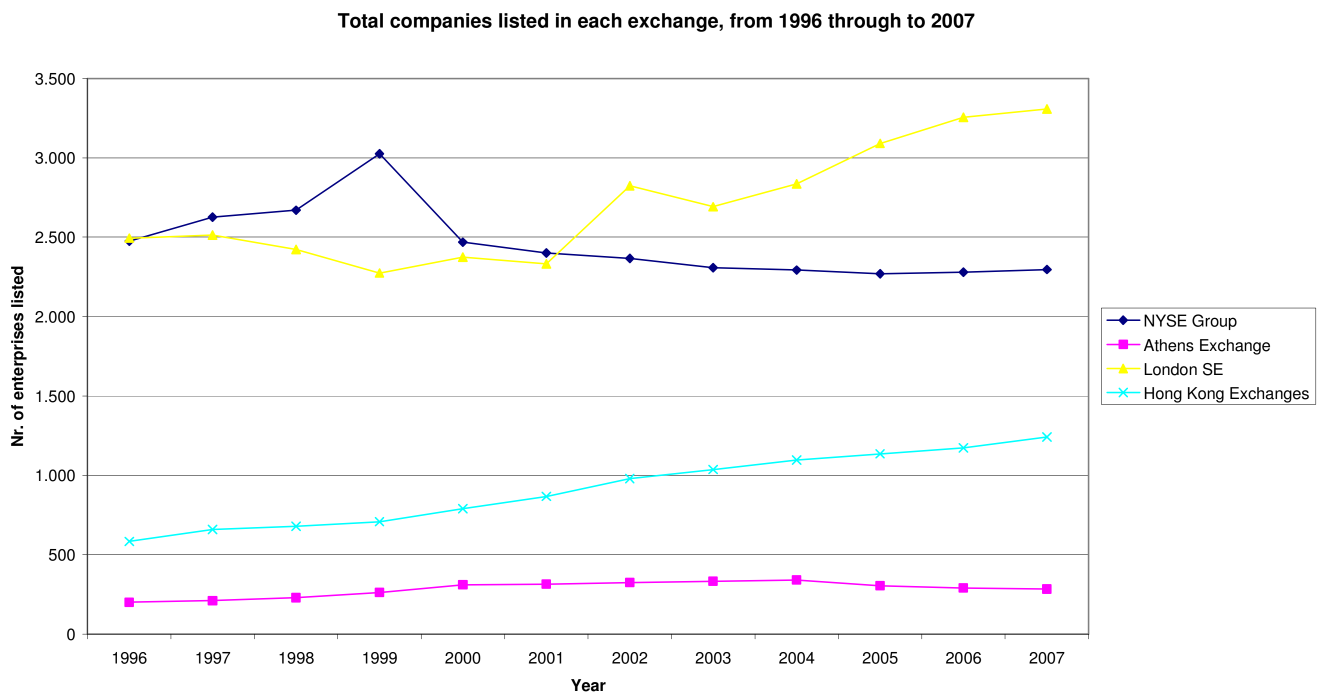


Fig. 6 Total companies listed in each sample exchange

As is clear, the total of listed companies assumes a positive trend for the LSE and HKEx, whilst the drive is negative and relatively constant for the NYSE and ATHEX, respectively.

4.2.1 ATHEX

The ATHEX maintains a constant total listings' trend throughout the analysis period. There are minor increases and decreases. However, if we look closely at the evolution, it is denotable that there is a peak in the domestic listings in the year of demutualization (2000). The same happens for the foreign listings, even though the levels of foreign listings are practically inexistent (only one foreign company was listed, in 2000). Furthermore, from the period of demutualization up till 2004, the domestic listed companies' evolution grows irrelevantly. From 2004 onwards, the evolution is consecutively negative. Then again, the number of foreign listed enterprises grows significantly, but its volume is reduced (three foreign enterprises listed, in 2007). Additionally, and contrary to my predictions, in the years prior to demutualization, the number of total listed firms does not decrease, indicating that other venues were not creating competitive pressures. I conclude that the analysis of the ATHEX's listed firms is practically inconclusive, in the sense that the volumes are insignificant. On the other hand, the trend inevitably contradicts my predictions – that demutualization is volume-enhancing. When comparing to Athens' financial index, EXAE (Exhibit G), we see that there is a positive evolution of the market. This information confuses the analysis furthermore, in the sense that we now cannot conclude whether the evolution of the listed companies results from demutualization or market movements.

4.2.2 HKEx

The total listed firms' tendency of the HKEx proves my hypothesis (H5) to be correct. From the moment of demutualization onwards, the number of listed firms increases significantly. Closely analysing each of the constituents of the total listings – domestic and foreign enterprises -, we can see that the number of domestic listings increases consecutively post demutualization, whilst the number of foreign listings is decreasing or constant. As in the case of the ATHEX, the HKEx also shows insignificant volumes of foreign listed firms – a maximum of 22 foreign listed companies in 1996 and 9 in 2007. Hence, the trend of the foreign listings proves my hypothesis to be wrong, whereas the trend of the domestic listings proves it right. Moreover, I find that – contrary to my expectations (H6) -, the number of listed firms in the periods prior to demutualization is not decreasing; indicating that competitive pressures were not eroding the bourses' revenues. When I look at the markets' movements, analysing the Hang Seng (Exhibit H), I observe that the index remains rather constant, therefore enforcing the idea that the growth of domestic listings is the result of better competitive strategies, brought into the exchange through demutualization.

4.2.3 LSE

The LSE's total listings' evolution post demutualization is consistently and significantly positive, except for 2001 and 2003, where the volume dropped 1,77% and 4,67%, accordingly. Therefore, the data is consistent with my hypothesis. Moreover, if we carefully analyse, in the moments prior to demutualization, the total number of listed companies decreases consistently every year, indicating that competition from other trading venues was eroding the exchanges' gains. However, once demutualization occurs, the trend reverses, peaking in 2002, with an overall increase of 21,10%. This peak, in 2002, is resultant of the increase in foreign listings. Specifically looking at domestic and foreign listings, we see that the primary are constantly increasing throughout the period analysed, whilst the last are consistently decreasing, except for 2007. This exception may be the result of the BI's takeover – it enhanced foreign competitiveness. Moreover, if we look at the underlying index, FTSE 100 (Exhibit I), we can see that it is rather constant, indicating that the markets' movements were minor. This fact is relevant to my analysis in the sense that it proves the increase in total listings is related to demutualization and not to the markets' movements.

4.2.4 NYSE Euronext

In the case of the NYSE, I cannot test for positive trends of the listed companies in the periods following demutualization, once the data is limited. However, I can and will analyse the evolution of the total listings in the moments prior to the structure change. The trend is rather obvious: steadily decreasing from 2000 until 2006 (year of demutualization). Specifically, the downhill tendency is a consequence of a decrease in domestic listings, as opposed to a reversed trend for the foreign listings. Speculating, we could say that the negative trend of the NYSE's total listings is linked to the increasing total listings of the LSE, as both exchanges are global players and compete with each other. Therefore, this proves my hypothesis right, once competitive pressures are negatively affecting the total listings of the NYSE. Moreover, the underlying index, S&P 500 (Exhibit J), remains significantly constant throughout the analysis period, indicating that the evolutions of the NYSE's listed companies are not linked to any market movements, but instead, to the structural evolution of the venue.

4.2.5 Performances' Conclusions

Excepting the analysis of the ATHEX, I am enabled to conclude that in the moments prior to demutualization, competitive pressures from other venues continuously erode an exchanges' revenues. Furthermore, I conclude that, with the introduction of a residual claimant, the number of listed companies in the exchange continuously increases. This indicates that demutualization is value-enhancing, in the sense that the increase of listed companies also reflects a value-enhancement strategy. Moreover, to assure my findings are correct, I looked at the market movements and was then enabled to link the evolutions of listings to demutualization.

4.3 Shareholders' Structure Analysis

In this section, I analyse a possible positive link between the increase of shareholders – creating more powerful minorities -, and better performances. Therefore, I analyse the growth of Institutional Holdings' and Insiders Stakeholders, and relate these facts with the performance of the exchange. However, I did not manage to collect data from two different years for the HKEx and the ATHEX. Hence, I will only analyse the LSE and the NYSE Euronext., so that I can link the evolution of shareholders to the evolution of performances. Yet, in Exhibits K and L, I provide the reader with the punctual (2008) situation of shareholders in the HKEx and the ATHEX, for a mere informative motive.

4.3.1 LSE

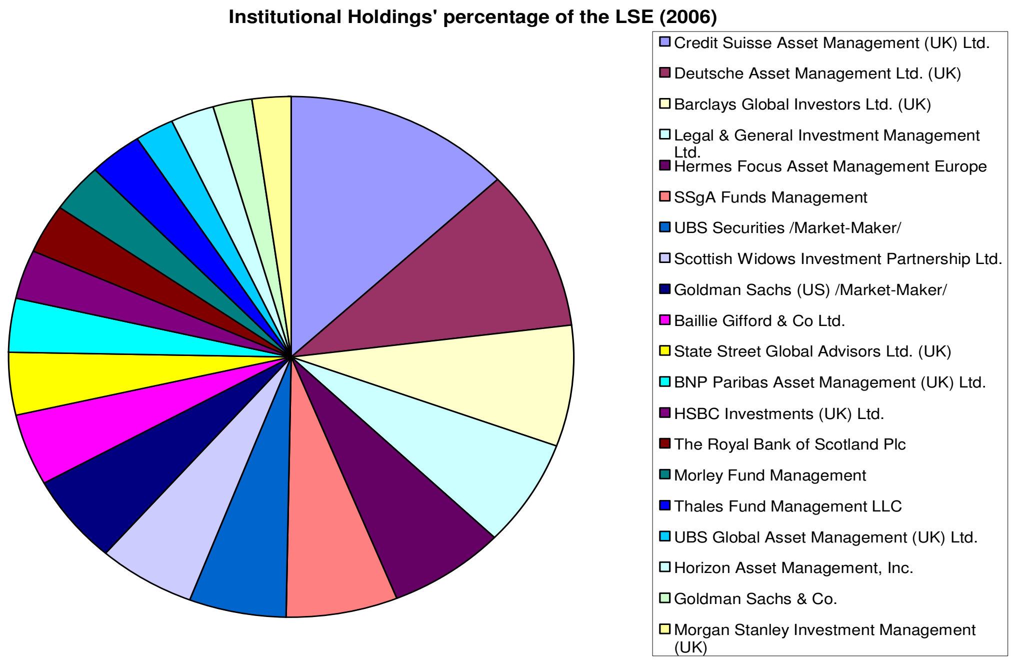


Fig. 7 Institutional Holdings of the LSE, 2006

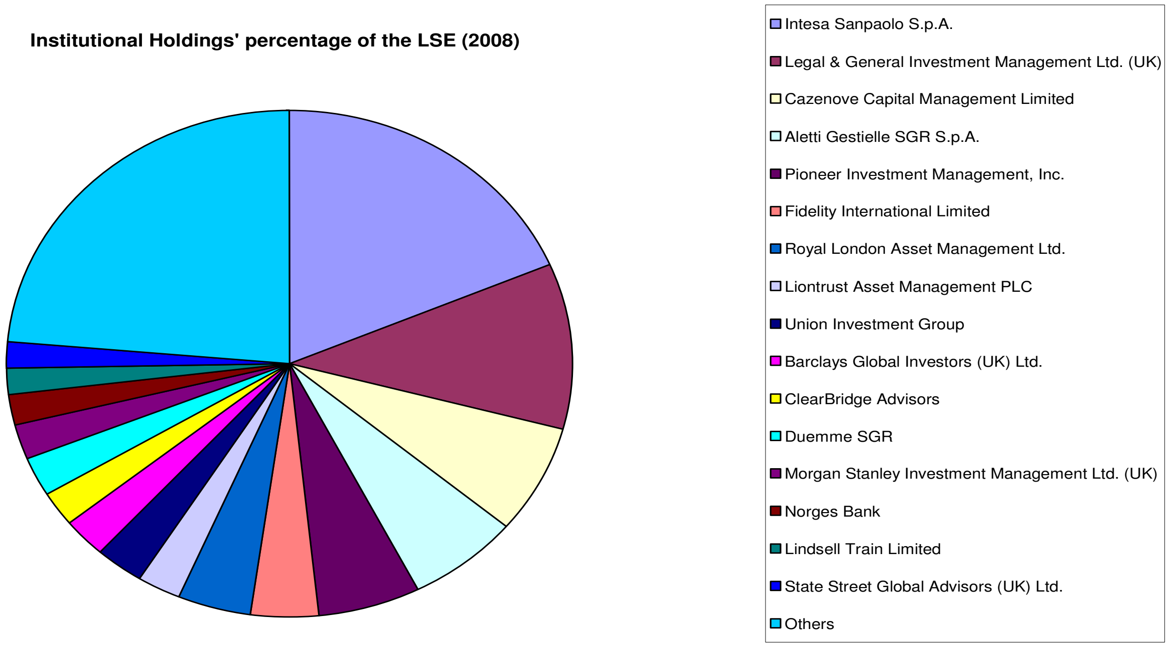


Fig. 8 Institutional Holdings of the LSE, 2008

As is clear in Figures 7 and 8, the number of institutional holdings in the LSE has grown significantly in two years time. Furthermore, and against my expectations, the major holdings have increased their share. However, if you closely look, the major holdings in 2006 are distinct to those in 2008, meaning that the composition of shareholders is mutating. Moreover, even though some major holdings increased their share of capital, the remaining capital is presently fractioned by a larger minority. Hence, the minorities are gaining importance and power in the LSE. Then again, insiders' stakeholders (Exhibit M) assumed a different tendency: the majorities' share of capital of the exchange is diminishing. Yet, similarly to institutional holdings, the minority stakeholders are gaining power in the exchange.

Interestingly, the institutional ownership of the venue decreased from 82,9% (in 2006) to 31,3% (in 2008). Moreover, the insider stakeholders' percentage of the venue assumed a contrary drift; growing from 29,5% (in 2006) to 47,4% (in 2008), meaning that the insider stakeholders are gaining power inside the exchanges' capital. In a sense, this may be value-enhancing, once these shareholders, who also operate on the exchange, want to see their returns increase; meaning that operations need to be effective and efficient.

As I presented earlier, the LSE has shown improving performances since the period of its demutualization. These positive performances are a result of better company policies – strictly aligned with value-enhancement. The natural question that follows is: why do performances improve with the structure change? The answer, reflected on my results, strictly relates to a larger number of shareholders, whose interests are related to maximising the venues' value. Hence, an increase in volume and diversity of shareholders has as a consequence, a dilution of the power of predecessor shareholders. In other words, with the increase of shareholders, it is harder for single members to implement self-interest policies into the exchange. The case of the LSE clearly shows the positive relationship between increasing shareholders and better performances; as shareholders increase, the performances of the exchange are improving.

4.3.2 NYSE Euronext

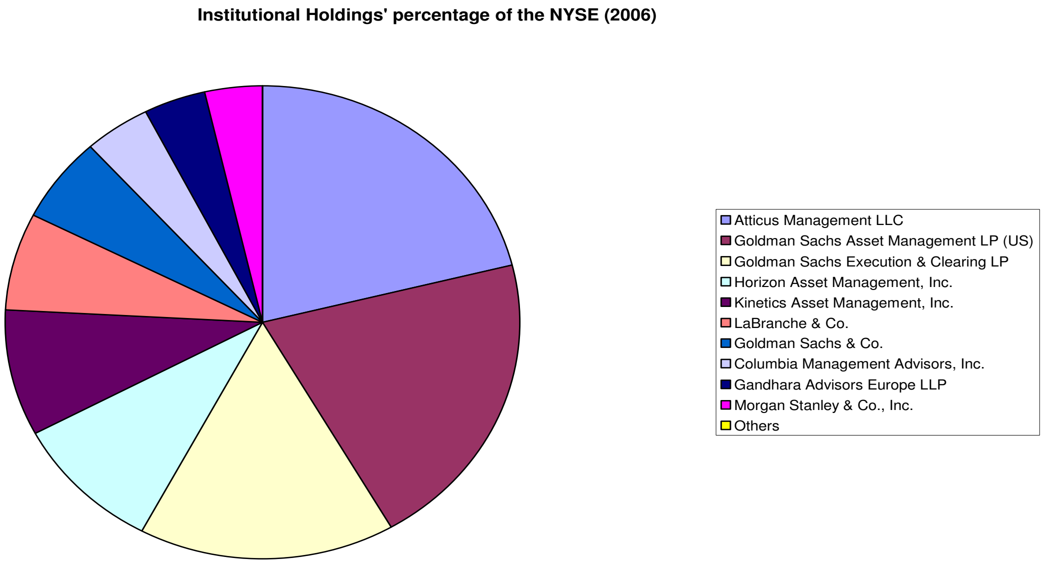


Fig. 9 Institutional Holdings of the NYSE, 2006

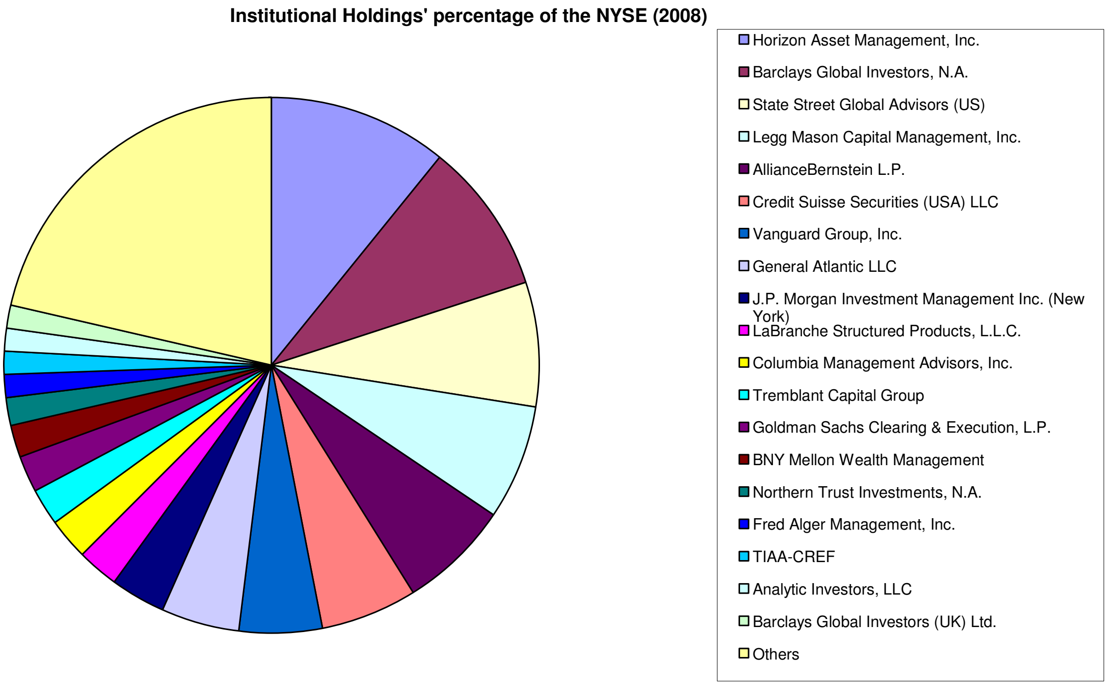


Fig. 10 Institutional Holdings of the NYSE, 2008

Even though the LSE's analysis is a good barometer to test if the increase of shareholders is positively linked to improved performances, the NYSE's case is much more objective, since the period studied is exactly when the exchange demutualized.

In 2006 - period of demutualization -, the number of institutional holdings was much reduced, compared to 2008. Furthermore, there was not only an increase in holdings but, unlike the case of the LSE, the minorities increased and the major shareholders' saw their share of capital diminished. This trend is also observed in the case of the insiders' stakeholders (Exhibit N).

Contrary to the case of the LSE, the institutional ownership share of the NYSE's capital assumed an increase tendency, growing 22,5% in the period analysed. On the other hand, the insider stakeholders saw their share of the NYSE diminished; decreasing from 7,5% (in 2006), to 0,61% (in 2008), meaning that the shareholders who too, operate on the exchange, saw their power within the venue diminished. This fact supports my hypothesis that a greater number of outsider shareholders is a good premise for better performances.

Moreover, as seen in the previous financial analysis, the NYSE has an improving PO ratio from 2006 onwards – which indicates value-enhancement. Therefore, I can conclude that the increase in shareholders at the time of demutualization was one of the significant structural changes that resulted in better value-enhancement policies. Thus, in line with my conclusions for the LSE, the NYSE's data too, shows that a larger number and variety of shareholders opens course for a better value-maximisation management, since the self-interest policies of sole members are diluted with the increase of shareholders.

If we look at the cases of the HKEx and ATHEX (Exhibits L and K, accordingly), we continue to see the patterns identified in the cases of LSE and NYSE Euronext. In other words, the HKEx, which shows positive performances since the time of demutualization, has a diverse and bigger shareholder base. Contrarily, the ATHEX, which has a more limited shareholder composition, has worse performances. However, this analysis of the HKEx and ATHEX is not conclusive, since the data I was able to collect only refers to one fiscal year; inhibiting an analysis of the evolutional pattern.

4.3.3 Conclusions concerning the Structure of Ownership

In conclusion, we clearly see that in the LSE and NYSE's analysis, as the number of shareholders augments, the performances of the exchange also improve. In my opinion, this results from the fact that a broader shareholder base disables specific shareholders to implement policies in their self-interest. Thus, the shareholders are voting forth value-maximisation, in order to promote their investment and, as a result, the performances of the exchanges are improving.

5. Conclusions

In this paper I have investigated the benefits of demutualization. Up until approximately a decade ago, stock exchanges were structured as mutually owned cooperatives. Today, all of the 10 largest international exchanges in the world are demutualized venues. That is, their membership is distinct from their ownership.

Due to a variety of reasons, but specially competitive and technological, exchanges around the globe are constantly converting into for-profit venues. Technology was the trigger for competition, in the sense that it was technology that came to compete with the traditional exchanges. Moreover, as discussed by La Porta, Lopez-de-Sillanes, Shleifer and Vishny (1997), with the emergence of technology, regulatory and national barriers were reformed and, hence, the exchanges' markets became truly contestable – the incumbent monopolies could no longer enjoy the privilege of being a sole provider of the industry. As a result, the traditional cooperative venues had to adopt value-maximization strategies, in opposition to the self-interest policies implemented by single members. However, due to the structures' conditions, exchanges were not being able to implement competitive strategies and, consequently, their revenues were eroding. The solution for the problem was demutualization.

As seen throughout my analysis, it is obvious that demutualization is value-enhancing, in line with the arguments of Mendiola and O'Hara (2003). I conclude the process is value-enhancing since, in the moments post structure change, the revenues are increasing, operational costs are decreasing, and the overall performances of the sample exchanges seem to be improving. This is clear with the increasing profitability from operations ratio, which shows the exchanges studied become more cost-efficient once demutualization is complete. Furthermore, strengthening this idea is the fact that (contrary to my predictions), the RoE increases; meaning that a greater return is being put forward to shareholders. This too, is an indicator of value enhancement – it would be impossible for the RoE to increase if the performances of the exchange were not improving.

On the other hand, as seen in cases presented, the effects of demutualization are not instantaneous. Moreover, demutualization can minimize the basis problems, but it does not constitute a solution. As seen in the case of the ATHEX, demutualization alone cannot solve the financial basis problems and, consequently, even after demutualization (2002), the exchange experiences a negative net-profit.

I also conclude that demutualization is volume-enhancing. Furthermore, in the moments prior to demutualization, the levels of listed companies in the sample exchanges seem to experience a decrease. I believe this is a consequence of competitive pressures, as argued by Hazarika (2005). However, the ATHEX does not prove this pattern, which, in my opinion, results from a lack of competition.

On the other hand, I also found a positive link between the number of shareholders (and its evolution), and the evolution of the exchanges' performances. In the two cases studied (LSE and NYSE Euronext), it is clear that as the number of shareholders increase, the performances of the exchange improve. The explanation for this is simple: the majority loses power and, therefore, sole members can no longer impose a number of self-interest policies into the exchange; meaning that the minorities are now strong enough to implement for-exchange policies. As a result, the performance of the venue improves and, consequently, the value put forward to shareholders is greater; which is an optimal situation for the minorities, as their share of capital is minor.

As shown by Ramos (2006b), I too conclude that demutualization is the initial strategy for a merger situation. In my analysis, 3 of the 4 sample exchanges merge with another exchange at the time of demutualization, meaning that demutualization could be the first phase for a merger process. In context, we could also agree (in relation with Ramos, 2006b) that, after undertaking demutualization, the exchanges go public in order to acquire other trading venues. This observation is pertinent, in the sense that 2 of the 4 sample exchanges analysed, went public and then acquired another exchange. The LSE acquired the BI and the NYSE merged with Euronext. However, in my opinion, these acquisitions are still in line with the introduction of a residual claimant (or demutualization), in the sense that the acquisitions clearly promoted revenues – value-enhancement.

Finally, I come to believe that this paper is interesting and relevant for the exchange environment in several ways. First, it produces an analysis that shows how demutualization is value-enhancing for the exchange. Secondly, it also confirms the previous conclusions of Hazarika (2005) and Ramos (2006b). However, in a future study, I believe I should analyse a greater number of exchanges and a longer period of data, in order to certify my results with a wider sample of exchanges, increasing further the reliability of my conclusions. Furthermore, I believe a future study would be interesting to cross-examine the relationship of variables, such as competition and acquisitions, in the sense that exchanges demutualize in order to promote value, which itself is eroded with competition. Therefore, if the exchange acquires another venue, this enhances its revenues and, consequently, it gains a competitive advantage.

References

Aggarwal, R. (2002), Demutualization and Corporate Governance of Stock Exchanges, *Journal of Applied Corporate Finance*, Vol. 15 (1), 105-113.

Allen, F., J. McAndrews and P. Strahan (2002), E-Finance: An introduction, *Journal of Financial Services Research,* Vol. 22 (1), 5-27.

Athens Exchange SA, General information (2008), http://www.ase.gr/default_en.asp.

Baumol, W. J., J. C. Panzar and R. D. Willig (1982), Contestable Markets and the Theory of Industry Structure, *Working Paper,* Harcourt Brace Jovanovich, New York.

Bradley, D. J. and B.D. Jordan (2002), Partial Adjustment to Public Information and IPO Underpricing, *Journal of Financial and Quantitative Analysis*, Vol. 37, 596-616.

Coase, R. (1937), The nature of the firm, *Economica*, Vol. 4, 386-405.

Di Noia, C. (1998), Customer controlled firms: the case of stock exchanges, *Working Paper,* Wharton School R.L. White Center for financial research.

Fleckner, A. M. (2005), Stock Exchanges at the Crossroads, Forthcoming in *Fordham Law Review*.

Habib, M. and A. P. Ljungqvist (2001), Underpricing and entrepreneurial wealth losses in IPOs, *Review of Financial Studies*, Vol. 14, 433-458.

Hansman, H. (1988), Ownership of the Firm, *Journal of Law, Economics and Organization*, Vol. 4, 267 – 304.

Hansman, H. (1996), The Ownership of Enterprise, The *Belknap Press of Harvard University Press. Cambridge*. Massachusetts, USA and London, England.

Hart, O. and J. Moore (1996), The Governance of Exchanges: Members' Cooperatives versus Outside Ownership, *Oxford Review of Economic Policy*, Vol. 12 (4), 53-69.

Hazarika, S. (2005), Governance Change in Stock Exchanges, *Working Paper*, City University of New York.

Hong Kong Exchanges and Clearing Limited, General information (2008), http://www.hkex.com.hk/index.htm.

Kondgen, J. (1998), Ownership and Corporate Governance of Stock Exchanges, *Journal of Institutional and Theoretical Economics*, Vol.154 (March), 224-251.

La Porta, R., F. Lopez-de-Sillanes, A. Shleifer and R. Vishny (1997), Legal Determinants of External Finance, *The Journal of Finance*, Vol. 52 (3), 1131 – 1150.

Lee, R. (1998), What is an Exchange? The automation, management and regulation of financial markets, *Oxford University Press*.

London Stock Exchange, General information (2008), http://www.londonstockexchange.com/en-gb/.

Loughran, T. and J. Ritter (2002), Why don't issuers get upset about leaving money on the table in IPOs?, *Review of Financial Studies*, Vol. 15, 413-433.

Macey, J. H. and M. O'Hara (1999), Globalization, Exchange Governance and the Future of Exchanges, *Working Paper*, Brookings-Wharton Papers on Financial Services, 1-33.

Macey, J. H., and M. O'Hara (2002), The Economics of Stock Exchange Listing Fees and Listing Requirements, *Journal of Financial Intermediation*, Vol. 11, 297-319.

Mendiola, A. and M. O'Hara (2004), Taking stock in the stock markets: The changing governance of exchanges, *Working Paper*, Cornell University.

Mishkin, F. S. and P. Strahan (1999), What Will Technology Do to Financial Structure?, *Working Paper*, Brookings-Wharton Papers on Financial Services, 249-277.

New York Stock Exchange Euronext, General information (2008), http://www.nyse.com/.

Pagano, M. (1998), The Changing Microstructure of European Equity Markets, in European Securities Markets - The Investment Services Directive and Beyond by Guido Ferrarrini (Ed.), *Kluwer Law International.*

Perotti, E. and P. Volpin (2004), Lobbying on entry, *Working Paper*, http://ssrn.com/abstract=957783.

Pirrong, C. (1999), The organization of financial exchanges markets: Theory and evidence, *Journal of Financial Markets*, Vol. 2, 329-357.

Brealey, R.A., S. C. Myers and A. J. Marcus (2002), *Principles of Corporate Finance*, III, McGraw-Hill Irwin.

Rajan, R. and L. Zingales (2001), The influence of the financial revolution on the nature of the firms, *Working paper*, University of Chicago.

Ramos, S. B. (2006a), Stylized facts about stock exchanges: Empirical Evidence, *Working Paper*, Instituto Superior de Ciências do Trabalho e da Empresa (ISCTE) - School of Business.

Ramos, S. B. (2006b), Why do stock exchanges demutualize and go public?, *Working Paper*, Instituto Superior de Ciências do Trabalho e da Empresa (ISCTE) - School of Business.

Rosen, R., S. Smart and C. Zutter (2005), Why do firms go public? Evidence from banking industry, *Working Paper*, Nr. 05-17, Federal Reserve Bank of Chicago.

Shleifer A. and R. Vishny, (1997), A Survey of Corporate Governance, *The Journal of Finance*, Vol. 52 (2).

Serifsoy, B. and M. Tyrell (2006), Investment Behaviour of Stock Exchanges and the Rationale for Demutualization – Theory and Empirical Evidence, *Working Paper*, Goethe University of Frankfurt.

Steil, B. (2002a), Changes in the ownership and governance of securities exchanges: Causes and consequences, *Working Paper*, Brooking-Wharton Papers on Financial Services.

Steil, B. (2002b), Building a transatlantic securities market, http://www.fese.be/initiatives/other_reports/steil_2002.pdf.

Reuters Knowledge – Investment Management (2008).

Wikipedia (2008), http://pt.wikipedia.org/wiki/P%C3%A1gina_principal.

World Federation of Exchanges (2008), Cost & Revenues Survey 2006.

World Federation of Exchanges (2008), Annual Report 2007.

World Federation of Exchanges (2008), Annual Report 2008.

Levine, R. and S. Zervos (1998), Stock Markets, Banks, and Economic Growth, *American Economic Review*, Vol. 88 (3), 537-558.

Zingales, L. (1995), Inside ownership and the decision to go public, *Review of Economic Studies,* Vol. 62, 425-448.

Exhibit A

This table presents a ranking of the worlds' largest stock exchanges ordered by market capitalization - USD million dollars (years 2006 and 2007)
Source: WFE Annual Report, 2007

Rank	Exchange	Governance Regime	USD mn end 2007	USD mn end 2006	% Change in USD
1	NYSE Group	Publicly Listed	15.651	15.421	1,50%
2	Tokyo Stock Exchange	Private Limited	4.331	4.614	-6,10%
3	Euronext	Publicly Listed	4.223	3.713	13,70%
4	Nasdaq Stock Market	Publicly Listed	4.014	3.865	3,80%
5	London Stock Exchange	Publicly Listed	3.852	3.794	1,50%
6	Shanghai Stock Exchange	Publicly Listed	3.694	918	302,70%
7	Hong Kong Exchanges	Publicly Listed	2.654	1.715	54,80%
8	TSX Group	Publicly Listed	2.187	1.701	28,60%
9	Deutsche Börse	Publicly Listed	2.105	1.638	28,60%
10	Bombay Stock Exchange	Publicly Listed	1.819	819	122,10%

Exhibit B

These tables present the synthesized Cash Flow, Balance Sheet and Financial indicators of the ATHEX. Years 1998 to 2007. Source: WFE.

	Year									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cash Flow										
Total Revenue	70,65	216,54	154,41	78,90	51,01	62,24	60,86	73,83	118,27	161,48
Gross Profit	55,96	190,06	124,38	47,41	22,75	38,19	55,42	70,02	109,43	140,83
Total Operating Expense	23,47	50,66	60,12	63,07	49,60	22,96	40,86	35,19	36,54	44,57
Operating Income	47,18	165,88	94,29	15,82	1,42	39,28	20,00	38,64	81,73	116,92
Net Income Before Taxes	61,95	197,69	119,19	28,80	-20,12	46,81	46,90	43,38	86,06	123,29
Net Income After Taxes	40,40	121,06	119,17	28,80	-20,12	46,81	33,61	27,12	58,08	91,03
Net Income	29,51	81,29	87,26	25,58	-20,22	43,79	33,59	27,10	58,07	91,03
Balance Sheet										
Total Assets	154,47	466,44	422,06	340,91	259,36	314,13	366,24	234,96	208,84	241,27
Total Debt	0,01	0,15	0,00	0,01	0,00	0,00	0,01	0,01	0,00	0,00
Total Liabilities	82,12	339,41	51,08	92,93	25,90	45,18	33,74	33,06	54,30	52,10
Total Equity	72,35	127,03	370,98	247,98	233,46	268,96	332,51	201,90	154,53	189,17
Total Liabilities & Shareholders' Equity	154,47	466,44	422,06	340,90	259,36	314,13	366,24	234,96	208,84	241,27

Note: Standardised in millions of €uros

	FISCAL YEAR									
Indicator	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
RoA (Oper. Profit / Total Assets)	30,54%	35,56%	22,34%	4,64%	0,55%	12,50%	5,46%	16,45%	39,14%	48,46%
RoE (Net Profit / Equity)	40,79%	63,99%	23,52%	10,32%	-8,66%	16,28%	10,10%	13,42%	37,58%	48,12%
Profitability from operations (Oper. Profit / Total Revenue)	66,78%	76,60%	61,06%	20,05%	2,78%	63,11%	32,86%	52,34%	69,10%	72,41%
Asset Turnover (Total Revenues / Total Assets)	45,74%	46,42%	36,58%	23,14%	19,67%	19,81%	16,62%	31,42%	56,63%	66,93%
Financial Leverage (Tot. Liabilities/ Total Assets)	53,16%	72,77%	12,10%	27,26%	9,99%	14,38%	9,21%	14,07%	26,00%	21,59%

Exhibit C

These tables present the synthesized Cash Flow, Balance Sheet and Financial indicators of the HKEx. Years 1999 to 2007. Source: WFE.

	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cash Flow									
Total Revenue	1.814,98	2.312,20	2.068,26	1.808,09	2.019,83	2.393,94	2.694,07	4.146,92	8.390,47
Gross Profit	1.202,17	1.732,73	1.405,85	1.338,33	1.549,87	1.976,35	2.172,93	3.247,50	6.658,23
Total Operating Expense	1.257,82	1.332,76	1.245,81	1.158,52	1.215,09	1.143,41	1.127,05	1.183,45	1.405,98
Operating Income	557,16	979,45	822,45	649,57	804,74	1.250,53	1.567,02	2.963,47	6.984,49
Net Income Before Taxes	557,16	979,45	822,45	649,57	804,74	1.250,53	1.567,02	2.963,47	7.190,81
Net Income After Taxes	520,67	873,65	740,43	588,51	692,69	1.056,88	1.339,56	2.518,57	6.169,28
Net Income	520,67	873,65	740,43	588,51	692,69	1.056,88	1.339,56	2.518,57	6.169,28
Balance Sheet									
Total Assets	14.460,90	14.169,00	13.745,01	14.035,47	19.807,98	21.443,40	22.930,92	40.464,41	87.944,19
Total Debt	204,43	0,00	46,45	49,46	50,29	0,00	0,00	0,00	0,00
Total Liabilities	10.344,34	9.290,04	8.509,60	8.539,08	14.193,85	17.411,17	18.593,45	35.206,82	79.566,84
Total Equity	4.116,56	4.878,96	5.235,41	5.496,39	5.614,13	4.032,23	4.337,47	5.257,59	8.377,35
Total Liabilities & Shareholders' Equity	14.460,90	14.169,00	13.745,01	14.035,47	19.807,98	21.443,40	22.930,92	40.464,41	87.944,19

Note: Standardised in millions of HKD

	FISCAL YEAR								
Indicator	1999	2000	2001	2002	2003	2004	2005	2006	2007
RoA (Oper. Profit / Total Assets)	3,85%	6,91%	5,98%	4,63%	4,06%	5,83%	6,83%	7,32%	7,94%
RoE (Net Profit / Equity)	12,65%	17,91%	14,14%	10,71%	12,34%	26,21%	30,88%	47,90%	73,64%
Profitability from operations (Oper. Profit / Total Revenue)	30,70%	42,36%	39,77%	35,93%	39,84%	52,24%	58,17%	71,46%	83,24%
Asset Turnover (Total Revenues / Total Assets)	12,55%	16,32%	15,05%	12,88%	10,20%	11,16%	11,75%	10,25%	9,54%
Financial Leverage (Tot. Liabilities/ Total Assets)	71,53%	65,57%	61,91%	60,84%	71,66%	81,20%	81,08%	87,01%	90,47%

Exhibit D

These tables present the synthesized Cash Flow, Balance Sheet and Financial indicators of the LSE. Years 1997 to 2007. Source: WFE.

	Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Income Statement											
Total Revenue	126,70	149,80	171,20	188,40	206,60	225,90	237,10	244,40	297,50	349,60	546,40
Gross Profit	30,00	149,80	171,20	188,40	206,60	225,90	237,10	84,60	120,10	185,60	546,40
Total Operating Expense	97,60	137,30	129,30	166,20	139,70	155,90	155,80	159,90	212,10	175,40	288,90
Operating Income	29,10	12,50	41,90	22,20	66,90	70,00	81,30	84,50	85,40	174,20	257,50
Net Income Before Taxes	39,70	22,30	48,50	30,40	75,20	79,50	88,80	92,20	93,50	161,50	227,00
Net Income After Taxes	28,10	14,70	32,10	15,20	49,90	52,70	63,10	64,50	66,80	110,60	173,00
Net Income	28,10	14,70	32,10	15,20	49,90	52,70	63,40	65,00	70,70	109,60	168,30
Balance Sheet											
Total Assets	322,20	352,20	365,20	325,40	365,70	427,30	483,50	360,40	413,70	267,10	19.564,20
Total Debt	30,00	30,00	30,00	0,00	0,00	0,00	4,90	3,30	1,10	420,10	17.999,80
Total Liabilities	127,30	126,20	120,10	83,40	84,40	105,60	117,80	124,10	124,90	619,60	18.396,50
Total Equity	194,90	226,00	245,10	242,00	281,30	321,70	365,70	236,30	288,80	-352,50	1.167,70
Total Liabilities & Shareholders' Equity	322,20	352,20	365,20	325,40	365,70	427,30	483,50	360,40	413,70	267,10	19.564,20

Note: Standardised in millions of Pound Sterling

	FISCAL YEAR										
Indicator	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
RoA (Oper. Profit / Total Assets)	9,03%	3,55%	11,47%	6,82%	18,29%	16,38%	16,81%	23,45%	20,64%	65,22%	1,32%
RoE (Net Profit / Equity)	14,42%	6,50%	13,10%	6,28%	17,74%	16,38%	17,34%	27,51%	24,48%	-31,09%	14,41%
Profitability from operations (Oper. Profit / Total Revenue)	22,97%	8,34%	24,47%	11,78%	32,38%	30,99%	34,29%	34,57%	28,71%	49,83%	47,13%
Asset Turnover (Total Revenues / Total Assets)	39,32%	42,53%	46,88%	57,90%	56,49%	52,87%	49,04%	67,81%	71,91%	130,89%	2,79%
Financial Leverage (Tot. Liabilities/ Total Assets)	39,51%	35,83%	32,89%	25,63%	23,08%	24,71%	24,36%	34,43%	30,19%	231,97%	94,03%

Exhibit E

These tables present the synthesized Cash Flow, Balance Sheet and Financial indicators of the NYSE Euronext. Years 2002 to 2007. Source: WFE.

	Year					
	2002	2003	2004	2005	2006	2007
Cash Flow						
Total Revenue	1.369,79	1.523,20	1.405,46	1.633,00	2.376,00	4.158,00
Gross Profit	260,13	295,91	253,61	276,00	576,00	1.510,00
Total Operating Expense	1312,14	1416,23	1392,53	1589	2142	3249
Operating Income	57,65	106,97	12,94	44,00	234,00	909,00
Net Income Before Taxes	57,65	106,97	43,30	91,00	329,00	921,00
Net Income After Taxes	38,94	61,73	31,16	43,00	208,00	668,00
Net Income	36,61	60,46	30,16	41,00	205,00	643,00
Balance Sheet						
Total Assets	-	2.009,20	1.982,25	2.204,15	3.466,00	16.618,00
Total Debt	-	0,00	0,00	0,00	0,00	2.713,00
Total Liabilities	-	1.280,85	1.214,78	1.405,02	1.797,00	7.234,00
Total Equity	-	728,35	767,47	799,13	1.669,00	9.384,00
Total Liabilities & Shareholders' Equity	-	2009,2	1982,25	2204,15	3466	16618

Note: Standardised in millions of USD

	FISCAL YEAR					
Indicator	2002	2003	2004	2005	2006	2007
RoA (Oper. Profit / Total Assets)	0,00%	5,32%	0,65%	2,00%	6,75%	5,47%
RoE (Net Profit / Equity)	0,00%	8,30%	3,93%	5,13%	12,28%	6,85%
Profitability from operations (Oper. Profit / Total Revenue)	4,21%	7,02%	0,92%	2,69%	9,85%	21,86%
Asset Turnover (Total Revenues / Total Assets)	0,00%	75,81%	70,90%	74,09%	68,55%	25,02%
Financial Leverage (Tot. Liabilities/ Total Assets)	0,00%	63,75%	61,28%	63,74%	51,85%	43,53%

Exhibit F

These tables present the Total, Domestic and Foreign listings in each of the sample exchanges, from 1996 through to 2007. Source: WFE

Total Listings

	Exchange							
	NYSE Group	% Change	Athens Exchange	% Change	London SE	% Change	Hong Kong Exchanges	% Change
1996	2.476	-	200	-	2.494	-	583	-
1997	2.626	6,06%	210	5,00%	2.513	0,76%	658	12,86%
1998	2.670	1,68%	229	9,05%	2.423	-3,58%	680	3,34%
1999	3.025	13,30%	262	14,41%	2.274	-6,15%	708	4,12%
2000	2.468	-18,41%	310	18,32%	2.374	4,40%	790	11,58%
2001	2.400	-2,76%	314	1,29%	2.332	-1,77%	867	9,75%
2002	2.366	-1,42%	324	3,18%	2.824	21,10%	978	12,80%
2003	2.308	-2,45%	332	2,47%	2.692	-4,67%	1.037	6,03%
2004	2.293	-0,65%	341	2,71%	2.837	5,39%	1.096	5,69%
2005	2.270	-1,00%	304	-10,85%	3.091	8,95%	1.135	3,56%
2006	2.280	0,44%	290	-4,61%	3.256	5,34%	1.173	3,35%
2007	2.297	0,75%	283	-2,41%	3.307	1,57%	1.241	5,80%

Domestic Listings

	Exchange							
	NYSE Group	% Change	Athens Exchange	% Change	London SE	% Change	Hong Kong Exchanges	% Change
1996	2.172	-	200	-	2.041	-	561	-
1997	2.271	4,56%	210	5,00%	2.046	0,24%	638	13,73%
1998	2.278	0,31%	229	9,05%	1.957	-4,35%	665	4,23%
1999	2.620	15,01%	262	14,41%	1.826	-6,69%	695	4,51%
2000	2.035	-22,33%	309	17,94%	1.926	5,48%	779	12,09%
2001	1.939	-4,72%	313	1,29%	1.923	-0,16%	857	10,01%
2002	1.894	-2,32%	323	3,19%	2.405	25,07%	968	12,95%
2003	1.842	-2,75%	331	2,48%	2.311	-3,91%	1.027	6,10%
2004	1.834	-0,43%	339	2,42%	2.486	7,57%	1.086	5,74%
2005	1.818	-0,87%	302	-10,91%	2.757	10,90%	1.126	3,68%
2006	1.829	0,61%	288	-4,64%	2.913	5,66%	1.165	3,46%
2007	1.876	2,57%	280	-2,78%	2.588	-11,16%	1.232	5,75%

Exhibit F (Cont.)

Foreign Listings

	Exchange							
	NYSE Group	% Change	Athens Exchange	% Change	London SE	% Change	Hong Kong Exchanges	% Change
1996	304	-	0	-	453	-	22	-
1997	355	16,78%	0	-	467	3,09%	20	-9,09%
1998	392	10,42%	0	-	466	-0,21%	15	-25,00%
1999	405	3,32%	0	-	448	-3,86%	13	-13,33%
2000	433	6,91%	1	100,00%	448	0,00%	11	-15,38%
2001	461	6,47%	1	0,00%	409	-8,71%	10	-9,09%
2002	472	2,39%	1	0,00%	419	2,44%	10	0,00%
2003	466	-1,27%	1	0,00%	381	-9,07%	10	0,00%
2004	459	-1,50%	2	100,00%	351	-7,87%	10	0,00%
2005	452	-1,53%	2	0,00%	334	-4,84%	9	-10,00%
2006	451	-0,22%	2	0,00%	343	2,69%	8	-11,11%
2007	421	-6,65%	3	50,00%	719	109,62%	9	12,50%

Exhibit G

This graph shows the tendencies of the EXAE index (giving us an idea of the markets' movements), compared to the ATHEX's price quotations' movements. Years 2005 to 2009. Source: Reuters Knowledge

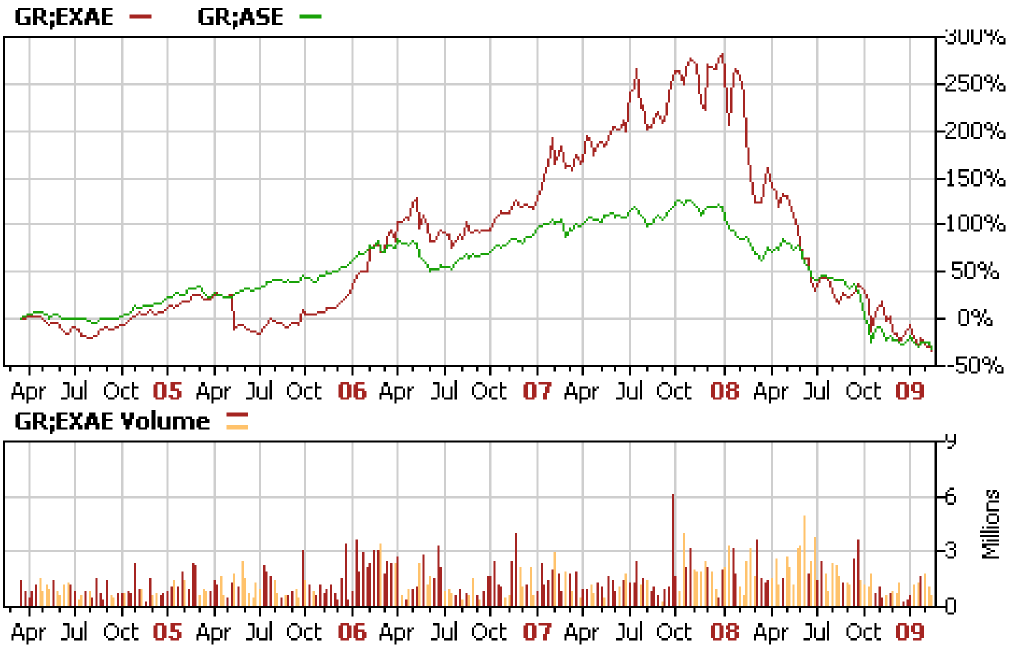


Exhibit H

This graph shows the tendencies of the index Hang Seng (giving us an idea of the markets' movements), compared to the HKEx's price quotations' movements. Years 2005 to 2009. Source: Reuters Knowledge

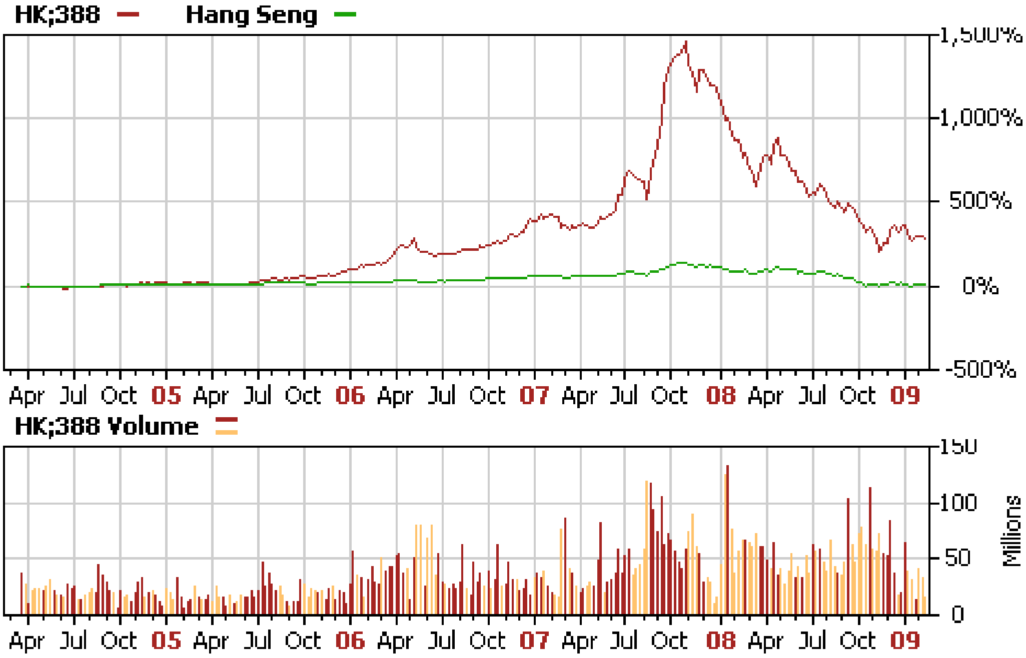


Exhibit I

This graph shows the tendencies of the index FTSE 100 (giving us an idea of the markets' movements), compared to the LSE's price quotations' movements. Years 2005 to 2009. Source: Reuters Knowledge

Exhibit J

This graph shows the tendencies of the index S&P 500 (giving us an idea of the markets' movements), compared to the NYSE Euronext's price quotations' movements. Years 2005 to 2009. Source: Reuters Knowledge

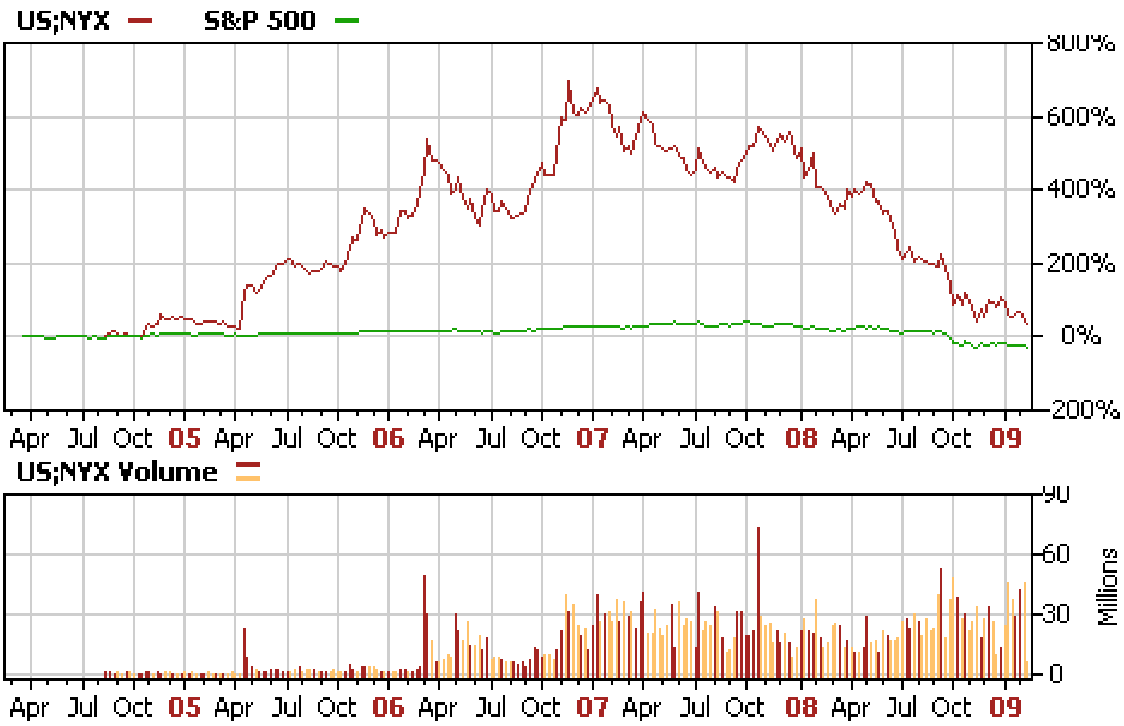
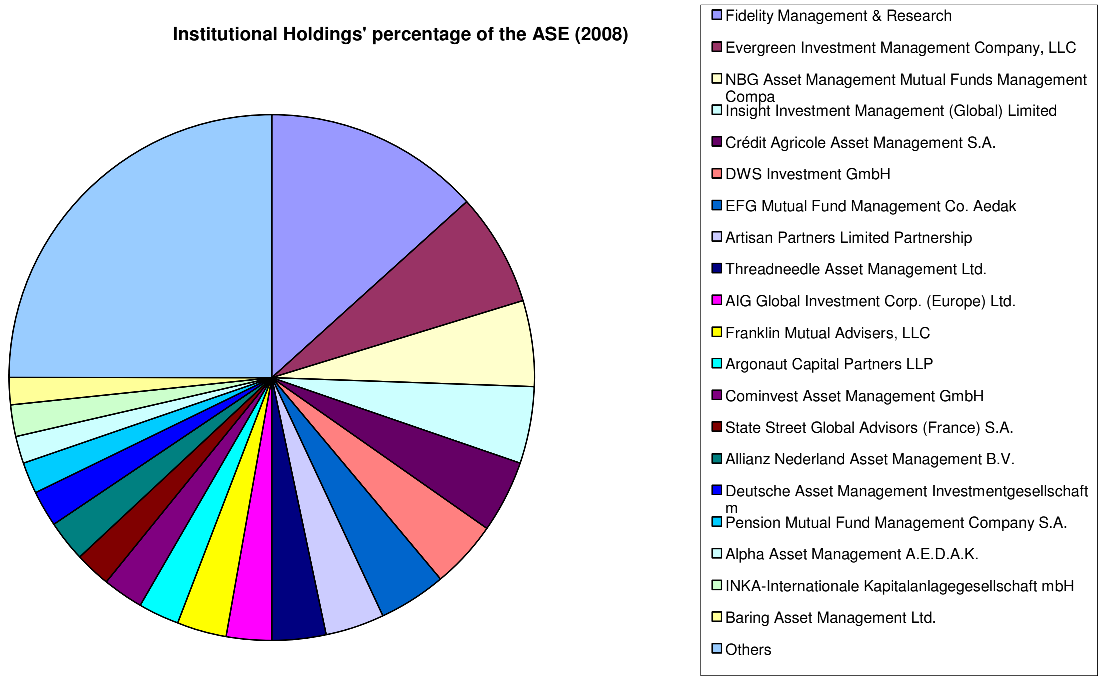


Exhibit K

These graphs show the respective compositions of Institutional Holdings and Insiders Stakeholders, of the ATHEX, in 2008. Source: Reuters Knowledge.



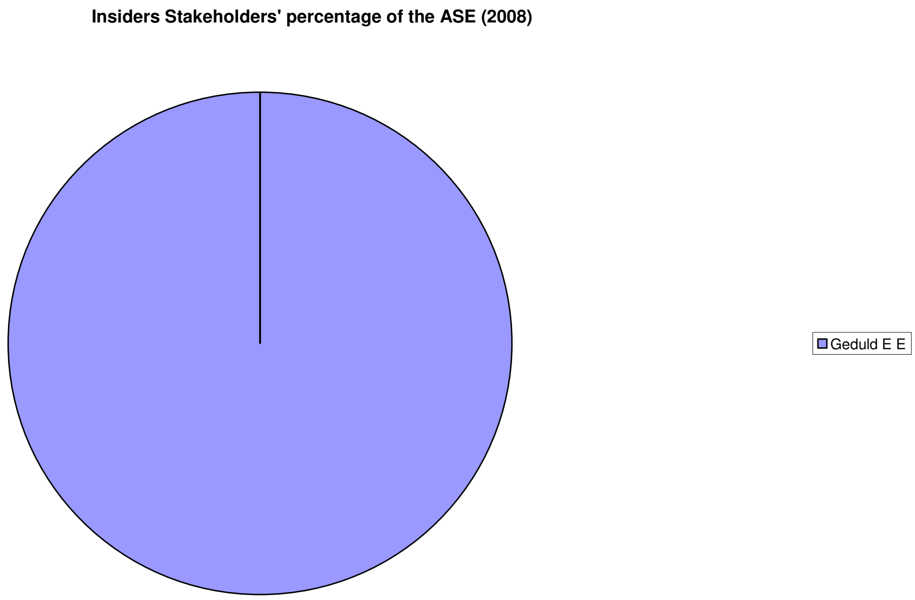
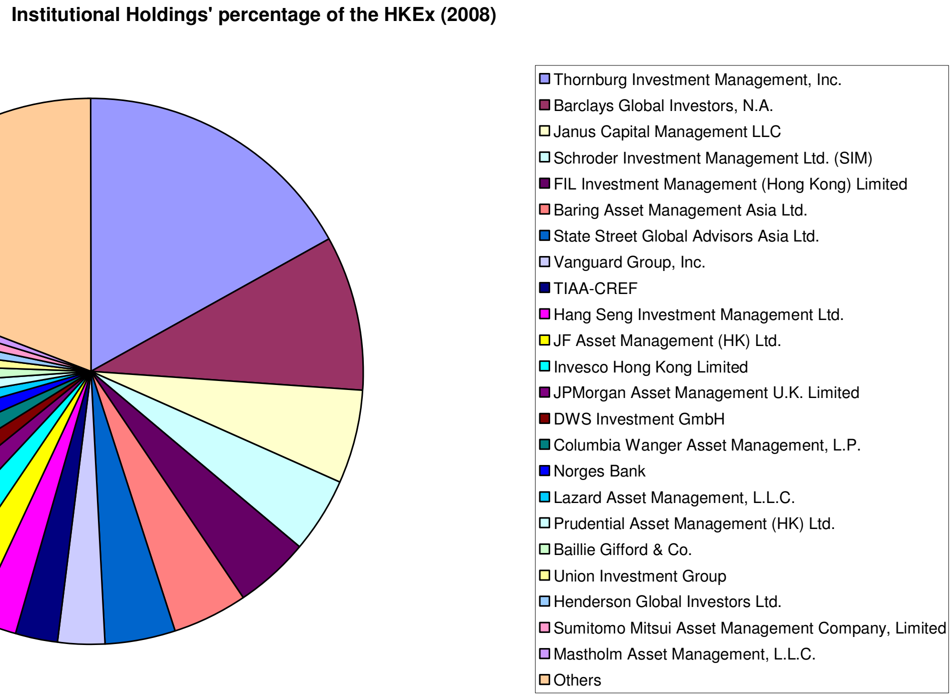


Exhibit L

These graphs show the respective compositions of Institutional Holdings and Insiders Stakeholders, of the HKEx, in 2008. Source: Reuters Knowledge.



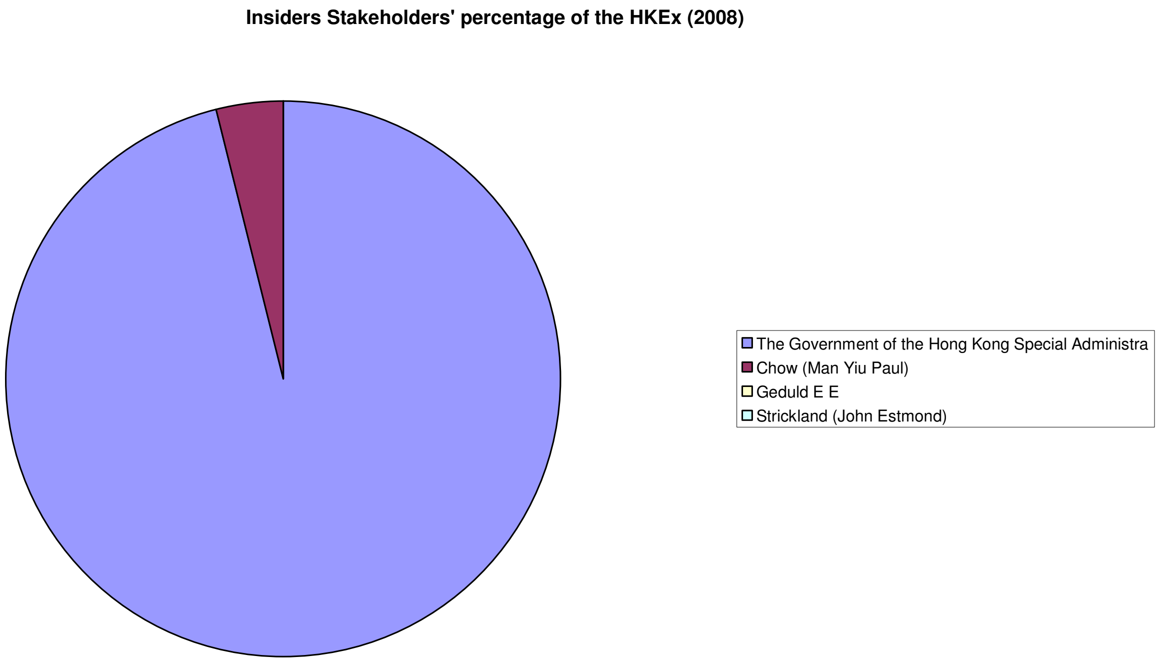
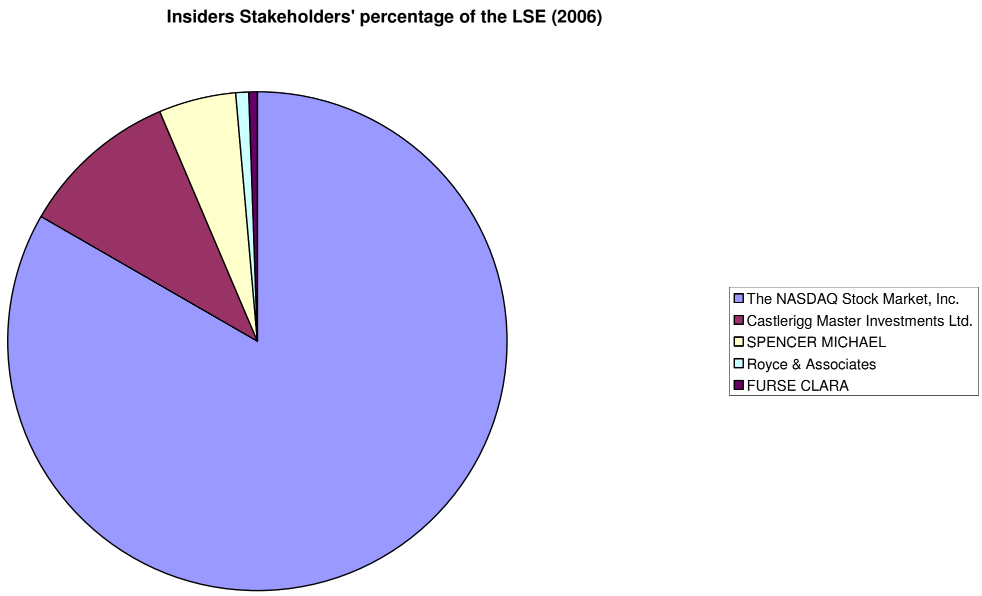


Exhibit M

These graphs show the composition of the Insiders Stakeholders of the LSE, in 2006 and 2008, respectively. Source: Reuters Knowledge.



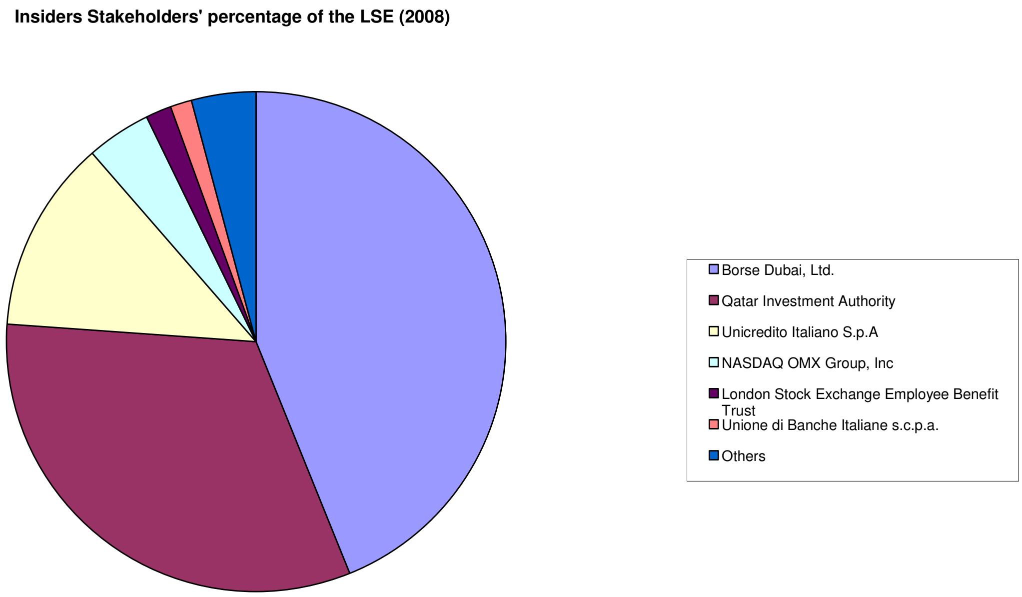


Exhibit N

The graphs show the composition of the Insiders Stakeholders of the NYSE Euronext, in 2006 and 2008, respectively. Source: Reuters Knowledge.