Prospects for the use of cryptocurrencies in international maritime logistics

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Abstract. This article analyzes the trends in the development of cryptocurrencies and considers the main trends in their use in international water logistics. The use of cryptocurrencies in recent years has become one of the responses to the opportunities and challenges of the modern global economy, as nowadays the global digitalization being introduced everywhere affects the development of almost all spheres of the economy. As a result of digitalization, new markets, forms of communication, goods and services have emerged. Active digitalization has led to the formation of a digital profile of a person, the requests of participants in the global economy to form alternative savings instruments, not correlated with the dynamics of traditional financial markets, new money equivalents that meet the current requirements of the digital economy and are more independent of the actions of the issuing countries. The emergence of cryptocurrencies was an attempt at a technological response to the emerging problems and challenges. The main purpose of this study is to study the role and prospects of using cryptocurrencies in modern international water logistics.

1 Introduction

The growing public interest in cryptocurrencies is largely due to the possibility of investing money and receiving very high profits due to the rise in quotations of cryptocurrencies (mainly bitcoin). However, it is also true that some people believe that investing in digital money is a "Ponzi scheme" and that the financial bubble is about to burst or has already burst. The driving forces behind the value of cryptocurrencies are less predictable, which is reflected in a significant jump in the value of cryptocurrencies and fiat money. Although these assets are not backed by real values, the potential returns from trading are very high, making cryptocurrency investments both very risky and attractive for speculative capital. We can talk about cryptocurrencies being "overvalued" or "undervalued," but it is important to understand that these terms apply more to fiat currencies [1, 2].

2 Materials and Methods

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This article is based on methods of analysis containing analysis of scientific and practical publications in the field of scientific problems, as well as economic and statistical methods involved in the analysis of the subject area [3-7].

Understanding the nature and popularity of this phenomenon requires a more detailed consideration of the preconditions for the emergence of cryptocurrency and the motives of economic actors (citizens, firms, banks and countries) that began to use it.

To understand the nature and popularity of this phenomenon, it is necessary to consider in more detail the preconditions for the emergence of cryptocurrencies and the motives of the economic actors (citizens, companies, banks and countries) that adopted them.

Prerequisite 1. The next stage in the evolution of money. Mankind has always tried to redefine the role of money. Types and forms of money have always followed the changes in the economic system, reflecting the current needs for measures of value, means of circulation, payment and accumulation. In the subsistence economy the role of money was played by various commodities, including shells, pets, hides, furs and salt, and after the industrial revolution by cash (paper) money, plastic cards and non-cash money using smartphones. In the digital economy, the function of money has remained the same, but the demands on it have increased:

- Cashless (digital) storage and settlement to the extent possible;
- Minimization of payment and storage costs;
- Maximum unification of technology for transmitting and storing value;
- Independence from the time and location of the sender; and independence from the time and location of the sender.
- No intermediaries for settlements and payments ("peer-to-peer") and no third-party influence;
- Speed, convenience and high reliability of payments and settlements.

Prerequisite 2. A crisis of trust in the existing world order and the current system of state regulation

In times of crisis the level of confidence in the state by economic actors is steadily declining. Such negative phenomena as high inflation, sharp currency devaluations, currency wars and sanctions are linked to inefficient and ineffective government foreign policy, economic and financial policy [7].

Prerequisite 3. Socio-economic transformation as a result of the digitalization process Cryptocurrencies were the first large-scale test of blockchain technology (distributed ledger technology1). This technology allows the creation of decentralized interactions and ensures their security. It makes economic relationships technologically more efficient by eliminating intermediaries who play the role of guarantor of each participant's obligations.

In addition, trends such as the rapid development of digital technologies, the cheapening of computer technology, the increase in computing power, and the deep penetration of mobile devices are opening up new ways of organizing economic relations.

Prerequisite 4. Processes of globalization of the economy. One of the hallmarks of today's global economy is the internationalization of the individual. This is especially evident in the fact that it is now possible to be a citizen of one country, but live in another and do business or work in a third. In other words, people are no longer confined by national borders and are no longer tied to a particular country, but can live and work in an environment in which they are comfortable [7].

Another feature of modern economic relations is the growing role of transnational corporations and large private companies. Because of their economic power, these companies influence the functioning of various sectors of the economy and the state as a whole. Private companies shape people's behavior, including their preferences and habits, regardless of their nationality. Moreover, multinational companies are already replacing the
state in traditional areas such as education, culture and health care, and security. A logical extension of this redistribution of roles between the state and private companies with ecosystems and platforms has been the use by companies of alternative currencies (e.g., points, award miles) to store and transmit value instead of or in addition to national and international currency [Cryptocurrencies and blockchain as attributes of the new economy: https://ece.eaeunion.org/upload/medialibrary/71f/Doklad_FINAL.pdf].

![Graph of cryptocurrency market value over time](image)

**Fig. 1.** The operation in global cryptocurrency market, dollars [Cryptocurrency data aggregator: https://www.coingecko.com/en/global-charts]

Today's global cryptocurrency market capitalization is 1.34 trillion doll., a change of 1.99% in the past 24 hours and -32.7% a year ago

**Table 1.** Top 10 cryptos by market capitalization [Cryptocurrency data aggregator: https://www.coingecko.com/en/global-charts]

<table>
<thead>
<tr>
<th>Rank</th>
<th>Crypto</th>
<th>Price, $</th>
<th>7 days, %</th>
<th>Daily trading volume, bln doll</th>
<th>Market cap-tion, bln doll</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BTC</td>
<td>30373,92</td>
<td>2.3</td>
<td>16, 75</td>
<td>587, 7</td>
</tr>
<tr>
<td>2</td>
<td>ETH</td>
<td>2112,84</td>
<td>10.6</td>
<td>10,08</td>
<td>252,1</td>
</tr>
<tr>
<td>3</td>
<td>TetherUSDT</td>
<td>0,999912</td>
<td>-0,1</td>
<td>28,41</td>
<td>81,0</td>
</tr>
<tr>
<td>4</td>
<td>BNBBNB</td>
<td>344,62</td>
<td>8,3</td>
<td>0,87</td>
<td>54,4</td>
</tr>
<tr>
<td>5</td>
<td>USD CoinUSDC</td>
<td>1,00</td>
<td>-0,0</td>
<td>3,7</td>
<td>31,5</td>
</tr>
<tr>
<td>6</td>
<td>RippleXRP</td>
<td>0,521465</td>
<td>0,6</td>
<td>1,1</td>
<td>27,0</td>
</tr>
<tr>
<td>7</td>
<td>КартдоADA</td>
<td>0,445666</td>
<td>12,2</td>
<td>0,4</td>
<td>15,6</td>
</tr>
<tr>
<td>8</td>
<td>DogecoinDOGE</td>
<td>0,093546</td>
<td>10,2</td>
<td>1,2</td>
<td>13,01</td>
</tr>
<tr>
<td>9</td>
<td>Lido Staked EtherSTETH</td>
<td>2 107,51</td>
<td>11,1</td>
<td>0,02</td>
<td>12,7</td>
</tr>
<tr>
<td>10</td>
<td>PolygonMATIC</td>
<td>1,18</td>
<td>4,9</td>
<td>0,3</td>
<td>10,8</td>
</tr>
</tbody>
</table>

The graph below represents the total market cap and volume of cryptocurrencies worldwide, which is the result of 10,76 cryptocurrencies tracked on 715 exchanges.

As of today, Bitcoin (BTC) has a market capitalization of 588 billion doll., representing a 44.06% dominance for Bitcoin. Stablecoins, on the other hand, has a market capitalization of 132 billion doll., representing a 9.9% share of the total crypto market.

### 3 Results

Against this background, the use of cryptocurrencies and blockchain technology is one answer to the opportunities and challenges of the global economy, including those related to government and market imperfections:
Cryptocurrencies are a product of the digital economy; cryptocurrencies are created using algorithms based on objective mathematical laws; cryptocurrencies are a product of the digital economy. Cryptocurrencies are controlled by the system itself, which makes them more resistant to the actions of third parties; Cryptocurrencies reduce transaction costs; Cryptocurrencies are a product of the digital economy; Cryptocurrencies are an international commodity created to benefit and serve all participants in the payment process.

Cryptocurrencies for the most part are not backed by a commodity and are not guaranteed by the state. Therefore, their value is determined by a person's perception and how they are valued by other members of society, that is, by the level of trust in them. Cryptocurrencies are used as money, despite the fact that they exist only in the form of software code and have a limited possibility of direct exchange with goods (they function as a means of payment). In relation to fiat money, their uniqueness lies in the fact that their circulation is limited and regulated without the participation of the state.

A computer program with a mathematical algorithm in its basis makes it possible to organize a self-regulating monetary system [8]. Compared to the traditional monetary system, digital money is difficult to "reprint" and thereby cause inflation, administratively limit/prohibit the use and transactions with cryptocurrencies. Thus, the external impact of strong players (states and their currencies) on cryptocurrencies is limited. In the long term, this can provide a stable value of digital money over time (the value of fiat money over a long period of time tends to decrease) [9].

Despite the technical limitations and difficulties associated with the mining and circulation of cryptocurrencies (low transaction processing speed, risk of system stability, etc.), some states are already experimenting with digital money, as well as blockchain technology. However, the significance of the prospects of using cryptocurrencies for citizens, government and business is different.

4 Discussion

From a business point of view, this is primarily a different format of interaction between economic agents with a reduction in the number of intermediaries represented by banks, state and quasi-state institutions. In practice, this means the minimization of bureaucratic formalities for carrying out settlements, an increase in the speed of service provision, and a reduction in the cost of conducting transactions [3, 5]. The irreversibility of transactions compared to the possibility of cancelling any bank transaction or challenging and terminating transactions in courts may be of particular value. The issuance of cryptocurrencies, digital signs (tokens) is also seen as a convenient way to attract private investment to finance the launch and/or financial support of ongoing business projects.

Computer programs based on mathematical algorithms make it possible to organize self-regulating monetary systems.

Compared to traditional currency systems, digital money is more difficult to "reprint" and thereby cause inflation or administratively restrict/prohibit the use and trading of cryptocurrencies. Therefore, the external influence of influential players (the state and its currency) on cryptocurrencies is limited. The long-term stability of the long-term value of digital money can be ensured (the value of fiat money tends to decrease over time).

Despite the technical limitations and difficulties associated with the mining and distribution of cryptocurrencies (low transaction processing speed, system stability risks,
etc.), individual states are already experimenting with blockchain technology, as well as with digital money [10]. However, the significance of the prospect of using cryptocurrencies for citizens, governments and businesses is different.

From a business perspective, the main reason is to change the form of interaction between economic subjects by reducing the number of intermediaries represented by banks, government and non-government institutions. In practice, this means the minimization of bureaucratic settlement procedures, the acceleration of service and the reduction of transaction costs. The irreversibility of transactions can be especially valuable, as opposed to the possibility of canceling any bank transaction or challenging a transaction in court, which can be avoided. The issuance of cryptocurrencies (digital tokens) is also seen as a convenient way to attract private investment to launch or finance ongoing business projects.

For states, this issue is more complex than in other economies. On the other hand, there is great potential for the development of financial technology. The use of cryptocurrencies and blockchain technology can be applied to interbank and intergovernmental payments, the issuance and distribution of debt instruments, simplifying and accelerating identification procedures, reducing transaction costs, and ensuring the security and convenience of transactions through the use of crypto technology. The potential of blockchain technology also has significant implications for the provision of government services (e.g., transactions related to the verification of property rights).

Another aspect of digital money has to do with the role of the state in the monetary system. As the sole issuer of legal tender, the state also controls the amount of money in the economy, its circulation and the monetary channels of inflation. The use of cryptocurrencies brings technological progress to the financial sector and, at the same time, reduces the regulatory and supervisory capacity of national (central) banks.

To date, the scale of cryptocurrency use2 does not indicate that most participants in the global economy are switching from the use of fiat money to cryptocurrencies. More or less on the scale of the global economy? Compared to other segments of the money market and aggregates, the capitalization of the cryptocurrency market is very small.

For example, the goal of creating a common EAEU financial market by 2025 includes the banking and insurance sectors, as well as the securities market. In this context, it is important to create conditions for the development of financial technologies and to provide for the potential for the expansion of the use of cryptocurrencies in regional and global financial markets. Support for the implementation of digital technologies in the financial sectors of EAEU member states will help to increase the speed and reliability of transactions and attractiveness to investors, taking into account the current requirements of speed and reliability of transactions and the creation of new financial products, attractive to investors. Aspects of integration based on the use of digital technologies, including blockchain, can manifest themselves in the reduction of transaction costs when making payments between residents of different EAEU countries, the formation of common payment systems, the increased use of national currencies in mutual settlements and their stability, decolonization of the economy. The formation of a common EAEU financial market based on modern digital infrastructure and the introduction of advanced technical standards for financial transactions will increase their attractiveness for economic entities of the member states and third countries [4, 11].

Recognizing the great potential of blockchain and cryptocurrencies, the EAEU business community is actively involved in the field of cryptoassets and the development of approaches to their regulation by individual member states of the Union.

It proposes to consider the nature and economic content of blockchain technology and cryptocurrencies in the context of two aspects:

- As a source of economic growth for member states in the new digital economy;
• as a risk factor for the stability of traditional monetary systems.
• As noted above, the main effects of integration have largely been exhausted, and the EAEU countries are now looking for new directions to deepen integration.

At the same time, the growth potential of national economies is limited by structural problems, such as high share of the state in the economy, large contribution of extractive industries, low labor productivity, high volatility of national currencies, vulnerability to external factors and low competitiveness of manufacturing goods compared to those of third countries. Given the growing uncertainty in the global economy, high competition from developed and developing countries, and limited access to financial resources, it will be difficult for the EAEU member countries to carry out structural reforms and achieve a sustainable growth trajectory in the medium term [11].

In this context, the active use of technological incentives by EAEU countries, including those related to the development of cryptocurrency activities and blockchain technology, could become a catalyst for economic recovery:
• Lack of internationally recognized rules, allowing the EAEU to develop "rules of the game" for trading in digital goods and creating a "digital jurisdiction".
• Lack of competition: The digital market is in its infancy, with "product lines" constantly expanding and demand and supply growing year by year;
• The creation of the crypto-economy requires the development of a legal environment and does not require large amounts of government funding;
• The EAEU countries have world-class capabilities in blockchain technology and cryptocurrencies;
• Cryptocurrencies can be used to attract investment in digital projects.

It is possible to use cryptocurrencies to attract investment in digital projects in the EAEU countries.

The introduction of blockchain technology and cryptocurrencies to stimulate economic growth requires coordinated action by all EAEU member states.

It is important to note that the disproportionate tightening of regulation has led to the migration of entrepreneurs to jurisdictions with more favorable conditions, especially since activities related to digital assets and digital tokens are characterized by a high degree of liquidity. Tighter regulation of digital tokens in the U.S. in 2017-2018 led to a significant change in the geographical structure of ICO projects funding: the U.S. share dropped from 32% to 10%.

5 Conclusion

The question of balancing the risks and benefits of introducing cryptocurrencies and blockchain technologies is the starting point for government support and full-scale launches in some countries. The EAEC regulators, in particular national (central) banks and finance ministries, have indicated that risks may arise if cryptocurrencies are fully liberalized.

At the same time, it would be a mistake to believe that illegal activities are the only driving force behind the development of digital tokens, including cryptocurrencies. First, a significant portion of digital token transactions require a certain degree of computer literacy, and fiat currencies are fully involved in the chain of illegal activities, since cryptocurrencies are not currently recognized as a means of payment. Second, the use of digital tokens (marks) has a much wider reach than in the financial sector. Financial projects account for only 30% of all ICO projects.

Another risk in the use of cryptocurrencies is the risk of losses for citizens from participating in projects that use digital tokens (tokens) as a means of financing. This risk is
not limited to cryptocurrencies, because even today, when traditional controls over financial markets are quite well developed, there are still cases of unscrupulous practices misleading investors, such as financial pyramids and manipulation of prices for financial assets and derivatives. The difference is that there is currently no established regulatory infrastructure for digital tokens (tokens) activities, nor is there widespread information and education content created to increase financial literacy and awareness among unqualified investors (mostly the general public). In the absence of a legal framework, investors bear the entire risk of not recovering their investments. There is no legal mechanism to protect non-professional investors in case of fraudulent or deceptive actions resulting in loss of invested funds. In addition, cryptocurrency systems are not backed by real assets and are based on the belief in the security of transactions and the ability of technology to protect funds.

Overall, the macroeconomic risks at this stage of cryptocurrency and blockchain technology development seem premature. These risks will be realized only if digital signatures (tokens) become widespread in everyday life, and currently digital signatures (tokens) have not yet proven their practical effectiveness in everyday use.

Therefore, a "window of opportunity" is forming for the EAEU. It will be the first integrated union to initiate the formation of a harmonized international legal environment for the use of cryptocurrencies and the testing of blockchain technology in the member states, creating the potential for further technological development of national economies.

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