EUROPEAN STOCK MARKET INTEGRATION
AND
ECONOMIC GROWTH: A THEORETICAL
PERSPECTIVE

By

Anna Vasila

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Abstract

This theoretical approach investigates the effects of stock market integration on the process of economic growth in the countries of European Union. If European stock markets have become more integrated with world capital markets and especially US markets, we would expect to see them play a fundamental role on the development of European financial sector and promote economic growth. More integrated and liquid European equity markets make investment less risky and easier of access because they allow investors to acquire equity and sell it quickly and cheaply as soon as they need immediate access to their savings. At the same time, companies enjoy permanent access to capital raised through equity issues. More liquid and deep European stock markets improve resource allocation by facilitating longer-term, more profitable investments and enhance prospects for growth in the wider region of Europe and in every member-country, including Greece.

1. Introduction

One of the most enduring debates in finance during the last decade is whether stock market integration causes economic growth or whether increased economic growth is a consequence of financial development. This issue had been extensively studied nearly three decades ago by Shaw (1973) and McKinnon (1973), who resulted in significant evidence that financial development promotes economic growth, mainly through a raise in the level of saving and investment. Their ‘financial liberalisation’ thesis argued that government restrictions on the financial system restrain the quantity and quality of investment.

Goldsmith (1969) reported a significant relationship between the level of financial development, defined as intermediary assets divided by GDP and economic growth. A number of subsequent studies have used the growth regression framework in which, the average growth rate in per capita output across countries is regressed on a set of variables controlling for initial conditions and country characteristics as well as measures of financial market development [King and Levine (1993a), Atje and Jovanovic (1993), Levine and Zervos (1996), Harris (1997) and Levine and Zervos (1998)]. Also Asteriou and Price (2000), looking for evidence for the role of financial development in the UK growth process, found that the causal direction runs from the

* PhD candidate, University of Athens, Department of Economic Sciences, 5 Stadiou str., 10562, Athens, Greece, Tel.0030-210-3689374, 0030-210-3225542, Fax. 0030-210-3225542, Email: avasila@econ.uoa.gr
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development of the financial sector to the real sector development (measured by real GDP per capita).

All of the above studies deal with issues of causality and unmeasured cross country heterogeneity in factors such as saving rates that may cause higher growth rates and greater financial sector development (Caselli et. al, 1996). A number of different techniques have been adopted to investigate these issues, such as (a) initial values of financial variables (King and Levine, 1993), (b) instrumental variables (Harris, 1997) and, (c) cross-industry variations in growth that should be not susceptible to country specific factors [Demirguc-Kunt and Maksimovic (1996) and Rajan and Zingales (1998)].

Granger causality tests have been widely used in studies of financial markets in order to indicate the causal direction that characterizes financial development and economic growth. The same technique has been used in several studies of the determinants of economic growth including government expenditures (Conte and Darrat, 1988); price stability (Darrat and Lopez, 1989); money supply (Hess and Porter, 1993); savings (Carroll and Weil, 1994) and exports [(Jin and Yu, 1995), (Rahman and Mustafa, 1997).

A more difficult question arises with respect to whether the forward-looking nature of stock prices could be driving apparent causality between stock market and growth. Current stock market prices should represent the present discounted value of future profits. In an efficient equity market, future growth rates will, therefore, be reflected in initial prices (Filer, Hanousek and Campos, 1999). This argues for using market capitalisation and liquidity rates, especially turnover (value of trades in the stock exchange over market capitalisation) as the primary measures of development, purging the spurious causality effect because higher prices in anticipation of greater growth would affect both the numerator and the denominator of the ratio.

In summary, a large literature emphasises the positive influence of the development of a country’s financial sector on the level and the rate of economic growth. The argument is that the services that a well-functioning financial sector provides, such as efficient capital allocation, lower transaction costs and easier access to world capital markets for firms and individual investors, have a supportive influence on the rate of economic growth. Section 1, in this paper, is referring to the way that stock markets influence economic growth. In Section 2, there is an overview of the most important models that examine the impact of stock markets integration to the economic growth of a country. Section 3 describes the present picture of European stock exchanges and, finally, Section 4 is referring to the evolution of Athens Stock Exchange (ASE) during last decade.
2. The contribution of stock markets to economic growth

There is a lot of worldwide discussion about the relation of the stock markets and the economic growth of a country. It is very interesting to see in what way a stock market can help or even speed up the economic growth of a country. The main reasons for this phenomenon are that stock exchanges:

- Increase liquidity and constitutes a mechanism for diversification of risk (risk management device), therefore making market participants more prone to invest.
- Improve the flow of information about activities of companies, which results to the improvement of corporate control and eventually to better corporate governance. In other words, the organisational and managerial structure of the corporations becomes more effective.
- Give the possibility to society’s savings to direct to alternative investment ways that are more productive. Existence of an exchange increases the stock of funding available for riskier investment projects prerequisite to economic growth. In general, it can be said that stock markets contribute to both capital accumulation and technological innovation.

3. The globalisation of capital markets

Stock exchanges should be harmonised with the international rules and regulations. The current trend is the globalisation of stock exchanges either in terms of alliances or of electronic links between them. The liberation of capital movement is also an important factor for future development of the financial markets. They should focus in a specific client target group either institutional or retail investors. Thus, it is very important to adopt the right strategy and formulate the appropriate rules in order to attract the targets investors’ group. Also, stock exchanges should establish sound supervisory structures, like, for example, clearness and transparency. It is very important for the European stock exchanges to take into consideration the work already made in this field by the respective U.S. markets.

3.1. The conditions of stock markets integration

Globalisation can be defined as the integration of capital markets throughout the world into an international capital market to which all participants (investors, financial institutions, exchanges, listed companies, lenders, borrowers etc) have an easy access in it and where prices are determined by the international demand and supply.
The factors that led to the acceleration of the integration process are:

- **Deregulation or liberalisation of markets and the activities of market participants.**
  Global competition has forced governments to deregulate (or liberalise) various aspects of their financial markets so that their financial enterprises can compete effectively around the world. More specifically, for the capital markets sector, the deregulation is consisted of two parts:
  1. Markets deregulation (i.e. the minimisation of the capital market rules). Market deregulation is consisted of measures that can drive through the liberation of capital markets and strengthen the competition at an international level. For example, measures upon transaction control investments in foreign countries, taxation rules, rules of a stock exchange etc.
  2. Institutional deregulation (i.e. the minimisation of financial institutes’ rules). Institutional deregulation consists of measures for raising the competitiveness between various financial institutions. For example, measures for the reduction of some of the banks’ privileges, abolition of separating lines among financial institutions, etc.

- **Technological advance.** The vast development in the areas of information and telecommunication networks technology is helping to overcome the obstacles of cross border trading by making it simple, fast, cheap, reliable and with no need for many intermediaries.

- **Economies of scale.** As with any industrial and commercial environment, economies of scale apply to the operation of stock markets. The bigger the markets, the more cost-effective they tend to be. This tendency is translated into lower costs of trading investors. Comparative costs of share dealing show that the corresponding fees in US are almost three times lower on average than UK.

- **Changing equity cultures.** Changing equity cultures is another reason for globalisation. Private investors are on the increase worldwide. It has been estimates that private investors hold some 50% of European stocks.

- **The Euro.** With the introduction of the common currency, stock markets are now able to quote prices in a single currency. This also makes clearing and settlement easier leading to integration.

- **International diversification of portfolios.** International diversification reduces significantly the systematic risk of a portfolio. The systematic risk is associated with the national market as a whole and cannot be diversified at a national level.

- **The attempt of capital markets to open their borders.** This fact helps international investors to attract new capital.
However, the steps toward integration are not always easy. There are numerous obstacles and difficulties. The major obstacles are related to the following six reasons:

- Governments and other national authorities do not want to lose a part of their control over financial markets.
- Capital markets, especially smaller ones, are sceptical to merge or co-operate with others due to their fear that they will lose a significant part of their existing market.
- The lack of trust between both parties for co-operation.
- Differences between national regulations, procedures and cultures.
- Small- or mid-capitalisation listed companies that are ‘globalisation avert’ for many reasons.
- Various political reasons.

### 3.2. Stock exchange quality characteristics

In order for a stock exchange to be able to support the economic growth of a country, it is very important to follow some quality characteristics. Therefore, the following issues must be addressed when we talk about a competitive stock exchange:

- **Efficiency**: The extent to which information available each time to the public is reflected to current prices. It refers to the fairness of prices but to the extent that investors have equal chance to form the correct expectations.

- **Liquidity**: The degree to which a market is liquid, meaning how easily trades are conducted in that market or, in other words, how easy it is to convert a security into cash. Liquidity components are the following:
  1. **Depth**: The size of a financial investment that can be traded at a given price.
  2. **Breadth**: The difference between the fair price and the actual traded price. It is usually measured by the width of the Bid/Offer spread that is the difference between the lowest sell price and the highest buy price. A high spread suggests an ineffective price discovery process because it implies that buyers have a very different opinion from sellers, therefore it is difficult to make trades.
  3. **Resilience**: The spread with which prices return to their initial “equilibrium” level after they change, in response to a trade by investors. This formulates a quality characteristic because investors can have at any time the “fair” value of a security.

- **Transparency**: The concept of transparency in a stock market includes the following elements:
  1. **Fairness**: The markets must be free from fraud and manipulation. Thus adequate mechanism for promoting fidelity between buy and sell side must exist.
2. Information Dissemination: A cornerstone prerequisite for the good function of the stock exchange.

3. Simplicity: The rules and structures of the stock exchange must be as simple as possible according to the targets aimed at.

4. Equal Treatment: Different investors and companies, given their different features, must be equally treated regarding the access to the stock exchange and its markets.

5. Stock dispersion: Adequate stock dispersion ensures a large number of trading parties and therefore, the more effective price determination and a lower probability of manipulation.

6. Inside information: Access and use of private (or inside) information is strictly prohibited in order to avoid price manipulations.

7. Protection: The means by which investors are protected from market manipulations, inefficiencies and failures. Especially, kinds of services provided are important, both in terms of offering protection for the less aware and of offering facilities to encourage participation from individuals.

- Cost-Efficiency: Transaction costs include all the commissions, fees and operating costs which have to be paid by a customer involved in a deal. These costs increase with the number of parties involved and the inefficiency of the procedures (e.g. fax is more expensive and takes more time than e-mail), and with the costs of the trading systems involved.

- Market Access: Who can see the trading bids and asks and who can actually trade. Viewing is available to all market participants but access is limited to stock exchange members.

- Orderly Markets: Reduced price volatility is a prerequisite in order to boost confidence in stock market institutions and to avoid excessive levels of risk. The management of periods of turbulence and protection of investors in periods of potential market disorder is a crucial point.

- Innovation: Innovation in products, rules and technology formulates a quality characteristic because it strengthens the competitive advantage of a stock exchange.

- Effective use of technology: A stock exchange should effectively use the advanced technology available in order to ensure high performance.

Even though the above difficulties exist, integration seems to be the future in the worldwide financial sector. The major consequences of capital markets integration will be the vast and inevitable rise of competitiveness in all levels (countries, financial institutions, stock exchanges), a new and common financial regulatory framework for all the countries in European Union, mergers and co-operations between stock exchanges, 24-hour trading, the dominance of
large stock exchanges against the smaller ones and finally, the possibility of lower levels of investor protection.

3.3. Legal structure of European stock exchanges

Historically, exchanges had two kinds of ownership structures: exchanges owned by the state or exchanges owned by their members. The main changes of ownership structure took place in Europe where the privatisation of stock exchanges started a few years ago. In Europe the percentage of members in stock exchanges decreased significantly, while other institutions (like banks, insurance companies, pension funds etc) saw their part in ownership increasing. In recent years, a number of stock exchanges have changed their legal organisation in order to be more flexible and to compete better with other international markets. The main reason that forces stock exchanges to alter their legal structure is the economical integration, which was accelerated in the last years.

Furthermore, the heavy investment programs are necessary for the continuous development of technology and the modernisation of markets that require new amounts of capital. In order to attract this new capital, many stock exchanges have decided to go public (demutualisation of stock exchanges). Recent examples include Deutsche Boerse, which was floated on 5th of February 2001 and Euronext, which was decided to go public on May 2001, while previous stock exchanges that had already gone public were the Italian, the Amsterdam Stock Exchange and Stockholm. Athens Stock Exchange (ASE) was listed on its main market in August 2001. Finally, London Stock Exchange (LSE) announced its intention to go public by the end of 2001.

The change to the legal structure also responds to the objective of enlarging the stock exchanges’ governance structure by including a portion of outside ownership as opposed to inside ownership represented by the members.

4. Stock market integration and economic growth

4.1. Impact on economic development

Recently there has been a significant revival of interest concerning the relationship between financial development and growth. New studies have provided theoretical and empirical underpinning that earlier research lacked: financial development can be shown to have not only level effects, but also growth effects. Two of the most substantial works is that of Levine and Zervos (1998) and Rajan and Zingales (1998).
In their article Levine and Zervos (1996, 1998a, 1998b) find that liquidity rates in stock markets, as it is calculated by the ratio of Value of Trades to Gross Domestic Product (GDP) and by Turnover (the ratio of Value of Trades to the percentage of capitalization in a stock exchange), as well as the level of stock markets’ integration with the world capital markets (Korajczyk, 1996) are positive and significantly correlated with present and future rates of economic growth, capital accumulation and an increase of productivity growth. The increase of liquidity rates in stock markets constitutes an important indication of the increase of real per capita income and accumulation of natural capital.

Stock markets may affect economic activity through the creation of liquidity. Liquid equity markets make investment less risky-and, as a consequence, more attractive- because they allow savers to acquire an equity and to sell it quickly and cheaply, if they need immediate access to their savings or want to alter their portfolios. At the same time, firms enjoy permanent access to capital raised through equity issues. By facilitating longer-term, more profitable investments, liquid markets improve the allocation of capital and enhance prospects for long-term economic growth. Also, by making investment less risky and more profitable, stock market liquidity can also lead to more investment. In other words, investors will come in markets if they can easily leave.

Levine and Zervos consider three measures of market liquidity. The first commonly used measure is the total value of shares traded on a country’s stock exchange as a share of GDP. Averaged over a long time, the value of equity transactions as a share of national output is likely to vary with the ease of trading, meaning that if it is very costly or risky to invest, there will not be much investing. It is interesting to mention that countries that had relatively liquid stock markets in 1976 (Hong Kong, Australia, Canada, United Kingdom, United States, Japan, Singapore, Taiwan) in 1976, tended to grow much faster over the next 20 years than countries with very illiquid markets (Argentina, Belgium, Spain, Luxemburg, Greece, Sweden).

The second measure of liquidity is the value of traded shares as a percentage of total market capitalisation (the value of stocks listed on an exchange). This turnover ratio measures trading relative to the size of the stock market. Finally, the third measure is the value-traded-ratio divided by stock price volatility. Liquid markets should be able to handle heavy trading without large price swings.

The basic conclusion that emerges from the statistical work of Levine and Zervos is that stock market development explains future economic growth. Multiple regression procedures suggest that stock market liquidity helps forecast economic growth even after controlling for a variety of
non-financial, economic, social, political and policy factors that may affect economic growth and, even after using instrumental variable estimation procedures, various periods and different country samples. Empirically, it is not the size of volatility that matters for growth but the ease with which shares can be traded.

4.2. Financial dependence and growth

The study of Rajan and Zingales (1998) led to the conclusion that financial development facilitates economic enlargement through the reduction of cost of external financing of companies. Specifically, they indicate that industrial sectors of economy, that are more depended on external sources of financing are much more developed in countries with more developed financial sectors. In other words, it is implied that, ceteris paribus, an industry such as Plastic Products, which is technologically more dependent on external funding, should develop relatively faster than Pottery, which requires little external finance, in countries that are more financially developed. To the extent that financial-market development (or the lack of it) is determined by historical accident or government regulation, the existence of a well-developed market in a certain country represents a source of comparative advantage for that country in industries that are more dependent on external finance.

The paper suggests that financial development may play a particularly beneficial in the rise of new firms. If new firms are considered to be the source of innovative ideas, then financial development can enhance innovation and thus, promote growth in indirect ways. Similarly, the cost imposed by a lack of financial development can also be a factor in determining the size composition of an industry as well as its concentration. This suggests that an additional indirect channel through which financial development could influence economic growth is by disproportionately improving the prospects of young firms. If these are typically innovators, then in a way we face Schumpeterian “creative destruction” that would not even get initiated in countries with less-developed markets.

4.3. Measures of stock market integration

Numerous papers test whether emerging stock markets are integrated into the world markets [Errunza and Losq, 1989; Bekaert, 1995; Harvey, 1995]. To examine whether integration is important for economic development requires country-specific measures of the degree of integration. If markets are financially integrated, capital should flow across borders to equalise the price of risk. However, if the markets are not integrated, because of possible capital controls or other constraints, then the price of risk may differ across markets. Korajczyk (1996) estimates
deviations from the law of one price of risk using the International Arbitrage Pricing Model (IAPT). He finds that market segmentation is larger for emerging countries than developed countries. Also market segmentation decreases through time for many countries, suggesting a reduction in the barriers to capital flows.

Using Korajczyk’s measure of market integration, as well as measures of stock market size, liquidity, volatility, concentration and institutional development for forty-four developed and emerging markets from 1986 to 1993, Demirguc-Kunt and Levine (1996) find that large markets tend to be less volatile, more liquid and less concentrated in a few stocks than smaller markets. In addition, internationally integrated markets tend to be less volatile. Furthermore, institutionally developed markets with strong information disclosure laws, international accounting standards and unrestricted capital flows, have larger and more liquid markets.

Levine and Zervos (1995) show that countries, which liberalised restrictions on capital and dividend flows, showed a market improvement in the functioning of their stock exchanges. Interestingly, while the results show that price volatility rises immediately after capital control liberalisation, the analysis of Demirguc-Kunt and Levine implies that, in the long term, stock return volatility is lower in countries with more open capital markets. They also examine the interaction between stock market development and financial intermediaries. They find that as countries grow and reach higher levels of income, stock markets and non-bank financial institutions develop rapidly. As stock markets and non-banks grow in importance, banks represent a correspondingly smaller share of the overall financial system. In other words, they find that across countries, the level of stock market development is positively correlated with the development of financial intermediaries. Thus, stock markets and financial institutions are generally complements; they grow simultaneously.

5. The picture of European stock exchanges

The first steps towards the integration of European stock exchanges concerned institutional regulations, as the concession to financial institutions to operate outside the national borders and the enactment of common criteria for the investors’ protection. Many enterprises started operating in more than one countries of EU, even after collaborations with other foreign organizations or after mergers and acquisitions. The three basic factors that will finally determine the future of European stock exchanges will be the progress of sophisticated technology, the rising competition between the exchanges and the regulation harmonisation progress.
With the introduction of Euro, which increased the transparency of prices through their expression to a common unit of measurement and constituted a huge step to the integration process, investors inside and outside EU, consider the European capital market as a single market. However its present structure lacks against investors’ demands. European capital market is segmented with a lot of national stock exchanges and clearing houses, in contradiction of U.S. capital market where a lot fewer stock exchanges dominates and there is only one clearing house. This situation deters the effective exploitation of modern technology and investments for all the financial institutions of the market, as the volume of transactions does not have the critical size or latent productivity is being observed in the market (Greenwood and Jovanovic, 1999). In Europe there are more than 30 national stock exchanges, almost 12 different transaction systems and approximately 20 national and 2 international institutions of clearing and settlement that prevents the creation of an effective stock market in Euro zone. Because of the particularly restrictive institutional framework, national institutions dominate clearing and settlement. However, there is a great tendency for the development of a central co-contractor in the stock market in order to simplify financial management for those who participate in the market, to increase liquidity of transactions and to decrease the cost of clearing and settlement.

The great segmentation of European capital markets also appears from the existence of different prices that prevail for the same financial products that are being traded in different countries. It can also be seen from the different accounting standards existing between country-members, making the comparison between financial results of enterprises particularly difficult, as well as from the pension funds’ programs, which are limited in the national borders. As a result there is an increase in the cost of capital, which leads European firms to seek for new sources of capital in international stock exchanges.

Table 1 provides a more complete picture of the existing resemblance and differences that prevail in European capital markets and shows the difficulties of the unification process. We can observe a great variety of trading systems, in the platforms and in the technology used, hence also in their effectiveness. Transaction hours differ and this has consequences in the information flow between markets. Supervisory bodies are different and the way that surveillance is being held differs between stock exchanges. Clearing systems and tax arrangements are dissimilar and the same stands also for dividend and transaction issues.

The transparency of prices that the single currency involves and the liberalisation of capital markets that it is accompanied by the integration of stock markets are expected to minimise the differences at least in tax arrangements. There is significantly less variety in investment products and the time margins of settlement in each stock exchange.
Table 2 presents evidence about listing requirements in a stock exchange. For example, capitalisation rates, capitalisation rate as percentage of GDP of a country and statistics for the Value of Trades and liquidity rates of a market, which is the rate of Value of Trades in a particular market to the capitalisation rate of that market. In general terms, the listing requirements of new companies do not differ significantly between stock exchanges, as for example, the three-year operation of a company with published balance sheets and, the minimal dissemination of its shares that it is publicly held (25%). Other conditions differ between stock markets, like the minimal initial capital of a company required for its import in the stock exchange. Also, differences exist comparing to U.S. and Tokyo stock exchanges. The capitalisation rate of a market as percentage of GDP reflects how mature European stock markets are. In Table 2, we observe that the differences between countries are very significant and except some extreme cases like Austria (13,2%) and Switzerland (214,5%), the remainder European stock exchanges range between 41,3% for Oslo and 156% for Helsinki. The corresponding rate for Athens Stock Exchange is 71,1%. These percentages tend to decrease because of the bending tendencies of share prices after 2000.

As far as liquidity rates are concern, London Stock Exchange demonstrates the higher rate of 0,83%, followed by the Spanish stock exchange, Euronext and Stockholm with liquidity rates of 0,72%, 0,68% and 0,65%, respectively. Athens Stock Exchange demonstrates a liquidity rate of 0,18%. The higher the liquidity rate is, the more effective the market is and the diffusion of information in this.

The introduction of Euro together with the changes in the investment behavior acted catalytically in the European stock exchange integration. The increasing cross-border transactions led to the creation of a more unified structure of European capital markets. Also the collection of information in the disposition of fewer but more powerful investment companies transmits power from stock exchanges to other participants of the market. Finally, technological improvements concerning the easier access of a capital market allow henceforth the easier transportation of capital liquidity from one market to the other and also the implementation of cheaper transactions.

European Stock exchanges seek to become more competitive in the new environment, establishing European platforms of products, strengthening the need for unified structures, for the reduction of cost through the use of common technology in transaction systems, clearing and settlement. However, each stock exchange maintains its own directions for the effective
operation of its market, transparency, safety, reliability and information of its investors, promotion of new products, differentiation of its revenues and rationalisation of its operation.

Today sovereign poles in European and international level are the London Stock Exchange, Euronext, Deutsche Boerse, New York Stock Exchange and NASDAQ. Each of them has traced its strategy regarding technological development and other interconnections, the mix of services that offer, the attraction of other investment companies, its emergence as a financial centre in its area and its specialisation. Each one has positive principles in terms of market, capitalisation, vertical or horizontal integration, product mix, technology and specialisation subjects but also points of skepticism on collaboration issues.

Medium and small stock exchanges seem to chose two different strategic ways concerning their future: Some exchanges are trying to unite all the other exchanges in their common geographical region. Stockholm Stock Exchange, for example, tries to be the larger market in the Scandinavian region through NOREX (Nordic Exchanges). NOREX Exchanges are trying to hold their blue chips into their countries by facilitating access for trading and clearing and settlement to foreign investors. Other stock exchanges prefer to merge in large alliances finding the best conditions for them. They have two targets a) they try to be compatible with the international standards of trading and settlement and b) they try to become larger at least into their own country in order to achieve better conditions in the case of merging with other exchanges. Finally, smaller stock exchanges try to protect themselves from the competition of the larger markets, which can be realised in three ways:

- Direct listing of a blue chip company in a foreign large stock exchange.
- Dual listing of a blue chip company in a foreign large stock exchange.
- Takeover of the listed companies from large multinational companies.

On the other hand there are alternative electronic systems of trading. They are created with the initiative of institutional investors and stock exchanges (as Virt - X and Tradepoint) and technological institutes (GL - Trade). They provide the appropriate conditions of membership and offer lower transaction costs from the traditional stock exchanges. Participants in them are either members of official stock exchanges or collaborators with some of their members. They maintain book of commands, they operate through matching orders and allocate internal clearing and settlement, where this is feasible. They absorb liquidity from the traditional stock exchanges, they offer quick order satisfaction, absence of intervention and investment anonymity that are important factors for investors which investigate for the cheapest transactions.
5.1. The evolution of Athens Stock Exchange

In the above analysis it was presented the most important trends in the European stock markets. The Greek stock market has succeeded in a rather short period of time to provide remarkable results concerning its development and maturity process. In order to converge with the other developed European capital markets, new institutions, products and processes were prepared and incorporated in its internal operation. Already, it is expected the implementation of four important measures (the qualitative and organisational upgrade of editing, segregation of competences between ASE and Capital Market Commission, transition in the regime of International Accounting Standards, code of Stock Exchange legislation) that are going to complete the institutional armouring of the market.

The latest years were realised important steps promoting significant reforms and energies. The most important are:

- The creation of the Parallel Market
- The dematerialisation of securities
- The change in the legal form of Athens Stock Exchange, that functions henceforth as Limited Liability Company
- The introduction of derivative Stock Exchange products
- The reduction of transactions cost
- The creation of electronic secondary market of titles of fixed income
- The development of an integrated electronic system of transactions (OASHS)
- The perceptible improvement of transparency, the control of the market and the dissemination of information
- The strengthening of the market surveillance
- The collaboration with Financial Times for the creation of Common Indicators FTSE / ASE and the promotion of ASE, particularly abroad.

The double effect of the appearance of large economic unions, particularly after the introduction of the single currency and mainly the free floating of capital worldwide, force the small regional markets to lose progressively great amounts of liquidity rates, because of the flight of domestic capital that is invested in bigger markets or via repurchases of domestic companies from foreigner companies and parallel listing in bigger stock exchanges.

An important reason for the decrease of liquidity in the running period is owed in the reduction of securities prices and in the unwillingness of investors to contract transactions. The economic situation is unfavourable for all markets worldwide (reduction of transactions 70-80%) and it is
estimated to last at least as long as the economic crisis. The basic problem of liquidity in the domestic market constitutes up most priority for the Greek capital market. In the recent years the modernising interventions, the important reduction of transactions and clearing costs, the intense extraversion and the organisational recomposition for the introduction of the ASE Group share for trading, aimed in the preparation for some strategic collaboration. In the direct plans of the Greek stock exchange it is included the creation of new markets and the introduction of new products and processes, the further reduction of transactions cost and clearing cost, as well as the reduction of the systemic risk of the market and, finally, the intense extraversion for the increase of liquidity and the achievement of alliances, even with the neighbouring countries or with the developed western markets.

In the frame of development of technological infrastructure of ASE a lot of work is being realised:

- Basic infrastructure and improvement of provided services. The main work of this category is:
  - The upgrade and extension of Network of Stock Exchange Transactions
  - The ASE - HUB.
- Various projects that will make the Greek market more accessible and compatible with the developed European stock markets. The more important achievements in this category are:
  - The integration of company Order Data Link (ODL)
  - The implementation of the second phase of the development of OASHS (Integrated System for Automatic Electronic Trading).
  - The development of SAT (System of Immaterial Securities).

Finally, the aiming collaboration with neighbouring markets is mutually advantageous. The Balkan stock markets are still in infantile stage and their absolute priority is to install functional central systems of clearing and transactions and to improve their organisation, the provided information and their transparency. The Greek stock exchange is willing to contribute in this effort, estimating that its leading role in the area would help realise its developing projects.

6. Conclusion

National stock exchanges are led in various forms of alliances and mergers with other financial institutions in order to increase their effectiveness and their competitiveness in an international level. Both results are positive for investors and for the economy in general. First, investors have the possibility of securities trading, easier and with lower cost. Second, for enterprises, profit
lies in the fast pumping of capital from the markets. Each movement and initiative is not an easy matter, mainly because it should create and not remove value from a stock market. Any collaboration – alliance – should ensure the existence of remote members in a bi-directional relation. Also should provide networking of the stock exchange through information suppliers, exploitation of its comparative advantage, effective structure of operation of local market and efficient listed companies that direct local and international demand to national shares, maintaining the existed liquidity and strengthening national economy.

Besides the several talks about future mergers and co-operations, each European stock exchange tries hard to raise its portion of the European capital market pie. This raise could be very critical for each exchange, especially these days, where the economical integration is a reality. The stronger a stock exchange is, the better its position will be at the negotiations with the other exchanges for future alliances.

From all the above, the question of how the future of the European stock exchanges will be towards the globalisation opportunities and threats, still remains. However, one think is certain for now: The last seven years the European capital markets are going through a very important transitional period. There is a lot of interest and actions around Europe that concern the future of stock markets and it is a common belief that the day that things will get a more permanent look is not far away.
7. Bibliography

14) FESE, Federation of European Securities Exchanges, www.fese.org


## APPENDIX

### Table 1. Institutional data of European stock exchanges

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Types of Securities Traded</th>
<th>Trading System</th>
<th>Trading Hours</th>
<th>Supervisory Body</th>
<th>Clearing &amp; Settlement Organization</th>
<th>Settlement Cycle</th>
<th>Taxes on Dividends &amp; Capital Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens</td>
<td>(1) Shares, Rights</td>
<td>Integrated System for Electronic Trading (Screen Based)</td>
<td>11:00 – 16:00</td>
<td>(1-3) Capital Market Commission</td>
<td>T+3</td>
<td>Capital Gains: None</td>
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<tr>
<td></td>
<td>(2) Bonds</td>
<td></td>
<td>10:00 – 14:00</td>
<td>(2) Minister of National Economy</td>
<td>T+3</td>
<td>Dividends: None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Futures and Options</td>
<td>SAKESS (electronic trading)</td>
<td>09:45 – 15:30</td>
<td>(3) Derivatives Exchange Clearing House (ADECH)</td>
<td>T+1</td>
<td>Non-Residents: T-bills: 10%, Bonds: 15%</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>CLICK (telephone trading)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dividends: 10% - 15%</td>
</tr>
<tr>
<td>Copenhagen Stock Exchange</td>
<td>(1) Bonds</td>
<td>SAKESS (electronic trading)</td>
<td>09:00 – 17:00</td>
<td>Danish Financial Supervisory Authority and Danish Securities Council</td>
<td>T+3</td>
<td>Dividends: 30 - 40% tax</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Equity Futures and Option</td>
<td>CLICK (telephone trading)</td>
<td></td>
<td></td>
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<td></td>
<td>Capital Gains: Less than 3 years held: 50-56% tax</td>
</tr>
<tr>
<td></td>
<td>(3) Shares, Warrants</td>
<td>SAKESS (electronic trading)</td>
<td></td>
<td></td>
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<td></td>
<td>More than 3 years held: 30-40%</td>
</tr>
<tr>
<td>Deutsche Boerse AG</td>
<td>Shares, Bonds, Warrants</td>
<td>Floor Trading (Xontro)/ Xtra (Screen-based)</td>
<td>09:00 – 20:00</td>
<td>The market supervisory of German Federal securities supervisory body (BaFin)</td>
<td>T+2</td>
<td>Dividends: 15% or 25%</td>
<td></td>
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<tr>
<td></td>
<td>Exchange Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Interests: 15%</td>
</tr>
<tr>
<td>Euronext Amsterdam</td>
<td>Equities, Bonds, ETFs</td>
<td>NSC-VE</td>
<td>09:00 – 17:30</td>
<td>Securities Board of the Netherlands (AFM)</td>
<td>T+3</td>
<td>Residents: 1.2% capital tax yearly on capital=17,600 euro</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Investment Funds</td>
<td>NSC-VW SWITCH</td>
<td></td>
<td>Clearing: Clearnet SA</td>
<td>Settlement: Negocif</td>
<td></td>
<td>Non-Residents: depending on tax treaties</td>
</tr>
<tr>
<td>Euronext Brussels</td>
<td>Equities, Warrants, Bonds, Derivatives</td>
<td>NSC-VE</td>
<td>09:00 – 17:30</td>
<td>Banking and Finance Commission, Euronext Brussels Market Authority</td>
<td>T+3</td>
<td>Dividends: 15% or 25%</td>
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<tr>
<td></td>
<td></td>
<td>NSC-VW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Interests: 15%</td>
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<tr>
<td></td>
<td></td>
<td>NSC-VW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No tax on Capital Gains</td>
</tr>
<tr>
<td>Euronext Lisbon</td>
<td>Equities, Bonds, Rights, Warrants, EFTs</td>
<td>Continuous trading system (LIST)</td>
<td>08:00 – 16:30</td>
<td>Securities Market Commission (CMVM)</td>
<td>T+3</td>
<td>Dividends: 12% or 40% for residents, non-residents: exception</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivatives</td>
<td>SEND (screen-based)</td>
<td>16:45 – 17:15</td>
<td>Financial Settlement: Central Bank</td>
<td></td>
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</tr>
<tr>
<td>Euronext Paris</td>
<td>Equities, Warrants, Bonds, Derivatives</td>
<td>NSC-VE</td>
<td>09:00 – 17:30</td>
<td>CMF/ COB</td>
<td>T+3</td>
<td>Dividends: 12% or 40% for residents, non-residents: exception</td>
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<td></td>
<td></td>
<td>NSC-VW</td>
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<td></td>
<td>NSC-VD</td>
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</tr>
<tr>
<td>Helsinki Exchanges</td>
<td>Shares, Rights, Bonds, Warrants</td>
<td>HETI (for shares, screen-based)</td>
<td>09:00 – 19:00</td>
<td>Financial Supervisory Authority</td>
<td>T+3</td>
<td>Dividends: 0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivatives</td>
<td>SOMilInfo</td>
<td>CET</td>
<td>Helsinki Securities and Derivatives Exchange, Clearinghouse Ltd.</td>
<td></td>
<td>Interests: 29% for capital gains</td>
<td></td>
</tr>
<tr>
<td>Irish Stock Exchange</td>
<td>Equities, Warrants, Bonds, Preference shares</td>
<td>ISE-XETRA</td>
<td>07:50 – 16:00</td>
<td>Central Bank Of Ireland</td>
<td>T+3</td>
<td>Taxed under Income &amp; Corporation tax regime</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>CREST (Equities)</td>
<td></td>
<td></td>
<td>Dividend tax at 24% of all Irish registered companies</td>
</tr>
<tr>
<td>Italian Exchange</td>
<td>Shares, Warrants, Rights, Bonds</td>
<td>MTA Liquid shares</td>
<td>8:00-17:30</td>
<td>Cassa di Compensazione e Garanzia; Monte Titoli</td>
<td>T+3</td>
<td>Capital gains: 12.5% for residents, foreign investors are exempt from capital taxation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government &amp; non-Government Bonds</td>
<td>MOT Less liquid shares</td>
<td>8:00 -15:30</td>
<td></td>
<td></td>
<td></td>
<td>Dividends: Domestic investors: 12.5%</td>
</tr>
<tr>
<td></td>
<td>Equity Derivatives</td>
<td>IDEM 9:15-17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Foreign investors: 27%</td>
</tr>
<tr>
<td>London Stock Exchange</td>
<td>UK &amp; International Equities, Options, Gifts and Fixed Interest</td>
<td>SETS, SEAG, SEATS Plus (inc AIM), SEAG International.</td>
<td>8:00-16:35</td>
<td>Financial Services Authority (FSA)</td>
<td>T+3</td>
<td>Dependent on taxpayer- at taxpayer's marginal rate of taxation</td>
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<td></td>
<td></td>
<td></td>
<td>8:00-16:30</td>
<td>CREST/ Euroclear</td>
<td>(?+1 for Gifts and Fixed Interest)</td>
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<td></td>
<td></td>
<td></td>
<td>8:00-16:30</td>
<td>Cede/Local Systems</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Bourse de Luxembourg</td>
<td>Shares, Warrants, Bonds</td>
<td>10:00 – 16:00</td>
<td>Commission for the Supervision of the Financial Sector</td>
<td>T+3</td>
<td>Withholding tax: 25% on dividends paid by domestic companies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>International Clearing Systems recognized by the Luxembourg Stock Exchange</td>
<td></td>
<td>On bonds (domestic and International): none</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- **(1)** Stocks, Bonds, Warrants, Derivatives
- **(2)** Equities, Bonds, Rights, Options
- **(3)** Futures and Options
<table>
<thead>
<tr>
<th>Stock exchange</th>
<th>Products</th>
<th>Trading hours</th>
<th>Regulatory body</th>
<th>Settlement</th>
<th>Dividends</th>
<th>Capital gains</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bolsa de Madrid</strong></td>
<td>Shares, Fixed Income, Warrants, Public Debt, Certificates</td>
<td>SIBE (screen-based)</td>
<td>C.N.M.V. (Comision Nacional del Mercado de Valores)</td>
<td>T+3</td>
<td>20% Withholding tax for residents and non-residents investors.</td>
<td></td>
</tr>
<tr>
<td><strong>Oslo Bors</strong></td>
<td>Shares, Warrants, Bonds Options and Futures</td>
<td>SAXESS (screen-based) OM’s (screen-based)</td>
<td>Oslo Bors, The Banking, Insurance and Security Commission of Norway</td>
<td>T+3</td>
<td>Residents: no tax Non-Residents: 15-25%</td>
<td>Residents: 28% Non-Residents: none</td>
</tr>
<tr>
<td><strong>Stockholms Borsen</strong></td>
<td>Equities, Warrants, Sse-bonds, ETFs, Rights Derivatives</td>
<td>SAXESS CLICK</td>
<td>Stockholms Borsen (SB) &amp; Swedish Financial Supervisory Authority</td>
<td>T+3</td>
<td>0-30% withholding tax on dividends &amp; interest paid on SEK denominated securities to non-residents. Tax reductions depend on bilateral tax treaties.</td>
<td></td>
</tr>
<tr>
<td><strong>SWX Swiss Exchange</strong></td>
<td>Equity products, Rights, Warrants, Bonds, Options</td>
<td>Fully integrated electronic trading system (EBS)</td>
<td>SWX Swiss Exchange/ Swiss Federal Banking Commission SIS Segalntersettle</td>
<td>T+3</td>
<td>Withholding tax: 35% (effective double taxation agreements) No capital gains tax</td>
<td></td>
</tr>
<tr>
<td><strong>Wiener Borse</strong></td>
<td>Shares, Equity instruments, Bonds Warrants Options, Futures</td>
<td>Xetra (screen-based) OM (screen-based)</td>
<td>The Financial Market Authority (FMA) OeKB (Österreichische KontrollBank AG) OTOB Clearing</td>
<td>T+3 T+1</td>
<td>25% for resident (for non-resident)</td>
<td></td>
</tr>
</tbody>
</table>

Source: FIBV
### Table 2. Market statistics 2001 of European and international in million USD$  

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Europe</strong></td>
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</tr>
<tr>
<td><strong>ATHENS (TSV)</strong></td>
<td>1876</td>
<td>• Minimum capital of Pta.200 million (12 million euro)</td>
<td>83.4</td>
<td>117.2</td>
<td>71.1%</td>
<td>96.0%</td>
<td>150.5</td>
<td>0.18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Three years annual accounts published</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• At least 25% of shares placed with members to the public</td>
<td></td>
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</tr>
<tr>
<td><strong>COPENHAGEN (REV)</strong></td>
<td>1871</td>
<td>• Activity not less than 3 years</td>
<td>85.1</td>
<td>161.5</td>
<td>52.6%</td>
<td>68.9%</td>
<td>290.6</td>
<td>0.34%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shares must be distributed on not less than 500 shareholders</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>• The company’s shares must be freely negotiable</td>
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</tr>
<tr>
<td><strong>DEUTSCHE BOERSE (TSV)</strong></td>
<td>1585</td>
<td>• Minimum portion of shares widely held: 25%</td>
<td>1 071.7</td>
<td>1 853.4</td>
<td>57.8%</td>
<td>67.8%</td>
<td>5 688.2</td>
<td>0.53%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Company’s minimum age: 3 years</td>
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<td></td>
<td></td>
<td>• Company’s equity value a minimum of EUR 1.25 million</td>
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<tr>
<td><strong>Euronext (REV)</strong></td>
<td>1999</td>
<td><strong>Amsterdam:</strong></td>
<td>1 843.5</td>
<td>1 921.3**</td>
<td>95%</td>
<td>115.1%</td>
<td>12 518.9</td>
<td>0.68%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimum track record of three years</td>
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<tr>
<td></td>
<td></td>
<td>• At least 3 profitable financial year</td>
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<td></td>
<td></td>
<td>• At least 10% of shares placed with members to the public</td>
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<td></td>
<td><strong>Brussels:</strong></td>
<td>1 843.5</td>
<td>1 921.3**</td>
<td>95%</td>
<td>115.1%</td>
<td>12 518.9</td>
<td>0.68%</td>
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<tr>
<td></td>
<td></td>
<td>• Market capitalization: EUR15 m.</td>
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<tr>
<td></td>
<td></td>
<td>• Three years audited annual accounts published</td>
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<tr>
<td></td>
<td></td>
<td>• Shares in public hands must represent at least EUR 5 million</td>
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<tr>
<td></td>
<td></td>
<td><strong>Paris:</strong></td>
<td>1 843.5</td>
<td>1 921.3**</td>
<td>95%</td>
<td>115.1%</td>
<td>12 518.9</td>
<td>0.68%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• At least 25% of shares placed with members to the public</td>
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<tr>
<td></td>
<td></td>
<td>• Three years annual accounts published</td>
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<tr>
<td><strong>HELSINKI (TSV)</strong></td>
<td>1912</td>
<td>• At least 25% of shares placed with members to the public and 10% of its votes</td>
<td>190.4</td>
<td>121.7</td>
<td>156%</td>
<td>242.1%</td>
<td>729.2</td>
<td>0.38%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Three years annual accounts published</td>
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<tr>
<td></td>
<td></td>
<td>• Market value 35 million euro</td>
<td></td>
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<tr>
<td><strong>IRISH (TSV)</strong></td>
<td>N/A</td>
<td>• Three years audited annual accounts published</td>
<td>75.2</td>
<td>102.4</td>
<td>73%</td>
<td>85.9%</td>
<td>89.9</td>
<td>0.12%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• At least 25% of shares placed with members to the public</td>
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<tr>
<td><strong>ITALY (REV)</strong></td>
<td>1808</td>
<td>• Free transferability of all shares</td>
<td>527.4</td>
<td>1 088.8</td>
<td>48.4%</td>
<td>71.5%</td>
<td>2 818.3</td>
<td>0.53%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Free float shares equal to at least 25% of capital</td>
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<tr>
<td></td>
<td></td>
<td>• Market capitalization of at least 5 million euro</td>
<td></td>
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</tr>
<tr>
<td><strong>LISBON (TSV)</strong></td>
<td>1769</td>
<td>• Three years annual accounts published</td>
<td>46.3</td>
<td>109.8</td>
<td>42.1%</td>
<td>57.8%</td>
<td>111.7</td>
<td>0.24%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sound financial and economic situation</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>LONDON (REV)</strong></td>
<td>1801</td>
<td>• Minimum market capitalization: 700,000 sterling</td>
<td>2 164.7</td>
<td>1 421.9</td>
<td>152%</td>
<td>184.3%</td>
<td>17 986.2</td>
<td>0.83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trading record at least 3 years</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• At least 25% of shares placed with members to the public</td>
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</tr>
</tbody>
</table>

2 Market liquidity 2001 = Value of Shares Trading 2001 / Market Capitalization 2001

** Total of France, Belgium and Netherlands’s GDP.
<table>
<thead>
<tr>
<th>Country (Exchange)</th>
<th>Year</th>
<th>Requirements</th>
<th>Turnover (CHF)</th>
<th>Change (%)</th>
<th>Volume (CHF)</th>
<th>Change (%)</th>
</tr>
</thead>
</table>
| LUXEMBOURG (TSV)  | 1928 | - Three years annual accounts published  
- Market value at least 50 m. Lux francs (13 million euro) 
- At least 25% of shares placed with members to the public | 23.7 19.2 123% 179.0% 2.8 0.011% |
| OSLO (REV)        | 1819 | - Market value of the shares: at least NOK 300 million  
- Company operated at least 3 years (annual reports published)  
- At least 25% of shares placed with members to the public | 69.4 168.0 41.3% 41.3% 252.1 0.36% |
| SPAIN (REV)       | 1831 | - Minimum capital of Pta.200 million (12 million euro)  
- Profits in the 2 previous years  
- At least 25% of shares placed with members to the public | 468.2 583.1 80.2% 90.3% 3,368.9 0.72% |
| STOCKHOLM (REV)   | End 18th century | - Company operated at least 3 years (annual reports published)  
- At least 25% of shares placed with members to the public and 10% of its votes  
- Market value at least SEK 300 m. | 236.5 218.8 108% 144.5% 1,546.9 0.65% |
| SWISS EXCHANGE (REV) | 1850 | - Capitalization of at least CHF 25 million  
- Company operated at least 3 years (annual reports published)  
- At least 25% of shares placed with members to the public | 527.3 245.8 214.5% 328.4% 2,379.7 0.45% |
| VIENNA (TSV)      | 1771 | - Company sales exceed EUR 5 million  
- Steady growth in the past  
- Projects for next 12 months are defined | 25.2 189.6 13.2% 15.8% 31.2 0.12% |

Source: FIBV, IMF and OECD

*NOTE ON TURNOVER STATISTICS*
Stock exchanges use different definitions and calculation methods to compile turnover statistics.
TSV exchanges count as turnover only those transactions which pass through their trading systems or which take place on the exchange’s trading floor.
REV exchanges include in their turnover figures all transactions subject to supervision by the market authority (transactions by member firms, and sometimes non-members, with no distinction between on- and off-market and transactions made into foreign markets reported on the national market).