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**TRADE NETWORKS EVOLUTION UNDER THE CONDITIONS OF STOCK  
MARKET GLOBALIZATION**

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*The modern perception of the stock market in terms of information technologies rapid development and under the institutionalists influence has been significantly modified and becomes multifaceted. It was detected that the main function of the market is activated, information asymmetry is minimized and more advanced financial architecture space is formed through trade networks. Formation of the modern trade networks has started on the basis of the old infrastructure, that had the highest tendency to self-organization and adaptation. The proposed architecture of trade networks of the stock market has a very clear vector of subordination – from top to bottom and has a number of positive points.*

**Keywords:** *stock market, trade networks, infrastructure, globalization, financial space.*

**Introduction.** The widely-spread integration and globalization processes are characteristic of the modern development of economic relations worldwide, including financial ones. Accordingly, a nation's capital becomes global and starts functioning as a catalyst of global changes in international economic and financial relations and in the transformation of institutions involved. In economic literature, there are a great deal of definitions of what the stock market, or equity market, is. Karl Marx believed it to be the sphere of functioning of fictitious capital represented as titles of ownership. A more modern definition comprises stock marketeers and legal relations among them as for the placement, circulation, and accounting of securities. But the stock market, with information technologies rapidly developing and due to institutional economists' influence, is starting to be viewed differently, in a number of aspects. One cannot imagine the modern society without invisible global networks that permeate it.

Thus, basing on the latest ideas of trade networks, let us try to analyse the architecture of modern global trade organisers on the equity market and define on what levels and how deep they cross-penetrate.

**Analysis of recent researches and publications.** The cross-disciplinary trade networks theory goes back to the works by D. Knoke, P. Marsden, S. Wasserman, B. Wellman, S. D. Berkowitz. They develop such basic concepts as social and information network, network node, network structure, and they postulate that networks have become the main organisational form of post-industrial society. A lot of ideas of the network approach are used in economic sociology. Examples are M. Granovetter, who in the mid-1970s published several works on the network organisation of the labour market, and H. White [1].

M. O. Jackson stresses that social networks permeate our social and economic life. They play a key role in informing about job opportunities, and are decisive for trading a great number of goods and services. They are the basis on which mutual insurance is carried out in developing countries. Besides, social networks are vital in learning how diseases spread, what foodstuffs we buy, what languages we speak, how we vote, how we choose whether to become criminals or not, what education we get, and how probable our future employment is. As network structures influence our welfare in a great many ways, it is important to understand (i) how social network structures influence people's behaviour, and (ii) what network structures can appear in the society [2].

M. Castells, the first to use the term 'network society', says that today's global society is network structures society. He emphasises, on the one hand, its universal nature, and on the other – its determining character, when 'the power of a structure turns out to be stronger than the structure of power', and the fact of one's belonging to a certain network becomes the most important source of power and changes in society [3]. A feature of modern society, according to M. Castells, is not so much the predominance of information as the transformation of the variants of its use, with global network structures taking the leading role in society and replacing the traditional forms of relations. M. Castells believes a network structure to be a set of interrelated nodes. The particular content of each node depends on the character of the particular network structure referred to. His conception of network society, and of information society related to it, is relevant not only for the social organism, but for the functioning of global financial space as well [4]. This could be a very important task for investigation specially in conditions of financial instability.

**Previously unsettled problem constituent.** Evolution of stock market trade networks is explained by the objective needs of the modern economy and the challenges of the financial crisis. As a result of heterogeneity caused by various conditions and rates of development of financial systems and the needs of the real economy, it is necessary to identify and formulate the structure of modern trade networks and areas of their development.

**Main purpose of the article.** The main purpose of the article is to determine the structure of modern trading networks and their evolution trends in the changing global financial space.

**Results and discussions.** A network is a system by means of which the process of communication is formed. So we can assert that networks help vitalise the main function of the market, minimise information asymmetry, and form more developed financial space architecture. The above phenomena are to take place mainly due to extensive infrastructure, which, viewed through O. E. Williamson's concept of technological paradigm, is defined as a number of legal entities that mediate the flow of securities. His institutional paradigm views infrastructure as a complex of institutions, enterprises that supply the market and perform a number of functions to stabilise its work (all these institutions belonging to the nonmaterial production sphere) [8].

Combining Castells's and Williamson's approaches when analysing the modern stage of the stock market's development and its place in today's global space, it is but logical to introduce the concept of trade networks of the stock market, or equity market. These trade networks are of specific architecture.

Comparing the traditional stock market infrastructure and less usual trade networks, one can

see that most components of the former are, in one form or another, found in the latter. The main reason for this is the fact that the formation of modern trade networks, from the very start, based on those old elements of the infrastructure that were the most self-organising and adaptive. Due to obtaining much independence, the adaptive tendency was the first to be actualised. It consisted in the concentration of the greatest possible number of stock market functions that were, even historically or organisationally, beyond their competence. The capability to self-organise was first activated at government level (in the latter half of the 20th century), and later it started developing on its own: the unstoppable merging and takeover processes started taking place in exchange trade operation.

The evolution of the stock market trade networks is determined by the needs of modern economy and by the challenges of financial crises. The traditional forms of trade organisers are uncompetitive and only found in countries with primitive economy. Different development levels (resulting from different conditions and growth rates of financial systems and needs of the real sector of economy) caused the formation of the following groups of trade network nodes.

On the 1st (basic) level, there are traditional stock exchanges and OTC trading systems that perform few functions and supply a local market. For international operations, a second level intermediary must be employed.

On the 2nd level, there are traditional nationwide stock exchanges that perform few functions, but have correspondent relations with foreign exchanges (however using the resources of the national depository).

On the 3rd level, there are stock exchanges that, having merged with foundation centres, were able to expand their functionality to the maximum (9 of 10 basic) and become real and permanent nodes of the global trade network, the starting points for counting real elements.

The 4th level is represented by foundation centres, that accumulate not only market information, but also financial capacities in time and space. Foundation centres form a specific field of influence that constantly tends to expand.

Level 5 is the last in the current context. Financial centres that embrace infinite possibilities, functional as well as evolutionary, are the nodal points all the network system rests on. Neither are stable the spheres of their influence, they oscillate against political and other factors. But, as compared to the groups above, they are the most stable.

The suggested structure of stock market trade networks has a pronounced subordination vector – vertically down. Besides, it has a number of positive aspects. In fact, regional elements subordinate to the upper levels no longer form the regional stock market and the environment for their existence, but adapt to the environment already existing. In the context of the highest degree of adaptation of the elements of the last levels, the topical issue is integration into global financial space, with regional features of development being preserved.

We propose that network economy should be viewed as a specific form of economic activity. It is based on horizontal communication and global electronic environment. The important elements that prevail are productive forces, knowledge, information, and relations that provide an instant reaction to demand and offer, as manifold connections among economic agents are the very nature of network economy. The progress of global economy was determined by integration processes that result in both globalisation and regionalisation of stock markets. With the process of mergers and transformations in the market area, capital tends to be internationalised in the countries dominating in the world's economy, which accelerates globalisation greatly. But integration and its consequence, globalisation, are the two important processes that determine the further development of world economy.

There cannot but exist different opinions about the globalisation process due to a lot of reasons.

Some think it will result in destroying all limits and barriers, in the classic free trade with no transaction costs etc. [5]. Some anti-globalists believe the process is widening the social and economic gap between different regions and is making insignificant the time-honoured national virtues and traditions [6, p. 52]. Globalisation and integration that are taking place in all areas of economic activity require supranational bodies. These institutions should facilitate the controlling, coordinating, and regulatory functions of the activities extending beyond national boundaries. Security markets of the world have entered the period characterised by alliances and associations, by mergers, cooperation, increase of electronic trading systems. With the parties' expenditure cuts becoming of fundamental importance, some stock exchanges agree on the integration of not only trading arrangement functions as such, but also of related financial services.

Our analysis of international experience shows that, the most popular forms of integration on the security market are:

- contractual forms of integration, with various cooperation and mutual support agreements being signed. But for a greater success, this soft integration form should develop into the next, a harsher one. Perfect illustrations of this are: the foundation of the derivatives exchange EUREX, the largest in Europe (it started with signing a cooperation agreement in 1996, then, in December 1996, followed signing a letter of intention of a merger that finished in 1999); the creation of NOREX Alliance (it started with signing a cooperation agreement in January 1998 and resulted in a complete merger); in February 2002, an agreement was signed between the Warsaw Stock Exchange and Euronext on cross-membership and cross-access to trading sessions, and in early 2009 WSE suggested a plan of its merger with Euronext;

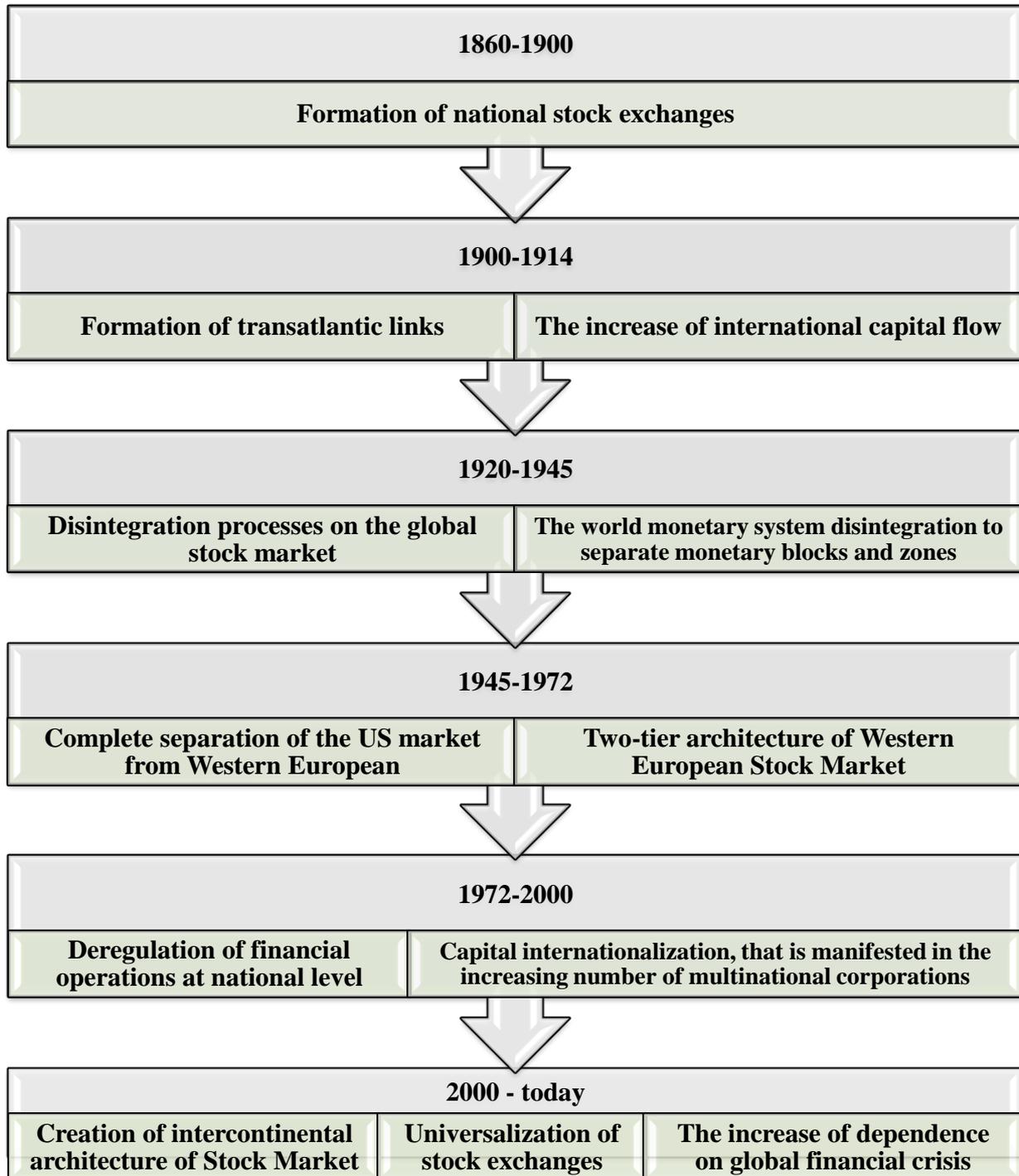
- exchange (strategic) alliances. They are typically created for a certain small number of operations. An example is GLOBEX Alliance created in 1998 by the exchanges CME, MATIF and SIMEX for intercontinental derivatives trade within a common trading system. Alliances of this sort are popular chiefly with clearing organisations;

- concerns and holdings. They are the ultimate form of integration for the equity market's exchange structures. As stated above, the largest alliances, like NASDAQ OMX Group, NYSE-Euronext, and also Hong Kong Exchanges and Clearing Limited (a Hong Kong based vertically-integrated company), Bolsas y Mercados Espanoles (the only group of Spanish exchanges) were created as concerns or holdings.

Theory says there are harsh and soft forms of integration. Soft forms imply the preservation of legal and economic independence, and enable joint activity (for example, Wiener Borse's control over the stock exchanges in Prague, Ljubljana, and Budapest). Under current conditions, both forms of integration are employed. But the most successful are the NASDAQ OMX Group and NYSE-Euronext. They were created and have been expanding as concerns, in other words, it is the harsh form of integration that is used. In the seventies – nineties, the main prerequisite for the integration of national stock exchanges into supranational alliances was deregulation and liberalisation policy. But in the last decades, the stock market infrastructure has faced a number of new tasks connected primarily with integration tendencies. This, naturally, requires a change in the conditions of functioning in global economic space.

We found that the processes of stock market globalisation and trade networks formation are closely interdependent and cannot go on in isolation. The phases of global stock market formation can be diagrammed as follows (see Fig. 1). The time gap of the years 1914-1920 results from the devastating consequences of WWI and the revolution in the Russian Empire. On the one hand, international capital flow increases, and multinational companies are created. On the other hand, as a reaction to these changes, servicing transnational capital is intensified in order to reduce risks and transaction costs. For the purpose, stock market architecture is changed, namely its infrastructure

which is, in its turn, based on share capital. Thus, the transnationalism of the stock market itself takes place, and general globalisation processes gather pace.



**Fig. 1. Phases of global stock market formation**  
 Source: own development

**Conclusions and further researches directions.** We investigated that security markets of the world have entered the period characterised by alliances and associations, by mergers, cooperation,

increase of electronic trading systems. With the parties' expenditure cuts becoming of fundamental importance, some stock exchanges agree on the integration of not only trading arrangement functions as such, but also of related financial services. Along with the commercialisation of exchanges, their ideology is changing, too. They used to serve their members and joint owners, but now they defend their own interests. We found that, the formation of the architecture of stock market trading networks nowadays is characterised by the following tendencies:

- striving for evolution from the lowest to the highest levels;
- the movement is not necessarily progressive and can change its direction;
- there is direct dependence between the degree of the nodes' stability and their level;
- nodes are linked by trading systems and web-technologies;
- integration at the earlier stages is driven by the geographical factors, and at the further stages by geopolitical and financial.

Integration and globalisation are sure to redirect investors' attention to higher profitability sectors of the world market. Besides, investors will tend to leave heavy-regulation spheres where the profit rate is lower and competition more intensive. It will result in higher mobility of capital flows. Over time, this redirection may appear to be quite useful for the whole global financial system: risk diversification causes a shift in international portfolios towards higher risks. Higher profitability of assets may speed up growth, and financial markets integration can increase the society's wealth greatly. In the immediate future, higher capital mobility may result in the global financial system's instability, as is evidenced by the recent economic and financial crises. To prevent the negative consequences of higher mobility of global financial space, the clear and stable architecture of stock market trade networks should be created.

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**ЕВОЛЮЦІЯ ТРЕЙДИНГОВИХ МЕРЕЖ  
В УМОВАХ ГЛОБАЛІЗАЦІЇ ФОНДОВОГО РИНКУ**

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Сучасне сприйняття фондового ринку з точки зору інформаційних технологій, швидкого розвитку і під впливом інституціоналістів було значно змінено і стає більш багатогранним. Було виявлено, що основна функція ринку активізувалась, асиметрія інформації зведена до мінімуму, і більш розвинений фінансовий простір формується через трейдингові мережі. Формування сучасних трейдингових мереж почалося на базі старої інфраструктури, яка мала найвищу схильність до самоорганізації та адаптації до них. Запропонована архітектура трейдингових мереж на фондовому ринку має дуже чіткий вектор підпорядкування – зверху вниз і має низку позитивних моментів.

**Ключові слова:** фондовий ринок, трейдингові мережі, інфраструктура, глобалізація, фінансовий простір.

**ЭВОЛЮЦИЯ ТРЕЙДИНГОВЫХ СЕТЕЙ  
В УСЛОВИЯХ ГЛОБАЛИЗАЦИИ ФОНДОВОГО РЫНКА**

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Современное восприятие фондового рынка с точки зрения информационных технологий, быстрого развития и под влиянием институционалистов было значительно изменено и становится более многогранным. Было выявлено, что основная функция рынка активизировалась, асимметрия информации сведена к минимуму, и более развитое финансовое пространство формируется через трейдинговые сети. Формирование современных трейдинговых сетей началось на базе старой инфраструктуры, которая обладала наивысшей склонностью к самоорганизации и адаптации к ним. Предложенная архитектура трейдинговых сетей на фондовом рынке имеет очень четкий вектор подчинения – сверху вниз и имеет ряд положительных моментов.

**Ключевые слова:** фондовый рынок, трейдинговые сети, инфраструктура, глобализация, финансовое пространство.