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# Global Concept of Financial Institutional Transformation of Stock Exchange

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ABSTRACT. The article is about the research of processes of global transformation of stock exchanges through the mechanisms of internationalization, corporate and network consolidation, and technology. Objective processes of internationalization in stock markets affected by financial globalization and arising global information resources create new challenges for stock exchanges that can be overcome by adequate development strategies. The growing competition between stock exchanges and new capital institutes requires stock exchanges to use modern exchange technologies, primarily innovative, in order to maintain liquidity and increase investment attractiveness. Have been analysed the newest tendencies and determinants of modern global financial institutional architecture construction, the leading role in which are starting to play new stock exchanges and stalk exchange platforms, formed in growing financial centres of the world. Have been identified he main components of international stock market restructurization in the process of financial globalization, one of the attributes of which turned out to be a certain fragmentation of markets and their universalization. Through the example of US and EU financial market modernization processes of the last decade have been analysed financial and legal mechanisms of the national and regional levels, which are designed to ensure sustainable development of the global economy at the post-crisis stage. Have been diagnosed international activity of stock exchanges through the quantity indexed of foreign companies in listing, volume of trade with foreign financial instruments, and participation of foreign investors in exchange trade. Have been offered and calculated indices of internationalization of the world's leading stock market. Have been analysed consolidation processes of the leading stock exchanges and new electronic trading systems at the regional, meso-global and global levels, which resulted in formation of powerful stock holdings able to meet the needs of a wide range of traders and investors with diversified investment strategies. Have been identified key factors of world stock exchange restructurization under the influence informatization, networking and technologizing processes. Have been revealed motivation, mechanisms, and consequences of stock markets in European Union, the USA and Asian region at the modern stage of development.

KEYWORDS. Financial globalization, international capital movement, international financial centres, stock exchange, alternative trading systems, internationalization of stock markets, consolidation of stock exchanges.

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## Introduction

As for today, determinantal factor of international capital movement definitely is globalization processes in the global economy. Economic globalization as a phenomenon is shown in three main aspects: expansion of international trade (real globalization), rapid spread of information technologies (scientific and technological, information and communication globalization), and rapid growth of international capital movement (financial globalization). Financial globalization occurs through integration of national financial markets and formation of a globalized financial market environment on their basis. As a result, financial component of economic globalization generates high mobility of capital, steady rising scale of financial and investment operations, diversification and integration of international financial flows.

Objective processes of stock markets internationalization affected by financial globalization create new challenges for stock exchanges, that are possible to overcome solely by means of search for the latest relevant opportunities. Growth of competition for financial and investment flows forces stock exchange institutes to adjust their development strategies crucially, synchronizing them with dynamics of global transformational processes. For the stock exchanges in priority is the problem of accumulation maximum investments to maintain and (or) strengthen its role on the financial market. The environment of global stock market services and modern stock exchange technologies, primarily innovative, are used by international stock exchange groups to maximize income, maintain liquidity and investment attractiveness.

The international character of the modern stock exchange mechanism is manifested not only in a large number of foreign companies in stock exchange listing and in large volumes of trade with the participation of foreign investors. Modern information and computer technologies make possible financial assets trading practically around the clock from any place on the world map, rapidly increasing the flow of orders traders and, accordingly, forming global capital flows.

To the study of modern trends in transformation of international stock markets, acquisition of dynamic forms of development in the process of financial globalization, are dedicated works of the following economists: S. Wine[2], A. Grinspen[3], N. Rubini[4], G. Stiglits[5],

[2] Vayn, S. *Investitsii i treyding. Formirovanie individualnogo podhoda k prinyatiyu investitsionnyih resheniy*. M.: Alpina Pablisher, 2017 [In Russian].

[3] Grinspen, A. *Epoha potryaseniy. Problemyi i perspektivyi mirovoy finansovoy sistemyi*. M.: Alpina Didzhitel, 2015. [In Russian].

[4] Rubini, N.and S. Mim. *Kak ya predskazal krizis. Ekstrennyiy kurs podgotovki k buduschim potryaseniyam.* M.: Eksmo, 2011. [In Russian].

[5] Stiglits, Dzh. Yu. *Globalizatsiya: trevozhnyie tendentsii*. M.: Natsionalnyiy obschestvenno-nauchnyiy fond, 2003. [In Russian].

H. G. Schinazi[6], D. Soros[7], Ya. Mirkin[8], M. Yershov[9], D. Lukianenko, A. Poruchnyk, Ya. Stoliarchuk, A. Kolot, A. Filipenko, V. Kolesov[10], O. Mozhovyi, O. Subochev[11].

Scientific discourse of national and foreign economists about trends and factors of financial markets globalization, coherence of intensification process of the international capital movement and institutional transformation of stock exchanges requires further methodological reflection and further scientific research. Before said is actualized by the fact that stock exchanges, as centres of extremely high offer and demand concentration on financial capital, as for today have a decisive influence on modern global financial architecture formation.

Financial globalization, through the strengthening of the role of world financial centres, based on international stock exchanges, catalyses total restructuring of the financial market and its individual segments, substantially changing the essence of money.

The purpose of the article is based on the study of processes of stock exchanges transformation in modern financial and institutional concept of their development, identification and synthesis of prevailing trends in this area. The focus is made on explicating key determinants of stock market globalization through their internationalization and consolidation.

## Main part

Growth of international capital movements under the influence of financial globalization directly affects functioning of the stock exchange mechanism. Stocks are one of the alternative investment options of the same level as, for example, traditional bank deposits, precious metals and real estate. Over the last decades, financial engineering generates a large number of innovative financial instruments that are attractive to potential investors. Thus, stock exchanges are forced to enter into a specific and fairly rigid competition with other powerful financial and credit institutions for financial flow focusing within their infrastructure.

Moreover, development of the latest IT-technologies and global social networks, their expansion on financial markets, formed another group of global competitors – off-market trading platforms, represented by information and communication networks and alternative trading

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[6] Shigazi, G.Dzh. "Sohranenie finansovoy stabilnosti". *Mezhdunarodnyiy valyutnyiy fond: Voprosyi ekonomiki*36, 2005. [In Russian].

[7] Soros, Dzh. *Novaya paradigma finansovyih ryinkov*. M.: Mann, Ivanov i Ferber, 2008. [In Russian]..

[8] Mirkina, Ya.M. ed. *Finanovyie strategii modernizatsii ekonomiki.* M.: Magistr, 2011. [In Russian].

[9] Ershov, M. *Mirovoy finansovyiy krizis. Chto dalshe?* M.: Ekonomika, 2011. [In Russian].

[10] Lukyanenko, D., Kolesov, V. and A. Kolot. Ya. Stolyarchuk i dr.*Globalnoe ekonomicheskoe razvitie: tendentsii, asimmetrii, regulirovanie: monografiya*. K.: KNEU, 2013. [In Russian].

[11] Mozgoviy, O. and O.Subochev. *MIzhnarodnI fInansovI tsentri v umovah fInansovoYi globalIzatsIYi: monografIya*. K.: KNEU, 2014. [In Ukrainian].

systems. Introduction of blockchain technology on financial markets is becoming a new global challenge for stock exchanges, resulting in their innovative transformation and further technological development.

Strengthening of fictitious capital international mobility through liberalization of national legislation, unification and standardization of legal regulation of international movement of financial assets has led to aggravation of competition between stock exchanges of different world financial centres for liquidity and attractiveness for investors. As a result, modern stock exchanges were put into competitive confrontation with serious institutes of global financial market: credit and financial institutions of other segments of the financial market, on the one hand, and off-market trading systems, on the other.

The response to such global challenges was dynamic process of internationalization of stock exchanges, which involves indirect or direct expansion into markets of other countries and separate regions.

The key indicators that can diagnose cross-border activity of stock exchanges are, first of all, number of foreign companies in listing and volume of trade in foreign financial instruments.

As of the mid 90s of the last century, more than 3,500 foreign companies were registered on global stock exchanges (given that one company could have quotes on several stock exchanges). It was so not only for developed stock markets, but also markets of developing countries (see Fig. 1).

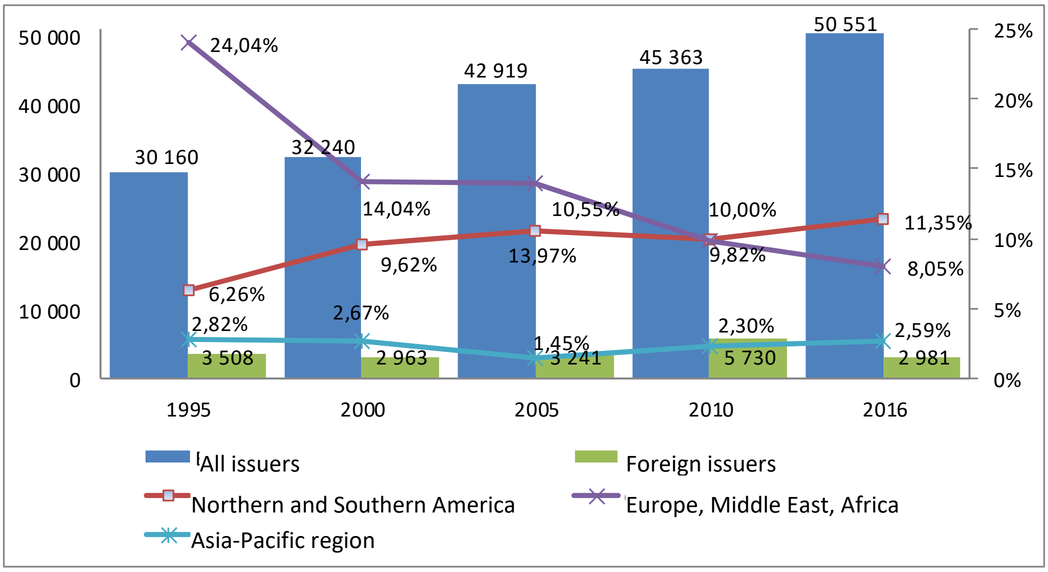


**Fig. 1.** Structural Dynamics of Listing on World Stock Exchanges (total number of companies and share of foreign companies)

Over the last two decades, the number of foreign companies listed on the world's stock exchanges has declined by 15% due to the review by economists and practitioners of some traditional approaches to motivating and quoting foreign companies on leading stock exchanges.

Thus, studies by G. Ammer and S. Holland showed that the listing of foreign companies on US stock exchanges significantly increases the demand for these stocks by American portfolio investors (the "cross-listing effect")[12]. According to their findings, after listing, the share of stocks owned by American investors is doubled (up to 11% of the total market capitalization). However, this is not prove that the main purpose of cross-listing is to expand the base of investors. Often companies go to US stock exchanges, already having a significant number of investors from the United States. That means that companies simply fulfil wishes of the latter.

According to S. Sarkisian and M. Shyla, the problems of expanding the pool of investors, increasing liquidity and transparency, play a minor role[13]. The greatest reduction in the cost of capital is felt by those companies that offer their stocks on the exchanges of those countries that for these companies are constant markets. In other words, the overall marketing of the company increases due to its stock marketability. From the listing of foreign companies get benefit those companies that were already known for their products before their entry into the stock exchange. This conclusion proves the idea that foreign listing only reflects, but does not overcome barriers between different segments of the international market.

S. Sarkisian and M. Shyl also proved that the benefits of cross-listing diminish over time, since with each new outbound issue, the company becomes more integrated and this makes each subsequent issue less significant than the previous one.

In turn, R. D. Dobbs and M. Hodhart claim that the benefits provided by listing of foreign companies from developed countries today do not exceed the expenses of companies caused by staying in foreign exchange registers[14]. Currently, corporate governance standards, operating in the United States and the United Kingdom are characterized by the highest level of protection of minority shareholder

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[12] Ammer, J., Holland, S.B., Smith, D.C. and F.E. Warnock. "Look at Me Now: What Attracts U.S. Shareholders?" *Board of Governors of the Federal Reserve System International Finance Discussion Paper* No. 815; *EFA 2004 Maastricht* No. 4086; AFA 2006 Boston Meetings Paper. (March 11, 2005). – https://ssrn.com/abstract=556208 or http://dx.doi.org/10.2139/ssrn.556208

[13] Sarkissian, S. and M. J. Schill. "Are There Permanent Valuation Gains to Overseas Listings?". Darden School of Business Working Paper No. 03-03. February 15, 2007. https://ssrn.com/abstract=395140 or http://dx.doi.org/10.2139/ssrn.395140

[14] Dobbs, R. and H. Marc Goedhart. *Why cross-listing doesn't create value McKinsey & Company*. McKinsey on Finance, November 2008. www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/why-cross-listing-shares-doesnt-create-value.

rights in all developed countries. As a result, there is no point in cross-listing for European companies in the US if they want to increase their investment attractiveness and market capitalization.

In addition, double listing increases the additional costs of the company, including those related to the need to compile and publish reporting in the host country. In the United States, for example, with the adoption of Sarbanes-Oxley Act, such costs have increased by several times. According to the financial advisers of British Airways and Air France corporations, annual reporting and stock-management expenses may amount up to $20 million for each company. As a result, these companies cancelled their listing on NYSE.

Draws attention a threefold reduction of the share of foreign companies in stock exchanges of EU. This can be explained by high level of integration of capital markets within the EU. The idea of a "single European passport" allows investment institutions to provide services in all EU countries regardless of their country of registration. Thus, legislative barriers to investors' access to different national capital markets level out and incentives for individual companies to cross-listing on foreign stock exchanges are reduced.

Over the last20 years, a number of global factors have influenced structural dynamics of foreign listing of each stock exchange. Among them it is possible to distinguish, first of all, world and regional financial crises, long-term recessions in the economy of individual countries and usage of competitive methods among global financial centres in the form of liberalization of national regulatory capital and tax systems, cheapening of credit and financial transactions, good geographical location, well-balanced macroeconomic protectionist policies (Table 1).

Let's analyse some tendencies of restructuring of international stock markets on the basis of statistical data of leading exchanges of the world.

Over the past two decades, NYSE, Nasdaq and London Stock Exchange have been leaders in number of foreign campaigns in stock exchanges. Among the developed markets, emerging dynamics of the number of foreign companies in both relative and absolute terms are demonstrated only by Australian Stock Exchange and Oslo Stock Exchange.

Another clear tend is also the increase of foreign securities in emerging markets – Singapore Stock Exchange, Hong Kong Stock Exchange and the Johannesburg Stock Exchange. Despite the reduction in number of foreign companies listed in stock exchanges of the world, the total trade in shares of such companies within the period from 1995 to 2005 increased from 1 to 5.76 trillion. USD to 9.29 trillion. USD in 2016. At the same time, the share of foreign trade in total volumes decreased from 9.5% to 8.3%[15].

[15] Compiled by the authors: *World Federation of Exchanges. Statistics. Monthly Reports*. https://www.world-exchanges.org/home/index.php/statistics/monthly-reports

*Table 1* **Structural Dynamics of Foreign Companies Listing on the Leading Stock Exchanges of the World**[16]

| **Year** | **1986** | **1990** | **1995** | **2000** | **2005** | **2010** | **2016** |
|---|---|---|---|---|---|---|---|
| **Stock exchange** | Number of foreign companies (Share in total number, %) | | | | | | |
| New-York | 59 (3.9) | 96 (5.4) | 247 (11.0) | 433 (15.1) | 452 (19.9) | 518 (22.4) | 485 (21.2) |
| Nasdaq | 244 | 256 (6.2) | 362 (7.1) | 488 (10.3) | 332 (10.5) | 298 (10.7) | 388 (13.4) |
| London | 512 (19.0) | 613 (24.0) | 531 (21.2) | 448 (18.9) | 334 (10.8) | 604 (20.4) | 479 (18.5) |
| Tokyo | 52 (3.5) | 125 (7.1) | 77 (4.3) | 41 (1.9) | 28 (1.9) | 12 (0.5) | 6 (0.2) |
| Frankfurt | 181 (No data) | 234 (No data) | 235 (14.5) | 245 (24.8) | 116 (15.2) | 75 (9.8) | 61 (10.3) |
| Prague [17] | 195 (No data) | 226 (No data) | 194 (21.5) | 158 (16.4) | 293 (23.3) | 152 (13.4) | 115 (11.0) |
| Switzerland | 194 (No data) | 240 (56.9) | 233 (51.9) | 164 (39.4) | 116 (29.0) | 50 (16.9) | 37 (14.0) |
| Toronto | 51 (No data) | 66 (5.5) | 62 (4.9) | 42 (2.9) | 39 (1.3) | 87 (2.3) | 51 (1.49) |
| Luxembourg | No data | No data | 228 (80.1) | 216 (80.0) | 206 (84.0) | 260 (90.0) | 152 (84.4) |
| Oslo | No data | No data | 14 (8.48) | 24 (11.2) | 28 (12.8) | 44 (18.4) | 43 (20.1) |
| Singapore | No data | No data | 22 (8.1) | 63 (13.1) | 122 (17.8) | 317 (40.8) | 278 (36.72) |
| Australian | No data | No data | 49 (4.16) | 76 (5.41) | 71 (4.14) | 86 (4.30) | 126 (6.01) |
| Hong Kong | No data | No data | 24 (4.43) | 11 (1.39) | 9 (0.79) | 17 (1.20) | 101 (5.12) |
| Johannesburg | No data | No data | 26 (4.8) | 23 (3.80) | 25 (6.7) | 45 (11.3) | 73 (19.4) |

For several decades London Stock Exchange was the leading platform for shares of foreign companies. Historic maximum volume of deals with foreign securities was reached in 2007 and amounted to 4,277 trillion. USD, that was equal to 41% of all transactions on the stock exchange. This was facilitated by the monopoly position of the LSE as a leading international financial centre with liberal legislation, highly integrated and deep capital market as well as good geographical position.

However, since 2008, London Stock Exchange has gradually started to lose its dominant position on the foreign exchange market in favour

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[16] Karolyi ,G. A. *What Happens to Stocks that List Shares Abroad? A Survey of the Evidence and its Managerial Implications,* 1996. https://ssrn.com/abstract=1612 or http://dx.doi.org/10.2139/ssrn.1612

[17] Compiled by the authors: *2000 year* – Euronext Paris, 2005 year – – Euronext.

of newly established multilateral trading systems (MTF, Multilateral Trading Facility). Establishment of the latter was regulated by MiFID-I Directive. The most popular MTF – Chi-X Europe and Trading, united in 2011, have created an advanced platform for trading stocks and depositary receipts from European and global companies.

Starting from 2013, Cboe Europe Equities platform has the same legal status of the authorized investment exchange in the United Kingdom under the laws of the United Kingdom. However, despite the existence of regulatory options, this platform does not provide classical stock market services, namely: stock listing.

As for today through Cboe Europe Equities comeas about 25% of the total turnover of shares listed on the exchanges of the 15 EU countries, making it the leading pan-European platform. On the other hand, taking into account the specific nature of the activity and legal status, all agreements concluded on Cboe Europe Equities are transactions with foreign stocks.

NYSE, Nasdaq USA, Nasdaq Nordic, Deutsche Bџrse, Hong Kong and Taiwan stock exchanges are also leaders in the absolute foreign exchange market. Regarding the relative indexes of the top 10, there are also stock exchanges in Johannesburg, Oslo and Mexico (Table 2).

*Table 2* **Annual Shares Trade of Foreign Companies on the Leading Exchanges of the World (million USD) and Their Share in the General Annual Volume (%)**[18]

| Stock exchange / Year | 1995 | | 2000 | | 2005 | | 2010 | | 2016 | |
|---|---|---|---|---|---|---|---|---|---|---|
| New-York | 260,643.4 | *8.5* | 1,141,896.0 | *10.3* | 1,234,230.4 | *8.7* | 1,736,120.23 | *9.17* | 1,103,018.2 | *5.6* |
| Nasdaq | 81,353.0 | *3.4* | 844,399.8 | *4.3* | 591,029.1 | *5.9* | 2,855,690.00 | *9.84* | 3,930,960.0 | *12.3* |
| London | 626,862.9 | *54.4* | 2,669,122.1 | *58.6* | 2,492,066.8 | *43.9* | 507,351.00 | *14.9* | 580,459.1 | *18.4* |
| Tokyo | 1,039.4 | *0.12* | 627.1 | *0.3* | 2,821.8 | *0.1* | 717.17 | *0.02* | 5,562.7 | *0.1* |
| Frankfurt | 13,801.5 | *2.32* | 321,323.1 | *15.2* | 165,647.1 | *8.6* | 223,817.10 | *11.9* | 85,573.1 | *6.4* |
| Prague (Euronext) | 10,558.4 | *1.7* | 26,603.0 | *1.0* | 129,468.8 | *4.7* | 8,016.23 | *0.37* | 5,963.7 | *0.3* |
| Switzerland | 17,600.8 | *5.17* | 28,208.4 | *4.4* | 18,594.0 | *1.91* | 3,150.31 | *0.43* | 4,189.6 | *0.5* |
| Johannesburg | 15,947.9 | *7.7* | 0.00 | *0* | 47,828.4 | *23.7* | 104,513.20 | *25.2* | 111,948.6 | *27.9* |
| Oslo | 324.4 | *1.3* | 8,894.3 | *12.8* | 33,457.3 | *14.3* | 64,207.76 | *22.3* | 15,241.7 | *12.8* |
| Taiwan | 0.00 | *0* | 1,535.3 | *0.16* | 597.4 | *0.10* | *8,376.23* | *0.92* | 36,725.4 | *7.17* |
| Mexico | 0.00 | *0* | 0.00 | *0* | 2,747.7 | *4.85* | *10,532.6* | *8.84* | 14,532.5 | *11.7* |
| Hong Kong | 243.2 | *0.25* | 699.4 | *0.19* | 432.0 | *0.09* | *7,768.42* | *0.52* | 45,790.4 | *3.39* |

[18]Compiled by the authors: *World Federation of Exchanges. Statistics. Monthly Reports.* https://www.world-exchanges.org/home/index.php/statistics/monthly-reports

Due to the results of the analysis it can be concluded that a generalized integrated index of the level of internationalization of particular stock exchange, which takes into account, for example, number of foreign companies in listing and volume of trading in foreign stocks on the stock exchange, it shall be calculated also taking into account also data on the number of foreign investors in the total volume of trades on the stock exchange. Such index, calculated as the arithmetic average of the above mentioned three parameters, we can identify as an index of internationalization of the stock market (Table 3).

*Table 3* **Index of Internationalization of the World Leading Stock Exchanges**[19]

| No | Stock exchange | The share of foreign companies in listing,% | Share of stock trading in foreign companies in general, % | Share of foreign exchange members (*investors) in general, % | Index of stock exchange internationalization, %, (Art. 3 + Art. 4 + +Art. 5) / 3 |
|---|---|---|---|---|---|
| 1 | Luxembourg | 84.44 | 12.57 | 61.54 | **52.85** |
| 2 | Oslo | 20.09 | 12.76 | 63.79 | **32.21** |
| 3 | Johannesburg | 19.41 | 27.91 | 35.25* | **27.52** |
| 4 | Frankfurt | 10.30 | 6.44 | 52.50 | **23.08** |
| 5 | London | 18.51 | 18.54 | 29.41 | **22.15** |
| 6 | Switzerland | 14.02 | 0.48 | 50.50 | **21.67** |
| 7 | Tokyo | 0.17 | 0.09 | 54.72* | **18.33** |
| 8 | Nasdaq Nordic | 4.05 | 4.02 | 46.74 | **18.27** |
| 9 | Warsaw | 3.58 | 0.61 | 48.20 | **17.46** |
| 10 | Hong Kong | 5.12 | 3.39 | 40.20* | **16.24** |
| 11 | Taiwan | 8.56 | 7.17 | 25.10* | **13.61** |
| 12 | Euronext | 10.94 | 0.33 | 27.27 | **12.85** |

Thus, as of 2017, the most international type of activity was observed on Luxembourg Stock Exchange, Oslo Stock Exchange and Johannesburg.

An important factor in achieving the competitive position of the stock exchange is the liquidity provided by network nature of stock exchange mechanism. In other words, expanding its own information and trading network, which covers a wide range of investors and traders, is almost the main task of management of any stock exchange.

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[19] Compiled by the authors: *World Federation of Exchanges. Statistics. Monthly Reports*. https://www.world-exchanges.org/home/index.php/statistics/monthly-reports

Rapid development of telecommunications and computer systems, on the one hand, and legal liberalization of financial markets of developed countries aimed at increase of their attractiveness, on the other hand, have caused the emergence of new alternative trading systems. Due to its flexibility, mobility, and affordability for investors, these systems have "dragged" a significant share of the liquidity of traditional exchanges over a relatively short period of time. It resulted in intense merging and absorption processes, both with each other, and with newly created competitors. The consolidation of trading platforms, formation of global stock exchanges on such basis, has become one of the dominant trends of the world stock market in recent decades. Within the period from 2000 to 2017 were made more than 50 transactions, where the object of consolidation were various stock exchanges[20].

In addition to increasing liquidity, stock exchanges are guided by other motivations. A merge takes place if there is a positive synergy caused by increasing revenue (expansion of the market), reduction in the costs of maintenance of stock infrastructure, and modernization of trading systems (economy of scale). This, in turn, makes possible subsidization of administrative, arbitration and supervision services that are not profitable, but important for traditional exchanges.

Merge also allows stock exchanges to expand the range of financial services and products offered without spending extra money and time on their development and marketing. This is very important due to the constant reduction of traditional sources of income of stock exchange from leasing and other stock exchange charges.

A good example of achieving positive synergistic effect from consolidation is the Euronext Exchange. By introducing a single trading platform for four sites, the management of the holding eliminated duplication of IT costs and optimized staff costs. As a result, direct costs of bidders at platforms in Paris and Amsterdam decreased by 15% and 31% respectively[21].

Analysis of the consequences of stock exchange platforms merge, conducted by M. Malkolamaki, showed that the effect of "scale" is clearly traceable in the event of merge of large organized markets. At the same time, this is true in relation to trading activity itself, whereas growth of incomes from listing is not directly related to integration processes[22].

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[20] "Changing business models of stock exchanges and stock market fragmentation". *OECD Business and Finance Outlook* 2016, OECD Publishing, Paris, 2016. http://dx.doi.org/10.1787/9789264257573-9-en.

[21] Pagano, M. and A.J. Padilla. *Efficiency gains from the integration of exchanges: lessons from the Euronext.* Centre for Studies in Economics and Finance (CSEF), 2005 http://www.ilsole24ore.com/art/SoleOnLine4/Finanza%20e%20Mercati/2006/05/padilla-pagano.pdf

[22] Malkalamakii, M. *Economies of Scale and Implicit Mergers in Stock Exchange Activities / Markku Malkalamakii.* Research Department, Bank of Finland, 2000. http://www.lse.ac.uk/fmg/documents/events/conferences/2000/future/40_malkamaki.pdf

The process of corporatization and commercialization has become the indirect factor that has simplified legal and procedural aspects of consolidation of exchanges in modern conditions. Status of public joint stock companies and free circulation of their own shares in the open market not only facilitated attraction of investment in stock infrastructure, but also stimulated integration of stock exchanges around the world.

In general, we can distinguish following modern models of the consolidation of the stock market infrastructure: 1) internal consolidation at the national level; 2) creation of international exchange unions and alliances; 3) formation of international universal stock exchanges; and 4) creation of vertically integrated exchange holdings. We can also talk about consolidation at the regional, meso-global and global levels.

Modern integration processes of the American and European exchange systems have become quite revealing in this context.

Starting from 2006, due to the formation and strengthening of the role of electronic trading systems, the structure of US stock market has undergone dramatic changes, turning from a duopoly (with domination of NYSE and NASDAQ) into a highly competitive one. This was also influenced by radical legislative innovations. In 2005 a share of NYSE in the total volume of stock trading in own listing reduced to 73.3% for the first time in 29 years.[23] The lion's share of the market was "taken over" by electronic communication systems Archipelago and Instinet.

In order to protect itself from further market loss by two of the largest exchanges in the US, it was decided to purchase the above-mentioned electronic platforms. So, after almost 212 years of existence in the form of a closed mutual company, NYSE was corporatized and purchased Archipelago Exchange, thus forming NYSE Group holding, while NASDAQ took over Instinet in order to implement its computerized trading system INET.

However, rapid development of IT technologies in financial sector has significantly accelerated entry to the market of new participants. The most competitive of them were BATS Trading and Direct Edge ECN.

High competitiveness of new electronic platforms is based on the following factors:

1) Usage of modern telecommunication and computer technologies. which do not require large funds for maintenance of the platforms and physical presence of traders, unlike the NYSE. The main clients of new systems are traders who specialize in algorithmic, high-speed trading.

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[23] Stavros, G. "Regulation and Innovation: Comparing the U.S. and European Stock Trading Markets". *Harvard Law School Student Scholarship*13, 2006. http://lsr.nellco.org/harvard/students/papers/13

2) Presence of large brokerage and investment companies among founders. Large client base and size of their own portfolios ensure filling of the system with initial liquidity, attracting new traders. Thus, owners of the holding, which operates BATS Trading System were Bank of America, Citigroup, Credit Suisse Group AG, Deutsche Bank AG, Getco LLC, JPMorgan Chase & Co., Tha Estate of Lehman Brothers Holdings Inc., Lime Brokerage LLC, Morgan Stanley, Tradebot Systems Inc. and Wedbush Morgan Securities. Direct Edge System was originally founded by a large brokerage company Knight Capital Group.

3) Aggressive pricing strategy. Electronic systems were first to introduce the practice of reimbursement to traders, placing orders on the stock exchange, "bringing" liquidity, and charging those whose orders enter the market later. At the same time, sending orders to the platform and adjusting it to the point of implementation, is free of charge.

At the beginning of the activities, BATS Trading and Direct Edge had the legal status of electronic communications networks, which are kinds of alternative trading systems. After expanding its own market share, BATS Trading and Direct Edge submitted to the SEC applications for the license and status of registered national stock exchanges. BATS Trading got a stock exchange license in 2008 and started operating under the name of BATS Exchange. Direct Edge Holding has got two licenses for the platforms: EDGA Exchange and EDGX Exchange in 2010.

Taking into account joint stockholders and similar business models, two new exchanges united in 2014, creating one of the largest stock trading operators called BATS Global Markets. As noted above, in 2017, the latter was taken over by the CBOE Holding.

As of December 2017, in the USA were registered 20 "National Securities Exchange" . Seven of them specialize in trading exclusively derivative securities (options), and thirteen – in both stocks and options trading. The latter, with the exception of two – Chicago Stock Exchange and new Investors Exchange, are included into three stock holding holdings. The share of the last on stock trading market and platforms that are part of their structure are given in Table 4.

Stock holdings are trying to obtain several licenses for the conduct of stock trading activities for greater flexibility in meeting the needs of a wide range of potential traders with diverse strategies. First of all, this is achieved by the introduction of differentiated tariff plans. Today traders can choose either a platform with low tariffs and high probability of executing orders, or choose higher refunds for replenishment of liquidity in exchange for lower probability of execution of orders.

*Table 4* **Leading Exchange Holdings on the Stock Market in the USA (average daily turnover in October 2017, billion USD; share among stock transactions)[24]**

| Intercontinental Exchange, Inc. | Nasdaq, Inc | Cboe Global Markets, Inc. |
|---|---|---|
| - New York Stock Exchange LLC<br>- NYSE Arca, Inc.<br>- NYSE MKT LLC<br>- NYSE National, Inc. | - NASDAQ Stock Market LLC<br>- NASDAQ PHLX LLC.<br>- NASDAQ BX, Inc. | - Cboe BYX Exchange, Inc.<br>- Cboe BZX Exchange, Inc.<br>- Cboe EDGA Exchange, Inc.<br>Cboe EDGX Exchange, Inc. |
| **58.6** ***(34.73%)*** | **53.9** ***(31.95%)*** | **47.1** ***(27.95%)*** |

The obvious positive result of competition between the organizers of trade was a radical reduction in the value of their services. If in 1970 commission for the purchase of shares by institutional investors at the NYSE was at 0.262 USD for a share when buying 500 shares, in 2001 it already amounted to 0.05 USD, and at the beginning of 2011 it dropped to the level of 0.0021 USD per share [25].

At the same time, when leading American exchanges are consolidated into holdings, trading platforms under their management remain isolated. Moreover, newly established stock exchanges are also trying to operate several platforms. The situation is even more complicated by the fact that there is a large number of other alternative trading systems on the market. Thus, as of November 2017, in the USA were registered 85 of such platforms[26].

As a result, having overcome the differentiation of trade centrers and secrecy of trade information, introducing advanced trade technologies, the US stock market faced a new level of fragmentation. Investors face the problem of choice: with which trading systems to work; with which systems to work directly, and with which through brokers; services which systems do not use at all. It means, the investor faces a problem of navigation in the environment of numerous stock exchanges and platforms, that require very deep analysis, and, accordingly, investment.

Genesis of modern organizational and consolidation processes in the development of stock industry in the EU is inextricably linked with the processes of European financial and economic integration. Fully integrated single market for financial services has been one of the main objectives of the EU for a long time. An efficient single market provides possibility for financial institutions from different member countries to provide equally high-quality services in all EU regions, thus creating a

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[24] "US Equity Issuance and Trading Volumes". *The Securities Industry and Financial Markets Association (SIFMA)*. https://www.sifma.org/resources/research/us-equity-stats/.

[25] Stoll, H. *Market Microstructure.* Financial Markets Research Center, Working paper, 2002. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.7204&rep=rep1&type=pdf

[26] "Alternative Trading System ("ATS") List". *SEC* https://www.sec.gov/foia/docs/atslist.htm

competitive environment that catalyses development of the entire EU economy. As a result, investors have deeper and more liquid market and more opportunities for diversification and profits, while issuers have easier and cheaper access to financial resources.

Analytical data on positive effect of single financial market functioning in EU have been published in several reports and studies. Thus, in report of P. Chekkini of 1988 it's indicated that the potential GDP growth from the unification of financial services markets could amount to 1.5%[27]. The study, conducted for European Commission by London Economics Company, in collaboration with Pricewaterhouse Coopers and Oxford Economic Forecasting, anticipated GDP growth of 1.1%, due to the reduction in the cost of capital for borrowers[28].

Having achieved some success in shaping the single EU securities market, in the late 1990s it became clear that further integration was hampered by a number of general-market and regulatory barriers.

In order to overcome these obstacles and make a break through in development of the single EU financial market in 1999, European Commission adopted Financial Services Action Plan in the field of financial markets in general and securities market in particular for the period of 42 years. As part of the implementation of the Plan, have been adopted a number of new Directives and implementing measures on which is based the whole modern regulatory system of the EU stock market.

The key document in the field of securities trading organization from the specified package was already mentioned MiFID-I. In terms of quality and quantity of changes that have occurred since the adoption of this Directive, it is compared with the above-mentioned package of legislative changes to Regulation NMS in the United States.

MiFID-I has fundamentally changed the EU stock market by regulating the activities of the main competitors of traditional stock exchanges – multilateral trading systems (MTFs) and so-called Systemic Intermediaries.

As in the United States, founders of most of the new MTF were large banks consortia. The latter aimed to get an alternative to European stock exchanges, clients of which they used to be.

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[27] Cecchini, P., Jacquemin, P. and A. Catinat. *The European Challenge 1992: The benefits of a single market*. Brookfield, Vt., USA: Gower, Aldershot, 1988.

[28] "Quantification of the Macro-Economic Impact of Integration of EU Financial Markets, Executive Summary of the Final Report to The European Commission – Directorate-General for the Internal Market". *London Economics in association with PricewaterhouseCoopers and Oxford Economic Forecasting*, November 2002. https://www.fep.up.pt/disciplinas/pgaf924/PGAF/CE_summary_londonecon.pdf or http://londoneconomics.co.uk/wp-content/uploads/2011/09/103-Quantification-of-the-Macro-economic-Impact-of-Integration-of-EU-Financial-Markets.pdf

Operators of traditional regulated markets in order to preserve the market segment of pan-European "blue chips" have introduced their own MTFs both an open and a hidden book of orders to meet the needs of institutional investors. For example, German Stock Exchange holding and the Berlin Stock Exchange launched Xetra International and Equiduct electronic platforms, respectively.

Northern Europe is one of the examples of regional integration of stock markets on the basis of the OMX operator. Consolidation of Scandinavian trading platforms developed from NOREX Alliance Stock Exchange to the formation of a vertically-integrated group based on Swedish-Finnish holding, which operates stock exchanges of seven Nordic and Baltic countries. There was implemented a single virtual OMX Nordic Exchange platform for the Stockholm Stock Exchange, Helsinki and Copenhagen, with common listing conditions and a single trading platform.

The second largest pan-European union after formation of Euronext group was the purchase in 2007. London stock exchange of Italian stock exchange operator Borsa Italiana SpA. In this way, British Stock Exchange has become the main European electronic platform for the sale of MTS SpA's sovereign and private bonds, along with Italian fixed-term market and depository clearing institution.

Increase in the number of market operators of various types, caused by innovation and legislative reforms, has led to increased competition at the pan-European level and, consequently, improved quality and reduced value of stock services provided. At the same time, the existence of a large number of trading platforms in Europe, as in the United States, leads to a high fragmentation of the market. Consequently, fragmentation index for the leading European indexes (DAX, CAC40, FTSE100 and AEX) has been at an average level of 2 over the past few years (this indicator shows the average number of platforms that need to be taken into account when executing sales orders at the best conditions[29]).

Despite the implementation by Directiveof "best execution" (best execution) principle, European trading floors are not required to take into account quotations of other systems and, accordingly, should not redirect orders to other markets in case of instant liquidity. This led to creation of a more complex market architecture in the EU than in the United States, which, in turn, requires traders and investors to actively use intelligent liquidity search and order routing systems.

[29] *Fidessa Fragmentation Index.* http://fragmentation.fidessa.com/europe/.

Considering the interregional level of the stock market consolidation, we can distinguish two waves of integration processes between stock exchanges – before and after the global financial crisis of 2008.

The first wave is characterized by the beginning of global stock holding formation through the takeover by the US stock market by NYSE and NASDAQ giants of pan-European regional platforms Euronext and OMX, respectively.

Such expansion from the US stock exchanges was caused by the following global factors:

1) Awareness of the growing threat from alternative trading systems by stock exchanges.

2) Higher technological level of exchange mechanisms of European platforms and, accordingly, greater experience in management of electronic trading systems.

3) Expansion of sources of income through access to promising markets of derivative financial instruments. This was particularly evident in the case of the merge of NYSE Euronext, as one of the world's leading derivatives trading organizations, LIFFE, is a part of the latter.

As the first wave of exchanges merged under conditions of stock market growth, this led to high costs for such deals. Thus, the merge of NYSE and Euronext is estimated at 14 billion, while NASDAQ and OMX – at 3.7 billion USD. Usually to exchanges of stock exchange, which is taken over, is paid in stock, not cash. Taking this into account, the price of shares of the NYSE Group since the announcement of the purchase of the European operator Euronext on June 1, 2006 until the final settlement with the shareholders on March 30, 2007 has grown from 64.51 to 93.75 USD. At the same time, at the beginning of 2005, the value of shares was $ 20.97.

The second wave of consolidation started against the backdrop of stagnating stock indices and fall in capitalization of most developed stock markets. This allowed new players to enter the rapidly growing market of merge.

So, in 2012, the Hong Kong Stock Exchange Holding purchased for 2.14 billion. USD one of the oldest platforms in the world – London Metal Exchange (LME). At the same time, the offer of Asian company was better than that of American competitors: Chicago Mercantile Exchange, NYSE Euronext and Intercontinental Exchange. The offer 22 times exceeded the last market price and 180 times last year's income of LME[30].

[30] Farchy, J. and R. *Cookson. HKEx agrees to buy LME for £1.4bn FT*, June 15, 2012, https://www.ft.com/content/6fdca33c-b54a-11e1-ad93-00144feabdc0.

The fall in volumes of operations on world stock markets and decrease in the returns of traditional stock exchanges have moved the centre of influence in direction of exchanges of derivative financial instruments. A striking manifestation of this trend is the takeover of NYSE Euronext, the largest listed company in the capitalization, with Intercontinental Exchange's stock exchanges with headquarters in Atlanta. The cost of transaction amounted to about 8.2 billion USD. In this case, the most attractive asset of the merged holding was the London Stock Exchange of financial derivatives Euronext.Liffe. Since Intercontinental Exchange already owns ICE Futures Europe in London, one of the world's leading commodity exchanges, the combination of two exchanges allowed to create a universal exchange hub in Europe.

Cross-border exchanges of associations cause increased attention of state institutions in comparison with consolidation of companies in other areas of activity. As a result, some potential merge agreements do not occur due to regulatory intervention. Thus, the Singapore and Australian stock exchange unions in 2011 did not take place due to the fears of Australian authorities that due to the agreement national financial capital will flow to Singapore, financial sector will collapse, which will lead to job losses and budget revenues.

In 2017, potentially the most expensive merge in history among stock exchanges between holdings of the German and London stock exchanges estimated at $ 20 billion USD was blocked by supranational bodies of the EU. European Commission has banned the deal because it "can significantly reduce the level of competition by creating a de facto monopoly in an important area of fixed income instruments clearing"[31].

## Conclusions

Global nature of modern stock exchange activities is shown in a number of key determinants: expanding the range of foreign companies in listing and increasing the number of foreign investors and traders in trading foreign financial instruments. Rapid development of information and computer technologies in world financial markets against the background of introduction of innovative exchange technologies and products of financial engineering, modes of remote access to trading and network mechanisms of the functioning of the global economy have led to fundamental restructuring of stock exchange institute, and, consequently, formation of a fundamentally new paradigm for the development of global stock exchanges on this basis.

[31] "Mergers: Commission blocks proposed merger between Deutsche Börse and London Stock Exchange Brussels". *European Commission* – Press release, 29 March 2017. http://europa.eu/rapid/press-release_IP-17-789_en.htm.

Current challenges faced by traditional stock exchanges and established mechanisms for their functioning, catalysed by global crisis phenomena in recent decades, have motivated the search for adequate ways of reforming both organizational and technological, and financial and legal models of development, reinforcing tendencies of internationalization, consolidation and technologization.

Competitiveness of exchange systems in financial globalization is achieved through formation of powerful stock exchange holdings, the main provider of which at the present stage are alternative trading systems, distributed information and computer networks, integrated in meso-global and global electronic platforms. The main mission of such modern stock exchange architecture concept is to concentrate liquidity, global networking of traders and investors, minimize transaction costs, and provide investment attractiveness.

Structural dynamics of internationalization processes of the global exchange system are ambiguous, which is explained by the key contradictions of the post-crisis stage of the global economy development. Objective trends in formation of world financial centres based on international stock exchanges, together with certain manifestations of stock market fragmentation and their universalization, will require stock exchanges to intensify the search for adaptive development mechanisms synchronized with processes of financial globalization.

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