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**IMPROVING FINANCING OF INVESTMENTS THROUGH THE
STOCK MARKET**

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INTRODUCTION

Relevance and importance of the dissertation topic.

Capital market development is one of the main drivers of the global economy, in other words, nowadays many economies are heavily reliant on the stock markets, and countries with well-developed capital markets can easily attract billions of foreign investments for their local businesses. Today, in order to attract foreign investments, there should be well-developed stock market, which means with good infrastructure, a range of investment products for all sorts of portfolios, as well as a stable local currency to protect investors' capital. Many foreign institutional investors have become interested to invest into the Tashkent Stock Exchange, besides there have been made several contributions to develop the stock market and enhance local financial securities' liquidity. Moreover, stock market boosts cash-flow to businesses in order to finance own projects resulting in prosperity of innovation and production growth in a country, but there is a flip side of a coin that connotes positive and negative effects. This viewpoint supports the motion that capital market development precedes economic growth, which implies that the causation relationship is that there are activities in capital markets that can favorably or adversely affect the growth of key economic system indicators.

The relevance of the dissertation research is related to find out ways to advance the Tashkent Stock Exchange by boosting the liquidity of its stocks as well as bonds. What is more, one of the main priorities of this work is to take measures to supplement hedging financial instruments such as derivatives for the purpose of protecting investors' portfolios against future uncertainties. Apart from this, there have been taken some steps on how to improve the liquidity of the Uzbekistan Composite Index (UCI) by means of introducing ETF or Exchange Traded Funds that would track the UCI value in order to attract cash inflows from local investors, that is to say, make local retail investors interested to invest into the Tashkent Stock Exchange, mainly into the UCI.

The head of our state mentioned about how significant is the capital market development in the country's prosperity. And now our country has become one of the centers of financial market in the Central Asia, even there are some initiatives in Presidential Decree № 291 referring to spur local investment programs among citizens of the Republic of Uzbekistan by providing citizens with the right to make voluntary funded pension contributions to purchase securities on the local stock market. At the same time, citizens can independently dispose of additional income received from the purchase and sale of securities and in the form of dividends (interest), also until they reach retirement age. What is more, measures for granting a preemptive right to purchase shares to employees of enterprises in the event of a public offering of these shares as part of an employee stock ownership plan (ESOP) introduced by the enterprise also mentioned in it. At the same time, in the legitimate document there is a point about "their funds, not exceeding their monthly salary and equivalent payments, allocated for the purchase of shares, are exempt from personal income tax".

The main trend at the current stage of the stock market development is to improve infrastructure by means of creating contemporary financial instruments in order to diversify investment products. Besides, the establishment of blockchain technology for the purpose of asset tokenization would considerably advance the infrastructure of the capital market in the Republic of Uzbekistan.

Presidential Decree № 6207 "The measures of further development of the capital market" accepted on 13th April 2021 "the share of freely traded securities in relation to GDP is extremely low accounted for 0.3% only". In other words, there should be taken steps to extend the figure at least to 1% of GDP. Besides, the liquidity of stocks at "Toshkent" Stock Exchange is significantly low making it harder for publicly traded companies to attract funds since there are some obstacles needed to be prevented, such as financial illiteracy of most people. In the Presidential Decree № 90 "On additional measures to implement effective mechanisms to support the capital market" accepted on 17th January 2022, it serves to a certain extent in the implementation of the tasks specified in the following decision: "In

order to further develop the capital market, expand the practice of privatization of blocks of state shares through the capital market, stimulate public investment in securities and create a healthy competitive environment in the financial market.

Compliance of the research with the priorities of the development of science and technology of the republic. The dissertation was completed in accordance with the priority direction of the republican science and technology development. “Formation of a system of innovative ideas and ways of their implementation in the social, legal, economic, cultural, spiritual and educational development of the information society and democratic state”.

Level of study of the problem. The capital market development through the stock market is being studied by many foreign scientists and researchers, as well as Uzbek scientists, and scientific and practical proposals are being made.

Among foreign scientist, Atje T.B., Voghouei N.C., Robinson H.K., Peia Y.U., Roszbach I.M. It is worth noting the researches of scientists such as Kitanović S.W., Krstić Q.E., Levine J.P., Williamson F.G., Huybens R.V., Smith A.S., Beck X.L., and others.

Current issues of stock market development in Uzbekistan Kh. Khudoykulov, A. Ibodullaev, R.R. Tojiev, Sh. Mustafakulov, A. Burkhanov, Kh. Kurbonov, N. Karimov, M. Eshov, S. Elmirzaev, B. Khodiev, M. Khamidulin, B. Toshmurodova revealed in the works of scientists and practitioners.

Levine and Zervos disclosed that: “There is a strong positive correlation between stock market and economic growth and consequently the most countries with good economic background have advanced their economies by scaling up the role of stock markets in financing businesses.”

The connection of the dissertation research with the scientific research plans of the higher educational institution where the dissertation was completed. The subject of this dissertation was carried out in accordance with the research plan of the Tashkent State University of Economics within the framework of the scientific project “Improving the scientific methodological basis of the

development of real sector industries and enterprises in the conditions of market competition”.

The purpose of the study is to study the ways of improving the infrastructure of the stock market in Uzbekistan, in our case the research object is the Tashkent Stock Exchange, by researching the international experience of the improving the infrastructure of stock markets, and to develop scientific and practical proposals for improving the infrastructure of the Tashkent Stock Exchange based on this information.

Tasks of the research:

Researching the concept of improving stock market infrastructure in the Uzbekistan;

Studying the methodology of stock market development;

Analysis of stock market as a driving factor for the economic growth;

To study the current state of development of the stock market in Uzbekistan;

Determining the impact of the contemporary financial instruments on the general capital market infrastructure;

Studying the concept of “Securitization” as a tool for converting bank loans into fixed-income assets such as “Mortgage-Backed Securities”, for the purpose of attracting extra cash inflow for the commercial banks so as to fund new loan applications;

Conducting an empirical research for the purpose of finding out the application of the Securitization in the Republic of Uzbekistan by means of the Tashkent Stock Exchange

Calculation of the relationship between the interest rate fluctuation, the population growth as well as mortgage loans allocation and consequently how they affect the Securitization process or creating mortgage-backed securities in the Republic of Uzbekistan through econometric analysis.

The object of the study is the Tashkent Stock Exchange

The subject of the research is improving the overall infrastructure of the Tashkent Stock Exchange.

Research methods. Methods such as systematic and economic-statistical analysis, econometric modeling, analysis were used in the research process.

The scientific novelty of the research is as follows:

To carry out an empirical research by using some econometric as well as statistical tools in order to analyze future trend of mortgage loans as they are considered underlying assets for mortgage-backed securities in this thesis. In greater detail, I took out some data of allocated mortgage loans within Uzbekistan for last 20 years between 2004 and 2024 (for the first half of the year), the variation of interest rates for the same periods as it is well-known based on the interest rates, mortgage loans would adjust, last but not least, population growth was also added since population growth does lead to mortgage loans rise. In this empiric research, dependent (Y) is Mortgage loans, and there are two independent variables (X_1) is Interest rates, (X_2) is Population growth. Thus, five econometric tools were selected to apply in this work: linear regression, correlation matrix, a scatter graphic matrix, a graphical histogram, as well as a graphical matrix. Hence, to create securitization process so as to add new investment products at the Tashkent Stock Exchange.

The practical result of the research is as follows:

A systematic analysis of the securitization process and the characteristics of its creation by means of the stock market was conducted;

Institutional reforms of the stock market regulation in Uzbekistan were studied;

factors affecting the effectiveness of the stock market development were evaluated;

the proposed strategic goals and the revival of the stock market development in Uzbekistan by means of the introduction of contemporary financial securities studied;

Hedging against market volatility and establishing equity derivatives is proposed.

Reliability of research results. The methodological approach and methods used in the research, appropriateness of the data, official sources of the data, including Statistical Agency under the President of the Republic of Uzbekistan, Tashkent Stock Exchange, Central Bank of Uzbekistan, National Agency of Perspective Projects. It is explained by the fact that the information was obtained from the sources, that the conclusions, proposals and recommendations were approved at the regional and international level, and that certain scientific results were put into practice.

Scientific and practical significance of research results. The scientific significance of the research results is explained by the fact that the developed scientific conclusions and proposals can be used in the future implementation of strategic directions for the stock market development in Uzbekistan.

The practical significance of the research results is based on the proposals and recommendations of practical importance put forward in the dissertation, as well as the methodological developments of the dissertation, research in the development of targeted comprehensive programs for the stock market development, and the expansion of investment products for the purpose of boosting the stock market liquidity.

Approval of research results. The results of the research were presented in 9 scientific articles, of which 4 republics and 5 international journals included in the list of the Higher Attestation Commission were published and discussed at 1 international and 4 republic scientific-practical conferences.

Publication of research results. A total of 9 scientific works were published on the topic of the dissertation, of which 4 articles were published in republican scientific journals and 5 in foreign journals recommended for publication of the main results by the High Attestation Commission of the Republic of Uzbekistan. 1 article was published at international scientific-practical conference, 4 articles were

published at national scientific-practical conference, 1 article was published in the Scopus database.

The structure and scope of the dissertation. The content of the dissertation consists of introduction, 3 chapters, conclusion, list of used literature and appendices. Its total volume is 110 pages.

CHAPTER 1. WAYS OF STIMULATING BUSINESSES TO ATTRACT INVESTMENT BY ISSUING STOCKS AND CORPORATE BONDS

1.1 Theoretical basis of issuing financial securities

In these days, it is impossible to imagine the economic prosperity without a participation of stock markets since well-developed countries like the United States, Japan, United Kingdom and others, their economic engines have been driven due to stock markets¹ capitalization. Even industrial emerging markets as India as well as China are embracing economic prosperity by accounting for 104.81 and 55.5% ratio of total market capitalization over GDP in December 2023, respectively. Regarding US ratio of total market capitalization over GDP is 172.7 % as of 17th December 2023, the share of stock market capitalization to GDP in UK, makes up 139.42%. Southeast Asian country like Singapore does make up 148.22% total market capitalization over GDP² which is the highest figure in Asia. As it is known widely in order to make economic engine prosper and advance doing business by providing lasting cash flow to legal entities it is vital to develop stock market as it was mentioned in the empirical studies by Atje and Jovanovich (1996), Korajczyk (1996), Levine and Zervos (1998)³ demonstrated a strong positive correlation between stock market and economic growth⁴ and they found that the most countries with good economic background have advanced their economies by

¹ Чичерин Б.Н. Курс государственной наукой/GARANT Analytics

² <https://www.voronoiaapp.com/markets/Global-Market-Capitalization-to-GDP-Ratio-Reached-Pre-Pandemic-Level-106-in-2023-1554>

³ <https://researchspace.ukzn.ac.za/server/api/core/bitstreams/>

⁴ <https://bura.brunel.ac.uk>

scaling up the role of stock markets in financing businesses. The financial economy, which is mainly concerned with mobilizing savings, the allocation of capital, exerting corporate control and aiding investors with risk management has been motivated as having an influence on real economic growth stated by (Levine and Zervos, 1996). Even by looking at historical financial and economic studies the issue of the impact of the⁵ financial market on economic growth was first raised almost 150 years ago within the classical school. In the early 20th century, J. Schumpeter examined the issue applying it to the theory of entrepreneurship. Later, due to objective factors – two world wars and the Great Depression – the issue of relation between the financial⁶ market and economic growth was out of the scope of the economic science that meant captured attention of politicians of those periods as one of the prime sources of funding businesses out of banking loans being not efficient in financing new businesses projects. Since the early 1960s, there has been a steady increase in interest in this issue: first large-scale research of mainly historical and economic nature, were carried out. In the 1970s-1980s, there were works which rejected a verbal description of the influence of the financial market on economic growth in a particular country or countries in favor of building theoretical models, including those based on economic and mathematical methods, taking into account the determinants of financial development: openness, political power and political institutions, financial liberalization, legal traditions, economic institutions, macroeconomic determinants, as well as determinants that characterize culture and geography (Voghouei at al., 2011, La Porta, at al., 2002, Acemoglu, at al., 2001, Acemoglu at al., 2002, Acemoglu, at al., 2003, Acemoglu, at al., 2005, Acemoglu and Robinson 2006, Rodrik, 2005, Huybens and Smith 1999, Levine, 2005, Stulz and Williamson, 2003, Kitanović and Krstić, 2009)⁷. Regarding studies above, stock markets, to some extent, might efficiently mobilize cash flow in economy by distributing funds into businesses since investors are more

⁵ <http://economy-lib.com>

⁶ <https://jssidoi.org>

⁷ https://jssidoi.org/Analysis_of_the_relationship_between_financial_development_and_economic_growth_in_the_E_U_countries.

knowledgeable when it comes to invest in share of stocks. Besides, stock markets do tend to improve financial literacy in a society.

The studies of (Beck and Levine 2004) disclose the relationship between economic growth and the financial system whose components are⁸ the stock markets on growth. They use an assortment of stock market development measures, including the overall size of the market (market capitalization relative to GDP), stock market activity (the value of trades relative to GDP), and market liquidity (the value of trades relative to market capitalization)⁹. By doing this, they found that market capitalization relative to GDP and the value of trades related¹⁰ to GDP are significant to define the economic growth based on stock market indicators.

In addition, supply-leading theory (Patrick 1966) emphasized that stock market development was a better forecaster of economic growth than bank-based development¹¹. Even in the work of (Peia and Roszbach 2015)¹² stated that among advanced economies, stock market development generally causes economic development¹³, while the causality between banking sector development and growth goes in the reverse direction, most of the time. In other words, based on their studies stock market development cause a rapid economic prosperity rather than through commercial banking development, and they found that the strong causal link between stock market development and GDP is present both in the short- and the long-term, while the reverse causality from real economic growth to banking sector development generally has a delayed effect.

Another studies (Akinlo and Akinlo 2009; Kar et al 2011; Pradhan et al 2013, 2014) with respect to stock markets, the various ways through which they affect economic growth have been noted in the literature. Firstly, stock markets mobilize domestic capital; secondly, engender efficient allocation of capital to

⁸ <https://bura.brunel.ac.uk>

⁹ Beck, T. and Levine, R. (2004) Stock Markets, Banks, and Growth: Panel Evidence. *Journal of Banking and Finance*, 28, 423-442. [http://dx.doi.org/10.1016/S0378-4266\(02\)00408-9](http://dx.doi.org/10.1016/S0378-4266(02)00408-9)

¹⁰ <http://etheses.whiterose.ac.uk>

¹¹ Patrick, H.T. (1966) Financial Development and Economic Growth in Underdeveloped Countries. *Economic Development and Cultural Change*, 14, 174-189. <http://dx.doi.org/10.1086/450153>

¹² [https://www.sciencedirect.com/science/article/Finance and Growth: Time series evidence on causality](https://www.sciencedirect.com/science/article/Finance%20and%20Growth%3A%20Time%20series%20evidence%20on%20causality)

¹³ <http://elibrary.ru>

productive investments; thirdly, stock markets provide opportunities for share ownership thereby providing individuals with relatively liquid means of sharing risks; fourthly, provide investment outlets for both domestic and foreign investments¹⁴.

As it was stated above, the role of stock market is crucially important in economic growth since all developed countries in most cases address their financial problems (deficits) by issuing securities rather than taking out loans from commercial banks. Moreover, stock market boosts cash-flow to businesses in order to finance own projects resulting in prosperity of innovation and production growth in a country.

Traditionally, the corporate policy is focused on corporate investment demand. In other words, financially constraints firms behave as if they have low discount factors (i.e., a high cost of capital) and tend to postpone investment to next period, based on empirical studies countries with developed stock market have a broad range of sources of external funds, and businesses in these countries doing well rather than countries with not developed stock market (Lamont 1997)¹⁵. According to Ologunde et al (2006)¹⁶, the capital market is a collection of financial institutions set up for the granting of medium- and long-term loans and one of the main sources of financing investment projects. By this he meant, in order to finance investment projects, it needs to be taken steps to develop stock market since only by issuing securities it is highly probable to attract funds for implementing new projects in businesses. What is more, based on empirical studies, there are three stages of financing industrial and economic development. There is an illustrated data below:

¹⁴ <https://bura.brunel.ac.uk>

¹⁵ <https://onlinelibrary.wiley.com/doi/abs/> Cash Flow and Investment: from Internal Capital Markets

¹⁶ Ologunde et al 2006: Interest Rate Variations and Stock Market Capitalization in Nigeria: An Empirical Analysis

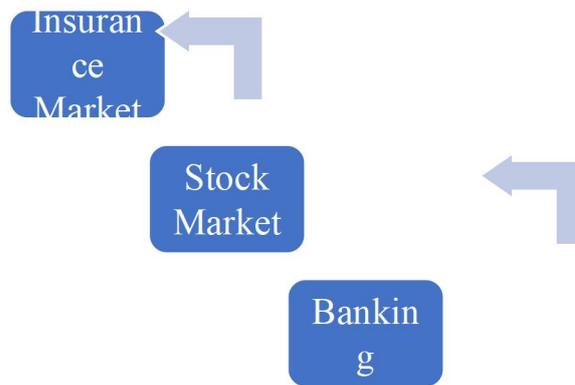


Fig. 1.1.1 - Stages of financing industrial and economic development¹⁷

So, in the first phase, Banking plays a key role in financing all sectors of economy including investment projects, then next, is a stock market, in other words, the potential role for efficient capital allocation to fund investment projects by issuing securities occurs in the second stage of financing. And last but not least, insurance market does capture cash flow within economy due to overheated stock market, entrepreneurs and other commercial institutions make an attempt to keep cash flow flatted by hedging risks of defaults and other economic troubles (mostly in well-developed countries function widely). Research into capital market development and economic growth has a long history. To date, there is a vast amount of research related to financial markets and¹⁸ economic growth. (Yang and Yi 2019)¹⁹ the casual relationship between financial development and economic growth is examined, utilizing the super exogeneity methodology²⁰. They use annual data for Korea during 1971-2018, during which Korea has experienced both phenomenal economic growth and a variety of financial liberalization and reforms. In their tests for super exogeneity, they find that financial development control causes economic growth, but the reverse is not true. their empirical results provide evidence in favor of the 'finance causes growth' view for the case of Korea while rejecting the 'growth causes finance' view. The policy implication is that Korea should give policy priority to financial reform rather than economic growth, because only a decisive and accelerated pace of financial restructuring can ensure a

¹⁷ Based on the author's development

¹⁸ <https://bura.brunel.ac.uk>

¹⁹ <https://econpapers.repec.org/article/eejpolmo>

²⁰ <https://jssidoi.org>

sustainable growth in the medium or long term. In other words, they found out that by developing capital markets it is probable to boost significantly investment influx to a country.

Leading Authors and researchers have argued in various studies that financial development is an engine to economic growth, and it is expected that this will drive the realization of the predictive outcome of these countries²¹. Capital Market Development. The provision of an avenue where investors meet companies and the government who are interested in raising long-term capital in the form of equity and debt, is the major function of capital markets²². A capital market fulfils the main financial intermediation role of redistributing funds from surplus uses to deficit needs²³. In terms of structure, the capital market is divided into a primary market for the issue of new securities, and a secondary market for the trading of these securities between investors. In terms of security-type, the capital market is divided into an equity market for the trading of common shares and equity related instruments, and the bond market for the trading of debt related instruments. There are a host of financial securities and instruments that are created with different risk-return classification primarily aimed at satisfying investors' appetite. It is observed that Capital markets are majorly considered among many reviewed studies in a more holistic approach of 'financial development', which mainly points to financial liberalization, developed banking systems and strong regulatory oversights²⁴. Stock market plays key role in redistributing funds from surplus uses to deficit needs.

This viewpoint supports the motion that capital market development precedes economic growth, which implies that the causation relationship is that there are activities in capital markets that can favorably or adversely affect the growth of key economic system indicators. In testing this, İyidoğan (2023)

²¹ <https://iiste.org>

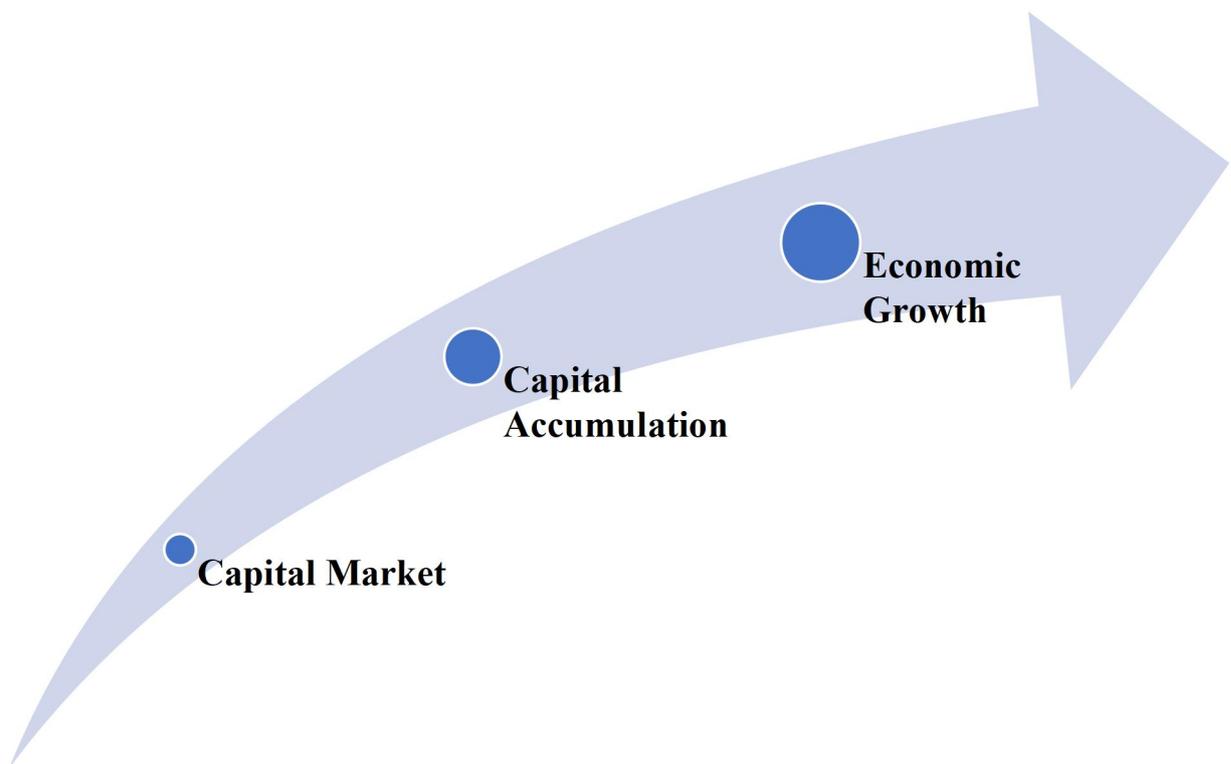
²² The term 'long-term capital' is traditionally described in financial studies as capital provided for investment for at least a year or longer (Sullivan and Sheffrin, 2021). That is not to say that capital market does not provide access to short term capital, but the long-term capital provision in this context is only used to describe a major determinant of well-functioning capital markets.

²³ <https://iiste.org>

²⁴ <https://iiste.org>

employed a long run regression analysis based on the granger causality econometric test on 1998—2022 monthly data of Turkey to show that financial development has a direct but nonlinear relationship that causes growth of an economy²⁵. Capital market development and economic growth is seen from the standpoint of a mutually causal relationship here in that, there are factors that can both contribute to the growth of the economy and development of capital markets at the same time, and these influences in turn can affect changes on both sides²⁶.

As Alin Marius Andrieş (2023) stated “In a market economy, the role of the capital market is of first rate. The well-functioning of the capital market is vital in the contemporary economy in order to be able to perform an efficient transfer of money resources from those who save towards those who need capital and those who succeed to offer it a higher capitalization; the capital market can significantly influence the quality of the investment decisions”²⁷ – mentions in his work.



²⁵ https://pep.vse.cz/artkey/pep-202302-0002_government-size-and-economic-growth-in-turkey-a-threshold-regression-analysis.php

²⁶ <https://iiste.org>

²⁷ <https://ceswp.uaic.ro>

Fig. 1.1.2 - The role Capital Market and Economic Growth²⁸

Capital market development is reported to mobilize savings within a country after resources allocated properly into businesses by exerting corporate control. Risk management is facilitated leading to ease trading of goods, services and contracts, afterwards capital is accumulated to increase in GDP as well as per capita income. Simultaneously, an expansion of takes place in Gross Domestic Savings, capital goods and services provision as well.

Khudoykulov Kh “Effective implementation will significantly increase the development of the capital market in the country, its share in the economy and its weight in attracting investments”²⁹ – mentions in his work. In other words, there is a positive correlation between capital (stock) market development and economic growth by allocating capital efficiently and provides sufficient funds to emerging, productive firms, which in turn breeds competition and innovation and ultimately drives GDP growth. Ibodullaev A. “In developed countries, the share of the stock market or stock market capitalization in GDP country is very high: 7090% on the stock exchanges of New York and Tokyo, 100-120% on Korean and London stock exchanges, 1000-1200% on the Hong Kong stock exchange. In addition, the total par value of securities issued to date amounted to 92.35 trillion. soums, of which only 1.5% or 1.4 trillion. soums, which is less than 0.4% of the country's gross domestic product”³⁰. By this he meant that almost all developed countries the role of stock market in GDP is significantly high³¹.

What is more, Ibodullaev A. mentions in his work following “The main data for our analytical result is the ratio trading volume on the stock market to the volume of GDP. That is, an increase in trade volume by stock market as part of

²⁸ Based on the author’s development.

²⁹ SCIENTIFIC COUNCIL AWARDED OF THE SCIENTIFIC DEGREES DSc.3/10.12.2019. 16.01. AT THE TASHKENT STATE UNIVERSITY OF ECONOMICS. KHUDOYKULOV KHURSHID KHURRAMOVICH “IMPROVING THE METHODOLOGICAL FOUNDATIONS FOR VALUATION THE COST OF CAPITAL OF JOINT-STOCK COMPANIES” /08.00.07 – Finance, money circulation and credit/ DISSERTATION ABSTRACT of the doctor (DSc) in economic sciences: T.2019

³⁰https://www.researchgate.net/publication/350421043_Development_of_the_Organized_Securities_Market_in_Uzbekistan/link/6098752392851c490fcb69df

³¹ <https://www.elibrary.ru/>

GDP means that at the macroeconomic level investment flows increased due to portfolio investments. However, trade volume on the stock market in Uzbekistan is only 3.6% of GDP. This figure is much lower than in other developing and developed countries³². Of course, despite the fact that the trading volume on the securities market in Uzbekistan is growing, the share of these indicators in the country's GDP is very small, which means that this market is not sufficiently developed. Its capitalization allows increasing the level of their liquidity by providing investment attractiveness of financial instruments³³.

Ibodullaev A. puts forward the idea that “At the same time, a further reduction in state participation in economy, the development of the stock market and the creation of a healthy competitive environment are the basis for an active investment policy, dynamic and sustainable development of all spheres of life of society and the state”³⁴.

1.2 Organizational and legal aspects of issuing financial securities

In general, as it is known widely there have been taken many measures to boost the economy, target inflation rate and also there have been made many efforts to improve Capital Market of the Republic of Uzbekistan by authorities. As it was stated in the Presidential Decree № 6207 “The measures of further development of the capital market” accepted on 13th April 2021³⁵, the share of freely traded securities in relation to GDP is extremely low accounted for 0.3% only. “Prior to take some measures, first and foremost it is necessary to consider following problems as well:

- the liquidity of the securities market is low, there is a need to develop the secondary market of state securities, there are not enough types of financial products put into practice, state stock packages are not sold on the basis of the

³² DEVELOPMENT OF THE ORGANIZED SECURITIES MARKET IN UZBEKISTAN ©Ibodullaev A., ORCID: 0000-0003-1465-8826, Tashkent Financial Institute, Tashkent, Uzbekistan

³³ <https://www.elibrary.ru/>

³⁴ <http://elibrary.ru>

³⁵ <https://lex.uz/docs/5371145>

principle of "one share one lot" and securities of economic entities low interest in attracting funds in the market;

- efforts to attract large institutional investors with long-term financial resources to the capital market are slow;
- the market infrastructure is insufficiently provided with modern information and communication systems, and the capabilities of local systems are used inefficiently in this area;
- capital market infrastructure at the regional level is completely underdeveloped;
- there is a lack of highly qualified specialists in the field of the capital market, who can actively promote and implement measures to increase market capitalization;
- there are many legal documents that provide for disproportionate regulation of the industry and do not meet modern market requirements and international standards;
- corporate relations are not organized based on modern approaches”³⁶.

Being mentioned in the Presidential Decree № 6207 “The measures of further development of the capital market” accepted on 13th April 2021 “the share of freely traded securities in relation to GDP is extremely low accounted for 0.3% only”. In other words, there should be taken steps to extend the figure at least to 1% of GDP. Besides, the liquidity of stocks at “Toshkent” Stock Exchange is significantly low making it harder for publicly traded companies to attract funds since there are some obstacles needed to be prevented, such as financial illiteracy of most people.

In the Presidential Decree № 90 “On additional measures to implement effective mechanisms to support the capital market” accepted on 17th January 2022³⁷. “In order to further develop the capital market, expand the practice of privatization of blocks of state shares through the capital market, stimulate public investment in securities and create a healthy competitive environment in the financial market:

³⁶ <https://lex.uz/> Presidential Decree № 6207 “The measures of further development of the capital market” accepted on 13th April 2021

³⁷ <https://davaktiv.uz/ru/news/prinjato-postanovlenie-prezidenta-ot-17-janvarja-2022-pp-90-o-dopolnitelnyh-merah-po-vnedreniju-effektivnyh-mehanizmov-podderzhki-rynka-kapitala>

1. Establish that from April 1, 2022 to December 31, 2028:
 - income accrued in the form of dividends on shares of individuals - residents and non-residents of the Republic of Uzbekistan are exempt from income tax;
 - on income accrued in the form of dividends on shares of legal entities - non-residents of the Republic of Uzbekistan, a 5 percent income tax rate is applied by analogy with legal entities - residents of the Republic of Uzbekistan;
 - income in the form of accrued interest on bonds of business entities of individuals and legal entities - residents and non-residents of the Republic of Uzbekistan are exempt from personal income tax and corporate income tax.
2. Establish a procedure according to which, starting from July 1, 2022:³⁸
 - when making transactions with securities at organized over-the-counter trading in securities, the seller (except for the issuer) pays a fee of 0.3 percent of the transaction amount instead of profit tax and income tax;
 - when the general meeting of shareholders makes a decision to exclude the company's shares from the stock exchange quotation list, shareholders - owners of voting shares of this company are given the right to demand the company buy back their shares.

Grant, from April 1, 2022, to local issuers the right, on the recommendation of the underwriter, to place their shares on foreign stock markets after preliminary placement on the RSE “Tashkent” or to place simultaneously on local and foreign stock exchanges.”³⁹

It allows issuers the right to raise funds from foreign markets making it easier to attract foreign capital to national businesses as it has been reported that many Uzbek companies collide with a lack of foreign currencies when it comes to accomplish some operations abroad. Even in the latest Presidential Decree № 291 “About additional measures for the development of the capital market” accepted on 2nd September 2023⁴⁰. “In order to further develop the capital market, improve its infrastructure, stimulate the attraction of investors to the capital market, simplify

³⁸ <https://www.elibrary.ru/>

³⁹ <https://www.elibrary.ru/>

⁴⁰ <https://lex.uz/ru/docs/6590029>

the procedure for the participation of foreign investors in the local stock market and protect the rights of investors:

1. Agree with the proposals of the Ministry of Economy and Finance, the Central Bank:

- on the transformation of the State Unitary Enterprise “Central Securities Depository” into the joint-stock company “Central Securities Depository”;
- on the gratuitous transfer to the Central Bank of the state block of shares in the authorized capital of JSC “Central Securities Depository”;
- on the creation of the joint stock company “National Clearing Center” upon the founding of JSC “Uzbek Republican Currency Exchange”⁴¹.

2. Establish a procedure according to which:

The activities of JSC "Central Securities Depository" for registration, recording and storage of securities, as well as settlements on securities are regulated by the authorized state body for regulating the securities market, and for settlements in cash based on the results of transactions with securities - the Central Bank;

- from January 1, 2025, unified accounting of government and corporate securities is maintained at JSC Central Securities Depository;
- the activities of JSC "National Clearing Center" as a "Central Counterparty" and for the implementation of centralized clearing (Clearinghouse) are regulated by the Central Bank;
- until May 1, 2024, correspondent accounts of National Clearing Center JSC and Central Securities Depository JSC will be opened for settlements with the Central Bank;
- until December 31, 2028, Central Securities Depository JSC, Uzbek Republican Currency Exchange JSC, Republican Stock Exchange Tashkent JSC are exempt from accrual and payment of dividends with the targeted use of these funds for their development.

⁴¹ <https://lex.uz>

Simultaneously, there is a point in "Presidential Decree 291" about an introduction of "Regulatory sandbox"⁴² as an initial phase of applying new tools to improve the liquidity of securities for a while. "3. Introduce a special legal regime "Regulatory Sandbox" in the area of the capital market and, within its framework, approve:

- ❖ basic concepts used in the capital market;
- ❖ separate rules for the activities and operations of foreign participants in the capital market;
- ❖ mechanisms for ensuring the confidentiality of information about the owners of securities and protecting their property rights"⁴³.

There are some initiatives in Presidential Decree № 291 referring to spur local investment programs among citizens of the Republic of Uzbekistan by providing citizens with the right to make voluntary funded pension contributions to purchase securities on the local stock market. At the same time, citizens can independently dispose of additional income received from the purchase and sale of securities and in the form of dividends (interest), also until they reach retirement age. What is more, measures for granting a preemptive right to purchase shares to employees of enterprises in the event of a public offering of these shares as part of an employee stock ownership plan (ESOP) introduced by the enterprise also mentioned in it. At the same time, in the legitimate document there is a point about "their funds, not exceeding their monthly salary and equivalent payments, allocated for the purchase of shares, are exempt from personal income tax".

In the 5th point of Presidential Decree №291⁴⁴ there are steps on how to protect rights of minority investors and attracting internal capital to the "Toshkent Stock Market".

"In order to protect the rights of minority shareholders and investors and stimulate their attraction to the capital market:

⁴² Regulatory sandbox generally refers to regulatory tools. allowing businesses to test and experiment with new and innovative products, services or. businesses under supervision of a regulator for a limited period of time.

⁴³ <https://lex.uz>

⁴⁴ <https://lex.uz/ru/docs/6590029>

a) starting from October 1, 2023: after the placement of shares of enterprises with a state share of 50 percent or more on the stock market through a public invitation, at least 30 percent of the net profit of these enterprises should be used to pay dividends for at least seven years, with the exception of restrictions established by legislative acts;

cancel the restriction on not exceeding by more than 10 percent the initial amount of the contract in the event that payment for the services of underwriters serving enterprises with a state share of 50 percent or more exceeds the amount stipulated in the contract as a result of the placement of securities at a higher price⁴⁵ and (or) in a larger amount quantity than planned;

b) starting from December 1, 2023, provide the authorized government body with the right to make orders to consider the issue of changing the executive body of the issuer and to suspend the issue of securities by the issuer for untimely disclosure of information and reporting⁴⁶ provided for by acts of legislation on the securities market, two or more times within a year”.

Based on the 6th point of Presidential Decree № 291 “Cancellation of the mandatory requirement to have an official website for joint-stock companies whose securities⁴⁷ are not listed on the stock exchange, with the exception of joint-stock companies with a state share of 50 percent or more”. In other words, private legal entities are no longer needed to have official websites prior to go public.

1.3 An investigation of stock markets of well-developed countries

There is no doubt that capital markets drive economies. And the main target of this paragraph is to carry out researches of well-developed countries’ capital markets, how they actually function, structures, uniqueness as well as principles, and of course attempts will be made to apply relative components to Tashkent Stock Exchange. For instance, the capital markets in the United States are the world’s largest which makes them more attractive for both domestic and

⁴⁵ <https://lex.uz>

⁴⁶ <http://ivo.garant.ru>

⁴⁷ Баянцэнгэл_ВКР 20240913

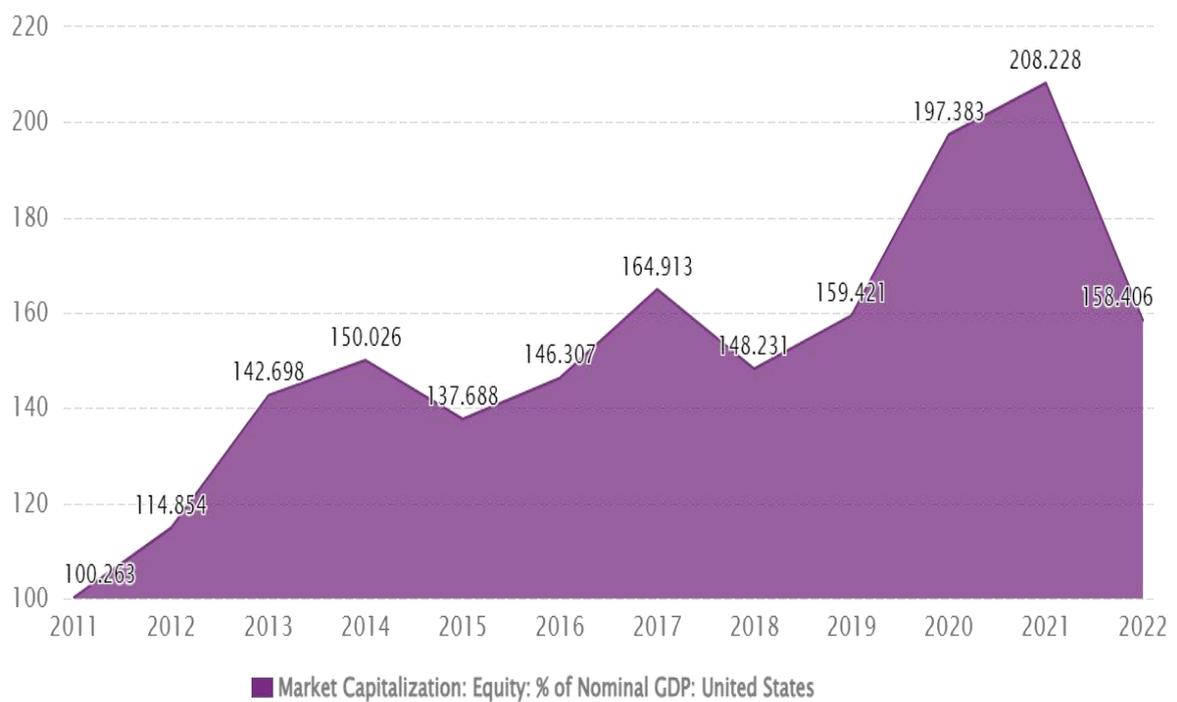
international companies that want to grow and expand. “In addition to the public equity markets which represent approximately 55 percent of all global public equity markets, the United States has the most developed private capital markets for companies that are not yet ready to go public or who do not want to go public. Since U.S. markets are so diverse, the range of capital providers is large and the competition for this capital is fierce. The U.S. capital markets are the largest in the world: 41% of global equity and 40% of global fixed income. They account for the dominant \$ value and % of global activity in every market sector, representing on average 46% of total global market activity. First and foremost, they provide diversified funding options. This means they are more attractive to businesses looking for capital and also means that the U.S. economy is less vulnerable to economic or market shocks.”⁴⁸

As it has been mentioned above the US capital market is highly attractive for both domestic and international companies willing to grow and expand since it is by far the most lucrative fund-raising tool for all types of businesses. Besides, every single US citizen is interested in financial securities investment making internal stock market as the most appropriate way to avoid future uncertainties economic crises such as inflation and others. Thanks to this development, US debts (treasury bills) have been reported to be risk-free assets and highly demanded within the international bond market.

Pic. 1.3.1 - View United States’s Market Capitalization: % of GDP from 2011 to 2022⁴⁹

⁴⁸ <https://www.sifma.org/about/U.S%20capital> markets are the total global market activity.

⁴⁹ <https://www.ceicdata.com/en/indicator/united-states/market-capitalization--nominal-gdp>



The chart does reveal data about the share of equity market capitalization in the US Nominal GDP in % over an 11-year period between 2011 and 2022. In general, what stands out from the given information above is that a figure has been rising notably and reaching 208.228 percent of Nominal Gross Domestic Product in 2021 which made the most profitable period in the chart. Even by looking at the least fraction, that dated back to 2011, was well above 100 % accounting for 100.263 %. In other words, information above describes how the stock market well-developed in the United States of America and the role of capital market in the economic growth that spurs companies to raise funds by going public rather than taking out corporate loans from commercial banks.

The U.S. equity market structure ecosystem is complex, with many moving pieces all intertwined to deliver the largest – 41.0% of the \$101.1 trillion global equity market cap, or \$41.5 trillion; 3.6x the next largest market, China – and among the deepest, most liquid and most efficient markets in the world. Key to delivering efficient, reliable, and low-cost markets is the underlying market structure. Market structure can drive liquidity and trade costs. Therefore, market participants continually strive to create the most efficient markets. This includes adapting new technologies to achieve operational efficiencies, searching for new

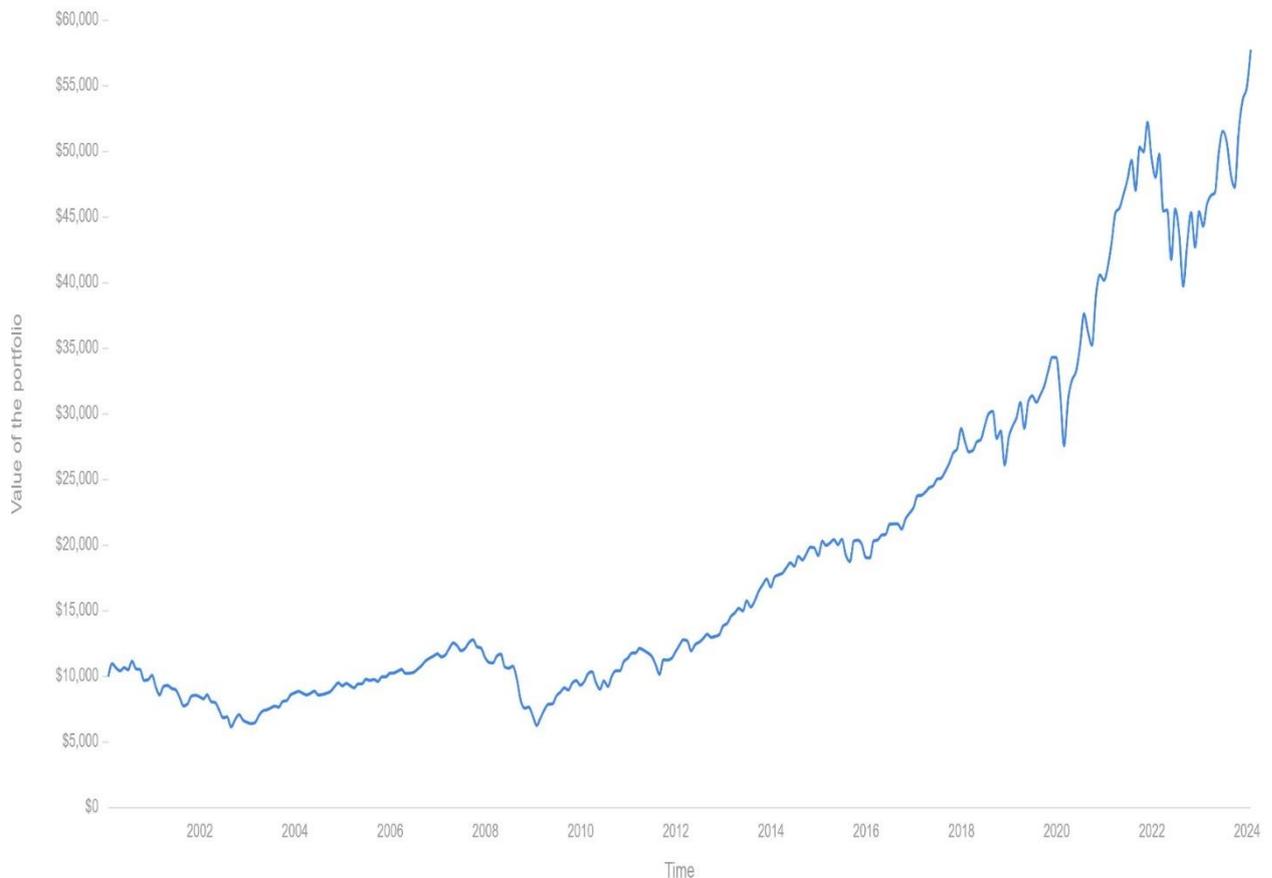
ways to transact and, generally, sculpting market structure to maximize efficiencies⁵⁰.

In greater detail, data above does disclose key components of U.S. equity market structures. First and foremost, the efficiency of equity market referring to the ability to raise capital with little or no effort at all, that is to say, the U.S. equity market is highly attractive, even lucrative for investors and one of the most appropriate ways to raise funds for companies by going public or just issuing debts (bonds). Next key component is, needless to say, reliability spurring cash flow to the U.S. securities that make them safe in terms of confidentiality and transaction processes, since all operations are accomplished by the safest central securities depositories, custodian banks and clearing centers and all transactions are meticulously examined by U.S. Securities and Exchange Commission. Last but not least, low-cost markets which mean brokers do charge negligible fees for taking transactions drawing investors' attention to the U.S. securities. What is more, as it has been reported that the US stock market does provide access to an international market like none other stock market does and its reach throughout the world is unparalleled. Thus, it helps in maintaining a diverse portfolio and minimizing risk as investor's portfolio will be spread over a large number of companies, resulting in generating excellent returns on investment. The most drivers of cashflow to stock market are equity indices helping retail investors invest in a basket of several stocks in order to minimize risks. Stock market indices serve as a benchmark for evaluating the performance of investment portfolios. By comparing portfolio returns to the performance of relevant indexes, an investor can determine if the investor's investments are outperforming or underperforming the market.

Even by investigating of US equity indices benchmarks like S&P 500, Dow Jones Industrial Average and others. It is clear how they work properly and drive cashflow from households to companies, generating revenue for both participants of capital market. Simultaneously, when it comes to combat inflation, it is worth to take equity indices into consideration since they are expected to hedge portfolios

⁵⁰ <https://sifma.org>

against inflation and other economic uncertainties as well as they could outperform different sources of investment tools. As mentioned above one of the main sources of cashflow to stock market are equity indices helping retail investors invest in a basket of several stocks in order to minimize risks. Stock market indices serve as a benchmark for evaluating the performance of investment portfolios. By comparing portfolio returns to the performance of relevant indexes, an investor can determine if the investor's investments are outperforming or underperforming the market. What is more, as it has been reported that the US stock market does provide access to an international market like none other stock market does and its reach throughout the world is unparalleled. Thus, it helps in maintaining a diverse portfolio and minimizing risk as investor's portfolio will be spread over a large number of companies, resulting in generating excellent returns on investment.



Pic. 1.3.2 - S&P 500 Historic Data between 2000-2024⁵¹

The chart above does represent historic data of S&P 500 between 2000-2024. In general, it can be seen that If 10 000 dollars had been invested at the beginning of the given period, it would have been returned back 6 times higher than principal almost 60 000 dollars, beating the inflation and taking portfolio to profit. In other words, this kind of equity indices can be created in Uzbekistan so as to protect funds against inflation and make investment plans for future since this could lead to safe retirement for aged people searching for financial stability after work. First and foremost, it is necessary to examine in greater detail how S&P 500 stock index actually works, afterwards some appropriate features can be taken to apply in Uzbekistan in order to advance fundraising via stock market. As it is

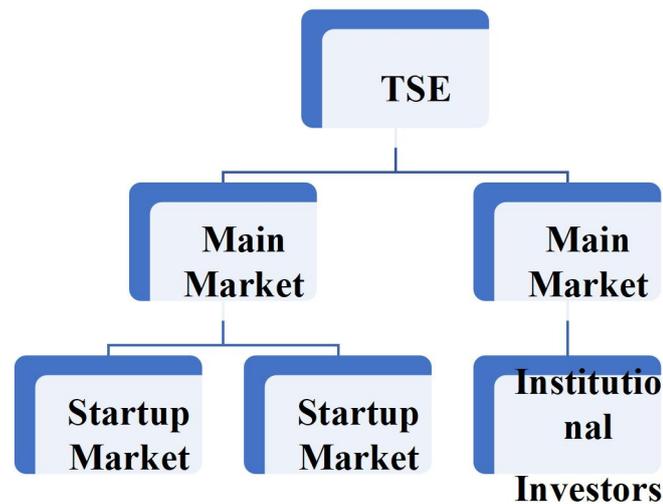
⁵¹<https://curvo.eu/backtest/en/portfolio/s-p-500-NoIgygZACgBARABgSANMUBJAokgQnXAWQCUEAOAdlQEYBdeoA?config=%7B%22periodStart%22%3A%222000-02%22%2C%22currency%22%3A%22usd%22%7D>

known that the S&P 500 is an index that tracks the stock market's performance based on the share price fluctuations of 500 of the largest companies in the United States. It's a weighted index based on market cap, which means more valuable companies have a greater influence on the index's direction. In Uzbekistan, it is worth to establish such equity index that would track the stock market's performance based on the share prices of at least 50 of the largest companies since it would lead to boost both local and international investors' attraction to Tashkent Stock Exchange and local companies' stocks. Regarding analysis of S&P 500, the index gauges the stock market's performance by calculating the share-price performance of 500 of the largest companies. These 500 companies are the most influential and powerful movers in the market. Here, measures could be taken to opt for by far the biggest and influential Uzbek companies and create an equity index to attract more funds, apart this would serve as a benchmark to analyze overall economic circumstance in the country. Another good example is Japanese Stock Market, being the world's fifth-largest stock market, was created in 2013, Japan's main stock exchange operator brings together the country's two main stock exchanges, which merged to combat the slowdown in market conditions in the country⁵².

In general, there are two stock exchanges in Japan. First is the Tokyo Stock Exchange (TSE) is the country's largest stock exchange. Founded in 1878, it now has some 3,900 listed companies. Second is the Osaka Stock Exchange (OSE) was founded in the same year and focuses mainly on derivatives, such as futures and options. The TSE lists the largest companies in Japan, including Toyota, Softbank, Keyence Corporation, Sony Corporation, and Chugai Pharmaceutical. The TSE is comprised of five sections; the first two sections are called the "Main Market" and incorporate large capitalization and medium capitalization companies. Two sections are reserved for startup enterprises. Last but not least, the last one is for professional investors only.

⁵² <https://www.marketscreener.com/news/latest/Japanese-stock-market-How-does-it-work-43990570/>

Fig. 1.3.1 - An Illustrated Structure of the Tokyo Stock Exchange⁵³

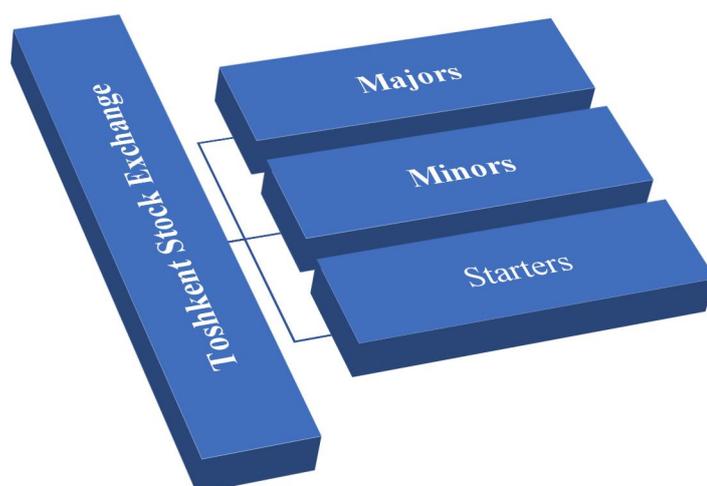


The uniqueness of Tokyo Stock Exchange is visible from illustrated picture above, making it easy to investigate how it actually operates, and TSE (Tokyo Stock Exchange) is run by the Japan Exchange Group. Consequently, this could be applied to Toshkent Stock Exchange. In other words, by dividing into three main categories like “Majors” large companies and “Minors” medium and small businesses, as well as “Starters” referring to startup projects.

Fig. 1.3.2 - The structure of Toshkent Stock Exchange would be in this form⁵⁴

⁵³ Based on the author’s development

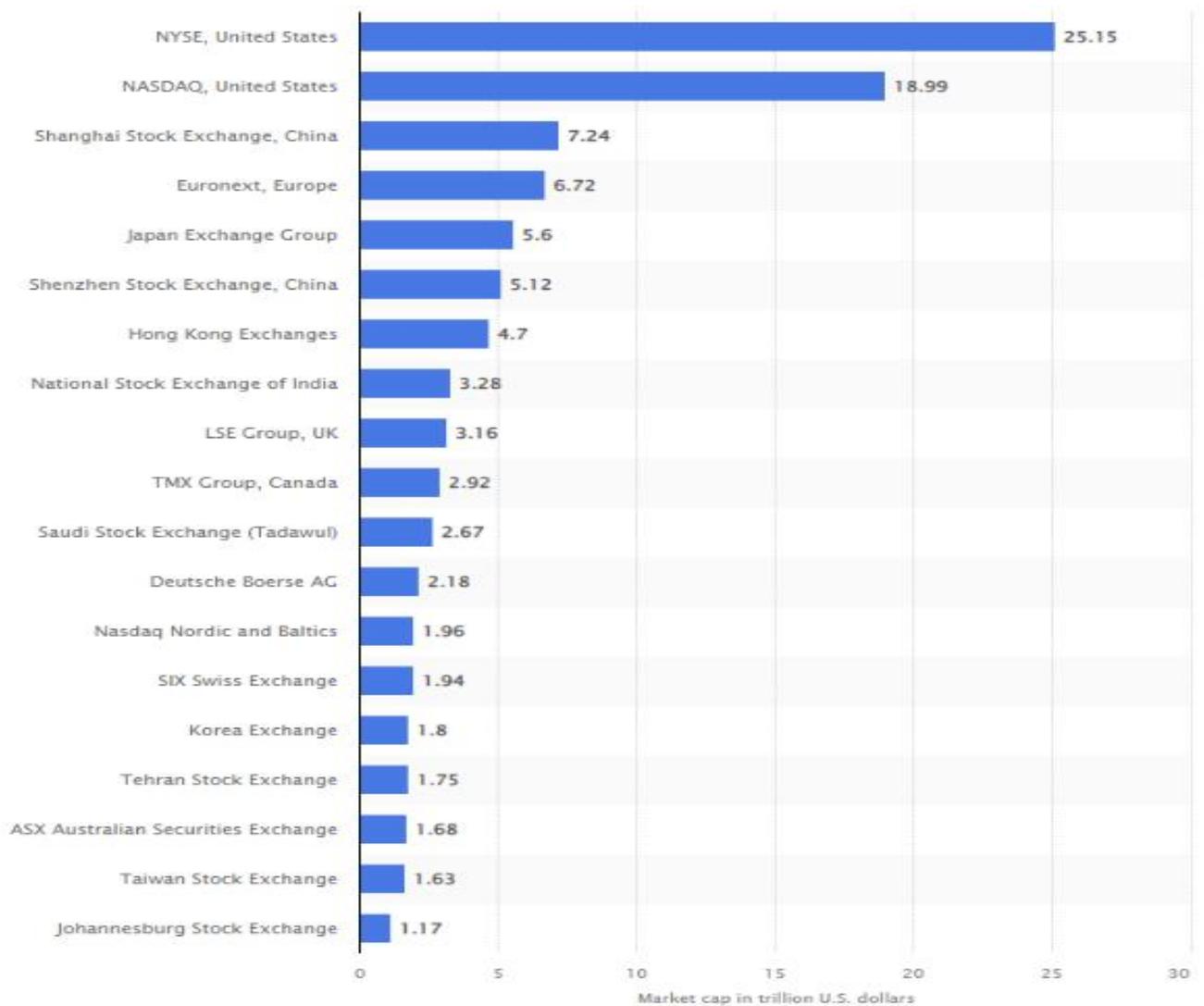
⁵⁴ Based on the author’s development



As mentioned, in “Majors”, there would be large companies with big market capitalization or even considered as well-recognized corporations in Uzbekistan, “Minors” category would cover medium-sized and small businesses, of course relatively small market capitalization. Finally, “Starters” there would be only startup projects which have not been entities yet. Regarding scale and size, Japanese Stock Market is in an enviable place, in terms of market capitalization, being the world's fifth-largest. It comes after the NYSE, the Nasdaq, the Shanghai Stock Exchange and Euronext.

Pic. 1.3.3 - Stock markets by market capitalization as of Q4 2023 (in trillion U.S. dollars)⁵⁵

⁵⁵ <https://www.statista.com/statistics/270126/largest-stock-exchange-operators-by-market-capitalization-of-listed-companies/>

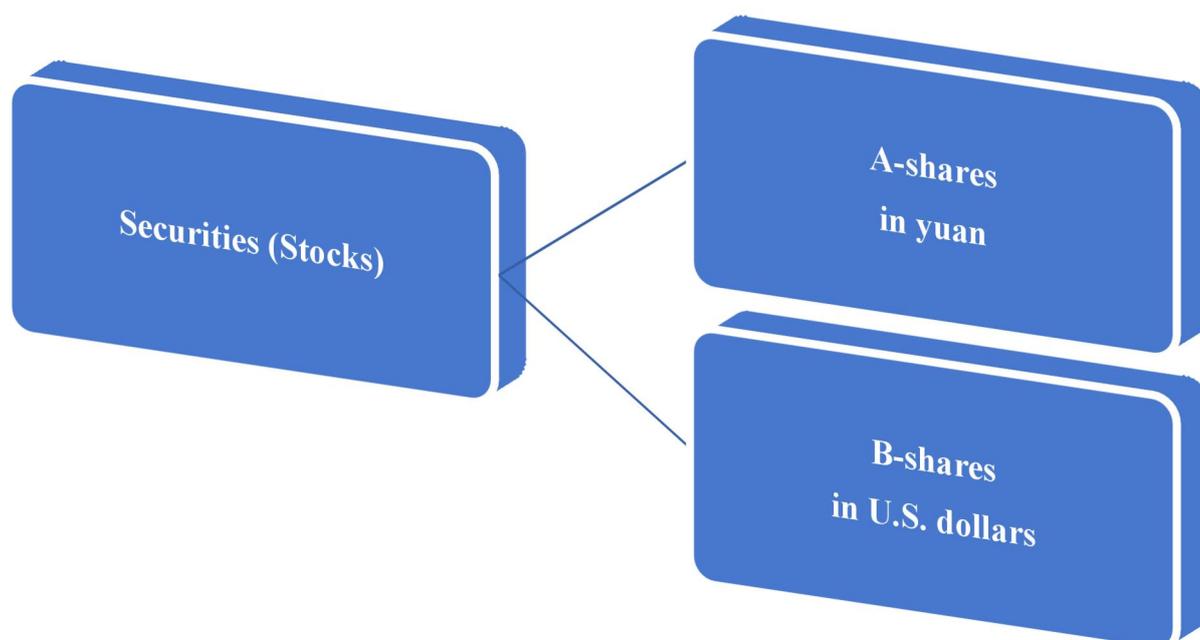


Next is the Shanghai Stock Exchange (SSE), founded in 1990, being the largest stock exchange in mainland China. It is a nonprofit organization run by the China Securities Regulatory Commission (CSRC). Stocks, funds, bonds, and derivatives are all traded on the exchange. One of the unique features of Shanghai Stock Exchange is that there are two main classes of stock for every listed company traded on the exchange—A-shares and B-shares. In other words, each company are provided two classes of securities, one is B-shares, being quoted in U.S. dollars, and are generally open to foreign investment. Another, A-shares, which are quoted in yuan, and are only available to foreign investment through a qualified program known as QFII⁵⁶. In nutshell, companies can raise capital both from

⁵⁶ <https://invest.gov.uz/ru/category/mediacenter/> The Qualified Foreign Institutional Investor (QFII) is a program that allows specified licensed international investors to participate in mainland China's stock exchanges.

internal investors in local currency as well as from external investors in foreign currency.

Fig. 1.3.3 - An illustrated form of classes of stock⁵⁷

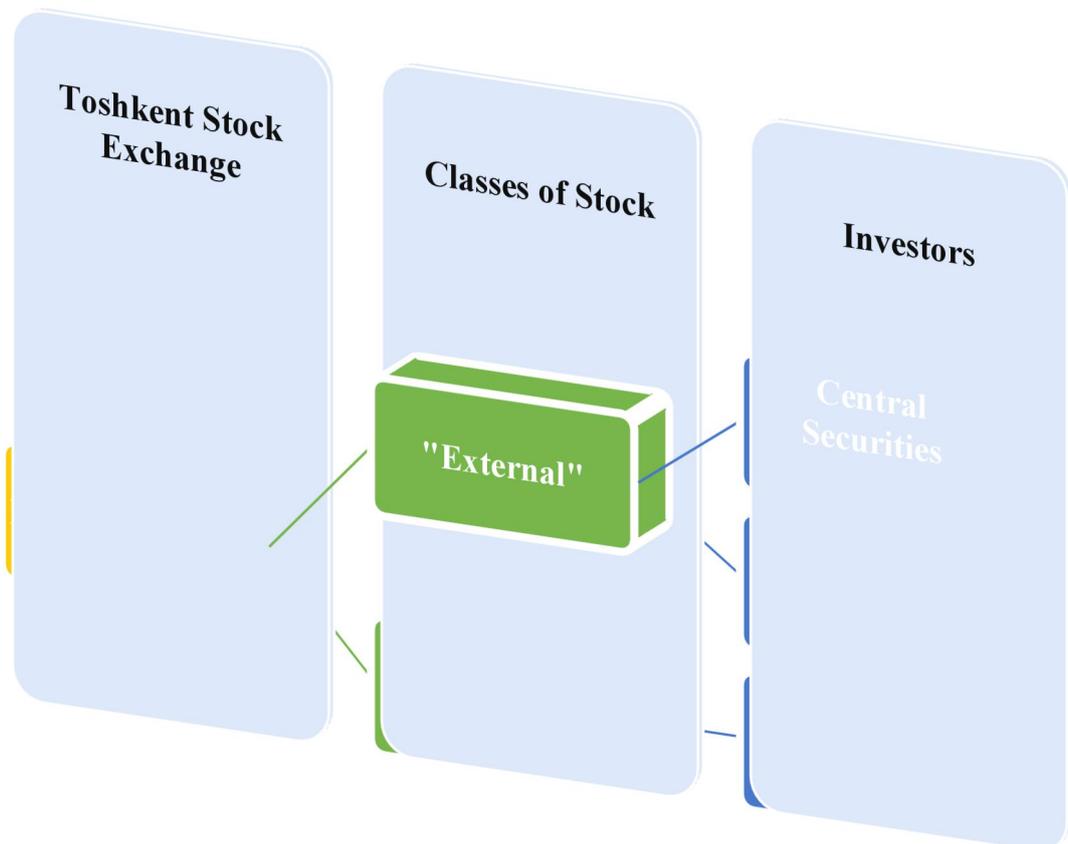


The same approach could be applied to stocks of publicly traded companies at Toshkent Stock Exchange by introducing two main classes of stock such as “Internal” as well as “External”. In other words, “Internal” would refer to quoting stocks in UZS certainly for local citizens. Regarding “External”, in this case, stocks would trade in USD especially for foreign investors. In greater detail, local investors should open brokerage accounts through local brokerage firms, and of course local investors would be provided “Internal” mode, investing in UZS to securities (stocks). Meanwhile, foreign investors should be registered as “Foreign Beneficial Owner” at JSC “Central Securities Depository”.

Fig. 1.3.4 - Scheme of classes of stock⁵⁸

⁵⁷ Based on the author’s development

⁵⁸ Based on the author’s development



Last but not least, the exploration of London Stock Exchange “LSE” is crucial to augment the liquidity of national stocks. London Stock Exchange enables companies and governments from around the world to issue securities such as shares or bonds to raise capital. Those securities can then be accessed and traded by thousands of investors, ranging from large financial institutions to private individuals. It is also responsible for supplying high-quality prices, news and other information to the financial community, for the UK community and across the world⁵⁹. In general, the London Stock Exchange possesses its own unique operational functions such as the Premium Listed Main Market. It is designed for the biggest companies and follows a Super Equivalence method, which states that the London Stock Exchange’s criteria and UK Listing Authority’s conditions must be met. In respect of small and medium-sized enterprises, the London Stock Exchange operates the Alternative Investment Market (AIM). Different businesses such as startups join AIM to gain access to growth capital. It is classified as a Multilateral Trading Facility. Its simpler admission process makes it easier for

⁵⁹ <https://hal.archives-ouvertes.fr/hal-03121415/document>

companies to join the market and become publicly listed. In nutshell, there are two options of raising capital based on the size of business for large companies “Main Market” and medium-sized and small enterprises “Alternative Investment Market” (AIM).

As was previously mentioned in this part of the research, while analyzing Tokyo Stock Exchange (TSE), the expertise of London Stock Exchange as well as Tokyo Stock Exchange, since there are some similarities between them, could be applied to Tashkent Stock Exchange by dividing into categories based on the size of business.

Conclusion on the first chapter

1. There have been made so many theoretical contributions to the development of a capital market, even there are financing stages of businesses. First and foremost, banking loans are fundamental in the first phase which is well-advanced in Uzbekistan. In greater detail, the second stage being stock market funding, that is to say, it is time to encourage enterprises to raise capital by issuing securities such as stocks and bonds in order to finance own projects. What is more, capital market development is reported to mobilize savings within a country after resources allocated properly into businesses by exerting corporate control. Simultaneously, it would lead to mobilize local people’s savings to the stock market, improving financial education within the country. In these days, in Uzbekistan, companies heavily rely on banking loans to spur cash-flow and enhance own business operations which result in restricted financing opportunities, since the stock market could provide a wide range of opportunities not only for businesses but also for local investors when it comes to raise funds for new entrepreneurial projects as well as boost investors’ capital. Besides, local businesses could raise foreign funds by going public to foreign stock exchanges leading to foreign currencies in.

2. In particular, several steps have been taken to improve legislative basis of the functioning of stock market. For instance, in the Presidential Decree № 90 “On additional measures to implement effective mechanisms to support the capital

market” accepted on 17th January 2022⁶⁰. “In order to further develop the capital market, expand the practice of privatization of blocks of state shares through the capital market, stimulate public investment in securities and create a healthy competitive environment in the financial market. Apart from this, measures for granting a preemptive right to purchase shares to employees of enterprises in the event of a public offering of these shares as part of an employee stock ownership plan (ESOP) introduced by the enterprise.

3. A stock market development does coincide with the creation of an equity index. To be more precise, it is crucial to create national equity index as a benchmark which would reflect overall economic condition in our country since all well-developed countries possess own national equity indices such as Nikkei 225 in Japan, Dax in Germany, FTSE in the United Kingdom, as well as S&P 500 in the United States. Based on equity indices (benchmarks), analysts do examine economic situation in a country, even they anticipate what it is going to happen in the near future.

CHAPTER 2. ANALYSIS OF TASHKENT STOCK EXCHANGE AND ITS SUPPORT FOR BUSINESSES

2.1 Analysis of Tashkent Stock Exchange and its role in securitization

As a research object of the thesis, Tashkent Stock Exchange, has been selected. Thus, in the first paragraph of this chapter, I will be exploring Tashkent Stock Exchange in a detail, in other words, SWOT analysis of the research object will be conducted. Further, attempts will be done to look for potential support of Tashkent Stock Exchange to local businesses in ways of encouraging them to go public. Then, the securitization of commercial banks’ loan portfolios will be covered in the second half of this paragraph, and a role of Tashkent Stock Exchange in this process, to put it another way, how the thesis object might spur the commercial banks of Uzbekistan to raise capital to fund loans by issuing

⁶⁰ <https://invest.gov.uz/prinjato-postanovlenie-prezidenta-ot-17-janvarja-2022-pp-90-o-dopolnitelnyh-merah-povnedreniju-effektivnyh-mehanizmov-podderzhki-rynka-kapitala>

mortgage-backed securities (real-estate) as well as asset-backed securities (auto, credit card receivables and business loans), will be analyzed too.

But first, a little background information about the object of thesis: “Tashkent Stock Exchange, officially The Republican Stock Exchange “Toshkent” (RSE) (Uzbek: Toshkent Respublika fond birjasi) is the only stocks and corporate bonds trading platform (as the exchange and OTC) in Uzbekistan. It was founded by the government in 1994 as an open joint stock company, located in the capital of Uzbekistan – Tashkent. RSE had a license for the exchange activity given by the State Committee of Competition and regulated under the Laws of Uzbekistan on exchanges (1992), on joint stock companies (1996), on securities market (2008) as well as a number of under-law legal acts of government and securities commission. In October 2019, the Capital Market Development Agency of the Republic of Uzbekistan (CMDA was created in 2019 and liquidated in 2021) reissued the license for the RSE. According to presidential decree dated March 19, 2012 Korea Exchange (KRX) became a shareholder of RSE in 2016 by acquiring 25 percent in the equity capital in exchange for the provision of a Unified IT complex.”⁶¹

In general, there have been made a wide range of contributions to develop the Tashkent Stock Exchange. Based on found data on the Internet. “The past year has left a notable mark on the trajectory of Uzbekistan’s stock market. In 2023, the market witnessed pivotal events, encompassing public offerings, remarkable shifts in retail investor dynamics and transformative regulatory and infrastructural changes. Despite the high deposit interest rates offered by banks in Uzbekistan, reaching up to 27% annually, one of the most noteworthy phenomena of 2023 was the influx of tens of thousands of new retail investors.

These individuals, entering the stock market for the first time, invested their funds in securities and became shareholders. This has had a strong impact on the overall dynamics of the stock market and has been reflected in the increased transaction volume on the Tashkent Stock Exchange. Due to a sharp increase in

⁶¹ https://en.wikipedia.org/wiki/Tashkent_Stock_Exchange

retail liquidity, the number of exchange transactions surged fivefold compared to 2022. In the past year, the stock exchange witnessed 411,900 securities transactions totaling 2.7 trillion som (~\$215mn), with the value down by almost half versus 2022 given reduced activity in major privatization and M&A deals. The remarkable surge in retail investor numbers is chiefly attributed to the rapid growth of fintech, notably with the introduction of the mobile investment service Jett.uz (which enables investors to open investment accounts and directly provides access to invest or trade national quotes, even investors could transfer their funds from Uzcard, Humo to their investment accounts). This innovation has allowed people from all over the country to access the purchase of securities through various mobile apps.

Despite the fact that the total trading volume through Jett amounted to just 15.59bn som (~\$1.3mn), the number of transactions on the secondary stock exchange through the service exceeded 320,000, representing over 80% of all operations on the Tashkent Stock Exchange. This vividly illustrates the heightened interest of the population in securities.”⁶²

Meanwhile, regarding the debt market, it is not highly active, regardless of experiencing approximately sevenfold rise in the number of transactions over the year, primarily attributable to retail investors. As it is highlighted on the Internet: “by the end of 2023, the central depository records corporate bonds issued by 33 entities, with a cumulative nominal value of 1063.4bn som. Among these, 26 companies, in the form of limited liability companies, have issued bonds totaling 669.19bn som, which became possible in Uzbekistan a couple of years ago – previously, only companies structured as joint stock companies could issue corporate bonds. The average coupon yield on bonds is 22-27%, and the maturity 18-36 months. The highest yields are offered by several microfinance organizations, which were allowed to raise funds through bond issues.

⁶² <https://www.intellinews.com/tashkent-stock-exchange-raising-its-game-on-marked-gains-in-reform-and-retail-311882/>

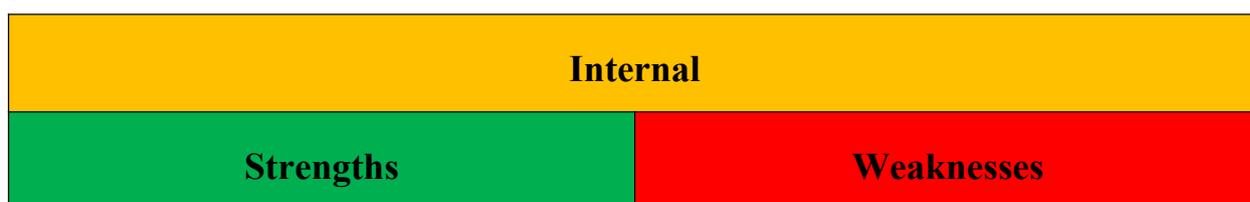
However, fixed-income instruments are not currently attractive to retail investors due to high competition with guaranteed bank deposits. Nevertheless, they may be of interest to institutional investors or commercial organizations looking to “park” excess liquidity. Additionally, at present, thanks to ongoing reforms in the country’s capital market development, bond yields are not subject to taxation.”⁶³

What is more, relying on the information which was indicated on the website www.Intellinews.com: “the most significant event in the domestic debt market was the country’s inaugural issuance of “green” bonds amounting to 50 billion som (\$~4 million) with a maturity of five years. The issuance was conducted by the holding company Saipro Group with the support of the Uzbekistan Direct Investment Fund and verification from the AIFC Green Finance Centre.”

To the best of my knowledge, in greater detail, this financial operation, being mentioned above, marks a crucial milestone in forming the internal market for GSS (Green, Social and Sustainability) financial instruments, denoting to consistent transition towards a green economy as well as sustainable development. This could be considered as one of the signals of promising choice for improving the capital market of the Republic of Uzbekistan.

As mentioned above, the most significant part of this paragraph is to make SWOT analysis of Tashkent Stock Exchange, in order to find out pros, cons, probable opportunities as well as upcoming threats which could be eliminated. After, a secondary step is supposed to launch the securitization process with the assistance of Tashkent Stock Exchange.

Fig. 2.1.1 - SWOT analysis⁶⁴



⁶³ <https://www.intellinews.com/tashkent-stock-exchange-raising-its-game-on-marked-gains-in-reform-and-retail-311882/>

⁶⁴ Based on the author’s development

All existing advantages of Tashkent Stock Exchange	All existing disadvantages of Tashkent Stock Exchange
<ul style="list-style-type: none"> - infrastructural changes; - retail investment boom; - rapid growth of fintech; - cooperation with Korean Stock Exchange 	<ul style="list-style-type: none"> - the lack of information about National Index UCI; - the absence of startup market
External	
Opportunities	Threats
All existing opportunities that could be used for the benefit of Tashkent Stock Exchange	All existing threats that could be eliminated for the benefit of Tashkent Stock Exchange
<ul style="list-style-type: none"> - transformation of Central Securities Depository; - creation of National Clearing Center upon JSC “Uzbek Republican Currency Exchange”⁶⁵ 	<ul style="list-style-type: none"> - high rate of financial illiteracy; - less professionalism in the capital market; - depreciation of national currency

By looking at the SWOT analysis above, it can be seen that the strengths of Tashkent Stock Exchange do outweigh the rest parameters, in other words, there are actually four advantages related to the thesis object like infrastructural change, boom in retail investment, rapid growth in financial technologies, and of course collaboration with Korean Stock Exchange. First and foremost, advancement in infrastructure, there have been made many contributions to improve Tashkent Stock Exchange, in particular, supports by active government initiatives, including tax incentives for investors, that is to say, foreign investors are now released from

⁶⁵ <https://lex.uz>

taxes on dividends received from shares within first three years. The development of employee stock ownership program (ESOP) which also indicates positive changes to infrastructure. Besides, there have been taken steps to create a single platform for disclosure of corporate and market information on disclosure of information by listed companies and shareholders on the basis of the single portal of corporate information and relevant sections of the website of the Tashkent Stock Exchange. In addition, the creation of an electronic table of the database on the official website of the Tashkent Stock Exchange that incorporates all related information about the name of the issuer, the type of share, the interest paid for the preferred share, the amount of the dividend paid and the date of its payment, which is open to all investors⁶⁶.

Next, a dramatic rise of retail investors (individuals) interests to participate in the stock market traded shares in the Main Board section of the Tashkent Stock Exchange, amounting to 166,20 billion UZS, and bought – for 242,82 billion UZS, by the end of calendar year (2023) respectively.⁶⁷ The third strength is a rapid growth of the financial technologies which support internal infrastructure of the Tashkent Stock Exchange that increase access to analyze financial statements of the quoted companies prior to make investment decisions, thus, resulting in higher transparency and higher stock price liquidity. One of the examples of cutting edge fintech programs is Jett.uz mobile app that can give access to invest in stock of companies listed at Tashkent Stock Exchange helping local investors augment their capital through mobile app⁶⁸. Last but not least, the cooperation with the Korean Stock Exchange as well as the Tashkent Stock Exchange is one of the efficient ways to advance the liquidity of Uzbek stocks and the whole capital market in Uzbekistan. They signed a document that would serve as a solid basis for the further joint measures to develop the software and hardware complex of the stock

⁶⁶ <https://lex.uz>

⁶⁷ https://uzse.uz/system/analytics/pdfs/000/000/201/original/Stock_Exchange_Review_2023__eng_new...pdf

⁶⁸ <https://lex.uz>

exchange, create new financial instruments, and develop the knowledge and skills of specialized specialists⁶⁹.

Regarding the weaknesses of the Tashkent Stock Exchange, to the best of my knowledge, a lack of transparency about national index UCI (Uzbekistan Composite Index) makes the capital market development slow, in other words, it is about time to advance a benchmark index UCI by introducing an aggregate market capitalization, fixing the order of highest to lowest weighting. In fact, UCI is analyzed based on the estimate of the conducted exchange transactions of listed companies on the Tashkent Stock Exchange. Following this, there should be created startup market board on the Tashkent Stock Exchange in order to facilitate startup companies to raise capital by going public since nowadays many advanced stock exchanges are reported to permit startup companies to go public.

With respect to external sides, so here threats do outweigh opportunities. Based on the SWOT analysis above, there are actually two opportunities for the Tashkent Stock Exchange, the first is the transformation of Central Securities Depository that will result in the improvement of capital market infrastructure as well as it could spur foreign investment to the Tashkent Stock Exchange. The creation of National Clearing Center upon JSC “Uzbek Republican Currency Exchange” is expected to improve the quality of security transaction processes and this could turn more foreign investors’ attention to the Tashkent Stock Exchange. However, there is a flip side of the coin, three current threats could inhibit the opportunities being emphasized above, thus those threats should be eliminated, of course there are some proposals how to overcome the threats that indirectly adversely affect the Tashkent Stock Exchange activities.

First and foremost, there is a huge issue related to the high financial illiteracy in Uzbekistan since a majority of people are not educated how to invest or to save money for hedging future economic uncertainties, so the answer for this problem is to spread⁷⁰ out financial literacy by introducing finance as well as

⁶⁹ <https://lex.uz>

⁷⁰ <http://economy-lib.com>

investment disciplines in school curriculums within the whole country. Then, the lack of professionalism in the capital market causes some obstacles to improve the function of Tashkent Stock Exchange. For instance, the absence of sufficient highly-qualified employees on the capital market in Uzbekistan, in other words, it is because of the absence of investment related disciplines taught at local universities with majors in economics and finance like securitization, asset management, wealth management, securities management and others. Finally, there is a strong local currency devaluation keeping foreign investors away from investing into Uzbek securities, certainly this problem could be solved by taking some monetary policy actions like raising interest rate, currency intervention (short-term solution against devaluation) or boosting export-oriented manufacturing. Shortly, all these threats, weaknesses could be overcome through suggestions, which have been mentioned above, for the benefit of Tashkent Stock Exchange and the whole capital market.

Second half of this part is exploring the ways of fixing up securitization process in Uzbekistan by means of Tashkent Stock Exchange. But first it is worth to run through securitization basics, in other words, how it means, how it actually works and other related functions. To put it briefly, the securitization process pools assets and repackages them into interest bearing securities⁷¹. After, an issuer plans a marketable security by merging financial assets, widely mortgage loans, consumer loans or even commercial loans as well. Once investors have purchased these securities, they would receive the principal (down payment) and interest payments of the underlying assets.

Based on information from the internet: “In securitization, the company or the originator that holds the assets determines which assets to remove from its balance sheets. A bank might do this with mortgages and personal loans it no longer wants to service. This gathered group of assets is now considered a reference portfolio. The originator then sells the portfolio to an issuer who creates tradable securities with a stake in the assets in the portfolio. Investors buy

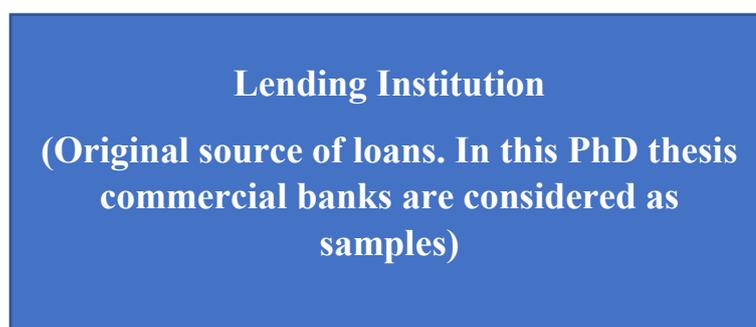
⁷¹ <https://www.iiste.org/Journals/index.php/JEDS/article/download/35130/36133>

the new securities for a specified rate of return and effectively take the position of the lender. Securitization allows the original lender or creditor to remove assets from its balance sheets to underwrite additional loans. Investors profit as they earn a rate of return based on the associated principal and interest payments made on the underlying loans and obligations by the debtors or borrowers.”⁷²

Regarding the assessment process, as Andreas Jobst (an economist in the IMF’s Monetary and Capital Markets Department) mentioned in his article “What is Securitization?”: “the conventional securitization structure assumes a three-tier security design – junior, mezzanine, and senior tranches⁷³”. A junior tranche does refer to a type of debt being unsecured and considered riskier but at the same time it pays a high-interest rate, as well as it owns higher exposure to losses than the rest of two tranches. Mezzanine tranches, however, are less exposed than to the defaults as well as losses, and they receive payment before the junior tranches. Finally, the highest-rated tranches are called as senior (often-rated AAA), and they are considered as the safest tranches and the first tranche to pay, meanwhile investors are paid a relatively low-interest rate.

In essence, there are generally three stages of the securitization process that could be applied to our stock market since there have been made many contributions to spur urbanization in Uzbekistan, in other words, home demand outweighs home construction supply.

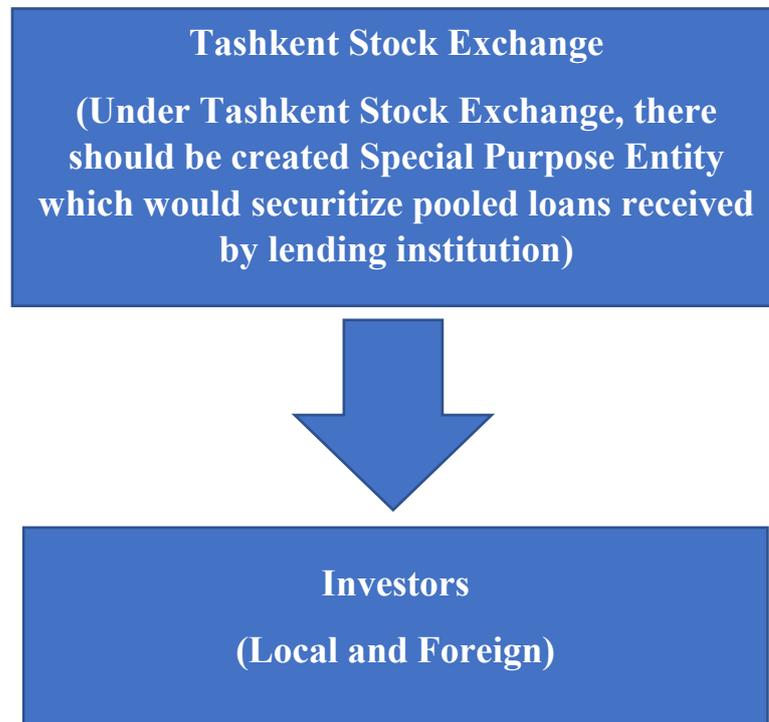
Fig. 2.1.2 - The structure of the Securitization Process⁷⁴



⁷² <https://www.investopedia.com/terms/s/securitization/>

⁷³ Tranches are pieces of a pooled collection of securities, usually debt instruments, that are split up by risk or other characteristics in order to be marketable to different investors.

⁷⁴ Based on the author’s development



As mentioned above, there are actually three stages of the securitization process. Firstly, a lending institution (in some sources it has been emphasized as a loan originator) does extract loan portfolio (mainly mortgage loans with high credit ratings) from balance sheet so as to prepare it to sending to Special Purpose Entity. Next, the Special Purpose Entity which would be under the Tashkent Stock Exchange control, that is to say, there should be created the Special Purpose Entity department in the Tashkent Stock Exchange. The Special Purpose Entity would pool loan portfolio and it would be securitized into securities backed by mortgages (MBS, mortgage-backed securities). Finally, those mortgage-backed securities would be offered to investors (local as well as foreign ones). However, in case of default, mortgage (real-estate) comes out as a collateral, to put it another way, an investor would receive home instead. Last but not least, lender institution would have to remain responsible for at least 5 % of the credit risk attached to these loans this means 5 % of the mortgage-backed securities would have to be paid out to an investor (in case of default) in addition with collateral (real estate).

We have carried out an empirical research by using some econometric as well as statistical tools in order to analyze future trend of mortgage loans as they are considered underlying assets for mortgage-backed securities in this thesis. In greater detail, I took out some data of allocated mortgage loans within Uzbekistan for last 20 years between 2004 and 2024 (for the first half of the year), the variation of interest rates for the same periods as it is well-known based on the interest rates, mortgage loans would adjust, last but not least, population growth was also added since population growth does lead to mortgage loans rise. In this empiric research, dependent (**Y**) is **Mortgage loans**, and there are two independent variables (**X₁**) is **Interest rates**, (**X₂**) is **Population growth**. Thus, five econometric tools were selected to apply in this work: linear regression, correlation matrix, a scatter graphic matrix, a graphical histogram, as well as a graphical matrix.

First and foremost is the Linear Regression used to predict the value of variable based on the value another variable, the relationship between Y and X₁, X₂

Source	SS	df	MS	Number of obs =	14
				F(2, 11) =	57.64
Model	485.796285	2	242.898143	Prob > F =	0.0000
Residual	46.3522362	11	4.21383966	R-squared =	0.9129
				Adj R-squared =	0.8971
Total	532.148521	13	40.9345016	Root MSE =	2.0528

y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
x1	.2679006	.2278001	1.18	0.264	-.2334841	.7692853
x2	2.379383	.2288033	10.40	0.000	1.87579	2.882976
_cons	-75.05947	7.773388	-9.66	0.000	-92.16858	-57.95035

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

Where:

❖ **y** = Mortgage loans;

- ❖ x_1 = Interest rates;
- ❖ x_2 = Population growth

Interpretation of Linear Regression Model Output

As it is visible from the linear regression model indicating relationship between response variable (y) as well as explanatory variables (x_1 ; x_2). In general, there are four the most significant components that should be disclosed so that to grasp the correlation between the movements of dependent variable (y) and independent variables (x_1 ; x_2). Firstly, it is Coefficient of Determination (Coef.) that shows the portion of the total variation in the response variable (y) explained by covariates (x_1 ; x_2), in simple terms, one unit change in (x_1 ; x_2) causes with x unit change in (y). According to model, it is obvious that if x_2 increases to 1%, then y would rise to 2.4 %, but regarding a growth of x_1 to 1% would result in 0.3% rise in y . In other words, there is a strong correlation between y (mortgage loans) and x_2 (population growth) thus if population grows to 1%, and that would cause 2.4% increase of mortgage loans allocation, while the observation depicts that there is a weak correlation between y (mortgage loans) as well as x_1 (interest rate) consequently as long as interest rate reaches 1% it would lead to the allocation of mortgage loans rise by 0.3%.

Second is a standard error (Std.Err.) does play key role in determining whether there is a true relationship between y and x in the population. In this work, it is certain that there is a positive relationship between (y) and (x_1 ; x_2) accounting for .2278001 and .2288033 respectively. In greater detail, there is an alternative hypothesis (H_A) between (y) mortgage loans as well as (x_1) interest rates, (x_2) population growth in turn. Meanwhile, regarding t-value component, it can be seen that there is an alternative hypothesis (H_A) or a statistically significant relationship between (y) mortgage loans and (x_2) population growth being 10.4 which is considerably higher than 1.96 to prove 95% confidence. On the other hand, the result for (y) and (x_1) shows a null hypothesis (H_0), to put it another way, there is no statistically significant relationship between (y) mortgage loans as well as (x_1)

interest rates made up 1.18 which is less than 1.96, briefly the outcome disproves 95% confidence.

Last but not least, there is one more component that makes pay attention to which is probability value or $P > |t|$ two tailed p-values that test the hypothesis that each coefficient is different from zero 0. Based on the theory, we need to have p-value less than 0.05 in order to prove a statistically significant relationship or an alternative hypothesis (H_A) between x (independent variable) and y (dependent variable). However, the outcome of p-value does unveil that there is a null hypothesis (H_0) between (y) mortgage loans as well as (x_1) interest rates since relied on data p-value of (y) and (x_1) is 0.264 which is greater than 0.05 coefficient. On the other hand, it is visible that a dependent variable (y) and independent variable (x_2) do appear to have an alternative hypothesis (H_A) or a statistically significant relationship exists among them constituted 0.000 which implies high significance.

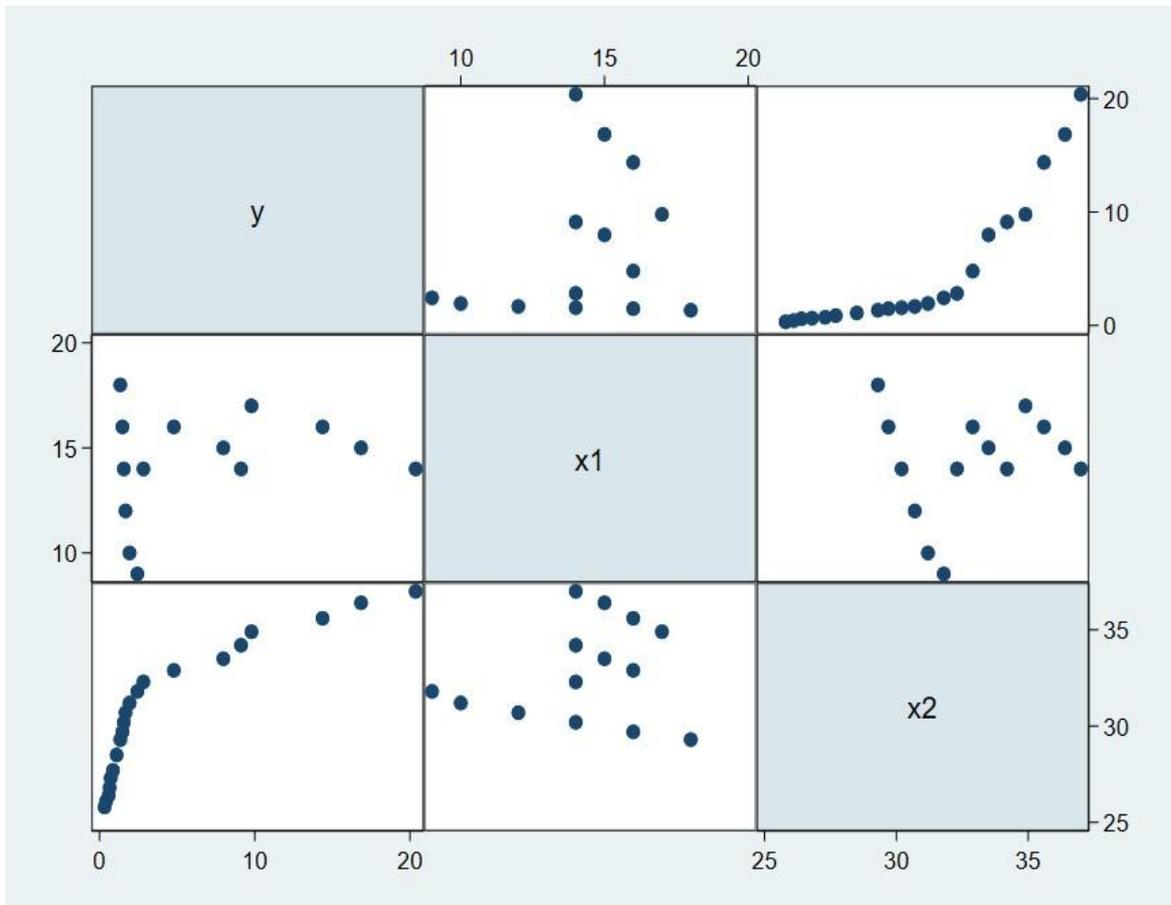
In conclusion, four components of linear regression model demonstrate an alternative hypothesis (H_A) between (y) dependent variable and (x_2) independent variable meaning population growth highly influence mortgage loans allocation rather than interest rates variation.

Next is the correlation matrix showing the correlation coefficients between two variables to measure how strong and in which direction they (variables) are linked in a straight line.

	y	x1	x2
y	1.0000		
x1	0.2378	1.0000	
x2	0.8797	0.1413	1.0000

In the correlation matrix analysis, it is clear to note that there is no correlation at all between (y) dependent variable as well as (x_1 ; x_2) independent variables. However, a correlation between dependent variable (y) and independent variable (x_2), amounting to $0.8797 \approx 0.9$, which is more than the coefficient of correlation between (y) and (x_1) made up $0.2378 \approx 0.2$. That is to say, there is more probable true relationship between (y) mortgage loans as well as (x_2) population growth rather than the correlation between (y) mortgage loans and (x_1) interest rates.

The third is a scatter plot matrix used to visualize bivariate relationships between combinations of variables. This graphic, in essence, explores cross-correlations among response variable (y) and explanatory variables (x_1 ; x_2). As mentioned above, dependent variable (y) is mortgage loans; independent variable (x_1) is interest rates; and a second independent variable (x_2) remained population growth. There is a below illustrated scatter plot matrix with detailed interpretation.

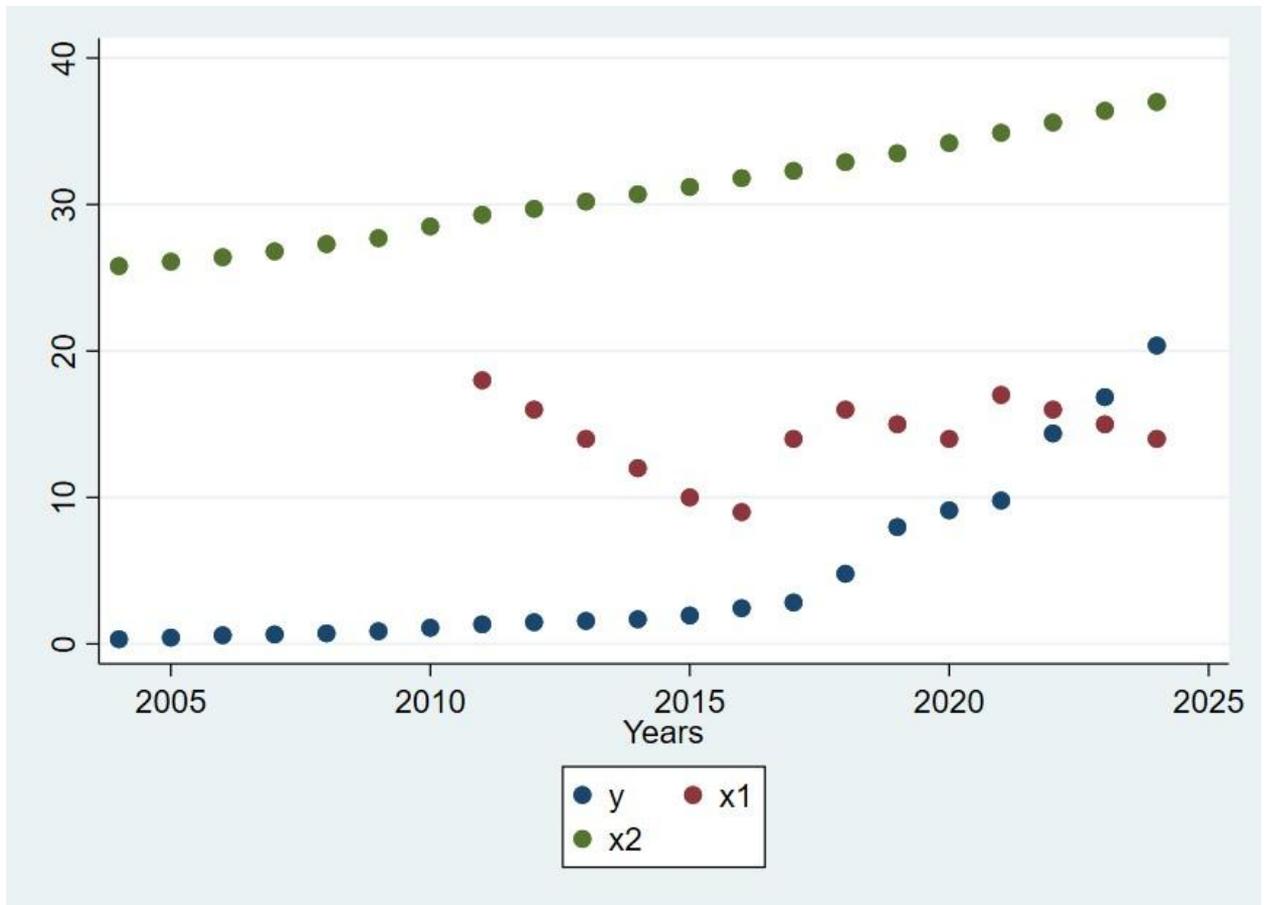


The interpretation of the scatter plot matrix

In the first column (y) dependent variable mortgage loans is x-axis, in the second column (x_1 or x_1) independent variable interest rates is x-axis and in the last third column (x_2 or x_2) population growth is x-axis. Overall, it can be seen that there is a cross-correlation between (y) which is mortgage loans, as well as (x_2) population growth. In other words, in the first column, it is clear that an increase of mortgage loans (y) causes a growth of population (x_2), simultaneously there is a similar trend in the third column where population growth (x_2), results in hiking mortgage loans allocation (y). However, cross-correlation does not exist among mortgage loans (y) and interest rates (x_1), even it is obvious from matrix that no matter how far independent variable (x_1) varies, there would be less effect on mortgage loans allocation (y) being dependent variable. The same is true for (y) mortgage loans in the first column, it is less likely correlated with (x_1) interest rates. In all, based on the scatter plot matrix, there is a cross-correlation between (y) and (x_2). To be more

precise, an alternative hypothesis (H_A) exists between mortgage loans and population growth.

The fourth is the Two-way (scatter by years) representing how each variable has changed within 20 years from 2004 to 2024.

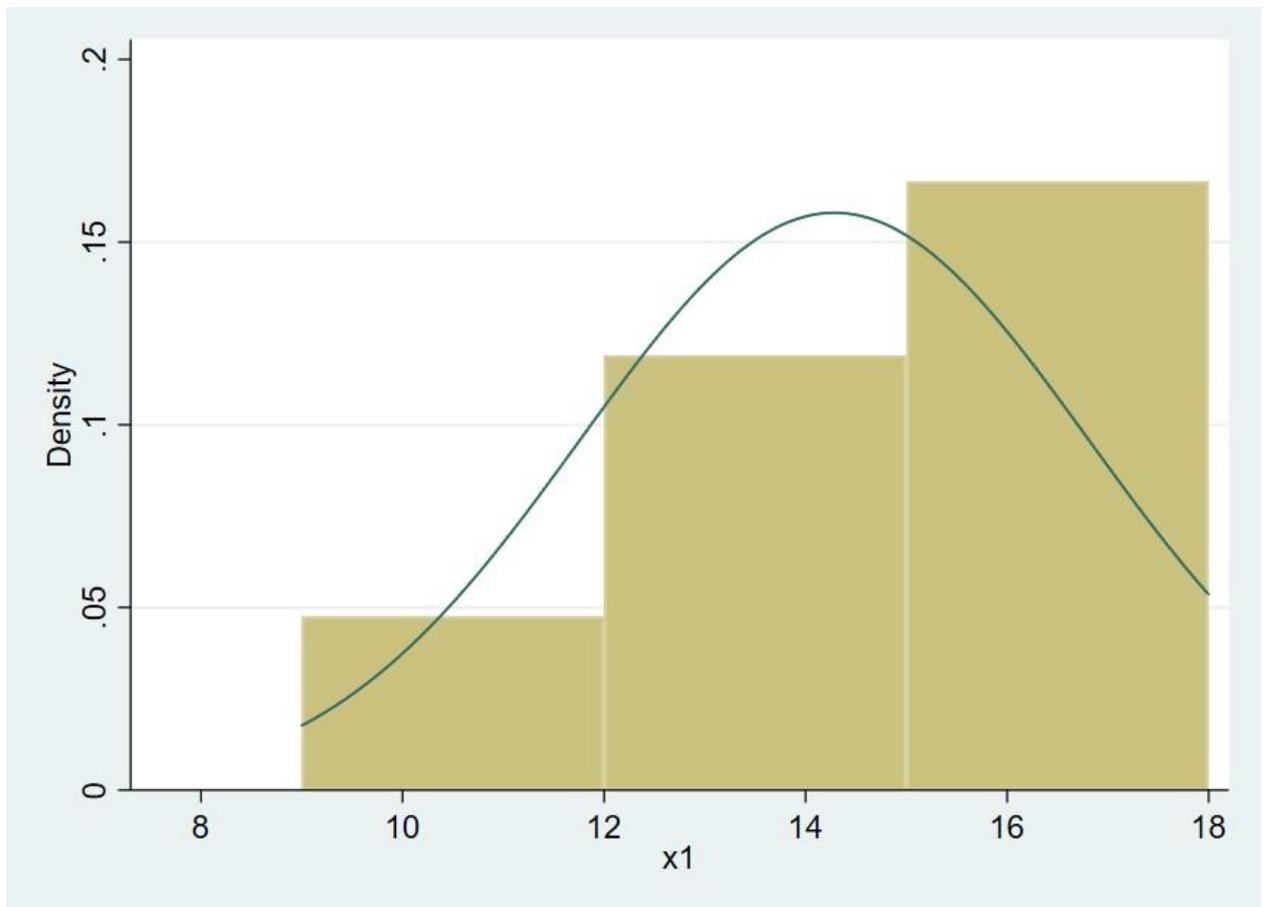


Two-way scatter by years

According to the graph above, a dependent variable (y) which is mortgage loans, has commenced to grow remarkably since 2017 made up 2,83 trillion sums of allocated mortgage loans, by the first half of 2024, this amount rocketed exactly 10 times accounting for 20,37 trillion sums of allocated mortgage loans in Uzbekistan and this upward trend is expected to continue in 2025, regardless of volatility in the interest rates (x_1). Meanwhile, the population growth does appear to have risen gradually indicating similar positive move as a dependent variable (y) does, in addition, independent variable (x_2) is anticipated to climb in 2025, which means

that it would result in an alternative hypothesis (H_A) in dependent variable (y) or would lead to lift mortgage loans allocation in Uzbekistan.

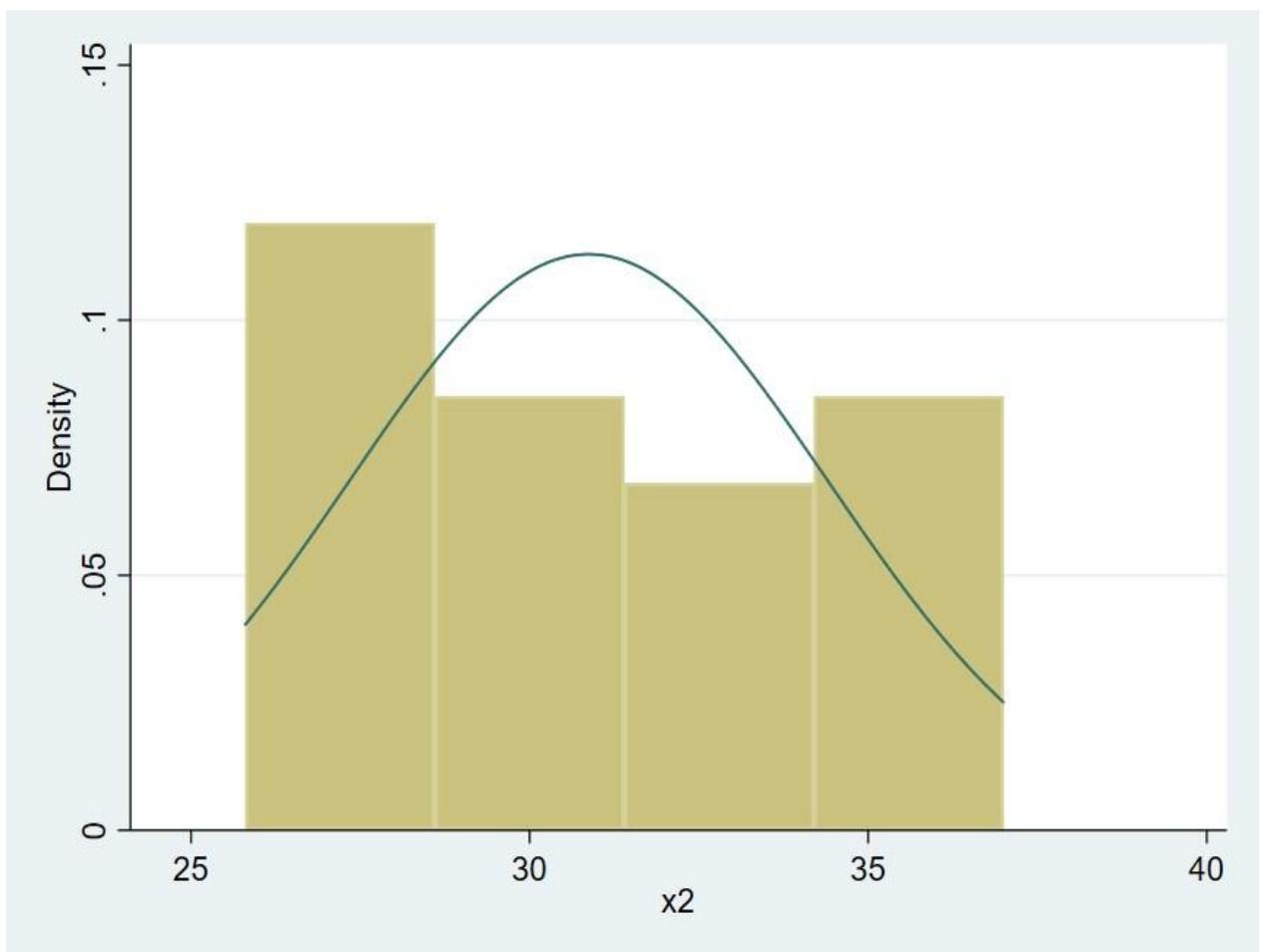
Last but not least, there is one more tool being used in order to analyze density of each variable separately in the given PhD thesis, and it is a graphical histogram bar which does visualize a representation of the distribution of data, to be more precise, higher bars in the histogram signify a greater concentration of data points within that interval, whereas lower bars indicate a lower density of data points in that range.



Density of X_1

First and foremost, there is a graphical histogram bar of the independent variable (x_1) which is the interest rates within last 20 years (2004-2024). As it can be seen that there is the highest level of density in 14% translating into above .15 percentage or (0.15%). In other words, interest rates have been adjusted to 140 basis points more frequently than the rest of basis points within last 20 years

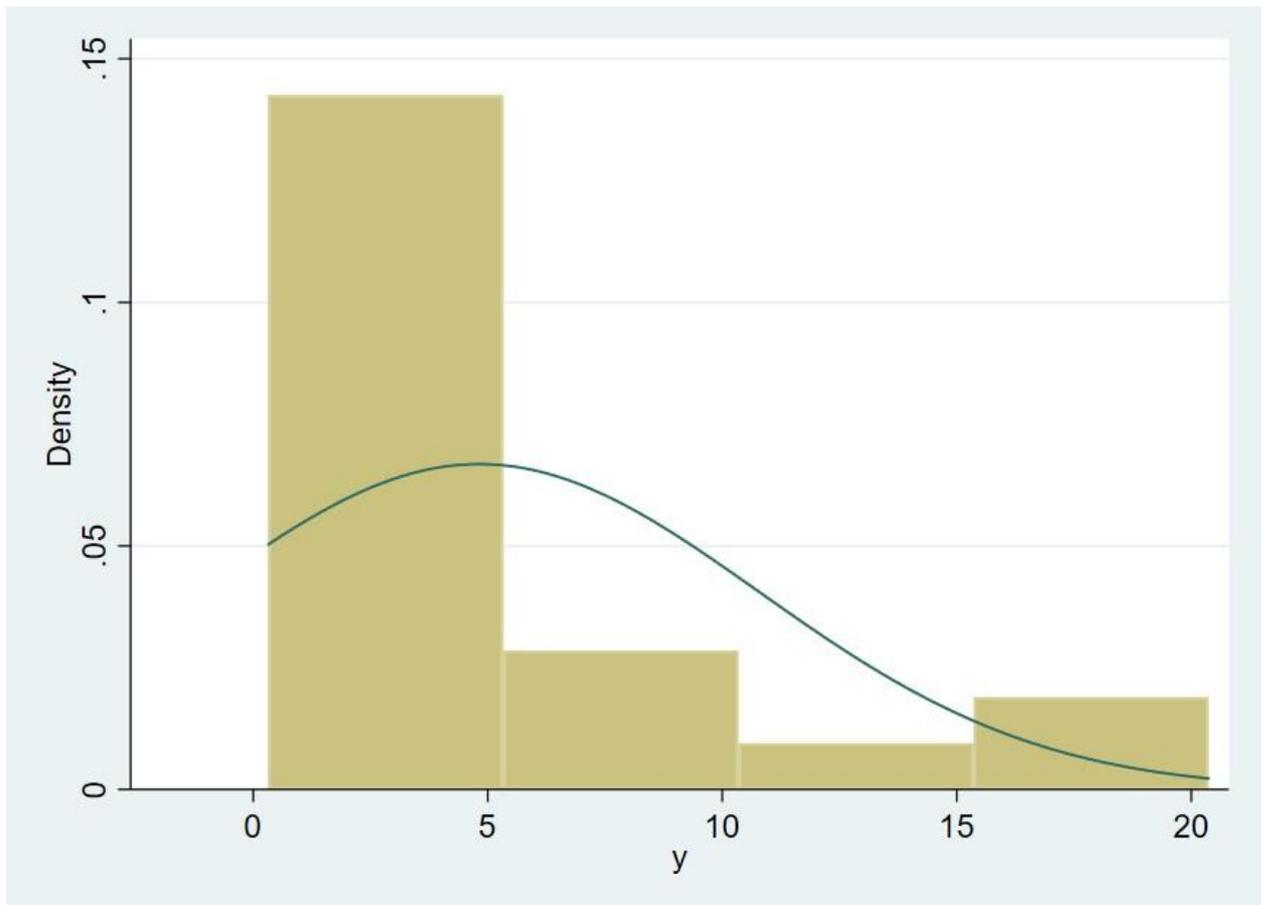
between 2004-2024, whereas, the least prevalent fixed rates were 90 basis points and 180 basis points, making up 0.02% of density level as well as 0.06% of density level respectively. In greater detail, for last 20 years interest rates reached only once 9%, and 18% in turn, forecasting a less probability of the interest rates variation toward being mentioned basis points in the near future. Briefly, it does depict a stability in monthly payments of financial products adjusted by interest rates such as mortgages.



Density of X₂

The second is a population growth which is an independent variable (x_2), consequently this histogram represents a density level in covariate (x_2) resulting in the highest level of density between 30 million as well as 32 million by reaching .12 density level being 0.12%. As it was mentioned in previous graphs, there is a true positive relationship or an alternative hypothesis between regressor (x_2) and regressand (y). While, according to the histogram above, approximately

37 million appears to have the lowest density level recording .05 density units or 0.05%, following there could be seen a similar pattern in 26 million that accounts for nearly .04 density units which is equal to 0.04%. In general, based on the histogram, a stable pace of population growth is expected to slow down in the near future, which would adversely affect (y) dependent variable mortgage loans' growth, but it does not connote the outcome of this prediction would occur surely.



Density of Y

Finally, there is a graphical histogram of dependent variable (y) which is mortgage loans. Overall, it is obvious that a 5 trillion sum mortgage loan allocation reaches the highest density level substituting more than .05 units or 0.05%, whereas the lowest unit of density level found in a 20 trillion sum mortgage loan allocation being nearly 0 unit. However, as this research method (graphical histogram) conducted apart, in other words, all variables have been visualized separately, the

research outcome would not prove that a response variable (y = mortgage loans) is anticipated to experience with downward trend in the near future.

To sum up, two out of three econometric tools do represent true relationship between independent variable (x_2) and dependent variable (y), in greater detail, there is an alternative hypothesis (H_A) between population growth (x_2), as well as mortgage loans (y) since as long as number of population is growing, the similar upward trend would be seen in the allocation of mortgage loans regardless of the interest rates variation in Uzbekistan translating into a high potential of securitization process, in simple terms, now based on the econometric analyses, it is noteworthy that a creation of mortgage-backed securities could open new ways of fund raising for commercial banks to finance mortgage loans.

2.2 An integration of Tashkent Stock Exchange with entrepreneurship subjects

This part of thesis is targeted at finding out ways on how to spur local businesses, mostly medium and large companies to raise funds by going public or issuing bonds, instead of taking out loans from commercial banks, as it is widely known that in Uzbekistan, almost all private firms use commercial loans in order to finance any kind of expenses⁷⁵ even when it comes to expand or diversify output, they select banking loans instead of going public or issuing bonds. Therefore, an attempt will be done to look for methods, or even create some so as to make local entrepreneurs interested in funding their projects by selling share of stocks (equity in companies) or placing bonds at Tashkent Stock Exchange.

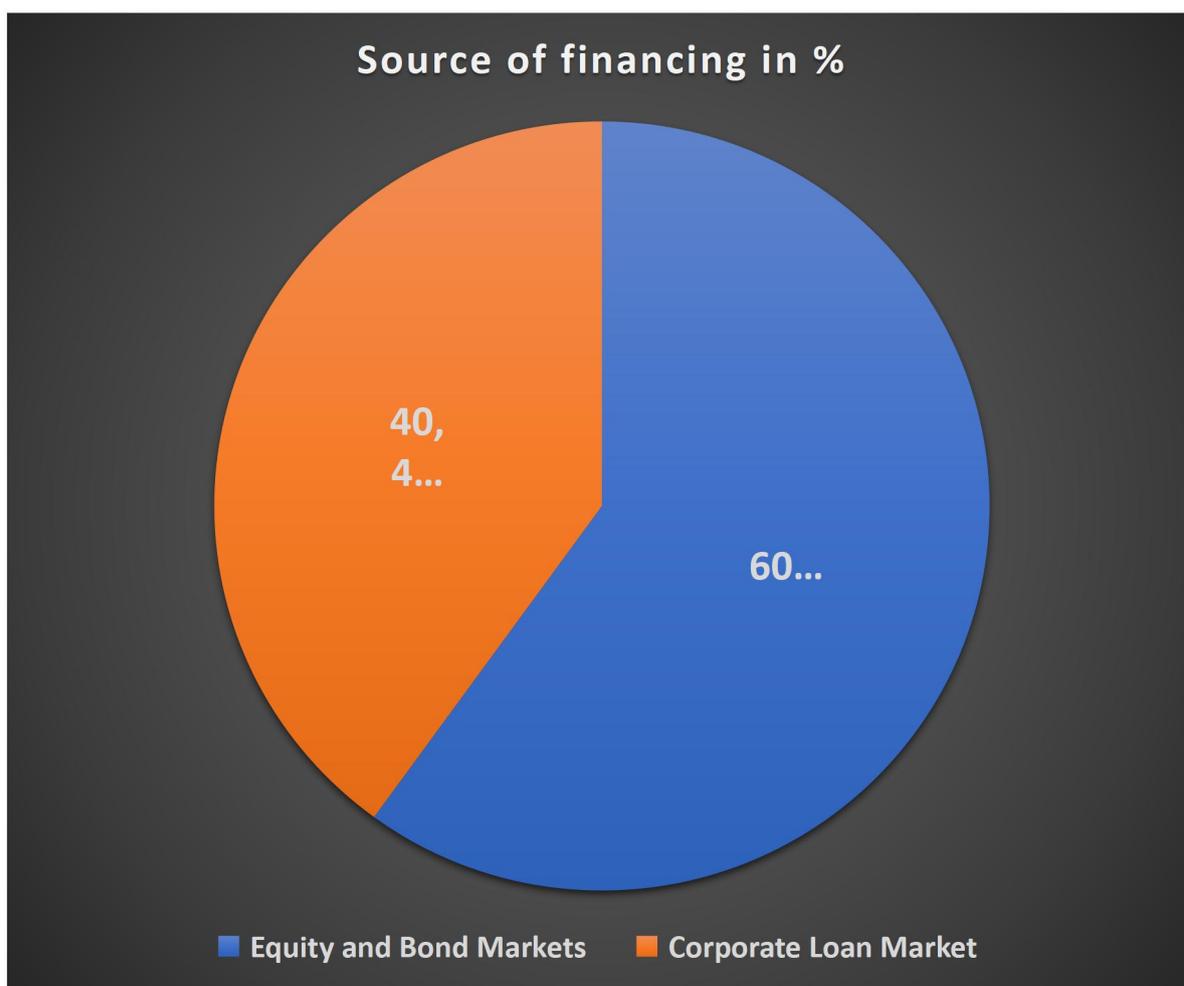
Firstly, there should be some credit limits for medium as well as large companies since many medium-sized and large firms are highly granted by banking loans, which makes difficult for them to look for alternative sources of funding. Besides, many private enterprises are totally dependent to corporate loans resulting in a strict restriction of financing own operations. For this reason, it is

⁷⁵ <http://webground.su>

crucially important to impose some certain restrictions in funding middle and large enterprises via corporate loans of commercial banks.

It is necessary to create a funding program for middle and large private companies based on the 60/40 funding ratio, to be more precise, a company willing to raise capital for its project, would be allowed to take out only 40% of estimated its total project's cost and the rest of 60% would have to go public by selling its stocks or issuing bonds, but in any all these operations would be accomplished through the Tashkent Stock Exchange. What is more, there should be taken some action to assist in an IPO process from the authorities of the Tashkent Stock Exchange by covering underwriting outlays partly or even fully so as to stimulate local enterprises to seek out funds beyond corporate loans.

Pic. 2.2.1 - The 60/40 funding ratio (medium-sized and large firms)⁷⁶



⁷⁶ Based on the author's development

This technique does appear to be one of the most appropriate way to spur medium-sized as well as large private enterprises to fund the rest of 60% beyond a corporate loan market, since many businesses in Uzbekistan, mostly middle and big firms, are highly dependent to commercial banks' loans when it comes to finance their own projects or even operations. For instance, a firm (medium-sized or large) is about to purchase a contemporary machine-tool in order to boost output by diminishing producing outlays, and therefore the company would need to borrow funds to acquire the machine-tool for a certain amount of money. Then, the business would apply to a corporate loan, and according to the 60/40 funding ratio, only 40% of demanded amount of capital from the credit application form would be endorsed by a bank clerk, the rest of 60% would have to be rejected since the enterprise would be forced to seek out an alternative source of financing such as placing corporate bonds or selling stocks with the assistance of the Tashkent Stock Exchange.

Similarly, there should be taken some counter steps from the authorities of Tashkent Stock Exchange by covering underwriting expenses of local companies IPO processes for the purpose of encouraging local firms (middle and big) to get involved in raising funds through the stock market. And by doing this, it is likely to proliferate demand for investment within local entrepreneurs in Uzbekistan. Even there has been made several contributions for developing Capital Market Infrastructure to stimulate local companies to attract external capital by selling securities through the stock market⁷⁷. In particular, according to RP-291 "On Additional Measures to Develop the Capital Market"⁷⁸, "Central Securities Depository" JSC created under Central Bank of Uzbekistan, in addition, corresponding accounts opened at the Central Bank of Uzbekistan for "Central Securities Depository" JSC as well as "National Clearing Centre" JSC making local companies' securities more attractive for foreign investors to invest in. Consequently, the 60/40 funding ratio is expected to be implemented beneficially

⁷⁷ <http://ivo.garant.ru>

⁷⁸ <https://lex.uz/ru/docs/6590029>

for all stock market participants, in other words, rights of both issuer and investor would be under the protection of the Central Bank of Uzbekistan, apart from this, local middle or large enterprises could attract foreign currencies to make a payment for purchases from abroad⁷⁹.

Moreover, there should be taken some measures of offering middle or large companies' securities willing to raise capital from foreign investors, by representing them to foreign nominees such as Clearstream, Euroclear and other huge custodian banks which own foreign nominal accounts at "Central Securities Depository" JSC, or at "National Clearing Centre" JSC. In addition, it is necessary to create stock classes⁸⁰ that would have to be divided into two main categories as "external" and "internal" since almost all foreign investors generally prefer to invest in US dollar nominated assets for the purposes of avoiding a national currency depreciation when it comes to withdraw dividends or coupon payments. So, the "external" class would be issued in foreign currency, in our case, this would be in US dollars, how about the "internal" class, of course, they would be placed in the national currency, UZS.

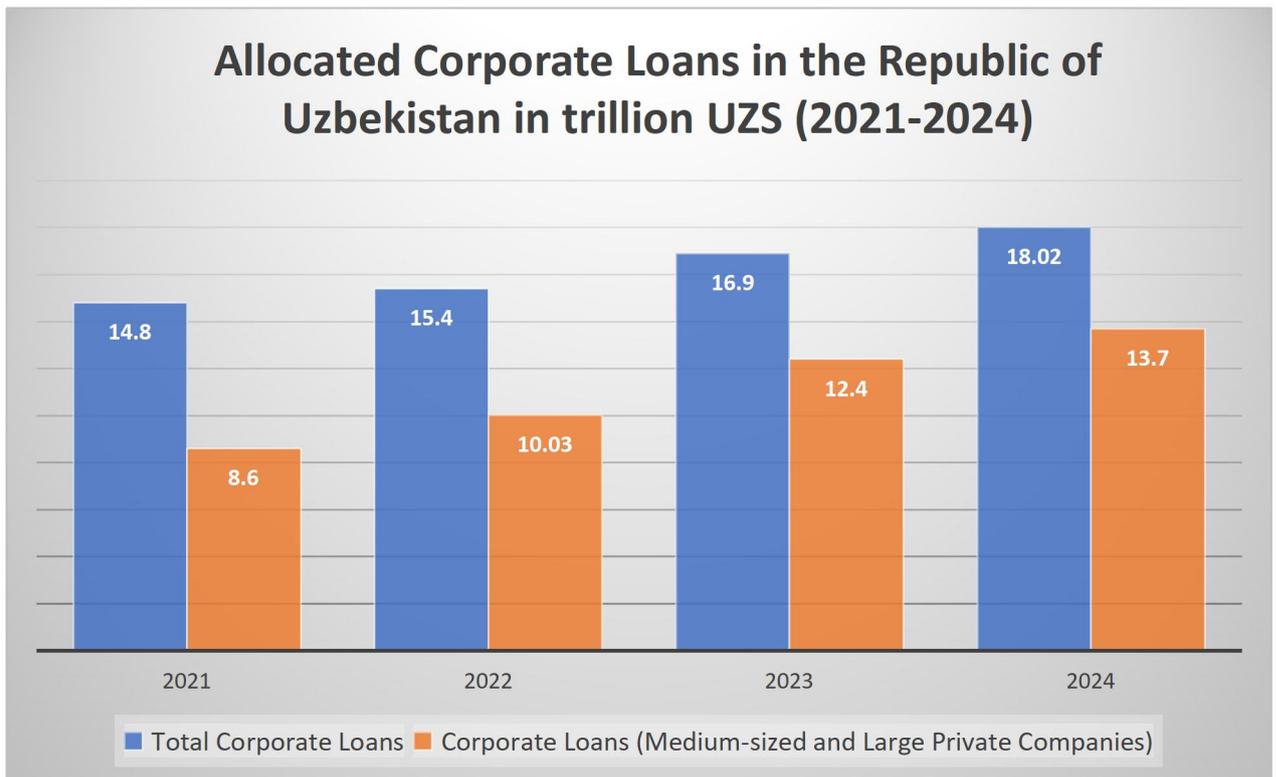
Simultaneously, middle and large private businesses would take advantage of this opportunity since they could attract funds in both national as well as foreign currencies, meanwhile it could result in widening a cooperation between local enterprises and international financial institutions that might add numerous sources of capital to finance corporate projects and other business operations. As emphasized, many private companies, medium-sized and huge ones, still rely on the corporate loans provided by local commercial banks. Thus, the 60/40 funding ratio could likely provide a promising choice to diversify ways of raising capital by means of the Tashkent Stock Exchange.

Pic. 2.2.2 - Allocated Corporate Loans in the Republic of Uzbekistan in trillion UZS (2021-2024)⁸¹

⁷⁹ <https://lex.uz ru/docs/6590029>

⁸⁰ Based on the author's development mentioned in the first chapter

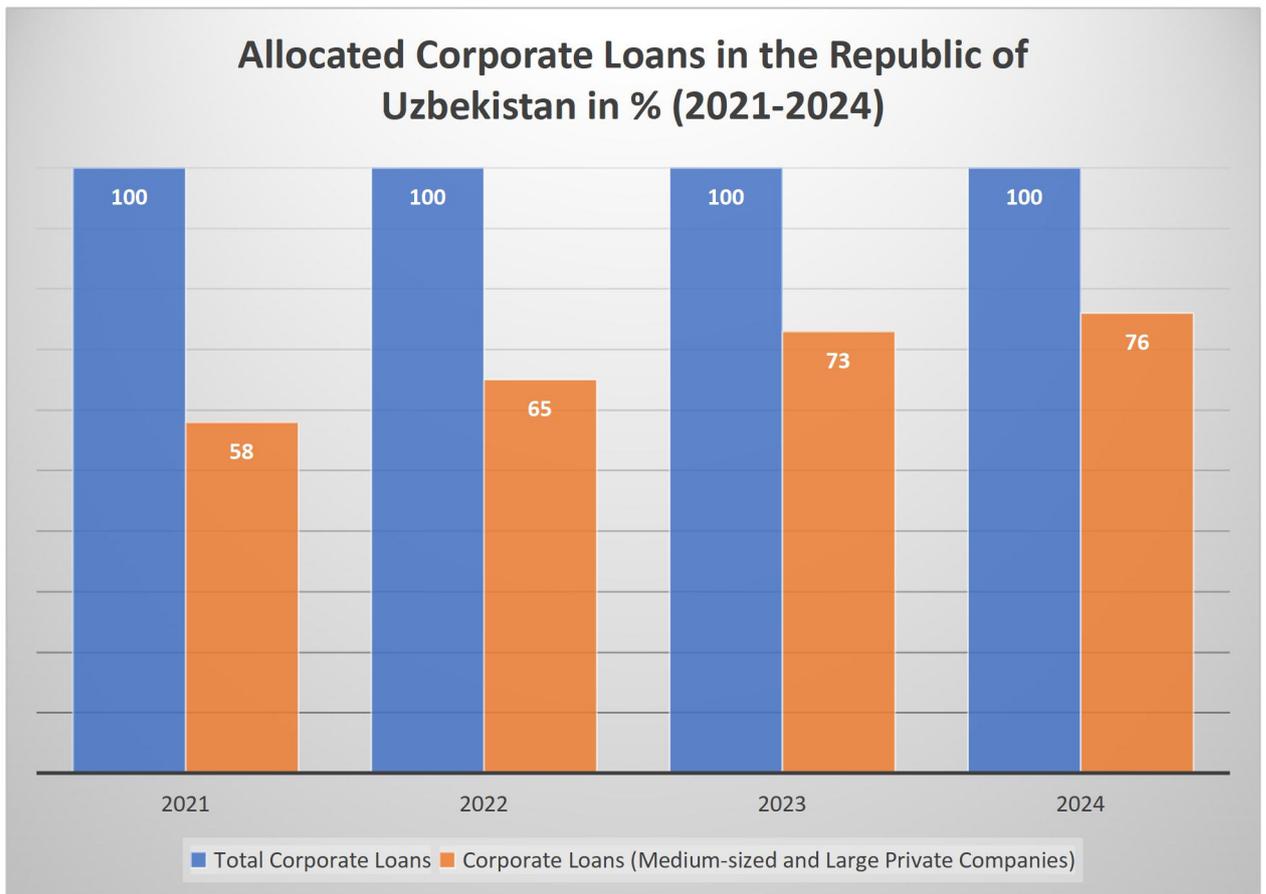
⁸¹ Based on the author's development. Data gathered from the Internet.



The bar graph above does represent allocated corporate loans in the Republic of Uzbekistan in trillion UZS between 2021 and 2024. In general, it can be seen that the total corporate loans allocated within 4 years increased from 14,8 to 18,02 trillion UZS, and out of these figures it is clear that corporate loans for medium-sized as well as large private companies accounted for 8,6 trillion UZS in 2021, and the number reached 13,7 trillion UZS by the August 1st (2024). Overall, it is obvious that more than a half of the total allocated corporate loans in each year taken by middle and large private companies showing how these private businesses are dependent to commercial banking loans when it comes to raise capital for business operations, or for the expansion of produced goods and services.

Pic. 2.2.3 - Allocated Corporate Loans in the Republic of Uzbekistan in Percentage % (2021-2024)⁸²

⁸² Based on the author's development. Data gathered from the Internet.



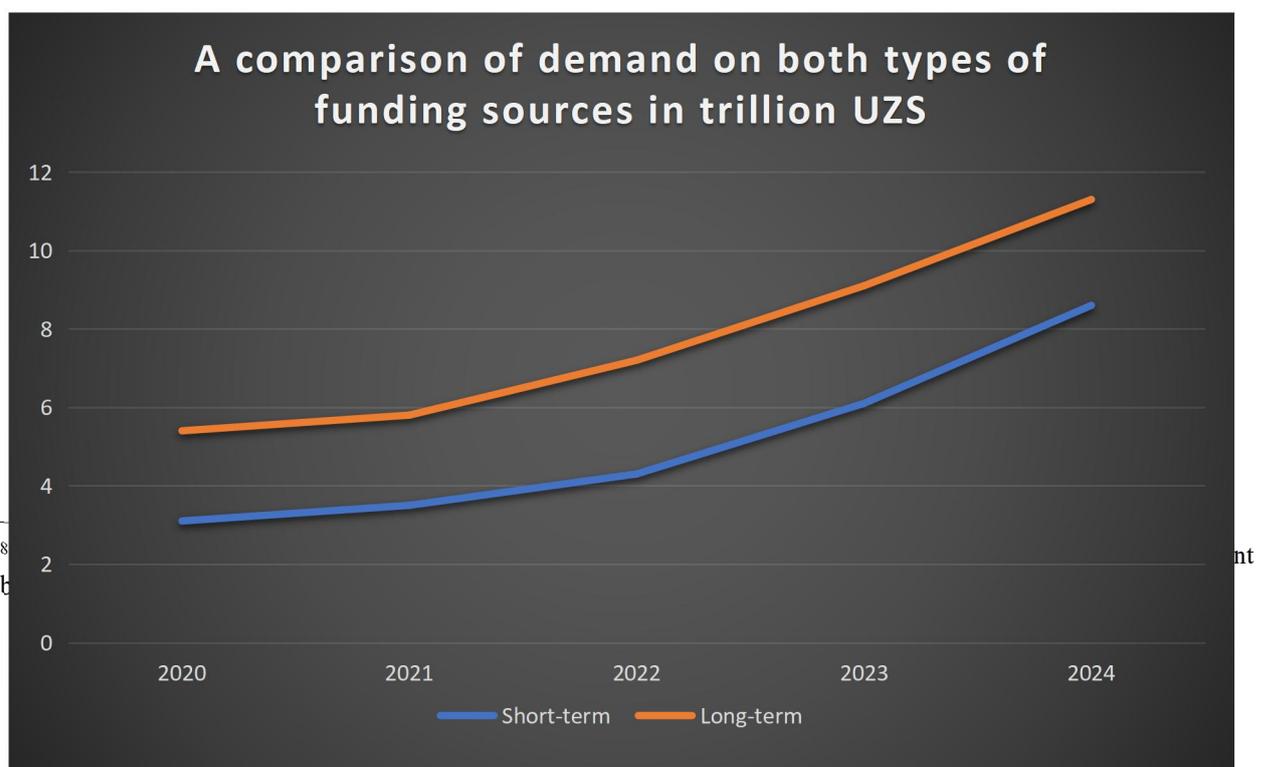
Next is the same information about allocated corporate loans by percentage and based on the bar graph, in 2021, corporate loans provided to the medium-sized and large private companies made up 58%, consequently this figure has attained 76% by the August 1st (2024). Thus, the proportion of middle as well as large private enterprises within 4 years only expanded from 58% to 76%, between 2021-2024, respectively.

By and large, the 60/40 funding ratio could promote medium-sized and large private firms to seek out alternative sources of capital raising by going public by means of IPO procedures, that is to say, to sell share of stocks to investors or placing corporate bonds, regardless of two options mentioned above, in any cases, all these processes would be accomplished with the help of the Tashkent Stock Exchange resulting in the expansion of a number of quoted companies on the listing board. Last but not least, there should be taken a similar step from the side of the Tashkent Stock Exchange by covering IPO expenses for those middle and huge private companies.

Second novelty is commercial paper⁸³ issued to raise capital to cover short-term liabilities and one of the advantages of commercial paper is that only placed by large companies with the highest credit ratings. Regarding maturity of this debt instrument, extend from 30 to 270 days to finance payroll, accounts payable, inventories and meet other short-term liabilities, in essence, commercial paper is generally placed on discount basis and redeemed at its face value. The Tashkent Stock Exchange could be as a financial intermediary between issuer and an investor by means of consulting both agents of the deal. Besides, it is interesting to note that many large enterprises collide with some shortages to meet their short-term liabilities, and there is a sole restricted option to entrepreneurs which is a corporate loan.

The rise of demand on short-term funding to large companies is one the main agendas today's financial world since now the most corporate loans' duration commences from 1 year and up to 10 years, in addition to this, mainly corporate loans have been allocated to small businesses in emerging markets like Uzbekistan. The shortage of capital to meet current liabilities making large companies seek out different ways to avoid short-term financial obligations by tax evasion, and simultaneously a lack of urgent short-term debt might lead to reduce a number of new projects implementation in large companies.

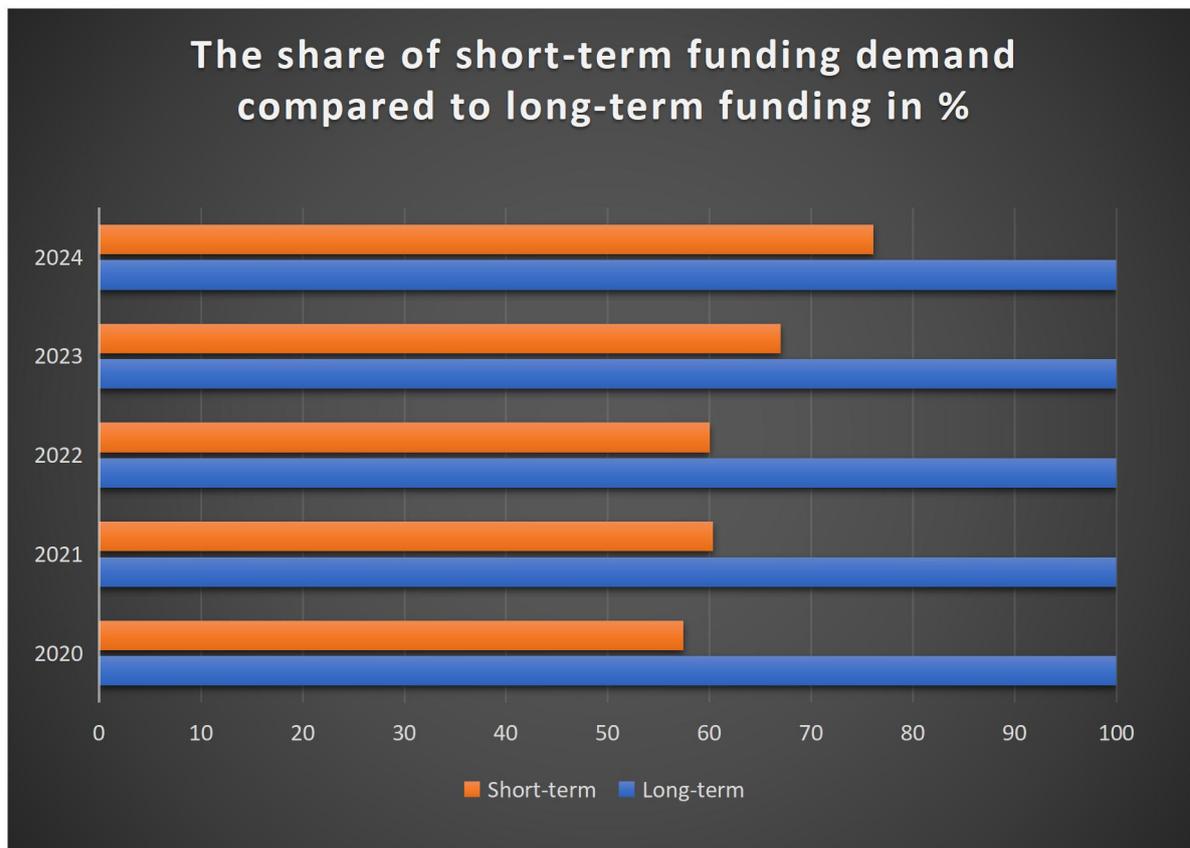
Pic. 2.2.4 - The rise of demand on long and short-term financing sources to



large companies in Uzbekistan between 2020-2024 (in trillion UZS)⁸⁴

The line graph above does illustrate the rise of demand on short-term as well as long-term funding sources in trillion UZS between 2020 and 2024 from the large companies in Uzbekistan. As it can be seen that there is a positive correlation among two indicators of the given graph above, that is to say, an increase in demand for long-term financing sources has led to similar upward trend in short-term funding sources which unveils there is high interest in urgent or short-term sources of capital meaning how the large companies could take advantage of commercial paper placement in order to meet own current liabilities such as payroll, accounts payables and others. At the beginning of period (2020), a bid on short-term funding was about 3.1 trillion UZS and this figure has reached approximately 8.6 trillion UZS, showing how a bid on short-term funding has been growing in the large companies.

Pic. 2.2.5 - The rise of demand on long and short-term financing sources to



⁸⁴ Based on the author's development. Data gathered from the Internet.

large companies in Uzbekistan between 2020-2024 in %⁸⁵

Based on the share of the short-term funding toward the long-term ones, thus it is obvious that the demand on short-term funding sources has increased from 57.4 % in 2020, to 76.1 % by 2024, representing the growth of short-term funding by the large enterprises. In general, both these graphs briefly disclose the necessity of establishing commercial paper as the new financial instrument to raise capital for meeting short-term liabilities specially for the large companies as they do collide with some shortages to cover many expenses like capital expenditures, inventories or working capital ones. Moreover, as it is widely known the length of corporate loans is set to start from 1 to 10 years, and attached with regular required monthly payments laid on. Therefore, corporate loans do appear not to compete with commercial paper in terms of structures and comfortability.

The introduction of commercial paper on the board of the Tashkent Stock Exchange could widen opportunities for raising capital to the large businesses not only within the country in national currency, but also it would lead local companies, certainly with the highest credit ratings, to attract external capital from abroad in foreign currencies like USD, Euro, Pound and others. Hence, the Tashkent Stock Exchange should assist in this process by means of taking some measure to make it work through consulting, creating special board for commercial paper debt instrument, last but not least, the expenses should be covered by the Tashkent Stock Exchange⁸⁶ in the first phase of issuing commercial paper by local enterprises with the highest credit ratings.

2.3 The spur of local financial securities liquidity

There is a great concern on how to advance a liquidity of local financial securities since our stocks or bonds are not considered as a highly liquid securities from the international investors' point of view. Certainly, local authorities have accepted several regulatory measures to fix this issue up such as introducing

⁸⁵ Based on the author's development. Data gathered from the Internet.

⁸⁶ <https://www.iiste.org/Journals/index.php/JEDS/article/download/35130/36133>

regulatory sandbox⁸⁷, and other related supportive steps taken but this does appear to be insufficient to boost foreign bids on local securities. Therefore, this part of the PhD thesis is intended to seek out innovative ways of improving the liquidity of local financial securities, of course, based on the current financial as well as economic conditions within the capital market of Uzbekistan. First and foremost, it needs to be taken some steps to develop corporate finance sector in Uzbekistan, in other words, almost all companies in Uzbekistan do not meet the international corporate finance requirements, and that is one the main reasons of failing in the attractiveness of the local securities, that is to say, many institutional investors, or ultra-high net worth individual investors around the globe are more inclined to read financial statements and reports of listed companies based on the standard corporate finance methods as these standards are widely endorsed in the financial markets like New York, Tokyo, Singapore, Hong-Kong, London, as well as Frankfurt. In order to make it work in Uzbekistan, it is necessary to create informative board on the Tashkent Stock Exchange site, and consequently every single listed company would have to upload own financial statements regularly relied on the following structure: “10-K = Annual report, 10-Q = Quarterly report, 8-K = Current report”⁸⁸.

A second important factor, that should be taken into account so as to boost local securities liquidity, is a lack of financial literacy within the local people since as long as citizens are financially illiterate this might cause national stock market underestimate, to put it another way, having improved local people’s financial literacy, it is highly probable to lift market capitalization of local securities and eventually it would result in foreign investment flood to the securities listed on the Tashkent Stock Exchange. Needless to say, it is worth to establish free lessons about financial literacy, for instance, retirement plan, how to run portfolio, or even some basic topics should be unveiled to the public, such as the crux of investment, its benefits and drawbacks should be explained in detail, difference between debt

⁸⁷ <https://lex.uz/ru/docs/6590029>

⁸⁸ <https://www.sec.gov/files/form10-k.pdf>

(fixed-income assets) and equity, how bond market performs and equity ones does. So, these investment related materials should be taught to the public, and by following mentioned instruction, it is highly probable to make citizens interested to invest in the local securities.

What is more, the whole education system of Uzbekistan should be involved in this process, that is to say, even secondary school curriculums should consist of at least two years of financial literacy subject, and similarly higher education system like universities, they have to add financial literacy as a compulsory subject regardless of the students' years. In addition, it is important to create national channel that would broadcast current affairs related to the capital market of the Republic of Uzbekistan and other financial market news around the world. Due to the absence of stock market news channels in Uzbekistan, majority is uninformed about the financial market news and how they do affect the whole economy and people's households or lives at all.

Next is to establish two classes of stocks at the Tashkent Stock Exchange, in other words, there should be taken some measures to create in two different currencies quoted stocks for a single security. In more detail, so as to boost liquidity of the local securities, it is necessary to create quotes in local currency for internal investors as well as in foreign currency as in US dollars to attract international investors, due to a high risk of local currency depreciation, many foreign investors are not willing to invest in Capital Market of Uzbekistan, thus an establishment of foreign currency quoted board at the Tashkent Stock Exchange could eliminate this issue. In addition, local businesses, going public, would have a direct access to foreign currency which they could apply to carry their export-import operations, that is to say, direct foreign cash-flow would dramatically increase. In the first phase, it is important to create two different types of security quoted boards at the Tashkent Stock Exchange, such as "Internal" as well as "External", meaning national currency quoted securities for the "Internal", and

foreign currency, US dollars, quoted securities for the “External” ones. A second stage is to make all brokerage firms, investment companies and other participants or agents of the Capital Market of Uzbekistan in developing two types of boards for national currency as well as for foreign currency of all quoted blue-chip stocks⁸⁹ so as to entice all internal and international investors to invest in, besides in foreign currency quoted stocks should follow national currency quoted stocks value, therefore it would need to create a single settlement software for all agents of Capital Market of Uzbekistan.

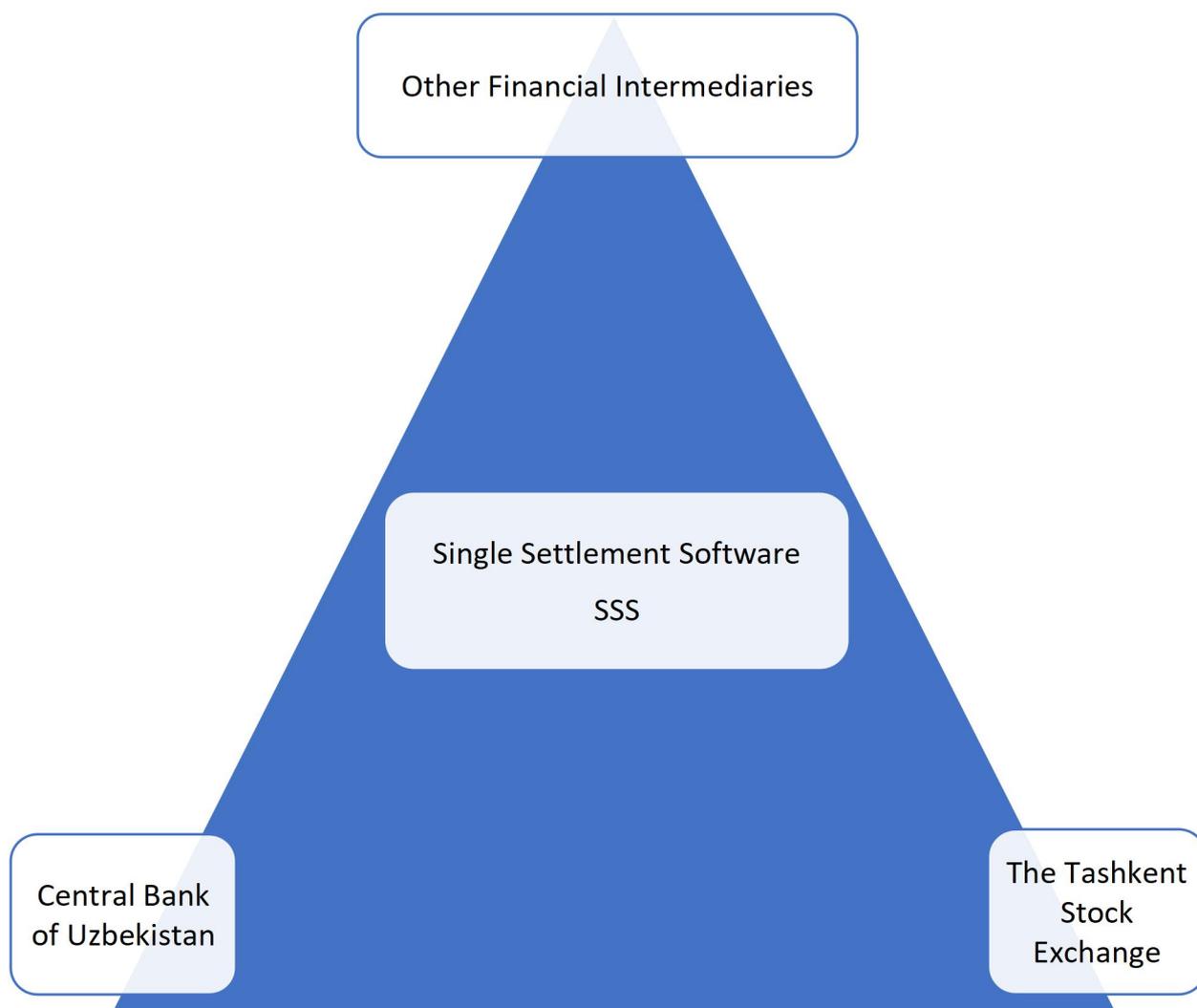
Last but not least, all operations would be conducted by two main organizations and last third could be other agents or participants of the Capital Market in Uzbekistan. So, the first angle of the software would be run by the Tashkent Stock exchange as the one of main regulators of this process, second angle is the Central Bank of Uzbekistan that would be obliged to regulate equality of values in both classifications of securities in “Internal” and “External” ones in terms of currency exchange. Finally, there would be third angle intended for other agents or participants of the Capital Market in Uzbekistan such as brokerage firms, investment companies, insurance companies and others. This project might be launched by means of the Regulatory Sandbox⁹⁰ by selecting certain financial intermediaries or agents as an experiment.

Fig. 2.3.1 - The structure of the Single Settlement Software in the form of triangle (SSS)⁹¹

⁸⁹ A blue-chip stock refers to the shares of an established, profitable, and well-recognized corporation.

⁹⁰ Based on the Resolution of President of the Republic of Uzbekistan №-291, dated on 4th September,2023. <https://lex.uz/ru/docs/6590029>

⁹¹ Based on the author’s development



As it can be seen above the triangle stands upon the two organizations as The Tashkent Stock Exchange, and Central Bank of Uzbekistan, in other words, the development of two boards as “Internal” and “External” would be regulated by the Tashkent Stock Exchange, regarding currency spreads, Central Bank of Uzbekistan would be responsible to align currency exchange, to be more precise, “External” types of securities would be quoted based on the “Internal” types of securities in terms of currency valuation since there is a huge spread between USD and UZS. At the top of triangle, other financial intermediaries operated in the Capital Market of Uzbekistan, in particular, brokerage firms, investment companies, and various financial institutions.

Another way to boost the liquidity of local financial securities is to develop over-the-counter market infrastructure, in other words, there is a great opportunity to spur the local Capital Market, and it would enable both small and medium

enterprises in Uzbekistan to raise capital beyond the corporate loans. As it is widely known that many small firms are limited with solely loans from commercial banks or microfinance institutions to run business operations, making it difficult to seek out alternative ways of financing. The over-the-counter market could probably ease this issue by adding one more variant to raise external fund as well as the development of over-the-counter market could result in lifting local securities liquidity up to the advanced level by improving access for small and middle Uzbek firms to raise capital through issuing stocks or corporate bonds. First and foremost, it is noteworthy to run through the crux of the over-the-counter market and what benefits it would provide for entrepreneurs and may attract not only minority investors within Uzbekistan but also from abroad. So, the over-the-counter or OTC market, briefly, is where securities trade via a broker-dealer network instead of on a centralized exchange like the Tashkent Stock Exchange.

There is a huge opportunity for small businesses in Uzbekistan to raise capital by selling own securities via the over-the-counter market without being listed on an exchange by means of a broker-dealer network, that is to say, amid brokerage firms and their clients. Even nowadays there have been made several contributions to spur capital market development and its infrastructure so as to create alternative sources of funding based on the Decree of the President of the Republic of Uzbekistan 6207 “On Measures for Further Development of the Capital Market”⁹². According to the road map table in 13th paragraph “the creation and introduction of over the counter by means of the Tashkent Stock Exchange providing trading in securities not included in the stock exchange listing” of DP-6207, it would diversify contemporary sources of funding for small businesses in Uzbekistan. In addition, Uzbekistan’s GDP has reached well above 100 billion USD, and the share of small enterprises in gross domestic product accounts for more than a half, hence small businesses are needed new ways of funding beyond corporate loans, simultaneously the over-the-counter market could advance financial literacy of local entrepreneurs and probably this would lead to a capital

⁹² <https://lex.uz/docs/6959602>

market development in Uzbekistan. Consequently, it is important to mention a creation of the over-the-counter market appears to be one the most effective ways of boosting financial intermediaries' revenue such as brokerage firms or investment companies, to be more precise, many brokerage firms in Uzbekistan do have insufficient number of investment products to offer own clients to invest.

All in all, there are a plenty of promising opportunities so as to introduce the over-the-counter market in Uzbekistan, even authorities have been taking various measures to improve capital market infrastructure in Uzbekistan to establish a wide range of financial products for all types of businesses. For this reason, the over-the-counter market might spur local financial securities liquidity, and besides it could decrease corporate loans dominance in the capital market, as mentioned above, almost all small firms are solely restricted to banking and microfinance institution loans. Last but not least, it is highly possible to attract foreign capital via the over-the-counter market for small businesses, in other words, many foreign investors have been interested in investing into small businesses in Uzbekistan for last 7 years that means new enterprises could have a chance to raise funds from abroad by issuing own securities by means of over-the-counter market regardless of inappropriateness to the centralized exchange listing requirements.

Conclusion on the second chapter

1. In the first part of this chapter, there have been made SWOT analysis of the Tashkent Stock Exchange. According to the strengths of the Tashkent Stock Exchange, first and foremost, advancement in infrastructure, in particular, supports by active government initiatives, including tax incentives for investors, that is to say, foreign investors are now released from taxes on dividends received from shares within first three years. The development of employee stock ownership program (ESOP) which also indicates positive changes to infrastructure. The development of employee stock ownership plan (ESOP) is another advantage which also indicates positive changes to infrastructure.

2. Regarding a second part of the chapter, an integration of the Tashkent Stock Exchange with local businesses, and it has been focused to make Uzbek enterprises get involved in placing corporate bonds as well as stocks by means of the Tashkent Stock Exchange. As it is widely known that in Uzbekistan, almost all private firms use commercial loans in order to finance any kind of expenses⁹³ even when it comes to expand or diversify output, they select banking loans instead of going public or issuing bonds.

3. Final part is about to seek out innovative approaches on how to boost local financial securities liquidities. To be more precise, international corporate finance expertise application in business sector of Uzbekistan has been studied, in addition, there has been mentioned a lack of financial literacy within the society that adversely affects the Capital Market Development, and in order to eradicate this problem some measures have been explored like adding compulsory financial literacy subjects to the schools, universities and other educational institutions within the country. Last but not least, the creation of foreign currency quoted type of stocks discussed as the way to avoid national currency devaluation problem for the purposes of enticing foreign investors to invest in the Capital Market of Uzbekistan.

CHAPTER 3. MEASURES TO IMPROVE THE TASHKENT STOCK EXCHANGE AND CAPITAL MARKET INFRASTRUCTURES IN UZBEKISTAN

3.1 The advancement of national index: Uzbekistan Composite Index (UCI).

Capital market infrastructure, first and foremost, starts with the equity indices or, to put it simply, benchmarks, since they represent general economic circumstance within a country. Consequently, many investors make investment decisions based on benchmarks movements and this means a further development of Uzbekistan Composite Index to entice foreign institutional investors to add Uzbek securities into their clients' portfolios. Certainly, Uzbekistan Composite

⁹³ <http://webground.su>

Index disadvantages do exceed the advantages, in other words, there are several obvious flaws such as: a lack of financial reports about the UCI variations at the end of each trading day, the absence of detailed information related to each company within the UCI, there is only value bar of the UCI at the Tashkent Stock Exchange website, no data about price fluctuations as well as it is important to mention that UCI is inaccessible to invest for investors.

The most significant downside is the absence of daily financial reports about the UCI variations, to put it another way, while investigating the index, there has not been found any clear reports of its movements. To be more precise, it is necessary to report how each stock's value contributes to the UCI variation and following the average price of the UCI index should be calculated by means of the sum of market capitalization of all stocks within the UCI. First simple step is to finding out sum of all companies' market capitalization within the index, or just combining total worth of all stocks in the UCI. Having found the combined total worth, next is to analyze the free-float market capitalization of each stock within the index, since free-float of stocks is a key component to find out the number of publicly traded shares of stocks at the UCI. Consequently, free float of each stock market capitalization should be mentioned in daily financial report for the purpose of informing investors how many publicly traded shares each company provides at the UCI. Last but not least, the existence of the Uzbekistan Composite Index values on the Tashkent Stock Exchange website is the one advantage of the Capital Market infrastructure, but it is insufficient to attract foreign investors or even local ones to invest into Uzbek financial securities. To be more specific, the UCI values ought to be translated into the currency values, referring to be traded at UZS. What is more, with the assistance of the Regulatory Sandbox project, it is worth to create an average weighted UCI in a foreign currency (like the USD) in order to entice external cashflow to the Capital Market of Uzbekistan. Hence, this would lead to bring the Tashkent Stock Exchange's infrastructure up to the advanced level as well-developed countries' stock markets are, in addition due to the high risk of national currency devaluation, many foreign

investors are reported not to invest into the Capital Market of Uzbekistan, and therefore an average weighted UCI development in a foreign currency could eradicate mentioned above currency hurdle.

Another main barrier is the inaccessibility of the UCI, in other words, no any data about how to invest into the UCI, even on the website of the Tashkent Stock Exchange, not found information on how to make investments in it. Eventually, it might result in investors mistrust. To solve this problem, it is necessary to launch UCI on trade by means of Regulatory Sandbox, following institutions ought to be involved to implement: NAPP (National Agency of Perspective Projects), the Tashkent Stock Exchange, certainly some well-known or experienced brokerage, investment firms should assist in the process through adding UCI as an equity index to own apps and offering to their clients as a national equity market benchmark. Regarding the Tashkent Stock Exchange's role, so in this case, the Tashkent Stock Exchange authorities would be in charge of all operations related to the UCI valuation, that is to say, reporting daily the equity index movement in detail, making the UCI accessible to investors in UZS, and for foreign investors in USD. Finally, NAPP would be a supervisor and responsible to run live testing of the UCI within Regulatory Sandbox framework by launching in a small-scale to the real capital market agents and investors.

The introduction of ETFs (Exchange Traded Funds) tracking UCI value would be a promising choice to make foreign and local investors interested to invest into the Uzbekistan Composite Index. But first it is worth to disclose the crux of ETFs in detail. According to the Barclays Bank information: "Exchange-traded funds (ETFs) are a popular type of collective investment that provide access to a wide range of markets. Exchange-traded funds (ETFs) are popular among investors looking to build a diversified but low-cost portfolio. ETFs offer investors access to a wide range of markets around the world usually at low cost. Most ETFs are passive investments, meaning they simply aim to track the

performance of an underlying group of investments.”⁹⁴ As being mentioned above, all ETF features highly suit to apply to the national equity index (UCI), in other words, the creation of ETF tracking the UCI value, would lead to improving the overall Capital Market infrastructure in Uzbekistan. Besides, many retail local investors are highly restricted in terms of funds they possess, and there is a limited number of investment products provided by the financial institutions in Uzbekistan. Furthermore, local retail investors are not fully confident to put their savings into a single stock or bond, due to being risk-averse, therefore by introducing the ETF on the Uzbekistan Composite Index, could result in engaging local retail investors to make investments to the UCI equity index since by its nature, the ETFs considered as less risky types of investment products that would fit our local retail investors.

Certainly, this process could be implemented by means of the Regulatory Sandbox which is run by the NAPP (National Agency of Perspective Projects) as one of the main regulators of launching this innovative investment product, and the Tashkent Stock Exchange would be responsible for taking measures to create the ETF based on the Uzbekistan Composite Index value. Last but not least, some foreign expertise should be involved due to the introduction of the ETF could be complicated without international investment banks contributions. Below, there is some data about how the UCI does actually operate and calculated.

⁹⁴ <https://www.barclays.co.uk/smart-investor/investments-explained/funds-etfs-and-investment-trusts/what-is-an-etf>.

Pic. 3.1.1 - Visual line chart, taken a screenshot from the Tashkent Stock Exchange website⁹⁵

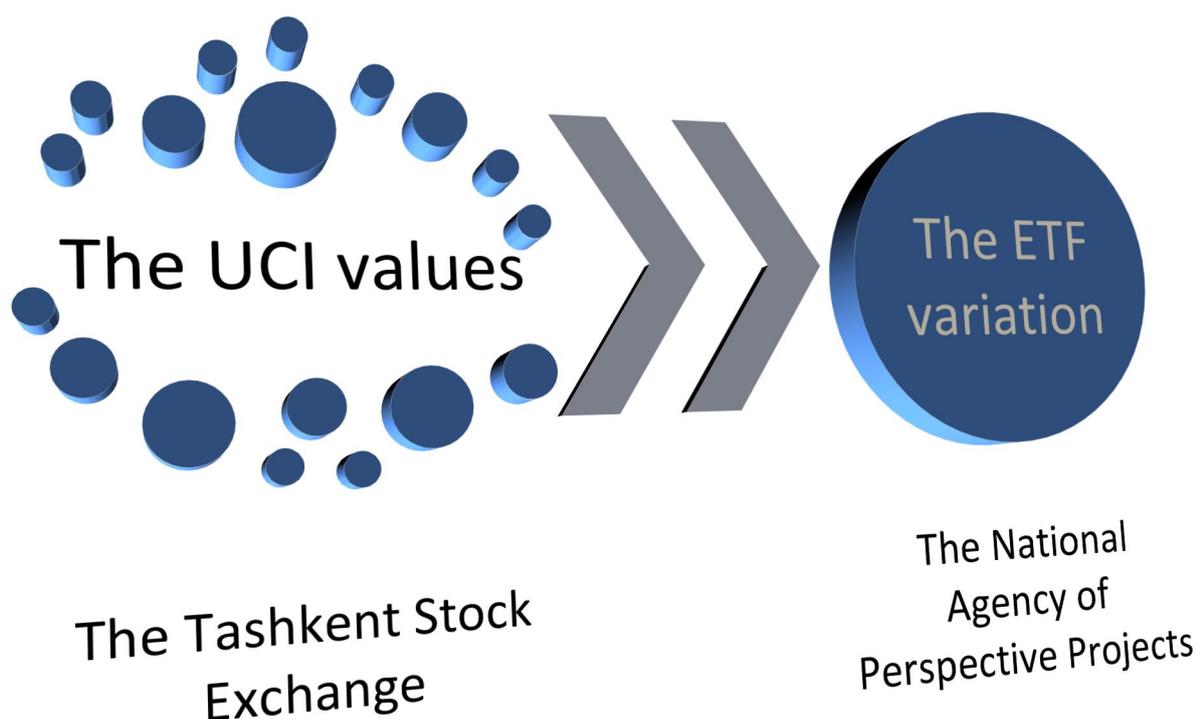


In general, based on the theory, the overall picture does illustrate that during one year there have been several huge swings, or that being said turbulence has taken place in the equity market of Uzbekistan, meaning the existence of high volatility in the economy. And it can be seen that within October 23th (2023) till October 21th (2024) the UCI value had fluctuated dramatically and from nearly 680 fallen to just below 640. And even there is no specific parameter to measure since value is the abstract concept. While exploring the graph, I personally (a researcher) could not manage to find out any specific information related to the values. What is more, no main technical analysis indicators provided such as Open interest, Volume, Average volume, Day's range. And the absence of other graph formats availability, such as Candle, Baseline, Mountain, as well as Bar. One more downside is that annual data does represent misconception about the economy of Uzbekistan. To be

⁹⁵ Based on the author's development. Data gathered from https://uzse.uz/price_indices

more precise, there is no any correlation between Uzbekistan’s economy and the Uzbekistan Composite Index value, hence the UCI value movements are implausible even based on the provided annual UCI value variations, so in this case, investors could be scared by the huge swings within a 1-year period that means a country has faced economic instability and high risk of default in terms of the graph. And finally, according to the graph above, the UCI benchmark equity index is pointing out the economic contraction or decreasing business sector within the country. For this reason, firstly, the graph should be suspended temporarily until the launch of ETF on the UCI by means of the Regulatory Sandbox regulated by the NAPP.

Fig. 3.1.1 - The structure of the ETF on Uzbekistan Composite Index⁹⁶

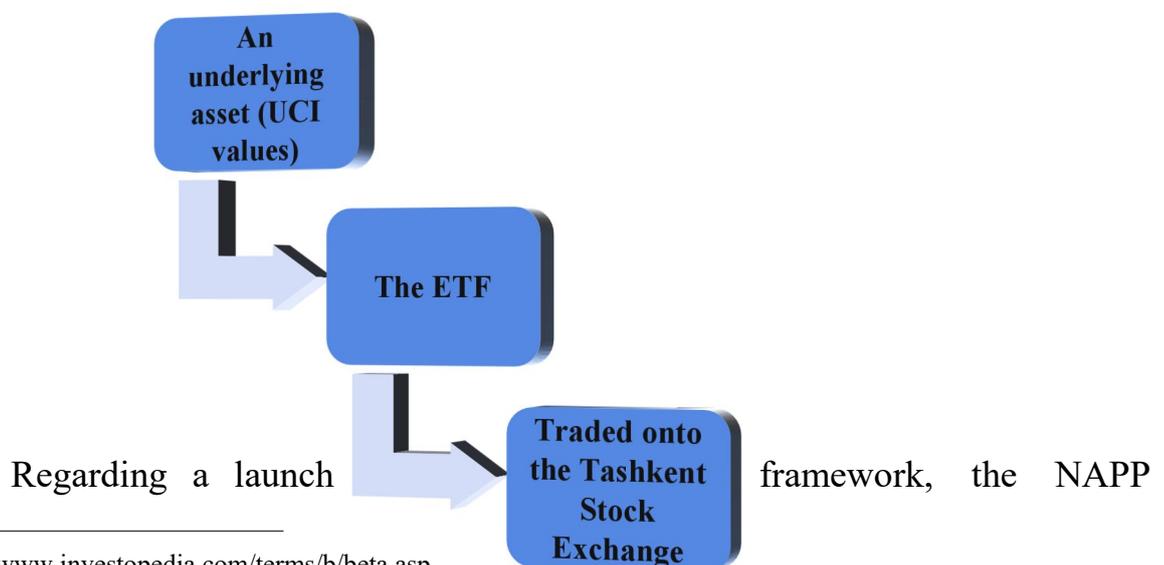


As it is shown above, the UCI value should be pegged to the ETF variations, in other words, there would be very strong positive correlation or an alternative hypothesis (H_A) between their movements and $\beta=1$, meaning its price

⁹⁶ Based on the author’s development.

activity correlates with the equity index⁹⁷. By doing this, it is highly probable to advance not only the Uzbekistan Composite Index, but also the Tashkent Stock Exchange infrastructure at all. In the creation of the ETF, the NAPP should be involved since it is responsible for the regulatory sandbox framework, that is to say, the Tashkent Stock Exchange cannot be able to launch this financial product on its own. Thus, by means of the regulatory sandbox, the ETF would be launched successfully in a small-scale to the Capital Market participants and investors. To calculate this, firstly, a value of the UCI would be used in the ETF basket and daily change reports would be issued on the website of the Tashkent Stock Exchange, it is important to note that the ETF would be passively managed, chasing solely the UCI values and in one simple transaction investment would spread within securities listed on the Uzbekistan Composite Index, meaning the performance of the ETF would rely solely on the UCI values. Afterwards the NAPP, via the regulatory sandbox, should launch the ETF in a small-scale to the investment companies and brokerage firms. Consequently, this would provide an access to the ETF for all types of investors regardless of a capital size, last but not least, there is a cost-efficiency to eliminate high charges to a portfolio management. Certainly, the ETF shares would be traded onto the Tashkent Stock Exchange as the other securities traded.

Fig. 3.1.2 - A visualized process of the ETF⁹⁸

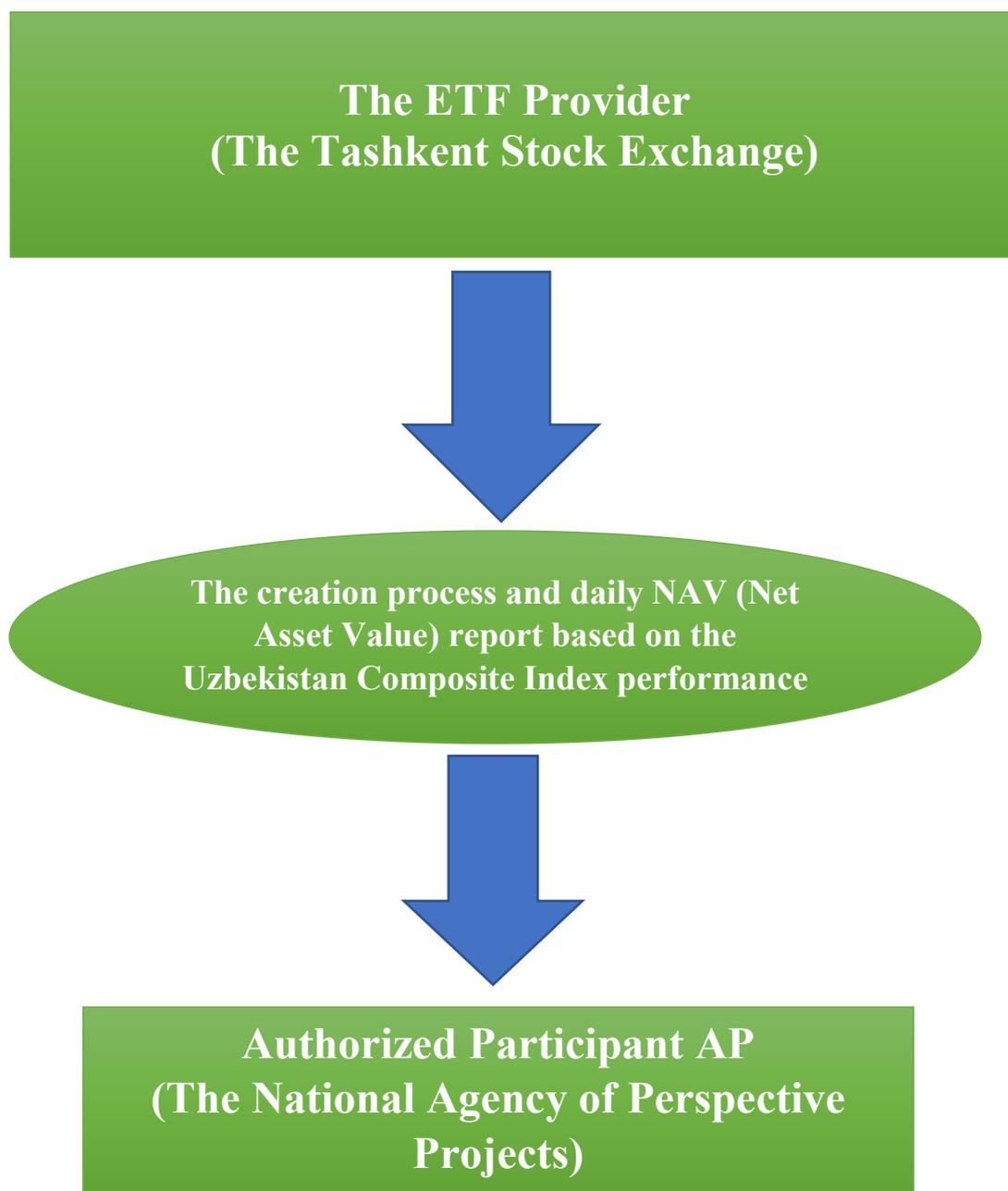


⁹⁷ <https://www.investopedia.com/terms/b/beta.asp>

⁹⁸ Based on the author's development

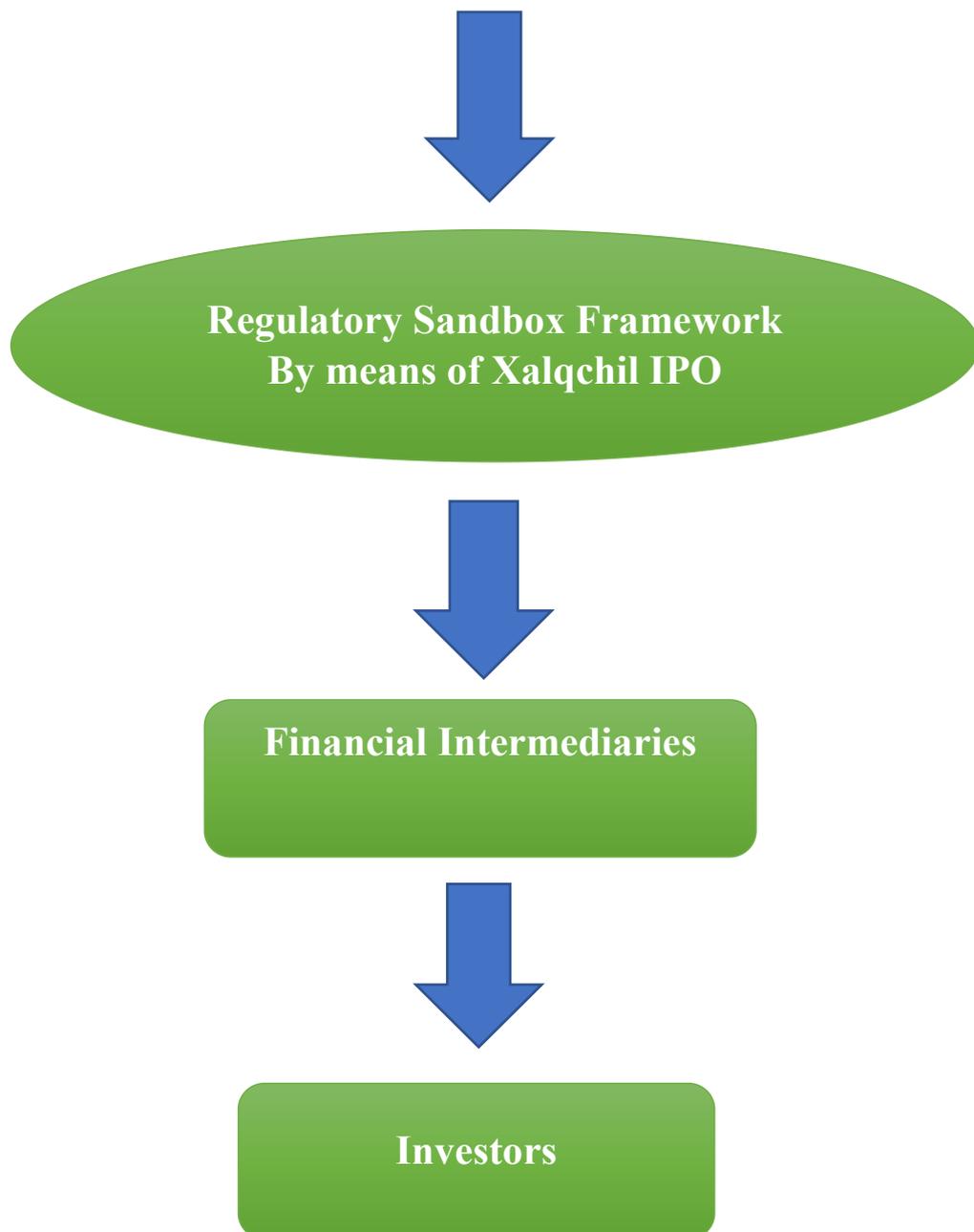
should be involved in this process by making contributions to attract investment companies to consult the regulator how to create the ETF based on the international standards through financial engineering⁹⁹ being an interdisciplinary branch of the investment industry. There is one more option to implement the ETF that would track the UCI performance.

Fig. 3.1.3 - The creation scheme of the ETF¹⁰⁰



⁹⁹ **Financial engineering** is an interdisciplinary branch of the investment industry that makes use of applied mathematics, statistics, computer science, financial theory, and economics to conduct quantitative analysis on the financial markets.

¹⁰⁰ Based on the author's development.



There has been given an algorithm of creation and redemption of the ETF on the Uzbekistan Composite Index performance, and here attempts will be done to disclose the process in detail. First and foremost, the Tashkent Stock Exchange will come out as an ETF provider, meaning a creation process and simultaneously daily report of NAV (Net Asset Value) indicator based on the Uzbekistan Composite Index performance, would fall into the Tashkent Stock Exchange's responsibility. Next is an Authorized Participant (AP) which would be the National Agency of Perspective Projects (NAPP), and consequently through the Regulatory Sandbox could launch a sale of the ETF shares in a small-scale to the financial

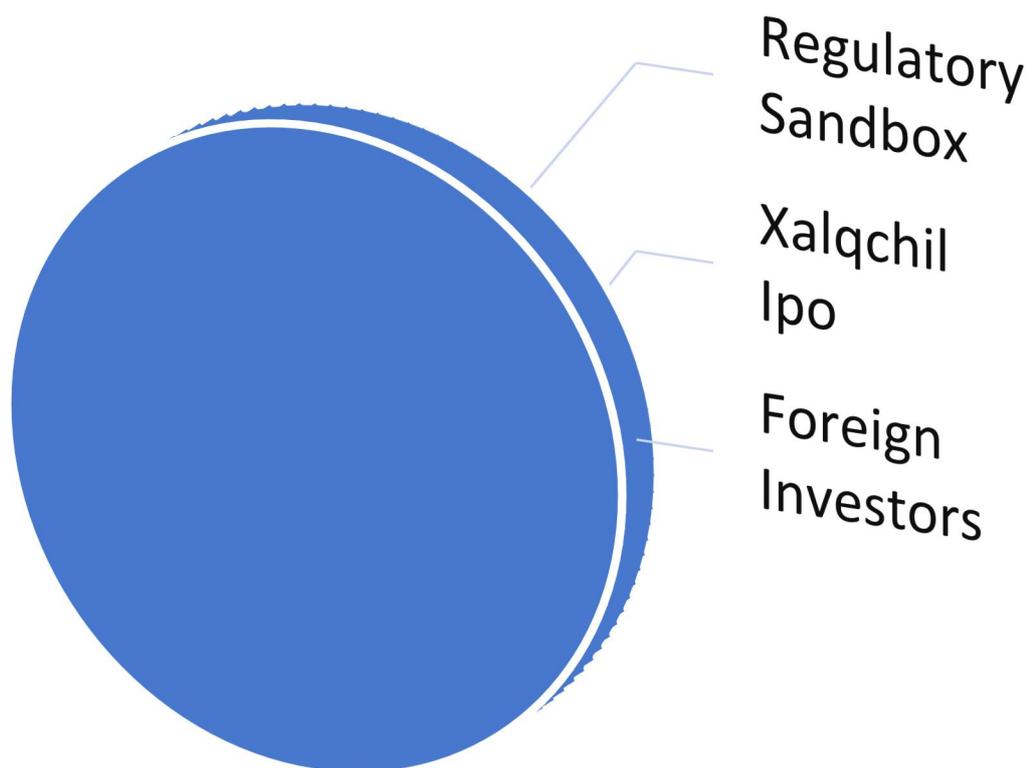
intermediaries then final stage would be offering the ETF shares to the public by means of Xalqchil IPO¹⁰¹.

Initially, portfolio features are essential part of the process, in other words, the ETF provider being the Tashkent Stock Exchange should clarify following technical as well as fundamental components: market price; market price change (UZS); market price change (%); shares outstanding within the UCI benchmark; total Net Asset Value (NAV) of all listed companies on the UCI; a fair value of the ETF; top at least top 5 holdings quoted companies in the benchmark index (UCI). In order to create the ETF, mentioned above components are necessary to be supplemented, needless to say, market price shows the current price at which a share of the ETF would be traded, there should be two supplements of the market price in a national currency and in percentage to explore average movements in the ETF prices or to calculate bid/ask spreads. With respect to shares outstanding in the UCI benchmark, it would be necessary to calculate the difference between an ETF total shares and all quoted companies' total shares traded publicly. A total Net Asset Value would have to be calculated since Net Asset Value or NAV does illustrate the difference between total assets and total liabilities based on the all-quoted companies within the UCI benchmark in a tracked index, and similarly a fair value of the ETF should be added along with Net Asset Value or NAV. For the purpose of more transparency, regularly at least top 5 the best performers in the ETF should be highlighted to make investors aware of the highest profitable companies within the UCI index.

Fig. 3.1.4 - A launch process of the ETF¹⁰²

¹⁰¹ <https://xalqchilipo.uz/>

¹⁰² Based on the author's development.



Regarding a launch process, in this case, there are, in fact, three stages to implement the ETF shares sales. In the first stage, Authorized Participant (AP) being the National Agency of Perspective Projects or NAPP briefly would commence IPO through the Regulatory Sandbox, in a small-scale, to a limited number of financial intermediaries in Uzbekistan. Having completed the first step, those provided financial intermediaries would have to sell shares to local investors via Xalqchil IPO as it is shown in the circle above, but firstly, institutional investors such as private companies and other organizations, afterwards retail investors should be involved in this acquisition process. Consequently, there is a final third stage which is to bid the ETF shares to the foreign investors through the Central Securities Depository of Uzbekistan¹⁰³. All in all, it is highly probable that the ETF shares sales would succeed relied on the algorithm above due to its simplicity and transparency as it is widely known many investors do generally prefer easier to understand investment products, unlike complicated ones, prior to make investment decisions.

¹⁰³ <https://uzcsd.uz/>

3.2 The introduction of a blockchain technology in order to tokenize fixed-income assets

Here, we are about to explore the ways of stimulating fixed-income assets or bond market of the Tashkent Stock Exchange via blockchain technology, in other words, how to increase the liquidity of corporate and government bonds by means of distributed ledger technology or briefly (DLT). Certainly, prior to commence the investigation of steps to introduce the blockchain technology to tokenize the fixed-income assets, first and foremost, we would like to walk a reader through the gist of asset tokenization, distributed ledger technology, smart contracts or a blockchain technology at all, since this state-of-the art technology might be unfamiliar to many people, even some economists and financiers are reported to have misconceptions about it. Firstly, let us disclose the essence of the blockchain, according to the Internet source: “Blockchain is a decentralized digital ledger that securely stores records across a network of computers in a way that is transparent, immutable, and resistant to tampering. Each "block" contains data, and blocks are linked in a chronological "chain.”¹⁰⁴. To put it simply, it is a chain of blocks which stores and records data (in our case it would be bonds’ maturity dates, coupon payments, prices and other related information), as mentioned above each block would contain transaction details and would be connected through chains. Once a bond issuer has placed bonds on the blockchain the first block called “genesis block” would be created. In respect of the distributed ledger technology, it refers to a digital system that records transactions related to assets. The transactions and other details are simultaneously recorded at numerous places. The database recorded through distributed ledger technology does not include an administration facility or central data storage. Instead, the database exists among several participants or across different geographical locations¹⁰⁵. In other words, all transaction details at the same time would be recorded at various places so as to secure data, and this would lead to reduce the transaction costs as well as the third-

¹⁰⁴ <https://www.investopedia.com/terms/b/blockchain.asp#:~:text=Definition.>

¹⁰⁵ <https://corporatefinanceinstitute.com/resources/cryptocurrency/distributed-ledger-technology/>

party involvement. For instance, when a bond issuer sells out a piece of corporate bond to an investor, a new block would be created and chained back with a genesis block, certainly the new created block would consist of all transaction details. Last but not least, there would not be financial intermediaries like brokerage firms, investment companies and others, meaning no intermediary costs. And this entire process would be run based on smart contracts, in greater detail, smart contracts are typically used to automate the execution of an agreement so that all participants can be immediately certain of the outcome, without any intermediary's involvement or time loss. They can also automate a workflow, triggering the next action when predetermined conditions are met¹⁰⁶. Similarly, smart contracts would conduct the same operations related to bond selling as well as redemption processes, that is to say, all transactions would be automated and predetermined by the issuer so as to provide transparency and security.

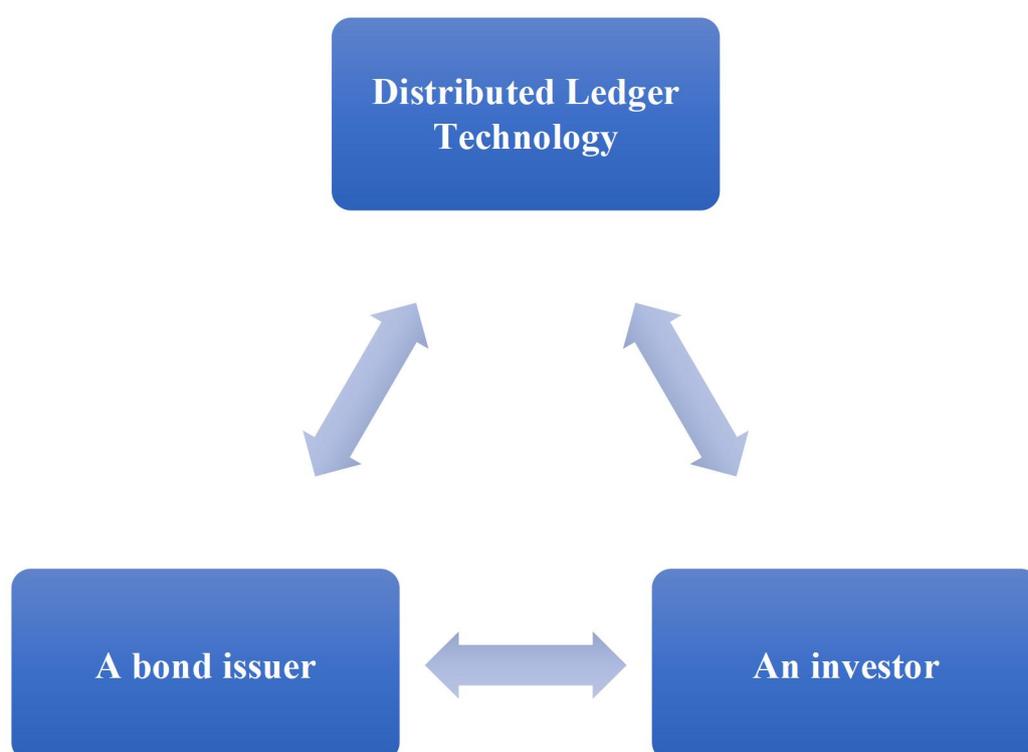
For instance, a bond issuer could fix all details about maturity date, coupon payments either annually or semi-annually, redemption and others before the creation of genesis block on distributed ledger technology, but it is crucial to mention that it would take to open a wallet on the distributed ledger technology for the purpose of moving transaction data from one wallet to another one automatically. Finally, the last term that will be discussed several times within this part of the PhD dissertation is a tokenization, referring to the process of creating a digital representation of a real thing. Tokenization can also be used to protect sensitive data or to efficiently process large amounts of data¹⁰⁷. In our case, we would like to apply the tokenization to the fixed-income assets like corporate as well as government bonds, since many retail investors cannot afford to add bonds to their portfolios due to the high price requirements and unfortunately this might adversely affect the liquidity of bond market in Uzbekistan. Therefore, the tokenization of bonds could boost a liquidity by tokenizing each piece of bond so as to make them affordable to the public. Firstly, the Tashkent Stock Exchange

¹⁰⁶ <https://www.ibm.com/topics/smart-contracts>

¹⁰⁷ <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-tokenization>

should take measures to create a blockchain technology for bonds tokenization, in other words, a bond issuer could easily create a digital representation of its bond a blockchain system so that the digital bond could be traded by investors on a blockchain-based exchange via distributed ledger technology. Finally, coupon payments as well as bonds redemption might be made automatically by means of the smart contracts.

Fig. 3.2.1 - The structure of the Blockchain-based Fixed-income Unit through Distributed Ledger Technology (DLT)¹⁰⁸



Certainly, the Tashkent Stock Exchange management should launch Distributed Ledger Technology project with an assistance of the National Agency of Perspective Project (NAPP) via “Regulatory Sandbox” framework in order to apply this innovative system within Capital Market participants. But in the initial phase, government bonds would be necessary to be tokenized and placed on the Distributed Ledger Technology, to put it another way, as an experiment, government bonds should be tokenized in order to sell out them to the public in the fractional amount since many retail investors cannot afford to purchase bonds due

¹⁰⁸ Based on the author’s development

to the high price of a single unit of a bond. Simultaneously, this might decrease dramatically money base in the shadow economy within Uzbekistan, afterwards it would lead to a significant growth in borrowing from local lenders, that is to say, nowadays according to the official report from the Ministry of Economy and Finance, in the first quarter of 2024, the country's public debt amounted to \$35.3 billion. Of this, \$29.4 billion (83%) was external debt and \$5.9 billion (17%) was domestic debt. In the first quarter, the ratio of public debt to GDP stood at 31.7%.¹⁰⁹ To be more precise, external debt accounts for 83% out of the entire country's public debt and the rest of 17% was domestic debt. Consequently, the creation of Distributed Ledger Technology would be a promising choice to make retail local investors interested to invest into government or corporate bonds, in other words, the tokenization of fixed-income assets (bonds) could substantially decline external debt borrowing for all government and corporate entities of the Republic of Uzbekistan.

First and foremost, it is necessary to create e-wallet on the Public Ledger Technology for every single public institution in Uzbekistan so initially all public organizations should be involved in this process of creation e-wallets, after that private companies could be welcomed to take part in. Finally, retail investors or ordinary people would get access to the Public Ledger Technology. Regarding investment products, the tokenization of government bonds should be selected in the experimental phase since they are considered to be risk-free assets, and as a type of bond it is worth to select pure discount debt instruments like zero-coupon bonds. Then, zero-coupon bonds should be tokenized on the Public Ledger Technology, of course, they should be affordable for all types of investors regardless of their budgets and that is a reason behind a bond tokenization, in other words, making fixed-income assets available for all investors in terms of price. Consequently, it would be necessary to issue tokenized short-term zero-coupon government bonds with a maturity of 30 days certainly a face value should be

¹⁰⁹ [https://kun.uz/en/news/2024/09/06/uzbekistans-public-debt-hits-37-billion-as-government-plans-further-borrowing#:~:text=According%20to%20a%20report%20from,17%25\)%20was%20domestic%20debt.](https://kun.uz/en/news/2024/09/06/uzbekistans-public-debt-hits-37-billion-as-government-plans-further-borrowing#:~:text=According%20to%20a%20report%20from,17%25)%20was%20domestic%20debt.)

adjusted to a monthly inflation rate. To be more precise, an investor could purchase tokenized bonds at discount price and those tokenized bonds would mature at a face value, nothing is unusual here only there are several benefits: the first is bonds would be tokenized, the second is no financial intermediary in the transaction processes, meaning there is no transaction cost which could save investors as well as bond issuers returns, the third is an enhanced liquidity of bonds, the fourth is the ease of settlement, in other words, settlement process might take a few minutes not days as it is accepted with a transaction of traditional bonds. And last but not least, the fifth is a transparency and security, that is to say, every transaction would be displayed for each member of Distributed Ledger Technology in order to take under control all processes and of course every user would be given two types of keys like private and public ones.

For instance, a 30-day zero-coupon bond with a face value of 45 000 UZS and YTD (yield to maturity) of 10.2% which is annual inflation rate by October 2024¹¹⁰. Surely, all processes would be accomplished via the Distributed Ledger Technology, to put it another way, those zero-coupon bonds would be tokenized and placed at the Distributed Ledger Technology. There is a clear explanation with the exploitation of the Future Value formula (FV) in order to define pre-determined Future Value (FV) of the given sample

Face Value or (PV) – 45 000 UZS

Yield to maturity (r) – 10.2%

t – 30 days

$$\mathbf{FV = PV(1+r)^t}$$

Answer:

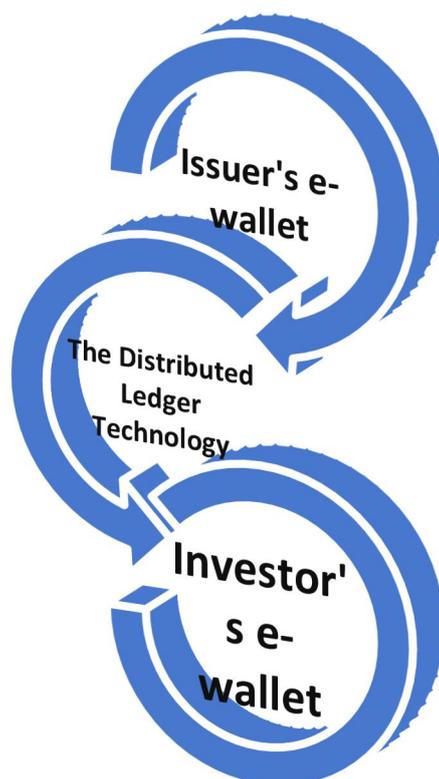
$$\mathbf{FV = 45\,000(1 + 0.102)}$$

$$\mathbf{FV = 49\,590\,UZS}$$

¹¹⁰ <https://daryo.uz/en/2024/11/01/uzbekistans-annual-inflation-climbs-to-102%25-in-october#:~:text=Year%2Don%2Dyear%20inflation%20has,lower%20rates%20in%20previous%20years.>

Thus, based on the calculation above, a net return would be 4 590 UZS, of course, in 30 days a tokenized bond holder would receive principal plus profit, smart contracts would automatically transfer the funds to the investor's e-wallet. This is how it works theoretically and similarly issuer, in our case, government authorities being responsible to issue bonds would have to place all functions or let's say fix up necessary algorithms related to tokenized bonds to their e-wallets at the Distributed Ledger Technology, consequently smart-contracts would be liable to accomplish all pre-determined tasks by the issuer and as it can be mentioned above there would be no third-party interactions in the settlement processes which means all transactions would be done automatically through the smart-contracts.

Fig. 3.2.2 - The structure of the smart contracts¹¹¹



As it is visible from the structure all settlements are carried by means of the Distributed Ledger Technology, in other words, there is no financial intermediary involved in it. Thus, only smart contracts would accomplish automatically all transactions based on the pre-determined conditions fixed by the issuer of

¹¹¹ Based on the author's development

tokenized bonds. There are several samples of bond tokenization processes based on the blockchain technology application, and we have discovered German Siemens company's experience in the application of blockchain technology to tokenize fixed-income assets or bonds, needless to say, the company issued tokenized commercial paper with the assistance of two private blockchain business units. In greater detail, "German industrial giant Siemens AG tapped global bank JPMorgan's blockchain-based payment system Onyx and SWIAT's private blockchain to issue and settle a tokenized version of its commercial paper, the companies said on Monday. Siemens issued €100,000 worth of crypto securities under the German Electronic Securities Act (eWpG) on September 13, then redeemed it three days later. The payments were conducted on the Onyx network using the JPM Coin System, while asset transfers were settled on the SWIAT network's delivery-versus-payment (DvP) mechanism. The whole process took 93 seconds from the confirmation of the trade by the parties on SWIAT to final confirmation of settlement sent to the parties that asset and payment transfers were completed. DekaBank also participated, acting as a regulated crypto securities registrar on the SWIAT network. The transaction marked the start of Onyx and SWIAT collaborating to develop asset issuance products on blockchain rails for commercial banks"¹¹².

As it is mentioned above, two private blockchain business units participated in these processes, the first is the Onyx network powered by the JP Morgan bank and the second one is SWIAT's blockchain based business unit. Thus, initial experimental issuance valued at €100,000 worth tokenized bonds and maturity was 3 days only, and all payment procedures occurred by means of the Onyx network with the application of JP Morgan Coin System as a core transaction method. Another example of the second tranche of tokenized bond issuance by Siemens has a volume of €300 million with a 1-year maturity period. According to the official press release, the current bond has a volume of €300 million and a

¹¹² <https://www.coindesk.com/business/2024/09/23/jp-morgans-onyx-blockchain-used-for-siemens-digital-commercial-paper-settlement>

maturity of one year. The securities transaction was settled via the private permissioned blockchain of SWIAT, and the Trigger Solution provided by the Bundesbank, making it possible to settle a Siemens bond for the first time in a fully automated manner, within minutes and in central bank money. In the transaction, Siemens leveraged its valuable experience with last year's first-time €60 million digital bond issuance, which had still required a two-day settlement period. As a result, this time the settlement risk was almost fully eliminated for all parties involved¹¹³. Similarly, based on the blockchain business model by SWIAT as well as Onyx technologies we could apply their techniques and experience to our Capital Market infrastructure development, for instance, let's take a closer look at the Onyx Asset Tokenization business model.

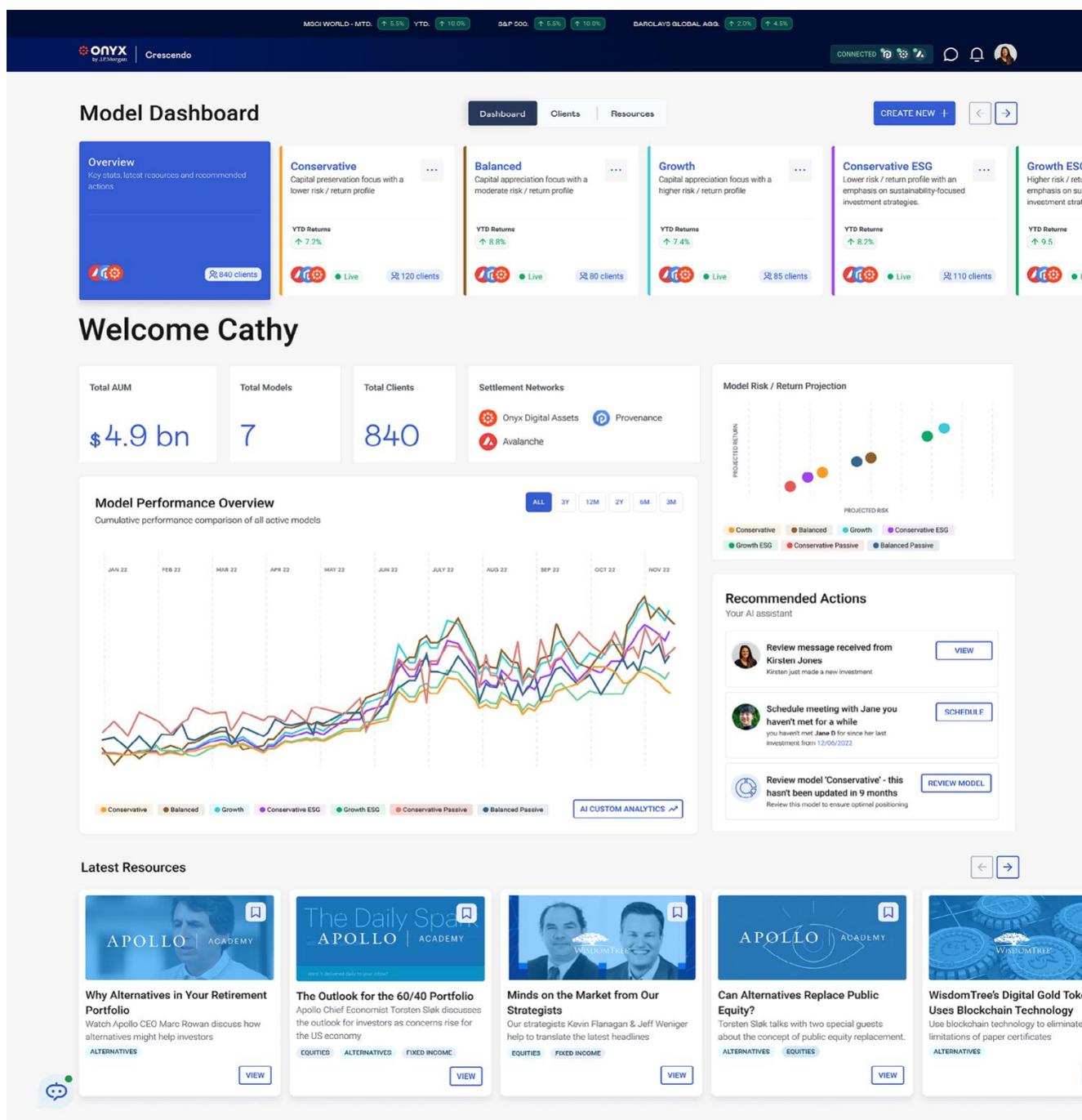
According to the JP Morgan official website source, the authorities state the following: “Onyx Digital Assets platform provides the blockchain infrastructure and breadth of resources to bring a unique variety of asset tokenization use cases to life and supports application development through every stage of the journey. Since Onyx was established in 2020, the Onyx Digital Assets platform has also facilitated intraday repurchase, or repo, transactions in order to provide short-term borrowing in fixed income through the exchange of cash for tokenized collateral. To date, more than \$300 billion of these repo transactions have been processed on the network”¹¹⁴. In other words, the system provides fast and secure fully automated settlement processes for its users, consequently, the Tashkent Stock Exchange could also create such kind of distributed ledger technology (DLT) for the purpose of bond tokenization since it would highly enhance the liquidity and transparency of fixed-income assets in Uzbekistan. Moreover, many retail investors cannot afford to invest into bond market due to a high price of bonds, therefore bond tokenization could eliminate this problem by halving bonds into fractions for the purpose of improving their liquidities. In addition, there is snapshot (picture) of the Onyx platform or how it is run on the

¹¹³ <https://press.siemens.com/global/en/pressrelease/siemens-remains-pioneer-another-digital-bond-successfully-issued-blockchain>

¹¹⁴ <https://www.jpmorgan.com/insights/payments/wallets/blockchain-onyx-asset-tokenization>

PC, in other words, front-end of the platform, with the explanation of necessary functions.

Pic. 3.2.1 - The snapshot of Onyx platform by J.P. Morgan¹¹⁵



The snapshot above represents all features of the Onyx platform, and firstly it is visible how portfolios modeled, key statistics related to the performance of tokenized assets, there is a number of clients, total number of models, risk and return projection, as well as settlement networks, meaning types of platforms

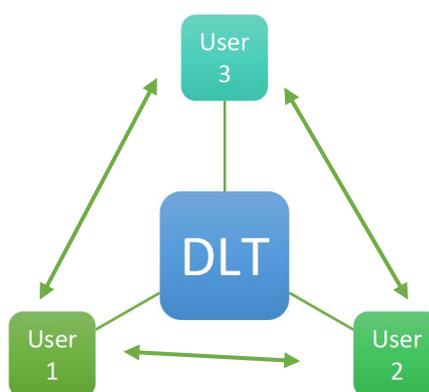
¹¹⁵ <https://www.jpmorgan.com/onyx/documents/portfolio-management-powered-by-tokenization.pdf>

leveraged in order to carry out transaction or we could state as collaboration with different blockchain platforms.

According to J.P. Morgan report “Portfolio Management Powered by Tokenization”:¹¹⁶ the infrastructure of Onyx Digital Assets permissioned EVM chain used for registering test fund assets (from J.P. Morgan Private Bank, Apollo, WisdomTree), model portfolios, investor portfolios, order routing and cash settlement via deposit tokens. Additionally, enabled rebalancing and connectivity to interoperability platforms. Similarly, Onyx Digital Assets Smart Contract records all of an investor’s cash and asset positions across multiple fund investments within a specific portfolio, while linking to a target model portfolio.¹¹⁶ In other words, the system provides fast and secure fully automated settlement processes for its users, consequently, the Tashkent Stock Exchange could also create such kind of distributed ledger technology (DLT) for the purpose of bond tokenization since it would highly enhance the liquidity and transparency of fixed-income assets in Uzbekistan.

As was previously stated, first and foremost, in order to launch this project, the National Agency of Perspective Projects should take part in the creation of the distributed ledger technology software system, then it is necessary to involve certain public organizations such as state-owned banks or state-owned insurance companies to purchase government bonds.

Fig. 3.2.3 - The shape of experimental launch¹¹⁷



¹¹⁶ <https://www.jpmorgan.com/onyx/documents/portfolio-management-powered-by-tokenization.pdf>

¹¹⁷ Based on the author’s development

Having launched a distributed ledger technology (DLT) by the Tashkent Stock Exchange with a help of the National Agency of Perspective Projects (NAPP), afterwards Ministry of Economy and Finance of the Republic of Uzbekistan should place tokenized bonds on the distributed ledger technology, for instance, a 30-day zero-coupon bond with a face value of 45 000 UZS and YTD (yield to maturity) of 10.2% which is annual inflation rate by October 2024¹¹⁸. Surely, all processes would be accomplished via the Distributed Ledger Technology, to put it another way, those zero-coupon bonds would be tokenized and placed at the Distributed Ledger Technology. And state-owned organizations should open e-wallets, in particular, we are considering state-owned banks, state-owned insurance companies as well as other government-joint organizations as initial investors on the distributed ledger technology so as to purchase the first issued a token of bonds by the Ministry of Economy and Finance of the Republic of Uzbekistan. After, as long as this project succeeds in the initial experimental stage, then a second stage of project could be taken by attracting retail investors and other private entities within the country. Lastly, at the final round of this project other institutions would be allowed to issue their own corporate tokenized bonds on the distributed ledger technology.

There is one more option to make this project work and it is estimated to be less expensive than the creation of national distributed ledger technology. In other words, the application of existent blockchain technology so as to tokenize bonds, for instance, the Ethereum blockchain also known as ERC-20 tokens¹¹⁹. Needless to say, there is a wealth of information about the ERC-20 tokens, thus it is worth to delve into the essence of the Ethereum blockchain protocol in a detail for the purpose of finding out the ways of applying to capital market infrastructure in Uzbekistan. According to the Internet source: “ERC-20 is the technical standard for fungible tokens created using the Ethereum blockchain. A fungible token is

¹¹⁸ <https://daryo.uz/en/2024/11/01/uzbekistans-annual-inflation-climbs-to-102%25-in-october#:~:text=Year%2Don%2Dyear%20inflation%20has,lower%20rates%20in%20previous%20years.>

¹¹⁹ ERC-20 defines a set of rules and functions that Ethereum-based tokens must adhere to, ensuring interoperability and compatibility with the various applications, wallets, crypto exchanges, and smart contracts across the Ethereum ecosystem.

one that is exchangeable with another token. ERC-20 allows developers to create smart-contract-enabled tokens that can be used with other products and services. These tokens are a representation of an asset, right, ownership, access, cryptocurrency, or anything else that is not unique in and of itself but can be transferred.¹²⁰”

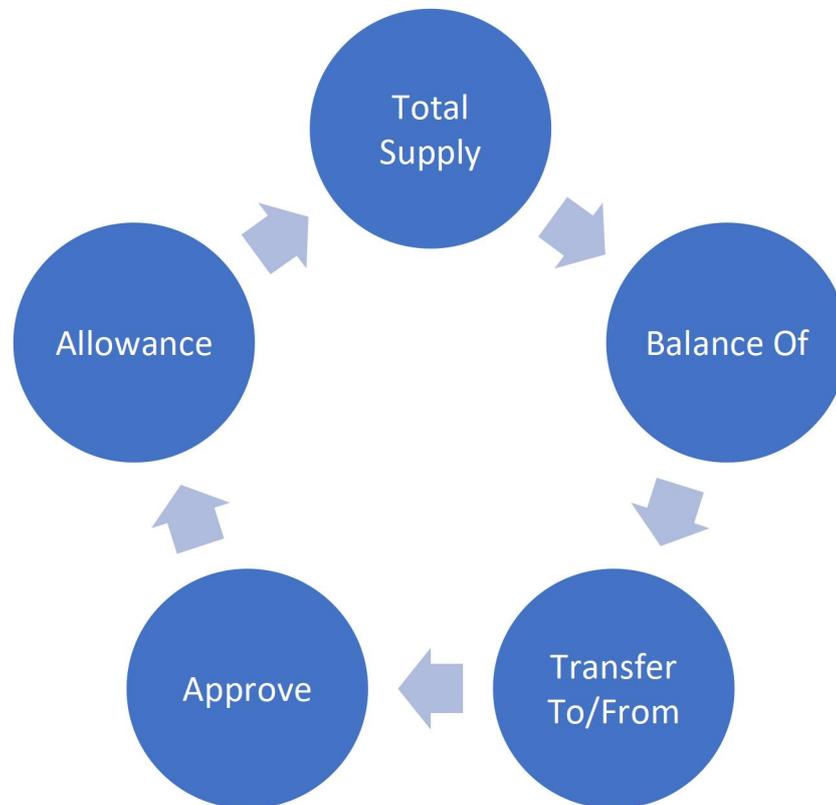
Surely, it might be arduous to apprehend the functions of ERC-20 protocol, therefore it is important to explain everything clearly for the readers of this PhD thesis. So firstly, a fungible token, perhaps, could be something new, as the word fungible token refers to the exchangeable with another similar token, that is to say, token might be any financial security such as stocks, bonds, derivatives and others, and this means securities might be issued on the ERC-20 protocol or simply put, traded at the Ethereum coin and this protocol also called as the smart-contract-enabled token. However, there are some requirements for the issuer to apply this protocol.

The functions a token must have, in order to run on the ERC-20 protocol, are the followings: the first is a total supply of tokens, the account balance, transfer conditions, an approval to withdraw a set number of tokens, as well as allowance for the returns. Needless to say, there is a wealth of information about the ERC-20 tokens, thus it is worth to delve into the essence of the Ethereum blockchain protocol in a detail for the purpose of finding out the ways of applying to capital market infrastructure in Uzbekistan. According to the Internet source: “ERC-20 is the technical standard for fungible tokens created using the Ethereum blockchain. A fungible token is one that is exchangeable with another token. So firstly, a fungible token, perhaps, could be something new, as the word fungible token refers to the exchangeable with another similar token, that is to say, token might be any financial security such as stocks, bonds, derivatives and others, and this means securities might be issued on the ERC-20 protocol or simply put, traded at the Ethereum coin and this protocol also called as the smart-contract-

¹²⁰ <https://www.investopedia.com/news/what-erc20-and-what-does-it-mean-ethereum/#toc-what-is-erc-20>

enabled token. However, there are some requirements for the issuer to apply this protocol.

Fig. 3.2.4 - A visual form of the Ethereum based ERC-20 protocol requirements¹²¹



Below, there is detailed information about each point of the requirements: first and foremost is the **TotalSupply**, referring to the total number of tokens that will ever be issued, next is **BalanceOf** that is the account balance of a token owner's account. Following, **Transfer** requirement, it automatically executes transfers of a specified number of tokens to a specified address for transactions using the token. After **TransferFrom** which automatically executes transfers of a specified number of tokens from a specified address using the token. And penultimate is the **Approve**, translating into a permission for a spender to withdraw a set number of tokens from a specified account, up to a specific amount. Finally, **Allowance**, returning a set number of tokens from a spender to the owner¹²².

¹²¹ Based on the author's development

¹²² <https://www.investopedia.com/news/what-erc20-and-what-does-it-mean-ethereum/#toc-what-is-erc-20>

The leveraging of the ERC-20 protocol on the Ethereum blockchain for national bonds tokenization would function in this form. Firstly, it is necessary to clarify the total number of tokenized government bonds would be generated, then the account balance of a token owner's account. After, a Transfer function could easily transmit tokenized government bonds to another address, an Approve function would enable one address to authorize another address to spend tokens on its behalf. Next is the Transfer From function which would enable an address (an investor) to receive tokens from another address (an issuer) that has granted allowance to transfer. And last one is the Allowance function, that would allow the issuer to return or redeem a set number of tokenized government bonds from the investor. In addition, there are three optional functions such as Name; Symbol; as well as Decimals, and this last third function might enable the tokens to divide into the number of decimal digits, to put it another way, as it was mentioned earlier tokenized assets can be divided into fractional parts in order to improve the liquidity of such assets as bonds since traditional bonds are reported to have a higher cost which is inaccessible to retail investors.

There are several real samples on how to leverage the Ethereum blockchain for the purpose of asset tokenization, so here we would like to walk a reader through the example of French Bank Société Générale how they managed to issue Green Positive Impact Senior Preferred Notes or just simply Green Bonds on the Ethereum blockchain via distributed ledger technology. In greater detail, this issuance is a 10,000,000 EUR Green positive Impact Senior Preferred Notes due 30 November 2026 and registered in a distributed ledger technology kept by Société Générale - Forge. The note serves a fixed 4.015% annual coupon paid on 30 November each year including Maturity Date. Regarding price, each token valued at \$100. The Notes are dematerialized notes registered in the name of each Noteholder in a distributed ledger technology (dispositif d'enregistrement électronique partagé). The DEEP used as register to evidence title to the Notes is Ethereum, a consensus algorithm based on proof-of-stake. The Notes are noted "Green" and proceeds can be used to finance eligible activities defined in

the Sustainable and Positive Impact Bond Framework: Renewable energy; Green buildings; Low carbon transport; Water management and water treatment; Pollution prevention and control and Circular economy¹²³. Certainly, ERC-20 digital tokens applied to this project launched by French bank Société Générale, and the settlement processes accomplished 24/7, or briefly stating, any time regardless of holidays and weekends, making the token bonds highly liquid to all types of investors. It is important to mention that Société Générale established its own platform SG Forge being the innovation branch, and it is specialized in developing financial product on blockchain running on Ethereum. According to data on the Internet: SG Forge builds the technological infrastructure to issue stablecoins, and tokenized bonds and structured products onchain that are regulatory compliant with all EU frameworks. Societe Generale – FORGE is a licensed French investment firm supervised by the Autorité de Contrôle Prudentiel et de Résolution (“ACPR”), controlled by the Autorité des Marchés Financiers (“AMF”). The Company is authorized to provide reception and transmission of orders in relation to one or more financial instruments, execution of orders on behalf of clients and safekeeping and administration of financial instruments for the account of clients, including custodianship and related services. Societe Generale – FORGE is licensed as an electronic money institution by the ACPR. It is authorized for issuing electronic money and distribution/redemption of electronic money¹²⁴.

Consequently, by means of the Forge platform the French bank SocGen (Societe Generale) can easily issue tokenized bonds and other financial securities making its products accessible to all investors, despite of their budgets. Nowadays, as it is widely known many retail investors have become interested in fixed-income assets when it comes to select financial products to hedge their portfolios against future uncertainties, in addition, blockchain run securities settled within 5 to 10

¹²³ <https://readi.fi/asset/debt-sg10green-societe-generale-green-positive-impact-senior-preferred-notes-by-societe-generale/>

¹²⁴ <https://readi.fi/platform/platform-rwa-tokenization-sg-forge/>

minutes, translating into time-efficiency. Following this, it is highly probable to entice foreign retail investors to invest into our Capital Market.

3.3 The establishment of equity derivatives at the Tashkent Stock Exchange

It is impossible to predict exactly what happens tomorrow, there is no exception for the stock markets. To be more precise, neither human beings (financial analysts) nor software programs (smart computers) can forecast upcoming volatilities in the markets, thus equity as well as bond derivatives were created to hedge against future uncertainties related to financial securities, even in some cases there might be high rewards for risk takers. The world market for derivatives is an immense one. The notion amounts outstanding in the over-the-counter (OTC) derivatives market worldwide exceeds \$640 trillion, with a collective gross market value of over \$27 trillion. The exchange-traded market has another \$60 trillion in outstanding notional¹²⁵. As it is mentioned, derivatives market is gigantic and there is a high bid on derivatives for stocks and bonds due to huge interest to make profits in spreads between spot and forward prices of them.

However, it is important to run the reader through the essence of derivatives and how they, in reality, function. According to the CFA Institute Research & Policy Center: “a derivative is a security with a price that is dependent upon or derived from one or more underlying assets. The derivative itself is a contract between two or more parties based upon the asset or assets. Its value is determined by fluctuations in the underlying asset. The most common underlying assets include stocks, bonds, commodities, currencies, interest rates and market indexes”¹²⁶. Regarding trading floor, so they can be traded both privately over-the-counter (OTC) either on an exchange, nevertheless it is significant to note that a number of OTC derivatives exceeds than those standardized exchange-traded derivatives number. In general, there are several common types of derivatives, such as futures, options, swaps, credit default swaps, forwards, last but not least,

¹²⁵ <https://www.theigc.org/sites/default/files/2015/02/Sundaram-2012-Working-Paper.pdf>

¹²⁶ <https://rpc.cfainstitute.org/policy/positions/derivatives#:~:text=A%20derivative%20is%20a%20security.>

collateralized debt obligations (CDOs) as well as mortgage-backed securities (MBS) also considered as sorts of derivatives contracts. It is important to note that there are several reasons why it is necessary to establish equity derivatives since derivatives are also highly levered instruments, and this has its own implications. On the one hand, the leverage makes derivatives attractive to speculators (those who wish to bet on price direction). In itself, this is not a bad thing, since speculators add considerable liquidity to the market and, by taking the opposite side, facilitate the positions hedgers want to take¹²⁷. Meanwhile, it is worth to keep in mind there is a single downside that leverage might increase the effect of price movement, resulting in abrupt unfavorable price direction which could cause disaster to the derivatives portfolio and the underlying equity might lose potential value, in other words, by being overvalued or undervalued due to the market sentiment or investors false expectations. For this reason, the main point is to reflect how derivatives can be used to hedge existing risk exposures and prevent other future uncertainties for the purpose of protecting investor's portfolio from the market instabilities and losses.

Having said that, unfortunately, the absence of equity derivatives at the Tashkent Stock Exchange may lead investors to a high-risk exposure and market volatility could cause huge losses to the investors' portfolios. To solve this problem, we have taken some measures to establish equity derivatives board at the Tashkent Stock Exchange, first and foremost, the equity derivatives should be split into two classes such as Main board as well as OTC. So, if we look at the market data or in other words how the UCI (Uzbekistan Composite Index) has performed since January (2024) up to date January 24th (2025), in this case, it is obvious that there have been many ups and downs, to put it another way, the benchmark index has been experiencing high volatility within the given period, translating into high-risk exposure in the market. Due to the absence of each individual security's data in the visualized graph form, we were forced to take as a sample the overall market performance in order to show general picture of the equities at the Tashkent Stock

¹²⁷ <https://www.theigc.org/sites/default/files/2015/02/Sundaram-2012-Working-Paper.pdf>

Exchange, meaning there is a shortage of data about how each security has been performing in the shape of the graphs.

Pic. 3.3.1 - The snapshot of the UCI Performance¹²⁸

632.47 ▼ (0.19) 2025-01-24



The line chart above does represent the UCI performance from January 24th (2024) to January 24th (2025), during 1 year period. What stands out from the chart is that it is obvious there have been many ups and downs, to put it another way, the benchmark index has been experiencing high volatility within the given period, translating into high-risk exposure in the market. This means there is a high volatility in the Capital Market which could lead to huge loss to investor's portfolio, so the benchmark index experienced enormous fluctuations within this given period. According to the data, at the beginning of the period, the UCI stood at just below 660 values on January 24th, and between May 25-27th, it hit above 700 values, precisely, in 5 months a 40-value gain. Based on the experience, in this kind of situations, in countries with developed derivative markets, many investors

¹²⁸ https://uzse.uz/price_indices

would have taken long positions in call options with the strikes to be exercised at 660 values and reselling the underlying security at above 700 values. However, this figure abruptly returned back to the initial value (660) on June 23rd, and it would have brought opportunity to go long on put options for an investor to hedge own portfolio in case of holding onshore equities. Last but not least, it is important to note that the UCI started to lose value, eventually it fell almost to 630 values, to be more accurate, a portfolio could have lost even initial value. Consequently, it is necessary to establish equity derivatives at the Tashkent Stock Exchange for the purpose of protecting investor's portfolio.

Tab. 3.3.1 - Trading Volume and Value Table¹²⁹

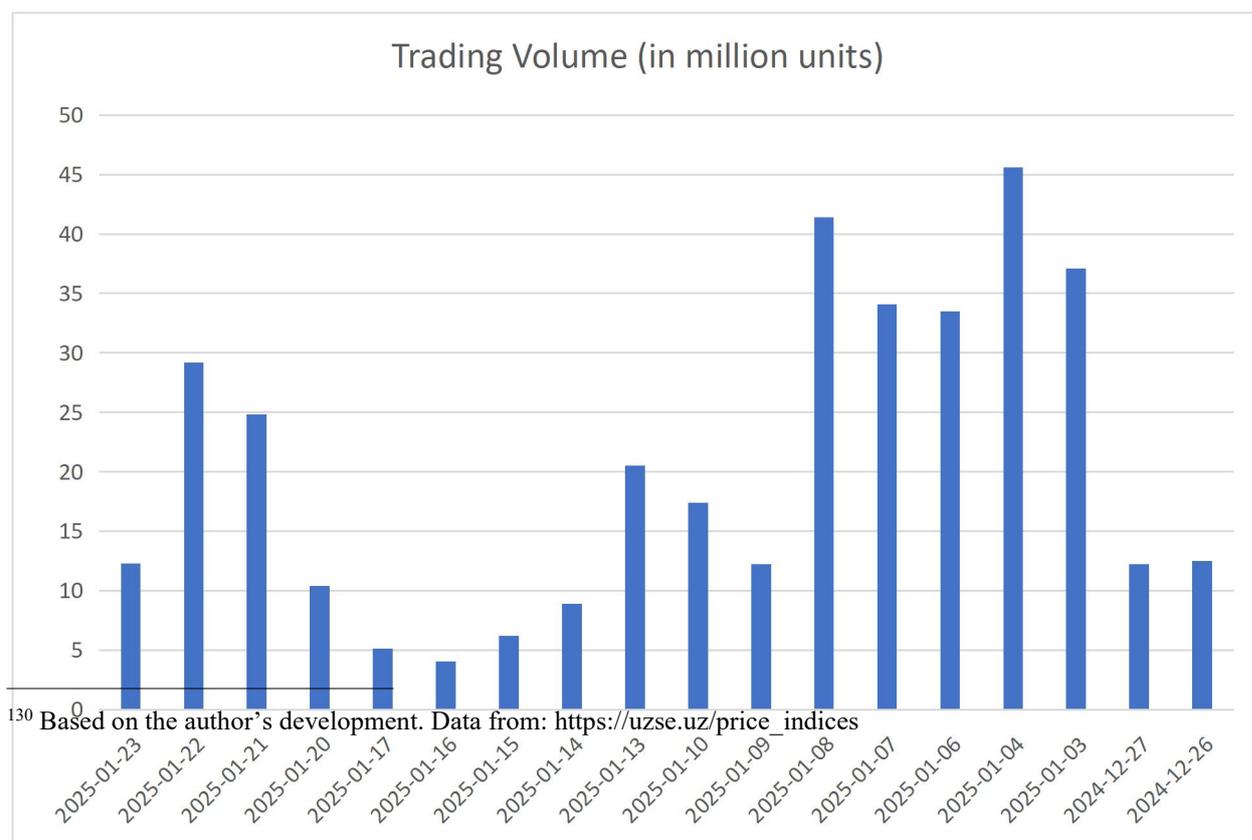
Date	Current Index	Trading Volume	Trading Value
2025-01-23	632,66	12261003	143637887,8
2025-01-22	630,29	29231101	205649988,9
2025-01-21	631,7	24788071	148363676,5
2025-01-20	635,91	10360828	104730498,6
2025-01-17	637,17	5140420	137145390,8
2025-01-16	647	4027258	54876153,28
2025-01-15	644,75	6181806	53700514,36
2025-01-14	643,79	8922130	55323809,96
2025-01-13	648,15	20526507	91013491,66
2025-01-10	652,95	17442582	43137305,48
2025-01-09	643,04	12234786	41125385,71
2025-01-08	652,57	41404390	108388764,4
2025-01-07	646,41	34074891	182663867
2025-01-06	639,18	33522782	102721786,5
2025-01-04	641,75	45589041	750320777,3
2025-01-03	640,26	37124976	54140401,92
2024-12-27	655,12	12243034	137343724,2
2024-12-26	648,05	12480482	90542630,41

There is information about Trading Volume as well as Value between December 26th (2024) up to January 23rd (2025). In general, it can be seen that Current Index during that period it fluctuated from 632 to 652, meaning a 20-value

¹²⁹ Based on the author's development. Data from: https://uzse.uz/price_indices

difference within a month that translates into a huge volatility for the portfolio and eventually it refers to adding some derivatives in order to hedge investor's position. Even looking at the Trading Volume and Value, there used to be significant distinctions among them, for instance, at the beginning of the period (2024-12-26) the volume made up 12.5 million trades, compared to a value of trades, it accounted for 90.5 million, being ninefold higher than trading volume and these considerable inequalities amid point out a surge demand on derivatives to hedge future uncertainties. Indicators recorded on the January 4th (2025) represent a significant difference amid volume as well as value trades, standing at 45.5 million, and 750.3 million units, respectively. According to the international experience, such a gigantic distinction can easily make an investor go long put options on the UCI equities as long as the investor has invested in. And finally, regarding last date, which is the January 23rd (2025) the difference among trading volume as well as trading value was just above tenfold, a volume of trades made up 12.2 million units, while a value of trades reached 143.6 million amounts, again it would have led the investor, who had gone long for the UCI equities, to take put options against the market volatility.

Pic. 3.3.2 - The bar graph of Trading Volume for the same period¹³⁰



Even, it is absolutely clear that during a month period, there used to be high swings in the trading volume, which indicates market volatility led to large fluctuations in the equities' values. The lowest volume was on the January 16th (2025), it constituted approximately 4.02 million trade units, however, the highest volume of trades made on the January 4th (2025), reaching nearly 45.6 million units. To be more precise, a risk management for the investors and their portfolios is critically low due to the market instability and huge volatilities, consequently the introduction of derivatives can be the best solution for the ongoing volatility of the equities. For instance, futures contracts as well as options (call and put) would be the most appropriate tools to protect investors' portfolios against those kinds of being mentioned above high fluctuations in the local equities.

Next, "Uzbek Commodity Exchange" (UZEX) common shares taken as a real sample of individual equity listed at the Tashkent Stock Exchange to point out how far equity derivatives are necessary to be introduced to hedge against market instability.

**Tab. 3.3.2 - Table about Uzbek Commodity Exchange" (UZEX)
common shares details¹³¹**

Date	Closed Price	Change	Opened
2025-01-27	3499,99	20,09	3410
2025-01-24	3479,9	39,9	3498
2025-01-23	3440	-40	3479,5
2025-01-22	3480	-20	3499,98
2025-01-21	3500	100	3400
2025-01-20	3400	-58	3458
2025-01-17	3458	-51	3399
2025-01-16	3509	9	3520
2025-01-15	3500	0,01	3500
2025-01-14	3499,99	43,99	3456
2025-01-13	3456	-43	3595
2025-01-10	3499	9	3500
2025-01-09	3490	30	3333
2025-01-08	3460	-69,99	3530,01
2025-01-07	3529,99	29,99	3545
2025-01-06	3500	-90	3580
2025-01-04	3590	-10	3600
2025-01-03	3600	-50	3650
Total %	50,04%	-0,12%	50,08%

¹³¹ https://uzse.uz/isu_infos/UZ7043200003/detail

The table above does highlight main features of the Uzbek Commodity Exchange's common share performance within January (2025), to be more precise, period between January 3rd up to January 27th. In general, as we mentioned above, we had taken only prime pieces of details out of the whole data, which include Closed and Opened Prices, as well as Spread amid, or change among two selected variables. Initially, on the January 3rd, the equity opened at 3650 values, but unfortunately it lost 50 basis points when the market closed, making up 3600 values, from the perspective of the investors, it would have cost remarkable losses to the portfolio. Regarding following two days, the equity experienced only losses, it shed negative 90 basis points on the January 6th, falling from 3580 to 3500, plus -10 basis points at the premarket trades. Briefly stating, the equity dropped three days successively, making huge losses to the investors who had invested into it, consequently it shows how far our equity market is needed to have derivatives to hedge its investors' portfolios against volatilities. However, on the January 7th, the equity gained 29.99 basis points, but again suddenly the equity lost 69.99 basis points on the following day (January 8th). According to data, only on the January 21st, the equity significantly increased to exactly 100 basis points from 3400 (opened) to 3500 (closed price), indicating high demand for the common shares of the UZEX by the investors. All in all, relied on the overall result in a percentage, during January month of 2025, Closed price accounted for 50.04%, meanwhile, opening price stood at just above 50.08%, but the most important part is that spread amid constituted -0.12% or 12 basis points, translating into notable losses for the investors going long on the UZEX common shares. So here, there is only one option to defeat these price instabilities by means of derivatives, such futures contracts, options and others.

Therefore, based on the all four reports above, it is obvious that there is a high demand to establish equity derivatives at the Tashkent Stock Exchange for the purpose of hedging investors' portfolio against value loss of principal, thanks to derivatives it would be a promising choice to manage volatility risks under control, apart from this, the establishment of equity derivatives might result in an enormous

liquidity inflow to the Capital Market of the Republic of Uzbekistan. Afterwards, there would be large opportunities to the investors to make gigantic profits in equity spreads by means of derivatives to purchase or sell the underlying equity at predetermined prices.

First of all, according to our research, there should be established only two classes of derivatives such as futures contracts as well as options, since they would be more likely suitable to our equity market, in other words, the authorities of the Tashkent Stock Exchange with the assistance of National Agency of Perspective Project, should establish futures contracts and options for the UCI. Initially, the Tashkent Stock Exchange along with the NAPP (National Agency of Perspective Project) should create expiration dates for futures contracts, based on the CME (Chicago Mercantile Exchange)¹³², many futures contracts are reported to expire on the third Friday of March, June, September as well as December, so in our case it is necessary to apply this being mentioned standard to the equities at the Tashkent Stock Exchange. To be more accurate, quarterly futures contracts would appear to be the most appropriate to the stocks at the Tashkent Stock Exchange, and of course as it is widely known the futures contracts holders are permitted to write option contracts for the purpose of hedging own positions, similarly this would operate in the same manner as highlighted above. In greater detail, futures contracts would be divided into quarter-futures types, meaning lifespan would be only 3 months, and there would be in total 4 quarter futures contracts, so the first one would expire on the third Friday of March, the second would expire on the third Friday of June, the third would expire on the third Friday of September and the last one would expire on the same day of December. Regarding the terms of work, an investor having long on futures positions, would be provided following conditions such as offset the position, liquidating the position, that is to say, exiting a trade; rollover which states to prolong position by replacing the old one to the newest: and final is the settlement, in this case, the investor would be in charge of purchasing the underlying equity at predetermined price. Pricing and valuation of

¹³² <https://www.cmegroup.com/>

futures contract on the equities at the Tashkent Stock Exchange, so the futures contracts would carry zero initial value and its price $f_0(T)$ would be established at inception. The futures price, in our case it is $f_0(T)$ would equal the spot price of the equity or the UCI index. The size would be deliverable number of underlying shares represented in each contract, then a single futures contract would have 100 shares of the predetermined underlying stock. There is a formula on how to value futures contract on equities:

Futures Price = Security Price + Interest Opportunity Cost – Cash Distributions

Or

$$F_0 = S_0(1+rt) - C_t$$

Where:

F_0 = Futures Price

S_0 = Price of underlying asset

r = Annualized risk-free rate to period t

t = Maturity of futures contract

C_t = Cash distributions (dividends or interest) to maturity

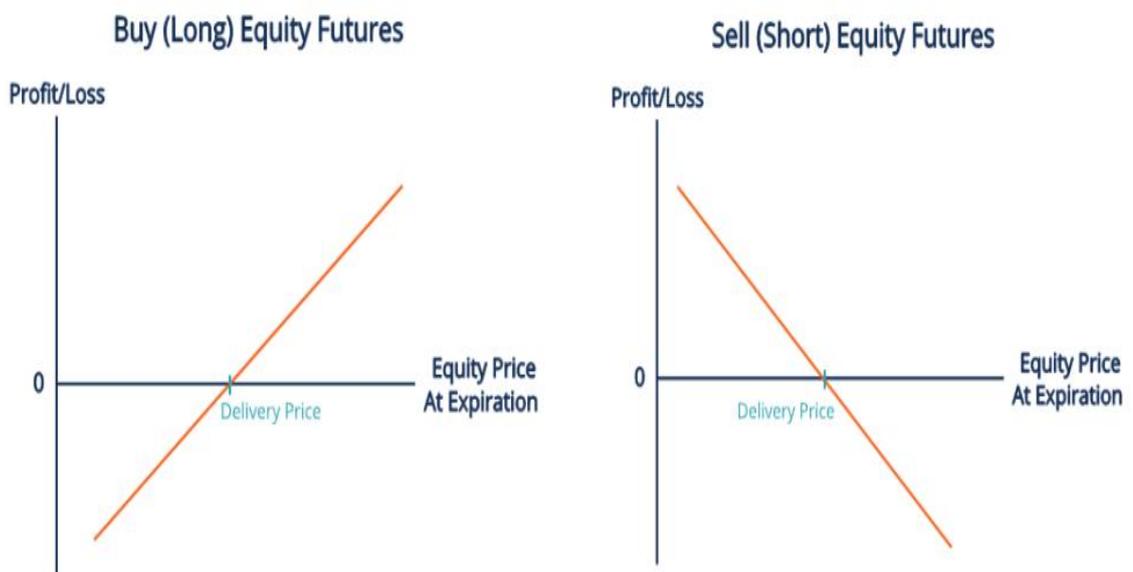
For instance, mentioned above pricing futures contract formula could be applied to our local equities. Thus, we have taken as a sample common share of UZEX traded at 3499.99 UZS (11.02.2025), in other words, $S_0 = 3499.99$ UZS, and for annualized risk-free rate to period t considered central bank interest rate which is 13.5%, so $r = 13.5\%$, regarding t that is maturity of futures contract or expiration date, as an example 21st March expiry date opted. Finally, C_t which is cash distributions (dividends or interest) to maturity, here as we have selected common share of UZEX, the institution has recently announced not to pay out dividends for its common shareholders for this year 2025, therefore $C_t = 0$. If we put all variables based on the formula above, there would following output:

$$F_0 = 3499.99(1+21.135)$$

$$F_0 = 77\,427.28 \text{ UZS}$$

To be more precise, a single futures contract position precise for the UZEX 100 common share stocks would cost 77 427.28 UZS, allowing an investor to purchase 100 common stocks of UZEX on March 21st, at the strike price of 3499.99 each common stock. In other words, the investor would have to exercise the futures contract on UZEX on expiration date, which means purchasing 100 common stocks and it would cost in total 349 999 UZS for the investor. Thus, going long for a single futures contract for UZEX 100 common stocks would cost 77 427.28 UZS for the investor, however it is important to keep in mind that having taken any positions in futures contracts would oblige the investor to buy or sell the underlying assets.

Pic. 3.3.3 - The picture of how equity futures work¹³³



As it visible above how equity futures work. In general, the function of futures contracts is not daunting task to comprehend, so firstly the term Delivery Price

¹³³ <https://corporatefinanceinstitute.com/resources/derivatives/equity-futures-contract/>

connotes the price at which both parties: buyer as well as seller agree to make the deal happen, to put it another way, the underlying asset (equity) is handed over from seller to buyer, and this process takes place at expiration which is equal to 0. Of course, based on the position long or short the investor makes profit as long as his or her assumptions appear to be correct. Last but not least, initial margin or upfront fee generally costs 10 % out of the entire deal.

In respect of option types, the best one is the European style options that can be exercised only at expiration in order to prevent future uncertainties since our equity market has no any previous experience in the application of derivatives. According to the CFA Institute, the option contracts have three unique features to explore for the purpose of having clear conceptions about their structures:

- “An option’s value comprises its exercise value and its time value. The exercise value is the option’s value if it were immediately exercisable, while the time value captures the possibility that the passage of time and the variability of the underlying price will increase the profitability of exercise at maturity.
- Option moneyness expresses the relationship between the underlying price and the exercise price. A put or call option is “at the money” when the underlying price equals the exercise price. An option is more likely to be exercised if it is “in the money”—with an underlying price above (for a call) or below (for a put) the exercise price—and less likely to be exercised if it is “out of the money.”
- Due to their asymmetric payoff profile, options are characterized by no-arbitrage price bounds. The lower bound is a function of the present value of the exercise price and the underlying price, while the upper bound is the underlying price for a call and the exercise price for a put.
- As in the case of forward commitments, the replication of option contracts uses a combination of long (for a call) or short (for a put) positions in an underlying asset and borrowing or lending cash. The replicating transaction for an option is based on a proportion of the underlying, which is closely associated with the moneyness of the option.

- The underlying price, the exercise price, the time to maturity, the risk-free rate, the volatility of the underlying price, and any income or cost associated with owning the underlying asset are key factors in determining the value of an option.
- Changes in the volatility of the underlying price and the time to expiration will usually have the same directional effect on put and call option values. Changes to the exercise price, the risk-free rate, and any income or cost associated with owning the underlying asset have the opposite effect on call options versus put options.”¹³⁴

Consequently, besides futures contracts, the establishment of options contracts would be a promising choice for the investors willing to invest to the Tashkent Stock Exchange quoted equities. Moreover, those options should be attached to the futures contracts for a similar underlying stock in order to provide futures holders to write options. In this case, an option writer, also known as a grantor or seller would be futures contracts holders by writing options for other investors, they could collect premiums from purchasers. Needless to say, it is significant to bear in mind that option moneyness expresses the relationship between the underlying price and the exercise price. A put or call option is “at the money” when the underlying price equals the exercise price. An option is more likely to be exercised if it is “in the money”—with an underlying price above (for a call) or below (for a put) the exercise price—and less likely to be exercised if it is “out of the money.”¹³⁵

Conclusion on the third chapter

1. In the first part of this chapter, the ways of improving the capital market infrastructure discussed, in other words, how to boost the liquidity of equity index UCI by means of the introduction of ETFs (Exchange Traded Funds) tracking UCI value would be a promising choice to make foreign and local investors interested

¹³⁴ <https://www.cfainstitute.org/insights/professional-learning/refresher-readings/2025/pricing-valuation-options#:~:text=The%20underlying%20price%2C%20the%20exercise,the%20value%20of%20an%20option.>

¹³⁵ <https://www.cfainstitute.org/insights/professional-learning/refresher-readings/2025/pricing-valuation-options#:~:text=The%20underlying%20price%2C%20the%20exercise,the%20value%20of%20an%20option>

to invest into the Uzbekistan Composite Index. And in the first part, we have already explored that all ETF features highly suit to apply to the national equity index (UCI), in other words, the creation of ETF tracking the UCI value, would lead to improving the overall Capital Market infrastructure in Uzbekistan. Besides, many retail local investors are highly restricted in terms of funds they possess, and there is a limited number of investment products provided by the financial institutions in Uzbekistan.

2. The second part was about the tokenization of the fixed income assets such as bonds, and of course there have been made some assumptions on how to tokenize government as well as corporate bonds into tokens for the purpose of increasing the liquidity since according to foreign expertise, many international financial institutions have solved the liquidity issue related to the bonds as it is widely known traditional bonds are not suitable to retail investors due to the higher price.

3. And a final part of a third chapter was the establishment of equity derivatives in order to hedge against market volatility. We have explored ways on how to introduce derivatives contracts mainly futures contracts and options to protect investor's portfolio against future uncertainties in the market. As discussed in the final part of the third chapter, there is a high level of volatility in the equity market, scaring many foreign as well as domestic investors to invest into the equities at the Tashkent Stock Exchange. All in all, the introduction of equity derivatives could increase the potential of stocks quoted at the Tashkent Stock Exchange, since many investors would like to have positions in derivatives so as to hedge their portfolios against future uncertainties and loss of their portfolios value.

CONCLUSION AND RECOMMENDATIONS

1. Take measures to grant a preemptive right to purchase shares to employees of enterprises in the event of a public offering of these shares as part of an employee stock ownership plan (ESOP) introduced by the enterprise also mentioned in it. At the same time, as mentioned in the second chapter of the first chapter: there is a point about “their funds, not exceeding their monthly salary and equivalent payments, allocated for the purchase of shares, are exempt from personal income tax”.
2. As mentioned in the third part of the first chapter, there should be created three categories in “Majors”, there would be large companies with big market capitalization or even considered as well-recognized corporations in Uzbekistan, “Minors” category would cover medium-sized and small businesses, of course relatively small market capitalization. Finally, “Starters” there would be only startup projects which have not been entities yet.
3. What is more, it is noteworthy to create two main categories of quoted stocks at Tashkent Stock Exchange by introducing two main classes of stock such as “Internal” as well as “External”. In other words, “Internal” would refer to quoting stocks in UZS certainly for local citizens. Regarding “External”, in this case, stocks would trade in USD especially for foreign investors. In greater detail, local investors should open brokerage accounts through local brokerage firms, and of course local investors would be provided “Internal” mode, investing in UZS to securities (stocks). Meanwhile, foreign investors should be registered as “Foreign Beneficial Owner” at JSC “Central Securities Depository”.
4. Next is a huge issue related to the high financial illiteracy in Uzbekistan since a majority of people are not educated how to invest or to save money for hedging future economic uncertainties, so the answer for this problem is to spread out financial literacy by introducing finance as well as investment disciplines in school curriculums within the whole country. Then, the lack of professionalism in the capital market causes some obstacles to improve the function of Tashkent Stock Exchange. For instance, the absence of sufficient highly-qualified employees

on the capital market in Uzbekistan, in other words, it is because of the absence of investment related disciplines taught at local universities with majors in economics and finance like securitization, asset management, wealth management, securities management and others.

5. There is another problem that should be solved in order to increase the liquidity of securities quoted at the Tashkent Stock Exchange which is a strong local currency devaluation keeping foreign investors away from investing into Uzbek securities, certainly this problem could be solved by taking some monetary policy actions like raising interest rate, currency intervention (short-term solution against devaluation) or boosting export-oriented manufacturing. Shortly, all these threats, weaknesses could be overcome through suggestions, which have been mentioned above, for the benefit of Tashkent Stock Exchange and the whole capital market.

6. According to the econometric analysis of the first part of the second chapter, two out of three econometric tools do represent true relationship between independent variable (x_2) and dependent variable (y), in greater detail, there is an alternative hypothesis (H_A) between population growth (x_2), as well as mortgage loans (y) since as long as number of population is growing, the similar upward trend would be seen in the allocation of mortgage loans regardless of the interest rates variation in Uzbekistan translating into a high potential of securitization process, in simple terms, now based on the econometric analyses, it is noteworthy that a creation of mortgage-backed securities could open new ways of fund raising for commercial banks to finance mortgage loans.

7. It is necessary to create a funding program for middle and large private companies based on the 60/40 funding ratio, to be more precise, a company willing to raise capital for its project, would be allowed to take out only 40% of estimated its total project's cost and the rest of 60% would have to go public by selling its stocks or issuing bonds, but in any all these operations would be accomplished through the Tashkent Stock Exchange. What is more, there should be taken some action to assist in an IPO process from the authorities of the Tashkent Stock

Exchange by covering underwriting outlays partly or even fully so as to stimulate local enterprises to seek out funds beyond corporate loans.

8. The introduction of commercial paper on the board of the Tashkent Stock Exchange could widen opportunities for raising capital to the large businesses not only within the country in national currency, but also it would lead local companies, certainly with the highest credit ratings, to attract external capital from abroad in foreign currencies like USD, Euro, Pound and others. Hence, the Tashkent Stock Exchange should assist in this process by means of taking some measure to make it work through consulting, creating special board for commercial paper debt instrument, last but not least, the expenses should be covered by the Tashkent Stock Exchange in the first phase of issuing commercial paper by local enterprises with the highest credit ratings.

9. Needless to say, it is worth to establish free lessons about financial literacy, for instance, retirement plan, how to run portfolio, or even some basic topics should be unveiled to the public, such as the crux of investment, its benefits and drawbacks should be explained in detail, difference between debt (fixed-income assets) and equity, how bond market performs and equity ones does. So, these investment related materials should be taught to the public, and by following mentioned instruction, it is highly probable to make citizens interested to invest in the local securities.

10. Next is to establish two classes of stocks at the Tashkent Stock Exchange, in other words, there should be taken some measures to create in two different currencies quoted stocks for a single security. In more detail, so as to boost liquidity of the local securities, it is necessary to create quotes in local currency for internal investors as well as in foreign currency as in US dollars to attract international investors, due to a high risk of local currency depreciation, many foreign investors are not willing to invest in Capital Market of Uzbekistan, thus an establishment of foreign currency quoted board at the Tashkent Stock Exchange could eliminate this issue.

11. The introduction of ETFs (Exchange Traded Funds) tracking UCI value would be a promising choice to make foreign and local investors interested to invest into the Uzbekistan Composite Index. But first it is worth to disclose the crux of ETFs in detail. Exchange-traded funds (ETFs) are popular among investors looking to build a diversified but low-cost portfolio. ETFs offer investors access to a wide range of markets around the world usually at low cost. In other words, the creation of ETF tracking the UCI value, would lead to improving the overall Capital Market infrastructure in Uzbekistan.

12. The introduction of the blockchain technology for asset tokenization, the Tashkent Stock Exchange management should launch Distributed Ledger Technology project with an assistance of the National Agency of Perspective Project (NAPP) via “Regulatory Sandbox” framework in order to apply this innovative system within Capital Market participants. But in the initial phase, government bonds would be necessary to be tokenized and placed on the Distributed Ledger Technology, to put it another way, as an experiment, government bonds should be tokenized in order to sell out them to the public in the fractional amount since many retail investors cannot afford to purchase bonds due to the high price of a single unit of a bond.

13. The introduction of equity derivatives at the Tashkent Stock Exchange in order to hedge market volatility due to the absence of derivatives at the Tashkent Stock Exchange may lead investors to a high-risk exposure and market volatility could cause huge losses to the investors’ portfolios. To solve this problem, we have taken some measures to establish equity derivatives board at the Tashkent Stock Exchange, first and foremost, the equity derivatives should be split into two classes such as Main board as well as OTC. First of all, according to our research, there should be established only two classes of derivatives such as futures contracts as well as options, since they would be more likely suitable to our equity market, in other words, the authorities of the Tashkent Stock Exchange with the assistance of National Agency of Perspective Project, should establish futures contracts and options for the UCI.

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