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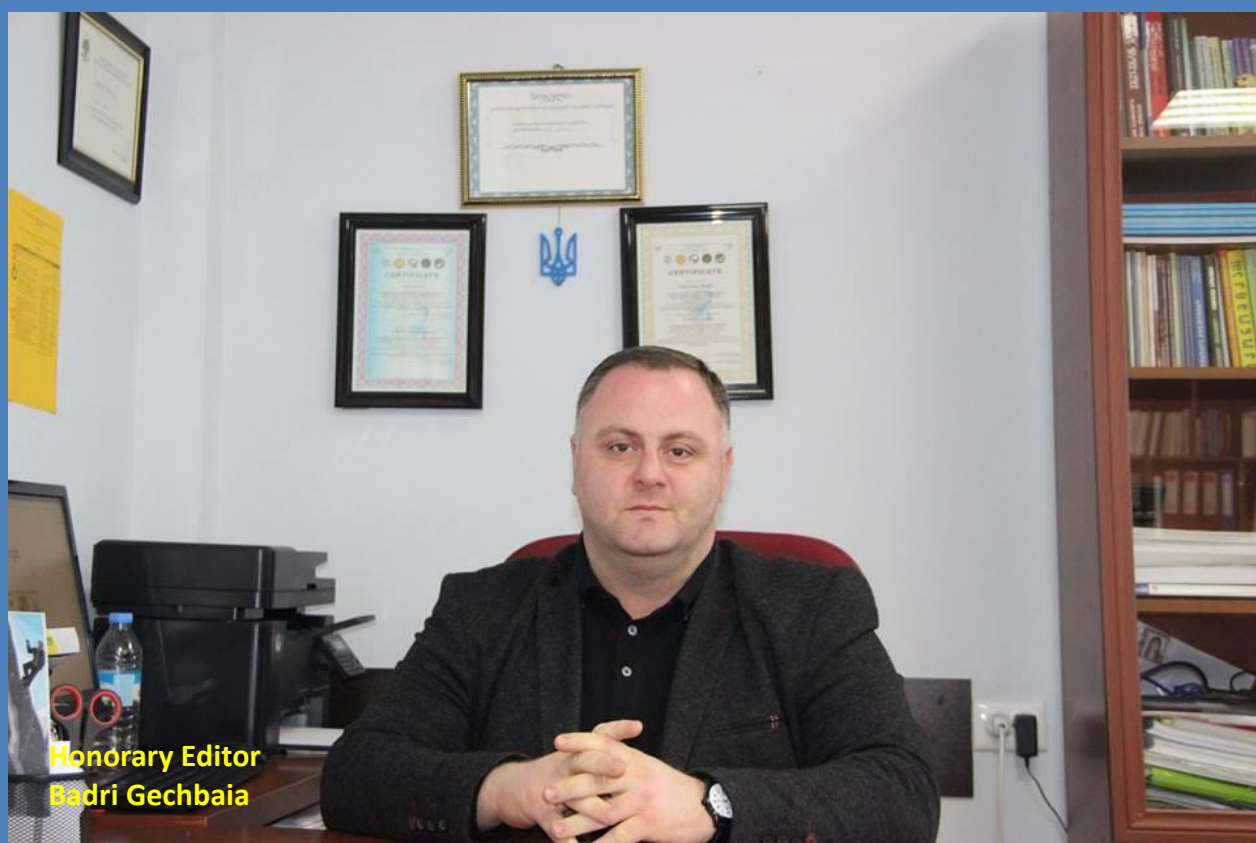
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"An investment in knowledge always pays the best interest." Benjamin Franklin

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## MUSIC AND LANGUAGE LEARNING

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### ABSTRACT

Music is a very effective tool that should play a larger role in the EFL/ESL classroom because it offers a great variety that appeals to the students. Most children enjoy music and therefore it should increase their interest in learning a new language in a very entertaining way. In this article we will speak about the important role of music in teaching and learning foreign languages. Educators need to be willing to incorporate music in their lessons in order to better enhance their students' learning. Music can be used to remove language barriers and should be implemented as early as the first grade. More music in every language classroom will inspire more students to become creative and independent. Music will allow educators and their students to understand each other and connect in a new way.

**Keywords:** music, accent, listening, pronunciation, creativity, song-lyrics, background.

### INTRODUCTION

Music contains a variety of vocabulary that can easily be adjusted to the appropriate age or level of learning. It is full of phrases and expressions that will prepare children for using genuine language. It teaches grammar and many songs can be used as grammar exercises, especially for adolescents since "in order to make a grammar lesson effective, beneficial, and interesting a teacher should use some well-developed and fascinating techniques in the classroom. Through music, culture as well as pronunciations and different accents can be taught. Figurative language and metaphors are a big part of music and songs and are very adjustable to our everyday experiences. Even slang can be introduced which is an ideal way for teachers to connect with their students on a new, exciting level. The creativity of songs encourages the students' imagination and enables original learning. Very often, songs tell a story and many lyrics are ideal for the students to build upon, using their own thoughts and ideas.

Through music, students will learn how to express themselves more effectively because song lyrics often spur lively discussions and different interpretations, which are needed in many EFL/ESL classrooms. Many students seem to be afraid of using the target language in the classroom because formal language learning creates a stressful atmosphere. Most of the time, the target language is only being used when students are reading from their textbooks or answering questions in their workbooks.

Music provides so many options and exercises and teachers can even involve their students when it comes to picking songs for the class or to work on to make the assignment even more personal. Music is fun, engaging, differs from the old routines and can be used for all ages and levels; although methods for each stage should vary since the focus on what needs to be taught is different.

Since most young learners love listening to songs and singing, it should be simple for teachers to apply music in their teaching. There are countless songs to be found online as well as on CDs that teachers can use for teaching. It is also important that teachers verify that every intelligence in the classroom is being met and therefore the assignments should be as variable as possible.

Most second language beginners have little vocabulary so the main focus needs to be on using the target language through communicating verbally as well as listening rather than through writing or grammar exercises. Young language learners need to experience a new language as a natural exposure and it is extremely important that the teacher uses the target language most of the time during language lessons. Researchers claim that there are number of reasons for the lack of success on the part of many foreign language learners, such as the fact that the students are not engaged in meaningful interaction in the FL during class (Polio and Duff, 1994). There are numerous things that can be taught to young children through songs that will remain with them throughout their lives and there are songs to be found about most elementary concepts like letters, numbers, colors, weekdays, months, seasons, body parts and clothes that will make the lessons full of life and excitement. These different concepts can be taught to young learners in simple and effective ways, which will be discussed in more detail.

### Background music

Using background music while the students do their work is a good change from the normal classroom environment, but the right mood has to be set in order to get the best results. Classical music is ideal for a good working environment although easy listening pop music can most certainly be used as well. For adolescents, listening to music is very often connected to their feelings, so background music can be incredibly powerful to use in the classroom to enhance the students' creativity and a peaceful state of mind.

## Song lyric

When choosing songs with lyrics it is important to begin with songs that the students are familiar with so that the teacher can see where their students' interest lies and also to get their full attention. As time goes by, the teacher can start using songs that are new to the students, yet appealing enough to engage them. The songs should have challenging vocabulary that is interesting and has a wide range. They should also contain language that can be analyzed and interpreted in many various ways. Songs, chants, poems, and raps will improve memory of content facts and details through rhyme, rhythm, and melody. There are so many different genres of music so the teachers need to be open minded and willing to explore music in many forms for all levels.

Pre-listening, the students would be introduced to the activity by viewing a photo of the artist singing the song and given the song title as well. Having the students brainstorm for a few minutes before playing the song will prepare them for the main task and can simply help relax the atmosphere. The teacher could ask questions about the artist to see if the students are familiar with the artist or ask if the students have heard of the chosen song before.

The assignment itself would be for the students to enhance their listening skills and vocabulary through a song. At first, the teacher should play the song for his students. After that, they are given handouts of the songs' lyrics with some of the words missing.

The teacher plays the song again, and this time, the students can read along and fill the missing words into the blanks. Usually the songs need to be played at least twice. Finally the teacher reviews these missing words with his students on the board. They discuss their meaning and the students take notes in their writing books. This exercise can be very challenging and the teacher needs to make sure that the songs' lyrics are clear so that the students will not feel discouraged. With time the lyrics can become more complex.

## Grammar

Teaching grammar can easily be done through song lyrics that are written especially with that in mind. There are also popular songs that teenagers can relate to that teach grammar. An example of a grammar exercise could be to learn about nouns and verbs through a pop song. Many song lyrics that can be found in pop songs include a good amount of grammar exercises, such as; "She loves you" by The Beatles that teaches the present tense, "Yellow" by Cold play that teaches irregular past tense verbs, "Lately" by Stevie Wonder where the students can learn about present simple and continuous and "Every breath you take" by The Police that teaches future continuous, and is also ideal to use for other activities such as analyzing lyrics and creating discussions.

## Pronunciation

hat learners need to concentrate on when learning pronunciation is to be able to communicate successfully with other non-native speakers of English from different L1 backgrounds. Music is such a good way to teach pronunciation to children of all ages. It is good for learners to hear a variety of pronunciations so that they will know what suits their personalities. Pre-listening, the teacher informs the class about different pronunciations and how music can display them. The task itself will be a song that contains lyrics with words that can be analyzed for their pronunciations and even syllables. It is important that the students are familiar with syllables since languages and music are mostly made from rhythm and pitch. The students will hear the song played once without reading the lyrics and then they will get to see the songs lyrics with some of the words missing from it. The students are supposed to listen to the song again and fill in the missing words. When all the words have been filled in, the teacher goes through their meaning and they explore how many syllables each word is.

## Creativity

Music brings out people's creativity, which is very often needed in language classes. Some children might be afraid to express themselves because many of them are used to writing in their textbooks and workbooks instead of using their

imagination and creativity. Music is a brilliant resolution to that. As mentioned earlier, background music does in fact enable the students' creative side and helps with their imagination as well.

Soft pop music can be helpful when the students are doing independent work and can create a pleasant working atmosphere. Song lyrics stimulate the brain and give the students ideas about how to write and use figurative language and metaphors. They increase the students' vocabulary and as a result help them to become better writers.

## CONCLUSION

Music is a strong method to use for teaching languages and it appeals to people of all ages and levels. It brings fun, creativity and depth into the classrooms and opens up new and exciting possibilities for second language teachers. We do hope that music will be heard more frequently in every language classroom in the future.

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## HUMOR IN FOREIGN LANGUAGE TEACHING

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### ABSTRACT

It is believed that using humor in the foreign language education contributes to learning process as it creates positive classroom atmosphere, where students do not feel frustrated to speak the foreign language, improves. Besides the advantageous effects of humor there are risks unless used appropriately. This paper examines the role of humor in a foreign language classrooms, describes its pedagogical benefits on academic settings, establishes the guidelines on using humor as a medium to facilitate L2 learning, discusses its advantages as well as the disadvantages and reasons of its avoidance. As a matter of fact, the use of humor in foreign language classroom is analyzed, paying special care to its significance, challenges in an effort to use humor in teaching a foreign language and the methodological problems. This paper, therefore, is set out to promote interest in the appliance of pedagogical humor in the language classrooms. To that end, the results from a recent study investigating the place of humor in "English language teaching are advanced as apparent support for exploiting humor in pedagogical purpose.

**Keywords:** Humour, pedagogical tool, discipline, entertainment, learning process, investigation, intercultural level, teaching strategy.

### XÜLASƏ

Yumor müxtəlif kommunikativ, sosial, akademik məqsədlərə nail olmaq və əlverişli öyrənmə mühitinin yaradılmasına kömək etmək üçün təhsildə güclü bir vasitə ola bilər. Bu, öyrənməyə deyil, eyni zamanda, daha çox müddət ərzində sinif keçirən tələbələrin diqqətini idarə etməyə kömək edir. Yumor xarici dilin öyrədildiyi və öyrəniliyi sinifdə linqvistik şüurun yaranmasına səbəb olan bir cihazdır. Pedaqoji məqsədlərlə yumor istifadə edərək xarici dilin tədrisinə və öyrənilməsinə son dərəcə kömək edə bilər.

**Açar sözlər:** yumor , pedaqoji vasitə, intizam, əyləncə, öyrənmə prosesi, araşdırma, mədəniyyətlərarası səviyyə, tədris strategiyası.

### РЕЗЮМЕ

Юмор может являться сильным средством обучения для достижения различных, академических целей и для создания благотворной творческой среды. Этот метод способствует не только обучению ,но в то же время помогает управлению вниманием студентов. Юмор –это инструмент для развития лингвистического сознания в классах ,где изучаются и обучаются иностранному языку .С педагогической точки зрения этот метод чрезвычайно полезен.

**Ключевые слова:** юмор, педагогическое средство, дисциплина, развлечение, процесс обучения, изучения, степень межкультурности, стратегия обучения.

### INTRODUCTION

The meaning of the term "humor" has changed over the years. Attitudes about humor and its effectiveness as a social device have changed across the time. Centuries ago, humor was believed to be something negative, often meaning unstable psychic condition. Furthermore, traditionally perceived as a form of distraction and actual waste of time, as it decreases morale and productivity (Torok & McMorris & Lin,2004). Only after 19<sup>th</sup> century humor gained a function to amuse people on social and cultural events. Nowadays, the term humor is established as the highest and richest form of comedy, denoting the wittiness or anything that makes us laugh (Weaver & Cotrell, 2011:168). At a later stage, humor was recognized as a social propriety and an intellect where wit and travesty can be viewed on stage.

At the intercultural level, humor was perceived in another way, i.e. what is humorous or funny in one culture may not be humorous or funny in another. Even in the same culture, humor differs from one community to another or from



one person to another. Over time and throughout history, humor has been used as a way of entertaining people in most academic disciplines, whether such entertainment is on campuses or in schools.

Humor is a multi-faceted part of human experience and thus a fundamental aspect of humanity's unique capacity for language. Joseph Gatt (2000) explains it best:

It is the "breathing-out of the soul". When during the lesson the pupils only listen to the teacher, who may be teaching in the same tone, then it is as if they only breathe in and have no opportunity to breathe out. They need humor, which the teacher can find in very different places. Therefore the teacher must bring in humor during his lessons and this humor should result from the vitality and momentum of the lesson.

Currently, it would appear that students are more tend to participate in classroom activities that allow to feel supported. As with all learning, learning a foreign language demands specific positive atmosphere in the classroom. Kristmanson (2000) emphasizes the need to create a welcoming and cheerful classroom for favorable learning of the foreign language, so that the environment is not threatening or frightening.

Humor has also been associated with a good classroom management. Walter (1990) reported that students who laugh are unlikely to have disruptive behavior. Also, humor is closely related to memory. So, it is often easy to recall an information that took place in a humorous context. It transforms the atmosphere of the class when the students enjoy sharing playful strategies with each other (Munoz-Basols,2004).

In the foreign language education, the competent use of humor by language instructor contributes a great deal both for teaching and learning processes. Although humor assists in teaching any academic discipline, it can also be applied in foreign language teaching as well through integrating all four skills. Activities that contain content related humor play a major role in learners' development linguistic and communication competences.

This topic is very important to study deeply as it is believed that humour could be an effective tool to create comfortable conditions for learners, where they feel secure and relaxed. In learning a foreign language, it is crucial to design an affective atmosphere to reduce the tension, to lower the stress level and to eradicate anxiety. As a result, the language learning process could become more productive. However, it is significant to identify problems that might arise while using humour as a pedagogical tool. Moreover, it is important to outline possible solutions to overcome those problems.

In this paper the place of humor in foreign language classrooms is identified, its pedagogical benefits on academic settings are described, tips and the guidelines on using humor as a medium to facilitate L2 learning are established, its advantages as well as the disadvantages and reasons of its avoidance in the past are discussed. As a matter of fact the use of humor in foreign language classroom is analyzed, paying special care to its significance, challenges in an effort to use humor in teaching a foreign language and the methodological problems.

This paper, therefore, is set out to promote interest in the appliance of pedagogical humor in the language classrooms. To that end, the results from a recent study investigating the place of humor in "English language teaching are advanced as apparent support for exploiting humor in pedagogical purpose.

This paper is based on an existing literature on the topic as well as the experience in learning a foreign language and the data collected related to this topic.

Humor can be a powerful tool in education to achieve various communicative, social, academic goals and help to establish favorable learning atmosphere. It contributes a great deal not only to learning, but it also helps to manage class holding students' attention span for a longer period of time. Thus, increase in concentration and attention develops academic skills and fosters creativity and productivity.

In his study, Satman (1995) supports the idea that positive humor, particularly when relevant to the material, can help create conducive atmosphere for learning , decrease stress level, provide an effective message delivery system aiding retention of information, break the ice between the teacher and learners and promote cohesiveness.

Chee (2004), classified humor in the language classroom into four major categories;

## 1. Textual (e.g. stories, Jokes)

“Humor in the form of a joke should be the spice of a lesson but it shouldn't over stretch the attention of the class”.(Gatt,2000)

## 2.Pictorial (e.g. cartoons, comics).

“Pictures used either on their own or with text help creates valuable stimulus in the classroom as it can help liven the story. When both text and picture are used together, it can help the young learner in the memorization of language structures”. (Weiggers, Grooters, Tormo, 1996).

## 3.Action/Games (e.g. theatre, video, role play, simulation, contests)

Vadillo (1998-) stated that children learn without being aware of it when they are learning through games because it is spontaneous and natural. They think and react quickly in a game without anxiety and pressure and for ESL games, they concentrate on the grammar and vocabulary.

## 4.Verbal (e.g. puns, word play, acronyms)

Gatt (2000) asserted that learners tend to enjoy the humor discrepancies such as slap stick humor. However, there are risks for foreign learners in word play as the double meanings may not be apparent.

Janet Elder suggested some examples of “brain-friendly humor in the classroom”;

- Cartoons and funny signs (on overhead projector or Power Point).
- Jokes and anecdotes (related to school, to subject or can be general).
- Other students' answers (nothing that would embarrass students but still funny).
- Word-play: puns, dumb headlines, goofy directions on packages.
- Funny print and video clips.
- Music: something with fun or funny lyrics.
- Bits of costume: interesting ties, t-shirts, hats.
- Sound effects: recorded sounds (snoring, time bomb) or your own (whistle).

There are many reasons to apply humor in the classroom: it creates a cooperative atmosphere helping students interact with each other better and keep the focus of the lesson. It facilitates the vocabulary acquisition, helps distinguish figurative from literal meaning. In addition, it improves visual memory and develops skills to solve ic problems.

Another reason to teach through humor is that as a human trait it is a self-effacing behaviour (Provine, 2000). It can allow timid and shy students to interact with the whole group. When it is used properly, humor helps the students to feel as a part of the class. In any kind of discipline, it is important to make students feel secure and relaxed as the affective factors influence the quality and speed of learning. This is particularly significant in a communicative classroom, where the verbal authentic communication, participation and interaction are emphasized. It is a way of reaching out to those students who are afraid and anxious to use the foreign language in the classroom.

Humor is as human and as authentic as the need to communicate. Humor plays a major even in the everyday social interaction. Thus, humor shouldn't be neglected, but instead, it must be a part of everyday classroom learning (Chiasson, 2002).

In foreign language education, humor can be applied in many way depending on various circumstances as subject of the lesson, focus of the lesson, activities used during the lesson and for different reasons. Nevertheless, some teachers keep avoiding using humor due to the premise that humor cannot be a serious tool to educate people. However, humor can offer far more than just entertainment in the classroom.

When humor is planned as apart of teaching strategy, a caring environment is established, there is an attitude of flexibility, and communication between student is that of freedom and openness. The tone is set allowing for human error with freedom to explore alternatives in the learning situation. This reduces the authoritarian position of the teacher, allowing the teacher to be a facilitator of the learning process. 'ear and anxiety, only natural in a new and unknown situation, becomes less of a threat, as a partnership between student and instructor develops (Watson and Emerson, 1988, p.89).

## CONCLUSION

The aim of the study was to examine the place of humor in teaching English as a foreign language. As the data have demonstrated, humor is a device that creates linguistic awareness in the classroom where foreign language is taught and learned. Utilizing humor in pedagogical purposes can extremely contribute to the foreign language teaching/learning.

The results of the present day would appear to support the beneficial effects of using humor as a pedagogical tool in the foreign language classroom. The role of humor as pedagogical tool in foreign language education is versatile and therefore needs to be investigated from different outlooks. According to fact that humor plays a significant role in communication in any language, it is obvious that it cannot be avoided.

In conclusion, I have made a case in this paper for the use of humor as a pedagogical tool in language classes. I have argued that non-linguistic humor is, in general, easier for learners to process than linguistic humor. In addition, I have also contended that students of translation should likewise be exposed to humorous discourse as part of their training. In the course of my remarks, I have claimed that linguistic humor offers a greater challenge to translators than non-linguistic humor. It would appear to be no accident that it is the linguistic-based humor rather than the non-linguistic that presents more difficulties for both language learners and translators.

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## SELECTING VARIOUS INDUSTRIAL COMPETITORS AFFECT THE RISK LEVEL OF VIET NAM STOCK INVESTMENT INDUSTRY

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### ABSTRACT

Under a one factor model, this paperwork estimates the impacts of the size of firms' competitors in the stock investment industry on the market risk level, measured by equity and asset beta, of 6 listed companies in this category. This study identified that the risk dispersion level in this sample study could be minimized in case the competitor size kept as current approximate size (measured by equity beta var of 0,034). Beside, the empirical research findings show us that equity beta min value decreases from 0,247 to 0,244 when the size of competitor doubles. Last but not least, most of beta values are acceptable. Ultimately, this paper illustrates calculated results that might give proper recommendations to relevant governments and institutions in re-evaluating their policies during and after the financial crisis 2007-2011.

**Keywords:** risk management, competitive firm size, market risk, asset and equity beta, stock investment

### 1. INTRODUCTION

Together with financial system development and the economic growth, throughout many recent years, Viet Nam stock investment industry is considered as one of active economic sectors, which has some positive effects for the economy. Additionally, financial risk and reactions has become an issue after the global crisis 2007-2009 which has some certain impacts on the whole Viet nam economy, and specifically, the Viet Nam stock investment industry. Hence, this research paper analyzes market risk under a one factor model of these listed firms during this period.

This paper is organized as follow. The research issues and literature review will be covered in next sessions 2 and 3, for a short summary. Then, methodology and conceptual theories are introduced in session 4 and 5. Session 6 describes the data in empirical analysis. Session 7 presents empirical results and findings. Next, session 8 covers the analytical results. Then, session 9 presents risk analysis and session 10 covers discussion. Session 11 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

### 2. RESEARCH ISSUES

For the estimating of impacts of a one factor model: the size of competitor on beta for listed stock investment industry companies in Viet Nam stock exchange, research issues will be mentioned as following:

Issue 1: Whether the risk level of stock investment industry firms under the different changing scenarios of the size of competitor increase or decrease so much.

Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of the size of competitor in the stock investment industry.

### 3. LITERATURE REVIEW

William Sharpe., (1963) pointed in a simplified model of portfolio theory that each stock is correlated with each other stock because all are correlated with "the market", and stock return depends on some factors such as a constant alpha and stock beta. And Harry Markowitz developed diversification and modern portfolio theory using beta as one of key factors. Beta is used in CAPM model, which is developed by Jack Treynor, John Lintner, Jan Mossin and William Sharpe.

Black (1976) proposes the leverage effect to explain the negative correlation between equity returns and return volatilities. Diamond and Dybvig (1983) said banks can also help reduce liquidity risk and therefore enable long-term investment. Fama, Eugene F., and French, Kenneth R., (2004) also indicated in the three factor model that "value" and "size" are significant components which can affect stock returns. They also mentioned that a stock's return not only

depends on a market beta, but also on market capitalization beta. The market beta is used in the three factor model, developed by Fama and French, which is the successor to the CAPM model by Sharpe, Treynor and Lintner.

Next, Kim et al (2002) noted that the nature of competitive interaction in an industry is important in assessing the effect of corporate product strategies on shareholder value. Pagano and Mao (2007) stated that An intermediated market can therefore remain viable in the face of competition from a possibly faster, non-intermediated market as long as the specialist can generate revenue for the above services that covers his/her costs associated with asymmetric information, order processing, and inventory management. Daly and Hanh Phan (2013) investigated the competitive structure of the banking industries in five emerging asian countries including Viet Nam and showed that the global financial crisis affected dramatically the competition of banking system in emerging Asian countries.

Last but not least, Ana and John (2013) Binomial Leverage – Volatility theorem provides a precise link between leverage and volatility.

#### 4. CONCEPTUAL THEORIES

Determinants of Equity and Asset Beta.

Generally speaking, beta can be estimated for an individual firm by using regression.

Beta is used in CAPM model, and it is a risk measure of a listed firm compared to the overall market risk. For example, if beta of a single listed firm equals to 2,5 it means that the firm risk is 2,5 times riskier than the overall risk of the market. Therefore, when an investor wants to make an investment in a financial market, beta is an overall risk measure in investing in a stock exchange market.

The impact of competition or the size of competitor on the economy and business.

In a specific industry such as stock investment industry, there are many firms offering the similar products and services and this helps customers select a variety of qualified goods that meet their demand. Competitors could affect price and customer service policies; hence, affect revenues and profits of a typical company. The competition could drive down profits that firms can earn. Sources of competition include, but not limit to, training. Increasing training can help competition raising productivity.

Two or more different firms offer various products or services to the same group of customer and the same need. This is called indirect competition.

#### 5. METHODOLOGY

In this research, analytical research method is used, philosophical method is used and specially, scenario analysis method is used. Analytical data is from the situation of listed stock investment industry firms in VN stock exchange and applied current tax rate is 25%.

Finally, we use the results to suggest policy for both these enterprises, relevant organizations and government.

#### 6. GENERAL DATA ANALYSIS

The research sample has total 6 listed firms in the stock investment industry market with the live data from the stock exchange.

Firstly, we estimate equity and asset beta values of these firms, as well as the risk dispersion. Secondly, we change the competitor size from approxiamte size to doubling size and slightly smaller size to see the sensitivity of beta values. We figure out that in 3 cases, asset beta mean values are estimated at 0,455, 0,421 and 0,423 which are decreasing more if the size of competitors doubles. Also in 3 scenarios, we find out equity beta mean values (0,477, 0,443 and 0,442) are also decreasing. Various competitors selected definitely have certain effects on asset and equity beta values.

#### 7. EMPIRICAL RESEARCH FINDINGS AND DISCUSSION

In the below section, data used are from total 6 listed stock investment industry companies on VN stock exchange (HOSE and HNX mainly). In the three scenarios, current financial leverage degree is kept as in the 2011 financial

statements which is used to calculate market risk (beta) whereas competitor size is kept as current, then changed from double size to slightly smaller size. In short, the below table 1 shows three scenarios used for analyzing the risk level of these listed firms.

Market risk (beta) under the impact of tax rate, includes: 1) equity beta; and 2) asset beta.

Table 1 – The number of companies in research sample with different beta values and ratio

	current size		double size		smaller size	
Equity Beta	No. of firms	Ratio	No. of firms	Ratio	No. of firms	Ratio
<0	0	0,0%	0	0,0%	0	0,0%
0<beta<1	6	100,0%	6	100,0%	6	100,0%
Beta > 1	0	0,0%	0	0,0%	0	0,0%
total	6	100,0%	6	100,0%	6	100,0%
	current size		double size		smaller size	
Asset Beta	No. of firms	Ratio	No. of firms	Ratio	No. of firms	Ratio
<0	0	0,0%	0	0,0%	0	0,0%
0<beta<1	6	100,0%	6	100,0%	6	100,0%
Beta > 1	0	0,0%	0	0,0%	0	0,0%
total	6	100,0%	6	100,0%	6	100,0%

Table 2 – Analyzing market risk under three (3) scenarios (Made by Author)

	FL as current
Competitor size as current	Scenario 1
Competitor size slightly smaller	Scenario 2
Competitor size double	Scenario 3

7.1 Scenario 1: current financial leverage and competitor size kept as current

In this case, beta values of 6 listed firms on VN stock investment industry market as: (refer to exhibit 2)  
 There is no listed firms with both equity and asset beta values < 0 and there is no listed firms with equity beta values > 1, or 0% of firms.

7.2. Scenario 2: competitor size double

Beta values of total 6 listed firms on VN stock investment industry market as: (refer to exhibit 3).  
 There is no listed firms with both equity and asset beta values < 0 and there is no listed firms with equity beta values > 1, or 0% of firms.  
 Competitor size increase has no change on the number of firms with equity beta value > 1.

7.3. Scenario 3: Competitor size slightly smaller

Beta values of total 6 listed firms on the stock investment industry market in VN as:(refer to exhibit 4).  
 There is no listed firms with both equity and asset beta values < 0 and there is no listed firms with equity beta values > 1, or 0% of firms.  
 Competitor size decrease has no change on the number of firms with equity beta value > 1.  
 All three above tables and data show that values of equity and asset beta in the three cases of changing competitor size have certain fluctuation.

**8. COMPARING STATISTICAL RESULTS** in 3 scenarios of changing leverage:

Based on the calculated results, we find out:

First of all, Equity beta mean values in all 3 scenarios are acceptable ( $< 0,5$ ) and asset beta mean values are also small ( $< 0,5$ ). In the case of reported leverage in 2011, equity beta max is 0,713 which is acceptable. If competitor size doubles, equity beta min reduces from 0,247 to 0,244. Finally, when competitor size is slightly smaller, equity beta min goes up to the initial value of 0,247.

Table 3 - Statistical results (FL in case 1) (source: VN stock exchange 2012)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,713	0,704	0,0085
MIN	0,247	0,213	0,0342
MEAN	0,477	0,455	0,0221
VAR	0,0341	0,0420	-0,0080
Note: Sample size : 6			

Table 4 – Statistical results (FL in case 2) (source: VN stock exchange 2012)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,713	0,704	0,0085
MIN	0,244	0,213	0,0316
MEAN	0,443	0,421	0,0217
VAR	0,0433	0,0498	-0,0065
Note: Sample size : 6			

Table 5- Statistical results (FL in case 3) (source: VN stock exchange 2012)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,713	0,704	0,0085
MIN	0,247	0,186	0,0611
MEAN	0,442	0,423	0,0194
VAR	0,0429	0,0498	-0,0069
Note: Sample size : 6			

The below chart 1 shows us : when competitive firm size decreases slightly, average equity beta value decrease more (0,442) compared to that at the initial selected competitor (0,477). Next, average asset beta decreases little (to 0,423). However, in case the competitor size doubles, the risk level of the selected firms decreases little (0,421). Last but not least, the fluctuation of equity beta value (0,043) in the case of doubling size competitors is higher than ( $>$ ) the result in the current case. And we could note that in the case competitor size slightly smaller, the risk is little more dispersed (0,05).

## 9. RISK ANALYSIS

Generally speaking, during the financial crisis 2007-2011, esp. the period 2007-2009, the investment and finance industry can survive well and maintain the development and profits, although these firms have to face other kinds of risks: materials or water or electric prices increasing. These risks can affect the operating cash flow of these companies.

Chart 1 – Comparing statistical results of equity beta var and mean in three (3) scenarios of changing competitor size (source: VN stock exchange 2012)

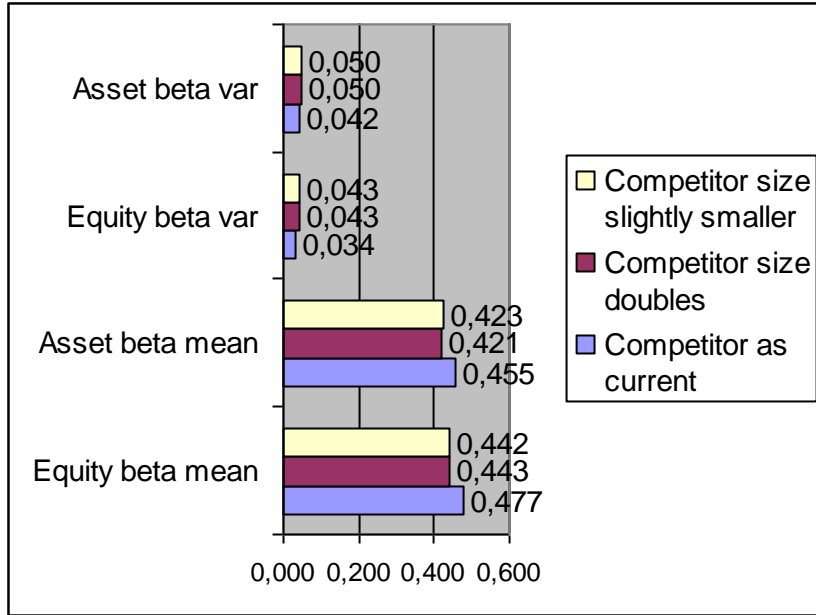
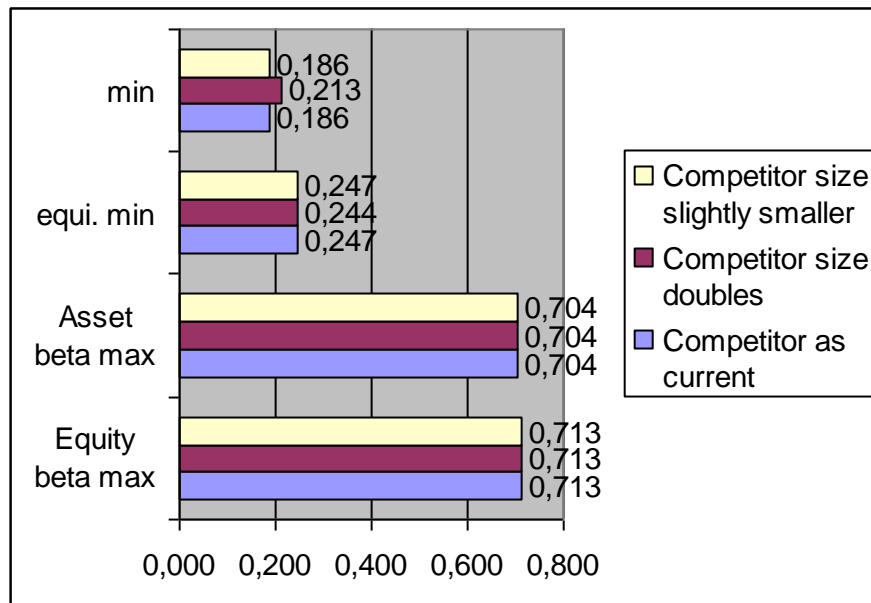


Chart 2 – Comparing statistical results of equity/asset beta max and min in three (3) scenarios of changing competitor size (source: VN stock exchange 2012)



## 10.DISCUSSION

Table 1 shows us there are 100% of firms having acceptable beta values ( $0 < \beta < 1$ ) in cases : current or doubling size competitors. If competitor size is smaller, this number maintains at 100%. Moreover, chart 2 tells us that asset beta min increases to 0,213 in case doubling size competitors.



Looking at exhibit 5, it is noted that comparing to beta results of electronic and electrical industry in the period 2007-2011, asset beta mean of stock investment industry group during 2007-2011 is higher in current situation (0,455) and in the other 2 cases. And the risk dispersion in investment and finance industry when competitor size is smaller during 2007-2011 (shown by asset beta var of 0,05) is also smaller than that in electronic and electrical industries (0,06).

## 11. CONCLUSION AND POLICY SUGGESTION

In conclusion, the government has to consider the impacts on the mobility of capital in the markets when it changes the macro policies and the legal system and regulation for developing the stock investment market. The Ministry of Finance continues to increase the effectiveness of fiscal policies and tax policies which are needed to combine with other macro policies at the same time. The State Bank of Viet Nam continues to increase the effectiveness of capital providing channels for stock investment companies as we could note that in this study when competitive firm size doubles, the risk level decreases (asset beta mean value is estimated at: 0,421), and the equity beta var value (0,043) is little higher than that in case competitor size as current (0,034).

Furthermore, the entire efforts among many different government bodies need to be coordinated. Finally, this paper suggests implications for further research and policy suggestion for the Viet Nam government and relevant organizations, economists and investors from current market conditions.

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## Exhibit

### Exhibit 1 – Inflation, GDP growth and macroeconomics factors

(source: Viet Nam commercial banks and economic statistical bureau)

Year	Inflation	GDP	USD/VND rate
2011	18%	5,89%	20.670
2010	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	6,88%	5,2%	17.000
2008	22%	6,23%	17.700
2007	12,63%	8,44%	16.132
2006	6,6%	8,17%	
2005	8,4%		
Note	approximately		

### Exhibit 2 – Market risk of listed companies on VN stock investment industry market under one factor model (case 1)

(source: VN stock exchange 2012)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (F.S reports)
1	ASIAGF	0,326	0,213	MAFPF1 as comparable	34,6%
2	MAFPF1	0,455	0,453		0,4%
3	PRUBF1	0,247	0,246		0,3%
4	VFMVF1	0,713	0,704		1,2%
5	VFMVF4	0,671	0,669		0,4%
6	VFMVFA	0,450	0,444	MAFPF1 as comparable	1,4%
				Average	6,4%

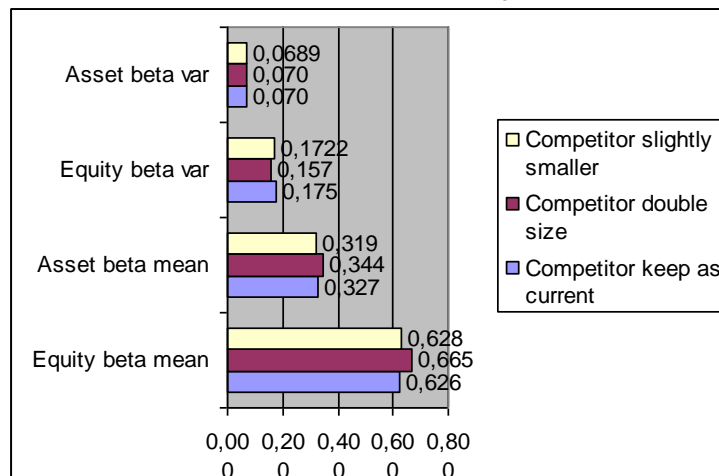
### Exhibit 3 - Market risks of listed stock investment industry firms under one factor model (case 2) (source: VN stock exchange 2012)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note
1	ASIAGF	0,326	0,213	MAFPF1 as comparable
2	MAFPF1	0,455	0,453	
3	PRUBF1	0,247	0,246	
4	VFMVF1	0,713	0,704	
5	VFMVF4	0,671	0,669	
6	VFMVFA	0,244	0,241	PRUBF1 as comparable

**Exhibit 4** – Market risk of listed stock investment industry firms under one factor model (case 3) (source: VN stock exchange 2012)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note
1	ASIAGF	0,284	0,186	BSC as comparable
2	MAFPF1	0,455	0,453	
3	PRUBF1	0,247	0,246	
4	VFMVF1	0,713	0,704	
5	VFMVF4	0,671	0,669	
6	VFMVFA	0,281	0,277	ASIAGF as comparable

**Exhibit 5** – Comparing statistical results of equity beta var and mean in three (3) scenarios of changing competitor size in 18 listed commercial electric firms 2007-2011 (source: VN stock exchange 2012)



## THE RELATIONSHIP BETWEEN PERFORMANCE OF THE ADMINISTRATIVE SYSTEM AND NATIONAL AUTHORITY OF GOVERNMENTS: AN ISLAMIC POINT OF VIEW

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### Abstract

Each government consists of two dimensions: 1) a structural dimension that involves policy- and decision-making bodies and, 2) a functional dimension that is a set of government institutions and administrations. Also, national authority in a country is an outcome of three components, including legitimacy, acceptance, and efficiency of its government. The authority of governments is not merely limited to their structural legitimacy and acceptance; but, their functional dimension and the performance of their administrations also play a crucial role in building and strengthening their legitimacy. Therefore, the aim of the present study is to investigate how the administrative system of a government affects its national authority, with an emphasis on the Islamic point of view. To do so, this research has been carried out within the framework of theoretical research with practical purpose. The research method of the current study was descriptive-analytical. In the present study, the relationship between two variables—namely, “administrative system” and “national authority”—has been investigated within the framework of causal research. Due to the theoretical nature of this study, the resources used mostly include documents and library resources. The results of this study indicate that there is a direct and causal relationship between the national authority of governments (effect) and the performance of their administrative system (cause). Also, this relationship reveals how the administrative system affects national authority.

**Keywords:** Structure and Function of Government, National Authority, Legitimacy, Acceptance, Efficiency of Government.

### Introduction

A political system is an integrated entity that is formed specifically from both structural and functional dimensions. A set of factors and institutions that constitute the structural dimension of the government include a set of institutions, such as parliament and other organizations. It is the responsibility of these institutions to formulate policies, policies and macroeconomic strategies as well as determining the principles of its political ideology. In contrast, a group of institutions and systems that undertake the implementation of the government plans and policies in the practical dimension, constitute the functional dimension of the political system. It must be noted that from the Islamic point of view, legitimacy of a political system is provided by two sources. Firstly, it arises from Divine Satisfaction and from the conformity of its ideological framework with religious standards. Secondly, the legitimacy of a political system is provided by the will of the people and the members of society. Hence, from the Islamic point of view, the legitimacy of the government systems has a dual foundation. However, from the non-religious perspectives, it is based solely on the popular and social acceptance of the governments.

Generally, according to the basics and principles of Islam, the efficiency of governments is not confined to their structural legitimacy and acceptance. But additionally, the functional dimension and the performance of the administrations play a crucial role in building and strengthening the legitimacy of a government. The functional dimension and the performance of the administrations also assure the permanency of the legitimacy and authority of the government over time. This is a truth, not only in the Islamic systems, but also in all political systems and in all eras of history. If we accept the fact that people, as the main aspect of each political system, are the key to authority and survival of governments at any given time, and their assessment of the nature of the system is mainly focused on the performance and administration of the system, and that the performance and administration of the system is the criterion of judgment about the system, the efficiency of the political system will be more salient than the legitimacy and

acceptance. There is no doubt that in case of negligence towards the functional dimension of a political system (which is reflected in the performance of its institutions and administrative bodies, and is the criterion of public satisfaction and acceptance), the structural legitimacy of the government will be negated naturally and the general authority of that political system will be abolished. Therefore, the purpose of the current study is to resolve this problem, because regardless of the ideological framework of governments, satisfaction of the people fulfilling their needs is the main component of authority and legitimacy of political systems. Therefore, according to what was explained above, in the present study, we examine how the administrative system of governments affects their national authority, with an emphasis on the Islamic point of view.

## Methodology

This research is a theoretical study due to its nature; however, it can be also an applied research in terms of its purpose. This research has been carried out using a descriptive-analytical method, in order to investigate the relationship between two variables (the administrative system and the national authority) within a causal-inferential framework. Due to the theoretical nature of this study, the resources used in it mostly include documents and library resources.

## Findings

Based on the basics and principles of Islam, the desirability of governments is not limited to their structural legitimacy, but is also affected by an axiom that "As one of the most important and influential factors of the desirability of governments, the importance of the functional dimension and performance of the administrative bodies has a crucial role in building, reinforcing and sustaining the authority of governments over time. This axiom is true within all political systems, including both Islamic and non-Islamic political systems. In order to explain this axiom, we firstly need to explain some of the administrative and executive managers' characteristics from the perspective of Islam. Afterwards, we will describe the concepts, principles, and components of the administrative system in Islam, based on the standpoint of Imam 'Ail (AS) as reflected in Nahj al-Balagha; we will describe two categories of factors, including structural and behavioral factors:

### The Characteristics of Administrative Managers from the standpoint of Islam

#### 1. Knowledge and Faith

Science and knowledge are the key to progress and survival of governments and to the security of communities (Movahedi Nejad, 2004: 100). But, obviously, science cannot be the sole protector against deviance. But, expertise must be accompanied by commitment. According to Qur'an, the management and leadership of the earth and its inhabitants should be in the hands of competent and faithful individuals (Al-Bahi,1981: 28). Virtue, meaning self-management, makes managers avoid violating the divine boundaries in favor of their personal desires.

#### 2. Conformity of Words and Actions

Regarding the contradictions between words and actions, the Qur'an says O you who have believed, why do you say what you do not do? (Qur'an (61:2)). This verse revealed on the day of the battle of Uhud, and is about Jihad and Muslims escaping the war; it refers to one of the worst disasters that may occur in an Islamic society.

#### 3. Consultation

In the Qur'an (Surah: Al Imran, Verse: 159), God addresses Prophet Muhammad (AS) and says: consult with your men about the quality of war and act in accordance with the majority vote. Also, Imam Ali (AS) emphasizes on the principle of consultation and says: Guidance leads to increased insight. Therefore, it is necessary for managers to pay special attention to the principle of consultation, so that they can make conscious and fair decisions.

#### 4. Precedence of Mercy over Wrath

Among the attributes of God is his mercy. Although Allah has determined punishment for illegitimate actions, he considers “another chance” on the basis of his mercy and forgiveness (Hamed Moqadam, 1986: 124-125). Regarding the verses of the Qur’an and the Islamic principles, it can be understood that reward and punishment plays an effective role in the development of human personality. On-time application of these two factors can help managers to achieve constructive and productive management.

## 5. Openness to the principle of negotiation

One of the management skills is the awareness of the texts of debates and negotiations. Exploiting these factors helps managers to be effective and productive (Fisher, 2003: 13). Generally, the use of negotiation techniques is one of the most effective approaches for discovering facts and achieving better outcomes.

## 6. Politics

In Islamic management, policy is equal to the practical methods which a manager uses to deal with his opponents. It must be mentioned that the Imam Ali’s goal in politics was beyond the achievement of political power, and the basis of the Imam Ali’s diplomacy was a deep commitment to ethical principles and values for performing the Islamic and divine commands (Derakhshe, 1992: 206)

## 7. Equality

One of the most important requirements that each manager has to fulfil, is to recognize the facilities of organization and government institution as the properties of the people and to avoid personal usage (Nabawi, 2011: 229). Based on the ethics of all religions, violating the equality is always regarded as a great oppression, and those who are oppressive, will be defeated by God's will.

## Concepts, principles and components of the administrative system in Islam, based on the standpoint of Imam Ali (AS) in his book, Nahj al-Balagha

### A) Structural Factors

#### Political Factors

Since autocratic political systems are not selected through the people’s vote, they have no accountability to the people, and this is the most important factor for the development of corruption in administrative systems. Hence, in traditional approaches to the administration of government issues, the theory of separation of the administrative system from the political system, in order to prevent the administrative system from being corrupted. According to this theory, managers and employees are not accountable to the people and society. But in the Islamic system, the political system is the basis of the administrative system; so that the correctness and corruption of the administrative system are the results of correctness and corruption in the political system. It should be said that as the public will and supervision affect the formation and sustainability of the divine political system, it also influence the decision-making process and the implementation of plans in the divine administrative system. Monitoring the performance of the administrative system is necessary for preserving the correctness and sustainability of the system (Sheikhi, 2011: 117).

#### Advisory decision-making

The logic of the Qur’an is that, even if the leader of the society has the highest position among humans (namely, the Prophet Muhammad (AS)), the Islamic community should not rely solely on him. In other words, this dependence should not be to an extent that could lead to destruction of the foundation of the society in case of Prophet Muhammad (AS) not being present (Agha Piroz et al., 2015: 116). Therefore, it is obvious that individual decisions often lead to autocracy and eventually make the whole organization inefficient. Hence, Islam has emphasized advice and consultation with others, in order to undertake the administrative actions correctly. As stated by Imam Ali (AS), anyone who consults with the wise men, will be guided in the right way (Nahj al-Balagha, Saying 173). This indicates that regarding the standpoint

of Islam in general and the standpoint of Imam Ali (AS) in particular, people should use opinions of experts and wise men, but final decision must be made by a single person.

## Rule of Law

The most important principle in the administration is the adherence of all individuals and especially managers to the law. Because the factor that sustains the correctness of governments and guarantees their public support is adherence to the law. In this regard, during his deprivation of the government, Imam Ali (AS) reminded managers that: "There are three things that if you honor them and act based on them, you don't need anything else; and if you neglect them, nothing else will benefit you. The three things are implementing the law equally for yourself and the strangers, following God's principles in happiness and anger, and fair and equal distribution of wealth among black and white (Al-Asqalani, 1946: 227).

## Transparency

The concealment of issues and subjects from the sight of the people, underlies illegal and criminal actions. generally , if all issues are clear, many problems such as bribery, injustice and potential corruption in the Government , hidden and self-seeking relationships , hidden transactions that cannot be audited, etc. will be vanished and generally, a situation like this increases the efficiency of the governance and management . In this regard, Imam Ali (AS) regarded the transparency of issues as the basis of government. In the beginning of his governance, Imam Ali (AS) stated that: I swear to Allah that I have never concealed any truth, and I have never lied (Nahj al-Balagha, Sermon 16). He also stated that: It is your right and I promise that I will never hide a secret from you, unless during a war (Nahj al-Balagha, Letter 50).

## Accountability

Responsibility is a prerequisite of management. This means that anyone is accountable and responsible in accordance with their role. Imam Ali has said, "I recommend you to be afraid of God about what you do at your own responsibility, because you are pledged to it". Every man has a commitment to his own achievement, says God. He says, "God warns you to beware of his punishment. Indeed, to him all will return". Then he says, "Thus, Swear to your God, I will ask all of them about what they were doing". O Servants of God, you know that God will ask you about your actions (Majlesi, 1670: 543).

## Organizational Supervision

In order to prevent the employees from violating the laws and offending the rights of the people, as well as to preserve the integrity of the administrative system, monitoring the administrations and the employees of the departments is essential. Imam Ali (AS) wrote a letter to one of his managers and told him: "I heard that you have destroyed useful lands and usurped as much as possible. Send me the details of your account immediately (Nahj al-Balagha, Letter 40).

## Improving the livelihood of the employees

The financial problems and poverty underlie many corruptions in the administrative systems. Therefore, one way to prevent administrative corruption form occurring is to improve the livelihood of employees and government managers. In the management methods provided by Imam Ali (AS), this important issue has been considered. Imam Ali (AS) told his commander (Malek Ashtar): Pay them (employees) enough, because it supports them for correcting and improving themselves. This way, they don't need to steal any amount of the public funds, and if they defy your orders or betray you, they will have no justification (Nahj al-Balagha, Letter 53).

### **B) Behavioral Factors**

#### **Impact of people on the correctness of the administrative system**

From the standpoint of Islam, without the participation of the people, the administrative system is not properly managed and its correctness cannot be guaranteed (Delshad Tehrani, 2000 b: 111). Islamic government is flourished only by the stability of the people and their full participation in the society. Imam Ali (AS) has tried to keep people away from dominative and submissive positions and to make them have a real presence in all areas (Delshad Tehrani, 2000 a: 111). He said: "don't speak with me the way people speak to arrogant kings. Don't walk away from me, as you walk away from angry people, and don't behave with duplicity and falsification. Don't think that if you express a truth, I'm going to get upset and don't think I'm trying to seem great. Someone who cannot tolerate hearing the truth or a complaint against injustice, would have much more difficulty for acting based on truth and justice. Therefore, don't avoid saying the truth or counseling for justice; because I don't think that I am protected from making mistakes, unless God protects me (Nahj al-Balagha, sermon 216).

### **Institutionalizing the Culture of Criticism and Openness to Criticism**

In order to nurturing the culture of criticism among the people, Imam Ali (AS) recommended his employees to get closer to the individuals who have more explicitness in saying the truth and give constructive criticism, rather than glorifying the current actions and plans (Mohammadi Rey Shahri, 2008: 42-43). Promoting the culture of criticism against managers and organizations will lead to disclosure (and correction) of possible shortcomings and corruptions.

### **Adherence to Justice**

According to the procedural justice, when current procedures of decision-making for the allocation of resources are considered fair by individuals, they will have more motivation for improving their performance (Rezaian, 2014:49). Procedural justice can be also an important factor for getting the people to cooperate and have a profound impact on one's work attitudes in the workplace (Ibid:49).

The principle of justice was one of the most important principles of administration in the management methods offered by Imam Ali (AS). The principle of justice is the criterion of everything; and without acting in accordance with justice, the goals of the Islamic government cannot be achieved. It is the most important principle in social management (Delshad Tehrani, 2000 b: 246). From the standpoint of Imam Ali (AS), justice is important in managing the affairs of administration and he considered justice as the criterion of policy (Tamimi Amedi, 1999: 116). "Justice is the criterion of administration" means that all employees are provided with equal facilities to make progress. Also, in the formulation and implementation of the law, justice and equality must be considered and the differences and advantages must be evaluated on the basis of qualifications and competencies (Delshad Tehrani, 2000 b: 253).

### **Education**

In each society, education has a direct impact on beliefs, ethics, and generally, on behaviors (Mesbah, 2012: 337). In general, education plays a crucial role in informing the people of the corruption of values, malignancy of the powerful individuals and their misuse of power, as well as informing them of the desirable circumstances, values and goals (Ibid:64). In other words, training the employees of the administrations has a central role in the positive development of the administrative system. Imam Ali (AS) said that the origin of any material and spiritual goodness is knowledge; and he considers ignorance as one of the key causes of corruption in any social environment. "Knowledge is the basis of any goodness (Hakimi, 2001: 96), and ignorance is the root of all evils (Ibid:64).

### **Meritocracy**

To achieve efficiency in administrations, employees have to acquire some features such as skills, knowledge, and beliefs. In other words, if incompetent people undertake the management of administrative system, efficiency of the administrations will be reduced. From the standpoint of Islam, managers are trustees for the people. Assigning responsibility and administrative authority to competent individuals, is one of the important examples of this trusteeship. As God says in Qur'an, "Indeed, Allah commands you to render trusts to whom they are due and when you judge between people to judge with justice" (Qur'an, 4:58). Furthermore, one of the most important principles of the administrative management from the standpoint of Imam Ali (AS) was to consider competence in the process of



assigning a responsibility to an individual. Imam Ali (AS) stated that the assigning the responsibilities to incompetent individuals leads to failure and disaster. Imam Ali (AS) addresses the judge appointed by himself and says: the government is a trust, and anyone who betrays in this trusteeship, will be damned by God until the doomsday, and Muhammad (AS) hates anyone who employs a traitor, in this world and in the world hereafter (Mahmoodi, 1997: 36).

## Punishment and Reward

The evaluation of employee performance, rewarding the competent employees and punishing the offenders, collectively cause the growth and advancement of committed individuals and correction of the offenders. In a recommendation, Imam Ali (AS) told one of his commanders that: Recognize their efforts through an accurate assessment and never reward someone because of someone else's efforts. Don't underrate the value of their services. The honor and dignity of individuals should not lead to overrating their works, and anonymity of some individuals should not cause you to misprize their great work (Nahj al-Balagha, letter 53).

Generally, other behavioral factors that promote the correctness and improve the performance of the administrative system are as follows:

1. Respecting the clients: Showing respectful and pleasant behavior toward clients;
2. Face-to-face communication with the people: Administrative managers in an Islamic system are obligated to investigate the people's problems directly and closely. In this regard, Imam Ali (AS) says that: The authorities hiding from the people are the origins of lack of awareness among the authorities (Nahj al-Balagha, letter 53);
3. Public Monitoring: From the standpoint of Islam and Nahj al-Balagha, the most effective form of monitoring the performance of administrations is the robust supervision carried out by social masses who believe in Islam and the Islamic government. Hence, social differences, social classes, the type of ideological attitudes, and other factors should not prevent people from monitoring the performance of the administrations and authorities;
4. Judicial factors: fair judgment, prevent employees from carrying out violations. In this relation, the religion of Islam has emphasized the provision of operators' rights in the judiciary system and monitoring their performance, in order to preserve the correctness of the judiciary and the administrative systems.

From the standpoint of Nahj al-Balagha, the government is a sociopolitical system which is assigned to the ruler or the Governing Council by God and the people, so that social order and improvement will be realized towards material and spiritual well-being of the individual and the society (Navaei and SeyedMoosavi, 2011: 76). Imam Ali (AS) has told the rulers that: don't say that I am a king and you must obey me, as this leads to a retrogression and destruction of the government. Based on the principle that proper and correct management leads to the evolution of individuals, society and government in addition to establishing a political system, Islam has defined the characteristics of the administrative managers and the components governing the administrative system. In accordance with what was presented in this section of the study, these characteristics and components are as follows:

Characteristics of the Administrative Managers: A principled and ethical diplomacy; commitment and expertise; advisory decision-making; appropriate encouragement and punishment, in accordance with the principles of Islam, and with respect to human dignity and dignity as well as the propagation and promotion of justice.

Components governing the administrative system: Rule of law, the correctness and corruption in the government affecting the correctness and corruption of the administrative system, transparency, accountability, organizational supervision, improving the income of employees, the role of people in the correctness of administrative system, institutionalization of criticism and openness to criticism, meritocracy.

Therefore, considering the Islamic principles required for the realization of an efficient political system that causes the development and improvement of the individual and society, we can understand the role of functional dimension and the performance of the administrative system in realizing, strengthening and sustaining the desirability of governments over time. Also, we believe that there is a direct and causal relationship between the administrative system (as the Cause and the Independent Variable) and the national authority of governments (as the Effect and the Dependent Variable); so that increasing the quality of performance of the administrative system leads to increased national authority of

governments and, decreasing quality of the performance of the administrative system leads to decreased national authority of governments. We described this relationship in the following conceptual model:

Figure 1: Conceptual model of the relationship between performance of the administrative systems in governments and national authority of the governments.

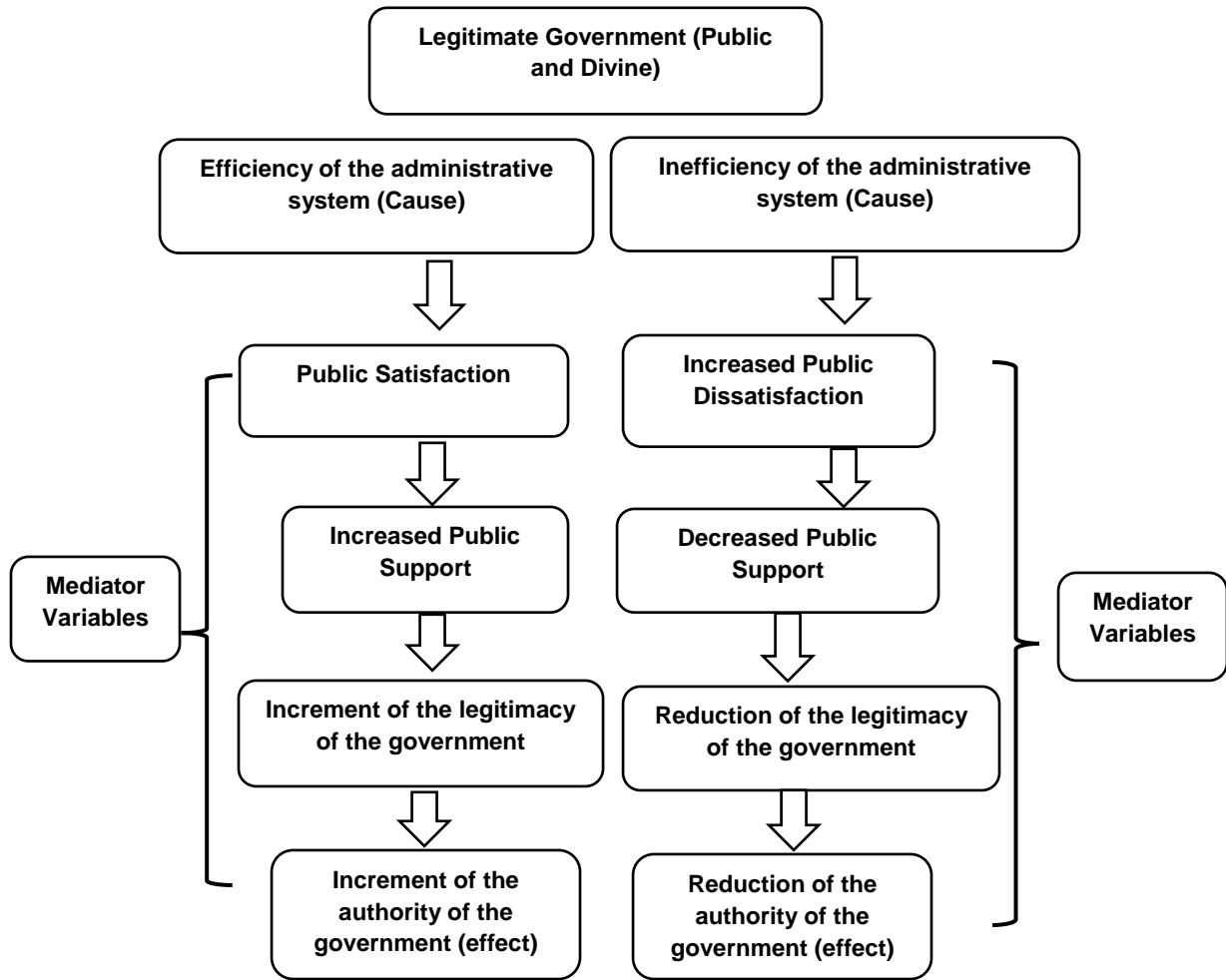


Figure: Author

### Conclusion

Based on the results of the current study, we found that one of the factors for building legitimacy is the positive performance and efficiency of governments. But it must be explained that according to Islamic teachings and principles, legitimacy and desirability of governments are not confined to the structural legitimacy of the governments. Therefore, since the governments implement their programs and actions through their functional dimension and administrative bodies, it can be stated that the legitimacy of a government depends on both structural and functional dimensions of the government. We discovered a direct causal relationship between the two variables, including the performance of the administrative system (cause) and the national authority of governments (effect). We used a diagram to describe how the administrative system influences the national authority of governments (Fig. 1).

It must be mentioned that in a significant number of Islamic countries, despite the existence of Islamic principles provided for monitoring the performance of administrative systems, there are deficiencies such as the lack of transparency, accountability, reward and punishment systems, and meritocracy as well as the weakness of the regulatory structures, and the unfair distribution of wealth, etc. In regard to the understanding the cause of these problems in the administrative system of all countries, including both Islamic and non-Islamic countries, we can mention the basis of the legitimacy of governments. Jean-Jacques Rousseau believes that "if a government and authority is delegated to an individual by the public will, it is legitimate; however, other routes for transmitting the political power are not legitimate". But from the standpoint of Nahj al-Balagha, people cannot be the sole origin of legitimacy. Because a society may suffer from intellectual, ethical and practical deviations and the people's ideas may not be rational, logical, and divine, and corruption may be embodied in the intellectual bases of the community. Indeed, such an issue is quite evident in many of the past and current societies. Obviously, these problems will lead to a reduction in the efficiency, acceptance, legitimacy, and finally the national authority of governments.

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## CRIMEA IN THE ART OF F.A. VASILYEV

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### ABSTRACT

The article presents the creative heritage of the peredvizhnik artists. The life of the artist F.A. Vasilyev is revealed in the article, the themes and style features of his paintings are described.

**Keywords:** a creativity, a style, a painting, a landscape, an art, an image.

### FORMULATION OF THE PROBLEM

The history of Russian culture of the XIX century is the period of the emergence of a new realistic art, when progressive people were aspired to serve the ideal of democratic art with their creativity. It was a time of wide interest to the social issues, when the foremost part of society faithfully believed in national revival and peasant revolution, and its reactionary part was burning with hatred in any attempt to change anything by existing procedures. The peredvizhnik artists reflected the life of the working people of Russia deeply and comprehensively. Genuine folk genre, the best examples of which were distinguished by militant journalism, was the leading one in their work, an important place was occupied also by the art of portrait and landscape. The works of the young painter F.A. Vasilyev deserves the special attention, he showed in his landscapes a special spirit of struggle and protest, the artist had a short life, only 23 years, but became one of the best landscape painters of his time.

**The purpose of the article** is to reveal the main stages of the creative path of F.A. Vasilyev.

### THE PRESENTATION OF THE MAIN MATERIAL

On the second half of XIX century arose the largest Russian progressive democratic association – the Association of Peredvizhnik Art Exhibitions (1870–1923), created on the initiative of G. Myasoedov, N.Ge, V.Perov. The Association included in its composition the advanced forces of the Russian democratic artistic culture, in particular a number of members of the Artel of Artists, which had already disintegrated by that time. It was a creative organization of artists, the emergence of which was prepared by the previous development of Russian realistic art and especially art of the 50-60s of the XIX century [1; 7].

Peredvizhnik artists set themselves the task of social and aesthetic education of the masses and sought to popularize their art widely. In connection with this, since 1871, in St. Petersburg and Moscow, they held 48 exhibitions that took place in major cities of the country: Kharkov, Odessa, Kishinev, Riga, Kazan, Orel, etc. Hence the name "Peredvizhniks". The pictures of the Peredvizhniks were characterized by sharpened psychologism, social and class orientation, high mastery of typification, realism bordering with naturalism, a totally tragic view of reality. Impressionism and realism were the leading styles in their art [5, p. 23].

The ideological and organizational leader of the Peredvizhniks for many years was I. Kramskoy. The partnership included Vasnetsov brothers, I. Levitan, M. Maximov, V. Polenov, I. Repin, K. Savitsky, A. Savrasov, V. Serov, V. Surikov, I. Shishkin, N. Yaroshenko at various times. N. Antokolsky, V. Vereshchagin, S. Korovin took part in the exhibitions. F. Vasilyev was one of the creators of movable art exhibitions. Members of the Society were ukrainian, armenian, latvian, moldovian artists: K. Kostandi, P. Levchenko, V. Surenyants, K. Gun. A significant role in the development of the art of the Peredvizhniks was played by a well-known art researcher and critic Pavel Tretyakov, acquiring the works of the Peredvizhniks in his gallery; he provided them with important materials and moral support. Many of the works of the Peredvizhniks were commissioned by Pavel Mikhailovich Tretyakov.

Many artists came to Crimea for etudes, and some of them remained to live there. Their paintings depicted warm colors of the southern sea, picturesque capes and coves, a peculiar way of life of the Crimean Tatars, episodes of sea battles. In the Crimea, the so-called "Cimmerian School of Painting" was formed, the representatives of which created romantic Black Sea landscapes (Cimmeria – the ancient greek name of the eastern Crimea) [4; 6]. One of the founders of the

Cimmerian school of painting was I.K. Aivazovsky, a bright representative of the "Cimmerian School" painting was L. Lagorio, a native from Feodosia and a pupil of I.K. Aivazovsky. The weak health led to the Crimea another famous Russian artist I.I. Levitan. A. Vasnetsov visited Crimea during his travelling around Russia and Ukraine. V.V. Vereshchagin in the 1890s travelled with his family across Russia and was in the Crimea, where he wrote the paintings "Crimea. Pines on the rocks "(1896),"Cape Fiolent near Sevastopol"(1897),"View of the Crimean Mountains". A.I. Kuinji often visited Crimea, in 1886 the artist purchased a plot of land near the village of Kikeneiz and built a house there.

The name of the great landscape painter Fyodor Alexandrovich Vasilyev is associated with the Crimea. He was born on February 10, 1850 in Gatchin city (now it is Leningrad region) in the family of a postal official from St. Petersburg. His father was a postal employee who, at the time of his birth, was not yet married to his mother, Olga Emelyanovna Polyntseva. Under the laws of the Russian Empire, such child was considered illegitimate. Subsequently, this circumstance brought the artist a lot of grief. In general, Vasilyev had no luck with documents all his short life. When the boy turned 15 years old, a family of four children was orphaned, the family impoverished. At the age of twelve he was sent to serve in the main post office, where he received a month's salary 3 rubles.

From early childhood, he showed the ability and interest in drawing. He quitted his service and went to study at the Drawing School of the Society for the Encouragement of Arts in Petersburg (1865-1868). At this time, he combined classes at school in the evenings with work of a restorer in the Academy of Arts of P.K. Sokolov. Towards the end of his studies, Vasilyev joined the circle of the famous artists, especially when he became close friends with I. N. Kramskoy and I. I. Shishkin. An important event in this period for the young artist was his trip to the island of Valaam, where, together with I. Shishkin, he worked for more than five months: from June to late autumn in 1867. Vasilyev used the advices of I. N. Kramskoy and I. I. Shishkin in the writing of his paintings [3]. Shishkin taught him to see the diversity of forms of nature, to distinguish between the construction, the nature of trees and leaves. He inspired his student for the love to the careful observation, to analysis, and, finally, to the process of artistic work. In the early landscapes of Vasilyev there is a lot of "Shishkin": a close analytical look at the world, attention to details.

In 1869 Vasilyev traveled to Tambov province, to the estate of earl P.S. Stroganov, the village of Znamenskoe (in summer), and to the Ukraine, also to his estate, the Khoteni village (in autumn). These trips played a favorable role in the development of the artist's original talent. In 1870 Vasilyev together with artists I. Repin and E. Makarov undertook a trip along the Volga. They sailed along the great river from Tver to Saratov, and the creative apartment was arranged in the vicinity of samara Stavropol, opposite the Zhiguli.

Upon returning from the trip Vasilyev created his new work "Thaw". The painting immediately became an event of Russian artistic life. The author's work, written in warmer colors than the first version, was shown at the 1872 World Exhibition in London. While working on the painting "Thaw", in the winter of 1870, Vasilyev caught a severe cold, doctors diagnosed tuberculosis. At the suggestion of earl P.S. Stroganov, the artist spent the summer of 1871 in his estates in the Kharkov and Voronezh provinces, but he did not recover. The society for the Encouragement of Arts gave him the means to travel to the Crimea (even before departure Vasilyev was enrolled as a volunteer student of the Academy of Arts and was awarded the title of first degree artist with the condition to pass the exam from the scientific course). In the Crimea Vasilyev spent the last two years of his life.

During this period, he creates many drawings (pencil, watercolor, sepia) and paintings. The central work about Crimean nature, a large picture "In the Crimean Mountains" (1873, the Tretyakov Gallery). In the Crimea, Vasilyev wrote significant paintings of the nature of the north: "Morning", "The Abandoned Mill", "The Swamp in the Forest. Autumn", "Wet Meadow"(1872, the Tretyakov Gallery). Here he wrote his latest paintings, including "Crimean Landscape", "Evening in the Crimea", "Winter in the Crimea", "Crimean Mountains in Winter", "Cypresses in the Crimea", "In the Crimea. After the rain", " View from Ericlik", "Ericks. Fountain (Crimea)", "Mountains and the Sea", "Surf in Yalt", "In the Crimea", "Surf at the Crimean coast"[6].

One of the most famous of his paintings is "In the Crimean Mountains", written before his death. In this picture there is no sea, only heaven and earth, majestic mountains, half hidden by clouds, and a slope along which the Tatar cart slowly moves drawn by oxen. The picture is completed by the master so simple and ingenious that this work was sent to the competition of the Society for the Encouragement of Artists and received the first prize.

Everyday conversation of Fedor Alexandrovich consisted of his mother Olga and his younger brother Roman, who came to the Crimea with him. Fedor deeply loved his brother. The age difference between brothers was 12 years, in Yalta Roman was already ten years old, the elder brother was seriously concerned about his education, since the entrance to the gymnasium was postponed because of the inability to send his brother to St. Petersburg. The close person of their small family was Platon Alexandrovich Cleopin, who had the estate of the Mordvinovs near Yalta, a great lover of

painting and a kind person. He took a sincere part in the fate of the young artist and more than once in difficult moments, gave him money. Vasiliev's financial affairs were really extremely complicated, because besides the money for treatment, it was necessary to support himself and his loved ones. More than once he had to ask for help Tretyakov. "My situation is difficult, the most desperate, he wrote to Moscow shortly after his arrival in Yalta in 1871. I'm alone in a strange city, without money and I am sick. I need 700 rubles." Responding to this desperate request and immediately sending money, Tretyakov simultaneously wrote a full of sympathy letter: "It is very sad, my dearest Fedor Alexandrovich, that you are so sick, but most importantly, above all, calmness and caution ... Be healthy, my dear friend, be brave! Who is ill when he is young, will be stronger in the old age! Your faithful P. Tretyakov." In addition, Pavel Mikhailovich, together with his wife, Vera Nikolaevna, in September 1872, specially visited Yalta to visit the sick artist [3]. Feeling obligated to Tretyakov for his attention and responsiveness, Vasiliev decided to give Pavel Mikhailovich the first opportunity to choose the paintings he would like to buy for his collection. Tretyakov sent money to Yalta many times after and the total amount, in the end, even exceeded the cost of purchased paintings. Therefore, part of the works from the already posthumous exhibition of the artist also entered the Tretyakov Gallery as a debt.

Of course, there were occasionally other meetings which Vasilyev greatly valued, with brothers artists: Mikhail Botkin, Konstantin Filippov, Ivan Aivazovsky. But the real holiday brought him the arrival in September 1871 of his biggest and heartfelt friend Ivan Nikolaevich Kramskoy. Together they walked for a long time at the sea, went to the mountains and, of course, conducted endless conversations about art and creativity. The difference of sixteen years did not interfere with their friendship. There are as many as 63 letters of their correspondence, it is a whole tome! And it shows not only friendship, but full mutual understanding between the two artists. As a sign of this friendship and with great love, Ivan Kramskii painted a portrait of his kind and young friend.

The artist worked a lot and tensely, sometimes at the expense of treatment. This did not contribute to recovery and led to a tragic end. Fedor Vasilyev died on September 23, 1873 in Yalta, lived there for the last two years and two months. From the end of April 1873 Vasiliev could no longer work. He only hoped for a trip to Italy. Everything depended on the decision of the Academy of Arts. The received refusal killed the artist.

He died on September 23 (October 5) in 1873 in Yalta. The grave is located there, on Polikurovsky cemetery. The artist I. I. Shishkin installed a monument on his grave. During the Great Patriotic War the grave was destroyed. According to pictures and maps of I.I. Shishkin it was managed to determine the burial place. In 1963 a monument of F.A. Vasiliev was installed. The pedestal is carved: "Outstanding Russian landscape painter Fedor Alexandrovich Vasiliev, born 10.02.1850 in Gatchin, died 23.09.1873 in Yalta."

To the 110th anniversary of the artist's birth, among the green lawns of the Kurdounner, formed by the houses No. 8, 10, 12 on Kievskaya street, a bronze bust of F.A. Vasiliev was erected on a pedestal, which is made of diorite. The authors are the sculptor N.L. Savitsky and the architect P.A. Starikov.

The art of Vasiliev has a tremendous power of public educational value. His paintings reflect morality and artistry, which are inseparable. Vasiliev's creative and spiritual development went so fast, as if he knew in advance that fate had let him go too short and it was necessary to do as much as possible, not to miss out of his attention and memory a single instant that life gives. The surrounding people were amazed at his phenomenal giftedness. It manifested itself in everything, in the speed and ease with which they perceived professional skills and accumulated knowledge from a wide range of fields. Natural giftedness allowed him to grasp everything on the fly, and deep nature processed knowledge into a serious system.

Fedor Alexandrovich Vasiliev lived a short life, but his contribution to Russian art is great: he left wonderful pictures of his native nature, where truthfulness is combined with subtle, soulful lyricism.

All the remaining works after it, mostly unfinished, were sold out. Of the albums of his two were purchased by the Empress Maria Alexandrovna and two were in the library of the Academy of Arts. One of the artist's paintings is reproduced on a postage stamp. A commemorative coin dedicated to the artist was issued.

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## THE IMPORTANT FACTOR IN LANGUAGE LEARNING

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### ABSTRACT

Testing and assessment is inseparable part of education. It indicates where student stands in the learning process, reflects the weakness and strength, and leads to the next level of the teaching and learning. Assessment is also used by different stakeholders in various contexts such as teachers in the classroom, university, ministry of education, employers, etc. Assessment has many forms and it plays an important role in student learning. In this article we will focus on the principles and procedures of foreign language assessment.

**Keywords:** Assessment, student learning, feedback, higher education, procedures

### XÜLASƏ

Test və qiymətləndirmə təhsilin ayrılmaz hissəsidir. Onlar tələbələrin öyrənmə prosesinin hansı mərhələsində olduğunu göstərir, onların zəif və güclü tərəflərini göstərir, tədrisin növbəti mərhələsinə yönləndirir. Qiymətləndirmə fərqli kontekstlərdə müxtəlif maraqlı tərəflər tərəfindən aparılır. Bunlara sinifdə qiymətləndirmə aparən müəllim, universitet, təhsil nazirliyi, işə götürənlər və s daxildir. Qiymətləndirmənin müxtəlif formaları vardır və onun tələbə öyrənməsində vacib rolu vardır. Bu məqalədə xarici dil qiymətləndirməsinin prinsipləri və proseduralarına nəzər salacağıq.

**Açar sözlər:** Qiymətləndirmə, tələbə öyrənməsi, əks əlaqə, ali təhsil, proseduralar

### РЕЗЮМЕ

Тестирование и оценка являются неотъемлемой частью образования. Это показывает стадию, в которой учащийся находится в процессе обучения, его слабости и сильные стороны, и направляет следующий этап обучения. Оценка используется в классе различными заинтересованными сторонами, такими как преподаватели, университеты, министерств образования, работодатели в разных контекстах. Существуют различные формы оценки, и они играют важную роль в образовании учащихся. В этой статье мы рассмотрим принципы и процедуры оценки языка.

**Ключевые слова:** Методы CLIL, преимущества CLIL, навыки, иностранный язык

### INTRODUCTION

We all remember the horror of giving exams and doing tests. We didn't sleep the night before exams, got nervous and excited as we got our results. Exams were the nightmare for us. Are they really that terrible? The term assessment refers to the use of methods and instruments to collect information to inform decision making about learning. [1] Without assessment teaching would be incomplete and it would be nearly impossible for students to have any systematic indication for their abilities with respect to what they have been taught. There exists many forms of assessment such as large scale assessment (entrance, end of semester exams), and small scale assessment which is carried out in the classroom by teachers (feedback for each student, tests), etc.

### THE FOUR QUESTIONS

Before any kind of assessment we must answer these questions: What we assess? Who we assess? How we assess? Who are the users of test results?

**What we assess?** Firstly, before we start we need to consider what we assess. We need to know the purpose and content of our assessment. The purpose of assessment can vary. We can assess the students for final grades, or just evaluate their progress in the learning process. Sometimes students are assessed for the effectiveness of teaching or to evaluate the teacher. As we know, in order to speak a language well and use it we need to have certain skills and knowledge. These skills are: reading, speaking, writing and listening. The knowledge of vocabulary and grammar are also essential as they are the building blocks of the language acquisition. Assessment very much depends on our teaching objectives and goals. If our objective is to develop communication skills, then we need to assess speaking in



the context of communication. If our goal is to enrich our students with vocabulary and grammar, then we need to assess this knowledge.

**Who we assess?** Secondly, we need to consider test takers in our assessment. We must consider their age, their knowledge of the test format, students' special educational needs etc. Age of tests takers is important mainly because of their world outlook. A 10 year-old can't take standardized tests like IELTS, and TOEFL as in order to take these tests the test takers need world knowledge as well as language skills. If our format of test is computer based, then test takers must have some basic computer knowledge. We also have to be aware of the learners we need special educational needs and adapt the assessment accordingly. If they have hearing disabilities they need the listening materials read to them, or if they have low eyesight the computers must be made set with bigger shifts, etc.

**How we assess?** Exams are taken in various forms. In the modern world, most universities has been computerized and most of the exams are taken via computers. Test administration transfer the questions into the computers and they can get the results instantly right after the exams. There are other type of exams such as written and oral. These exam form are also effective as they can evaluate the speaking and communication skills of students which computers can't do.

**Who are the users of test results?** Usually the information gathered from the assessment is used for different purposes. It can be used to diagnose the effectiveness of teaching at higher educational institutions, to admit students to the next semester or academic year, general admission exams to universities or admission to certain jobs. Thus, the users of the information can be university administration, employers, admission officers, etc. Admissions officers and/or academic departments or programs often require non-native speakers of English to show evidence of their ability to perform at high enough level to study in the university environment. Thus, they set cut-off scores for these potential non-native-speaking applicants based on the demands of the curriculum to either accept the applicant for admission or to indicate that the applicant needs additional language training [1].

## ASSESSMENT FOR LEARNING

The principal characteristic of Assessment for Learning is effective feedback provided by teachers to learners on their progress. The value of the feedback is dependent on two factors: the quality of the feedback and how learners receive and ultimately use it [2]. Assessment for Learning is usually done in the classroom and it is directly calculated on the progress of students. It is a kind of assessment which takes place in the classroom and we can also call it a small scale assessment and it must take place in such a positive way that it can lead to the progress of learners. The main purpose of this assessment is to achieve learning, in other words students are learners here.

Effective teachers use classroom assessment for multiple purposes, such as determining their students' learning skills, diagnosing specific learning challenges, monitoring the development of their students' skills, and engaging students in their own learning processes.

Depending the purpose, assessment may come in different forms such as tests and feedback.

Typically, tests are categorized according to their uses:

-Placement tests provide information that is useful for determining students' appropriate levels of instruction within a program or institution.

-Diagnostic tests are used to assess students' strengths and weaknesses, providing teachers and students with information that can guide decisions about appropriate instruction to meet students' needs.

-Proficiency tests are intended to assess students' ability in a language independent of a curriculum or specific course content. A proficiency test measures a learner's level of language. It can be compared with an achievement test, which evaluates a learner's understanding of specific material, a diagnostic test, which identify areas to work on, and a prognostic test, which tries to predict a learner's ability to complete a course or take an exam. Proficiency tests are uncommon within the classroom but very frequent as the end aim (and motivation) of language learning. IELTS and TOEFL are examples of proficiency tests [3]. When giving these tests it is now in general assessed in accordance with Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR) guidelines. It was put together by the Council of Europe as the main part of the project "Language Learning for European Citizenship" between 1989 and 1996. Its main aim is to provide a method of learning, teaching and assessing which applies to all languages in Europe (Wikipedia). CEFR guidelines describes the language proficiency with levels: A1, A2, B1, B2, C1,

and C2. A1 is equal to Beginner, A2 to Elementary, B1 Pre intermediate, B2 Upper Intermediate, C1 Advanced and C2 Native speaker.

-Achievement tests measure whether a student is reaching instructional objectives. A good deal of the assessment taking place in the classroom is via achievement tests. The discussion in this chapter addresses this last essential use of assessment.

There are variety of tests such as multiple choice, matching, gap filling, logical ending, rubrics, quizzes etc. These tests are the tools of assessment.

In order to achieve the aims of learning and get the students to progress, tests must take place frequently. It can be in the form of comprehension tests after each learning, consolidation tests after each unit, and revision tests after every 4 units. By doing so students can see if they met the learning outcomes and teacher can see the effectiveness of his teaching. If the results are not satisfactory teacher must reconsider the teaching. The unsatisfactory results may be due to wrong teaching methods or techniques, low motivation of either students or teacher. Teacher must find the reason, make some corrections and restart the teaching over again.

Another type of assessment is feedback. Feedback is information a teacher or another speaker, including another learner, gives to learners on how well they are doing, either to help the learner improve specific points, or to help plan their learning. [4] Feedback plays an important part of student achievement and motivation. The purpose of feedback varies such as on a piece of writing, speaking, reading comprehension skill, the use of grammar and vocabulary.

As teachers we must give timely feedback on our students' progress and mention their strengths and weakness. It can take place both orally and written.

Feedback can have either a positive and negative effect on student achievement, thus teachers must be careful and choose the correct technique. In order to avoid a negative feedback teacher must go beyond error correction and see the overall picture of students' work. In the oral feedback pitch of tone, correct use of words and facial gesture plays an important role. In the written feedback use of small smileys, figures, positive words can be used.

Recently, on a social media, I came through a feedback on student's writing by a teacher from UK, Sandy Millin. It can be a good example of a positive feedback:

"Comments: It's good to read something a bit different. " If I ever go to Skyrim, I'll know what to see and what to avoid. To improve your accuracy, check spelling, word forms, and wrong words. The range of language used is good, though there sections end with a conditional, which is a bit repetitive. A good attempt!" [5].

## ASSESSMENT OF LEARNING

Assessment of Learning is the end of semester exams, entrance exams, graduation exams, etc. It is the assessment that becomes public and results in statements or symbols about how well students are learning. It often contributes to pivotal decisions that will affect students' futures. It is important, then, that the underlying logic and measurement of assessment of learning be credible and defensible [6].

Designing assessment of learning or large scale assessment (exams) is a long and hard process. It requires consideration of values and principles, team work, effective strategies and practice.

There are the following values and principles: validity, reliability, transparency, authenticity, motivation, promotion of deep learning, fairness, equitability, formativeness, timeliness, incrementality, redeemanility, demanding, enabling the demonstration of excellence, efficiency and manageability [7].

Let's look at some of the most important ones.

**Validity.** Assessment must meet the initial purpose. For example, if we want to assess vocabulary and grammar then we mustn't assess the communication skills. Students already have the stress of exam, by doing so we would give our students much more stress.

**Motivation.** Assessment should help students to structure their learning continuously during their studies, not just in a few critical weeks before particular assessment climaxes. Assessment should allow students to self-assess and monitor their progress throughout a course, and help them to make informed choices about what to learn, how to learn it, how

best to evidence. If the tests that they are going to give exam doesn't much coincide with their lessons students can be demotivated.

**Transparency.** Exam results can't be changed, no surprise for students shouldn't be prepared.

**Fairness.** All students' knowledge must be equally evaluated and no discrimination should occur.

**Equitability.** All students must be treated equally no matter what they get from tests.

**Formativeness.** Assessment should be formative – even when it is primarily intended to be summative. As we know, the purpose of formative assessment is to teach students. The same must happen with summative assessment. It should lead students to learn, give feedback and show what next step they should take.

**Timeliness.** Assessment must be done as often as possible so that students can get enough feedback. It is better than one assessment at the end of the semester when students look for it in horror.

**Demonstration of excellence.** The best students should be enabled to demonstrate their strongest sides. It will increase their motivation.

There are the following procedures of test: collecting information, making evaluation, making a decision.

In general tests can be taken via computers, teachers of the institution or the guest exam takers. They all have pros and cons. Tests taken by computers is the easiest one as you can get the information and grading at the blink of an eye. It is reliable and transparent. Tests taken by the teachers of the institution may know their students in person, their strengths and weakness. It can sometimes be not fair as the students' performance during the semester can affect their marks during the test as well and can be unfair. Guest exam takers don't know the students in person and the grading can be transparent, and fair. But it can cost for the institution to invite these people.

Evaluating students is a hard process as the evaluator must give the best mark to the students. There are different criteria for every assessment form. If the assessment is done through tests with multiple choices, then the evaluation can be done according to the correct answers. There are some test systems where two wrong answers delete one correct answer.

According to the evaluation, in general students get marks. Universities determine their grading system according to European Credit Transfer and Accumulation System (ECTS).

## HOW TO MAKE THE ASSESSMENT STRESS FREE

There can be found many resources on how students can overcome exam stress. For example, sleeping well the night before exams, avoiding beverages like alcohol and caffeine, have a good rest such as walking, talking to friends, eating well, getting up on time, etc. But having a stress-free exams isn't much written. I think the only downturn of the assessment is the stress it causes to test takers. It solely depends on teachers and exam takers. Let's look at ways on how to make assessment (exams, tests, etc.) stress free.

Motivation is the turning point in test taking. Students should wait for exams and must be motivated to give the exams. Assessment must motivate the test takers to learn and to do progress in their learning. After the assessment there must be a positive feedback to lead students to the next level, tell their weakness and show them how to achieve the desired progress.

Test takers must be prepared to assessment months ago. This means, they should know how they will be assessed, the content of tests, the form of exam (oral, written, computerized), etc. They should also have similar assessment every month to let them evaluate themselves about what they know and what they need to learn. It will enable them to work on themselves. It will also prepare them to the test format.

In general, when students know their subjects well enough, then the stress level during the exam decreases. Teachers must be aware of that and make sure that students know all the subject content. It can be achieved by well-organized teaching and repetitions.

## INNOVATIONS IN ASSESSMENT

Over the last ten years or so, much thought has been given to the use of innovative assessment, and more generally, universities and colleges have focused on enhancing assessment practices. Initiatives, research and developments on assessment have led to a rich collection of established theoretical perspectives and good practice guidance for those seeking to make changes to how assessment is designed for students [8].

Most universities and test designers take computer-based exams. Assessment which is carried out via computers is very flexible and less time consuming. IELTS testing system is the most preferable assessment form among universities for its relevance to the CEFR descriptors and evaluates all the language skills. Aptis test is also designed according to this form. The difference is that on this test all language skills are evaluated on computer while speaking and writing skills in IELTS are taken by exam takers and on paper.

## CONCLUSION

Assessment is the core of education but doing it right is the key. It should be well prepared and stress free. There are different forms of assessment but all of them should serve the students' learning process.

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## SYNTHESIS AND QUANTUM-CHEMICAL MODELING OF 2-O-( $\beta$ -D-GLUCOPYRANOSYL)- $\alpha$ ,D-MANNOPIRANOSE

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### ABSTRACT

The main attention of researchers working in the field of carbohydrate chemistry is focused on the synthesis of these compounds and their numerous derivatives, since the problem of establishing the structure of monosaccharides to the present time is not difficult. In the transition to disaccharides, on the other hand, the questions of establishing the structure are put at the forefront.

The specific difficulties in the synthesis of disaccharides first of all is, the need to protect all the hydroxyl groups of the polyfunctional sugar molecule, which plays the role of aglycone, except the glycosylated ones. Therefore, the first task in synthesizing the disaccharide is to prepare a sugar derivative which contains the one free hydroxyl group at a given position.

To prepare such compounds almost all types of sugar derivatives are used, but the most important role is played by alkylidene derivatives, acetates, tosylates, haloglycosides, benzyl ethers, etc.

Naturally, there are no general methods for synthesizing sugar derivatives with a free hydroxyl group in the given position, but it is possible to formulate the main approaches to solving this problem.

The carbohydrates belong to the widespread substances in nature. Successes achieved in the field of carbohydrate chemistry played an important role in the development of representations about stereochemistry, conformational and informative analysis, tautomers and in formation of refined organic synthesis.

As a result of multistage transformations, a new type of binding with disaccharide 2-O-( $\beta$ -D-glucopyranosyl)- $\alpha$ ,D-mannopyranose was synthesised. In the literature there is no detailed description of the reaction, when the products are fully displayed. Condensation of 2,3,4,6-tetra-O-acetyl- $\beta$ -D-glucopyranose with 1,3,4,6-tetra-O-acetyl- $\alpha$ -D-mannopyranose in the presence of zinc chloride and phosphoric anhydride gives 2-O-( $\beta$ -D-glucopyranosyl)- $\alpha$ -D-mannopyranose-octaacetate.

The paper describes a quantum chemical study of the synthesis characteristics of an acetylated free hydroxyl group and acetyl halides (D-mannopyranose pentaacetate chloride, 1-chloro-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose, mannopyranose D-tetraacetate, octaacetate- 2-O- ( $\beta$ -D-glucopyranosyl) - $\alpha$ -D-mannopyranose).

With the help of semi-empirical quantum chemical methods AM1 and DFT for the full display of the obtained products the structures of synthesized disaccharides are studied. Of the 4 variants of the synthesis of 1-chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose in the third variant with the interaction of D-mannopyranose pentaacetate with three  $\text{PCl}_5$  molecules, with clearly observed calculations, functional, it is obvious that a reaction in accordance with this scheme may be possible.

In the result of theoretical calculation relevant recommendations have been confirmed and obtained for 2-O-( $\beta$ -D-glucopyranosyl) -  $\alpha$ -D-mannopyranose final synthesis at all stages.

The study of the structural-morphological elementary composition of the samples showed that the synthesised substance is a chromatographic pure compound.

**Keywords:** Disaccharides, Acetylchloride, Quantum-chemical calculation, Semi-empirical AM1 method, Theory DFT

## აბსტრაქტი

ნახშირწყლების ქიმიის მეცნიერ-მკვლევართა ძირითადი ყურადღება მიმართულია შაქრების და მათი წარმოებულების სინთეზზე. მონოსაქარიდების აღნაგობის დადგენა დღესდღეობით არსებით პრობლემას არ წარმოადგენს. თუმცა დისაქარიდების შემთხვევაში მათი აგებულების დადგენა პირველ ადგილზეა.

დისაქარიდების სინთეზში პირველ რიგში სპეციფიკურ სირთულეს წარმოადგენს მრავალფუნქციური შაქრის აგლიკონის მოლეკულის ყველა ჰიდროქსილის ჯგუფის დაცვის აუცილებლობა, გარდა იმისა, რომელიც ექვემდებარება გლიკოზილირებას. ამიტომ დისაქარიდის სინთეზის დროს პირველ ამოცანას წარმოადგენს თავისუფალი ჰიდროქსილის ჯგუფის შემცველი შაქრის წარმოებულის მიღება.

ასეთი ნაერთების მისაღებად გამოიყენება პრაქტიკულად ყველა ტიპის შაქრის წარმოებულები, მაგრამ მათ შორის მნიშვნელოვანია ალკილიდენური წარმოებულები, აცეტატები, ტოზილატები, ჰალოგენკლიკოზიდები, ბენზილატები.

სინამდვილეში თავისუფალი ჰიდროქსილის ჯგუფით შაქრის წარმოებულთა სინთეზის საერთო მეთოდები არ არსებობს, თუმცა შესაძლებელია ამ პრობლემის გადაჭრა განსაკუთრებული მიდგომით.

ნახშირწყლები მიეკუთვნებიან ბუნებაში ფართოდ გავრცელებულ ნივთიერებებს. ნახშირწყლების ქიმიის დარგში მიღწეულმა წარმატებებმა მნიშვნელოვანი როლი შეასრულეს სტერეოქიმიის, კონფორმაციული და ინფორმაციული ანალიზის, ტაუტომერიის შესახებ წარმოდგენათა განვითარებაში და ნატიფი ორგანული სინთეზის ჩამოყალიბებაში. მრავალსტადიური გარდაქმნების შედეგად სინთეზირებულია დისაქარიდი 2-O-(β-D-გლუკოპირანოზილ)-α-D-მანოპირანოზა. ლიტერატურაში არ არსებობს ამ რეაქციის დეტალური აღწერა პროდუქტების სრული ჩვენებით. 2,3,4,6-ტეტრა-O-აცეტილ-β-D-გლუკოპირანოზის კონდენსაციით 1,3,4,6-ტეტრა-O-აცეტილ-α-D-მანოპირანოზასთან თუთიის ქლორიდის და ფოსფორის ანჰიდრიდის თანდასწრებით სინთეზირებულ იქნა 2-O-(β-D-გლუკოპირანოზილ)-α-D-მანოპირანოზის ოქტააცეტატი.

სტატიაში აღწერილია აცეტილირებული, თავისუფალი ჰიდროქსილის ჯგუფის და აცილჰალოგენიდებისათვის დამახასიათებელი სინთეზის (D-მანოპირანოზის პენტააცე-ტატის ქლორირების, 1-ქლორ-3,4,6-ტრი-O-აცეტილ-D-მანოპირანოზის, D-მანოპირანოზის ტეტრააცეტატის, 2-O-(β-D-გლუკოპირანოზილ)-α-D-მანოპირანოზის ოქტააცეტა-ტის) რეაქციების ქვანტურ-ქიმიური კვლევა.

ნაჩვენებია ნახევრადემპირიული ქვანტურ-ქიმიური AM1 და DFT მეთოდებით სინთეზირებული დისაქარიდების აღნაგობის შესწავლა მიღებული პროდუქტების სრული ჩვენებით. 1-ქლორ-2-O-ტრიქლორაცეტილ-3,4,6-ტრი-O-აცეტილ-D-მანოპირანოზას სინთეზის ოთხი ვარიანტიდან მე-3 ვარიანტში D-მანოპირანოზის პენტააცეტატი PCl<sub>5</sub>-ის სამ მოლეკულასთან ურთიერთქმედებით სიმკვრივის ფუნქციონალის მეთოდით ჩატარებული გათვლებით ნათლად ჩანს, რომ ამ სქემით შესაძლებელია რეაქცია წარიმართოს.

თეორიული გათვლების შედეგად დადასტურებულია და მიღებულია შესაბამისი რეკომენდაციები 2-O-(β-D-გლუკოპირანოზილ)-α-D-მანოპირანოზის საბოლოო სინთეზისათვის ყველა სტადიაზე.

ნიმუშების სტრუქტურულ-მორფოლოგიური ელემენტური შედგენილობის კვლევით დადასტურებულია, რომ სინთეზირებული ნივთიერება წარმოადგენს ქრომატოგრაფიულად სუფთა ნაერთს.

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საკვანძო სიტყვები: დისაქარიდები, აცეტილქლორიდი, ქვანტურ-ქიმიური გათვლები, ნახევრად-ემპირიული AM1 მეთოდი, DFT თეორია.

## INTRODUCTION

The use of glycosides for modification of biologically active organic compounds may change their biological and physiological effects on the one hand and on the other hand to reduce their toxicity. A new, possibly biologically-contained 1,2 - O-glucoside linked disaccharides was synthesized on the base of carbohydrates [1,2,3,4].

Many laboratories of the world throughout the decades have made significant contributions to creating a reliable method of synthesis of glycosides. From the numerous reactions leading us to the formation of glycoside bond, only some of them can be considered as a general method of synthesis of glycosides. The halogen atom is widely used in the introduction of a replacement in the glycoside center of sugar, as the halogen atom in the acetyl-halogenides is quite easily replaced by nucleophilic substitution [5, 6, 7, 8].

As for the possibility of existence of the new type of linked disaccharides (Sophoroze, laminarbioze, laminarina, Nigeroze) and synthesis methods have been developed by Prof. A. Gakhokhidze(1909-1998), who is known in the world literature as Gakhokidze's synthesis. They are widespread compounds in nature. They have high physiological (immunological, anti-tumor, etc.) activity. These compounds have been widely used in medical and biological studies and are considered as expensive substances [9].

Biological functions, which carry out binding to 1,2 - disaccharides in the vital processes of living cells, make it important for their synthesis. In this regard, the perspective is the method of modern physical organic chemistry as experimental and theoretical methods. In recent years among the theoretical methods, geometric and quantum-chemical modeling of microprocessor is popular, based on the classical performance of the complex molecular reaction capabilities and the power of adequacy with their subsequent optimization. The computational multiprocessor cluster systems of South-Eastern European countries are used to build models of complex molecular systems by applying the corresponding input-file and accepting output-file or calculation results [10-11].

For this purpose, Density Functional Theory DFT and Semi-Empiric AM1 (Austin Model 1) modern quantum-chemical methods are used in the coordinate mode of reaction. The computation was performed using the software system "Priroda", which had been created by M. Lomonosov Moscow State University Center for Quantum Chemistry.

Disaccharide 2-O-(β-D-glucopyranosyl)-α-D-mannopyranose (8) was obtained by condensation of 2,3,4,6-Tetra-O-acetyl-β-D-glucopyranose (2) with 1,3,4,6-Tetra-O-acetyl-α-D-mannopyranose (6) in an indifferent solution, in the presence of zinc chloride and phosphoric anhydride, followed by saponification of the resulting acetylated disaccharide (7).

2,3,4,6 -Tetra-O-acetyl-β-D-glucopyranose was obtained from 2,3,4,6 -Tetra-O-acetyl-α-D-glucopyranosyl bromide (1) under the action of silver carbonate. 1,3,4,6-Tetra-O-acetyl-α-D-mannopyranose (6) was prepared as follows: 1,2,3,4,6-Penta-O-acetyl-α-D-mannopyranose (3) was converted to 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl-β-D-mannopyranose(4) by the action of an excess of phosphorus pentachloride.

Under the action of ammonia in a solution of absolute Diethyl ether, 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl-β-D-mannopyranose (4) immediately loses the trichloroacetyl group and is converted to 1-Chloro-3,4,6-tri-O-acetyl-β-D-mannopyranose (5), which the silver acetate gives 1,3,4,6-Tetra-O-acetate-α-D-mannopyranose (6).

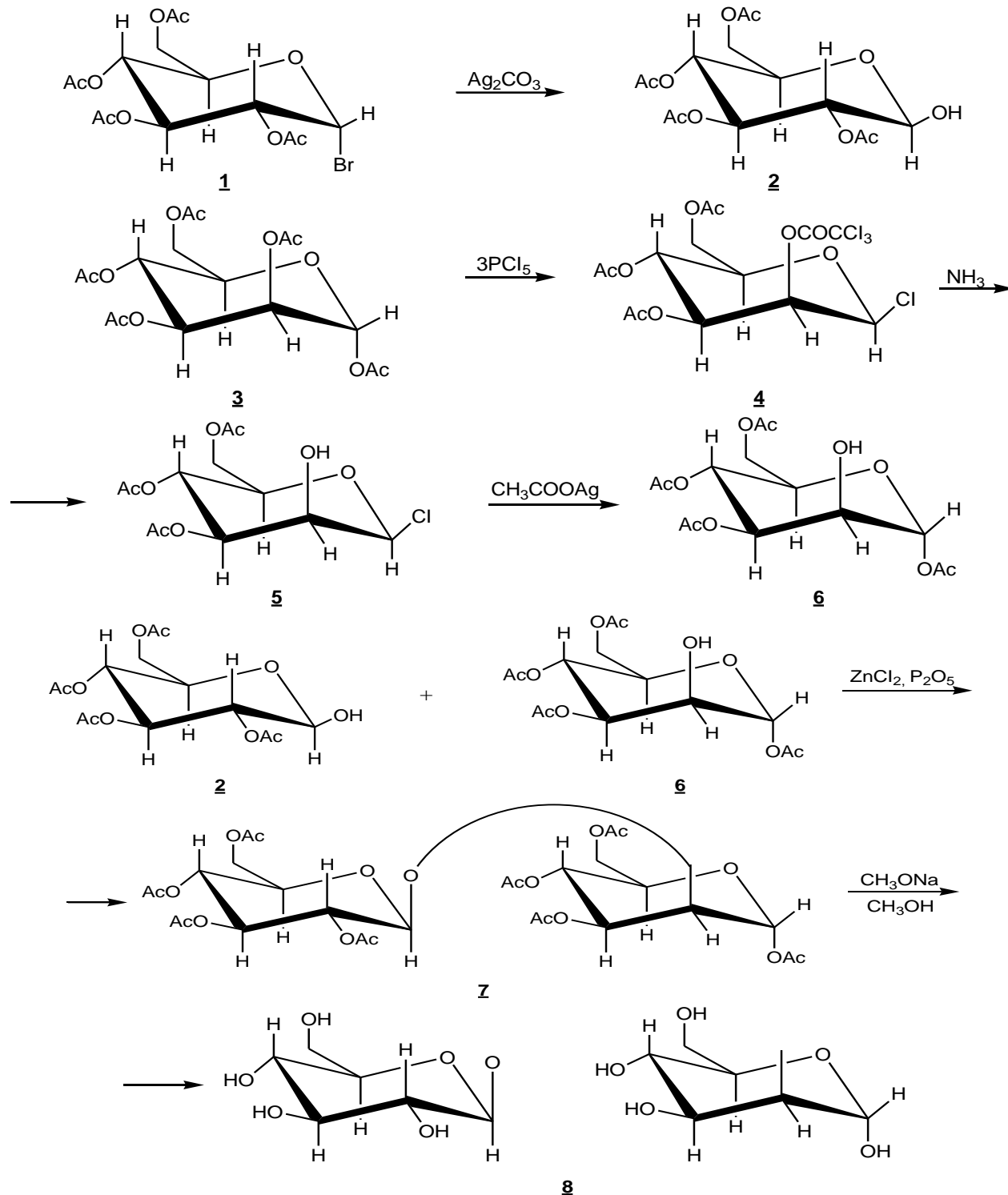
For the condensation of 2,3,4,6-Tetra-O-acetyl-β-D-glucopyranose (2) and 1,3,4,6-Tetra-O-acetyl-α-D-mannopyranose (6) into the disaccharide 2-O-(β-D-glucopyranosyl)-α-D-mannopyranose octaacetate(7), we dissolved their equal amounts in dry chloroform, the fused Zinc chloride was added and the resulting mixture was shaken for several hours at room temperature.

The solution was then filtered off from zinc chloride, phosphoric anhydride was added thereto and the mixture was again shaken. Synthesised a new, probably biologically active 2-O-(β-D-glucopyranosyl)-α-D-mannopyranose (8) (Scheme 1).

Disaccharide 2-O-(β-D-glucopyranosyl)-α-D-mannopyranose (8) was obtained as white crystals.

With quantum-chemical AM1 and DFT methods theoretically calculated and confirmed the acceptable Reactions by stage. For the complete mapping and description of the reaction of 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl-β-D-mannopyranose (4) and the synthesized products, four options were proposed:

**Scheme 1.**





1. Interaction with  $\text{PCl}_5$ 's four molecules with the formation of acetylchloride and hydrocarbons:

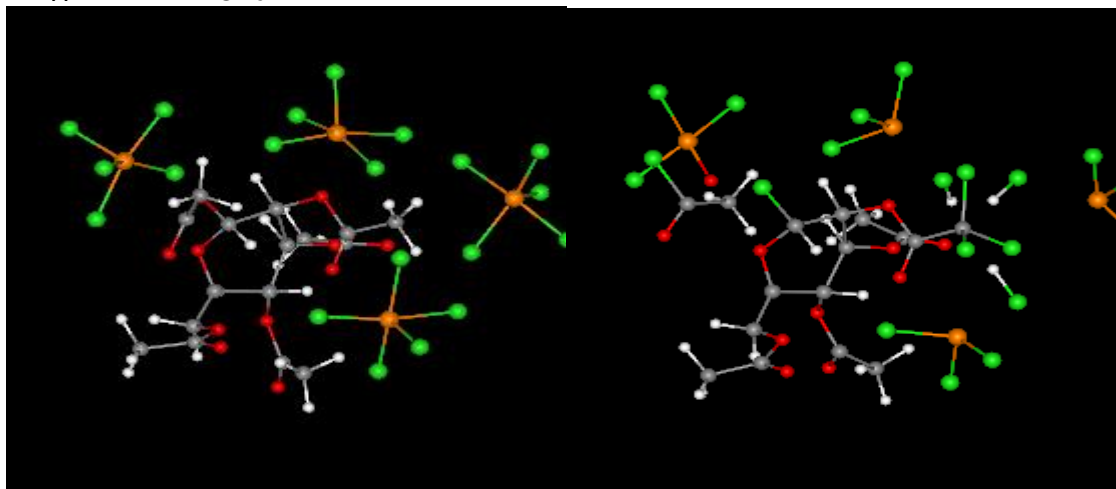
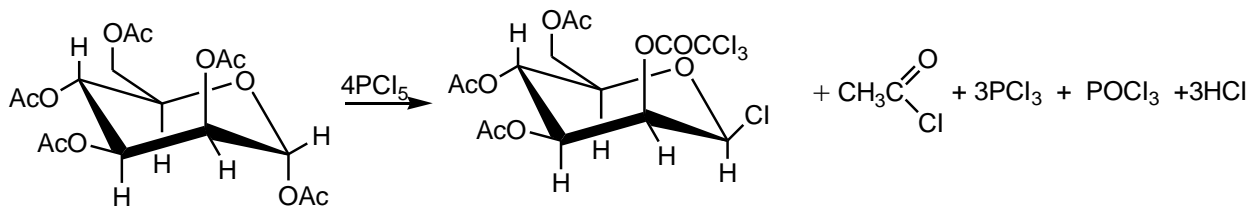
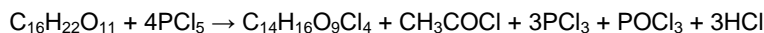


Figure 1: Initial condition

Figure 2: Final condition

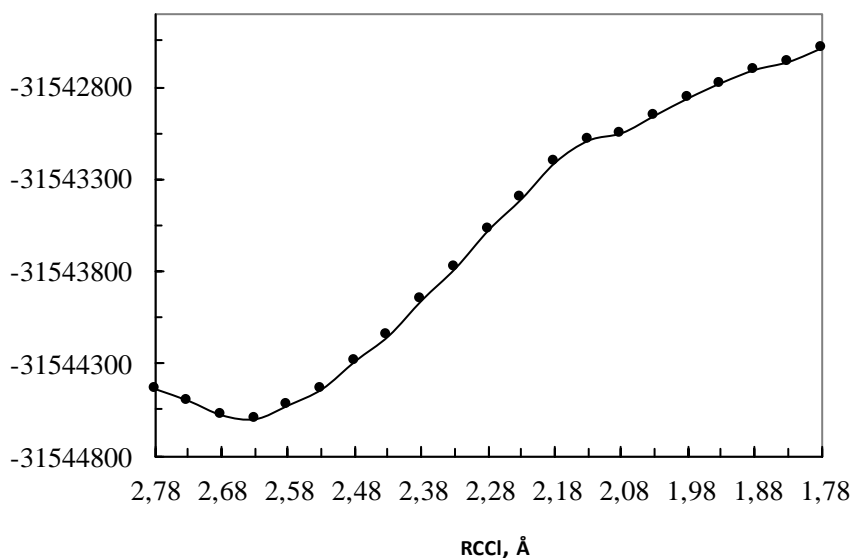


Figure 3: The dependence of the change in the energy system between the distance between the chlorine and carbon atoms  $R_{\text{C-Cl}}$

2. Interaction with  $\text{PCl}_5$ 's four molecules with the formation of acetylhydrochloride and hydrocarbons:

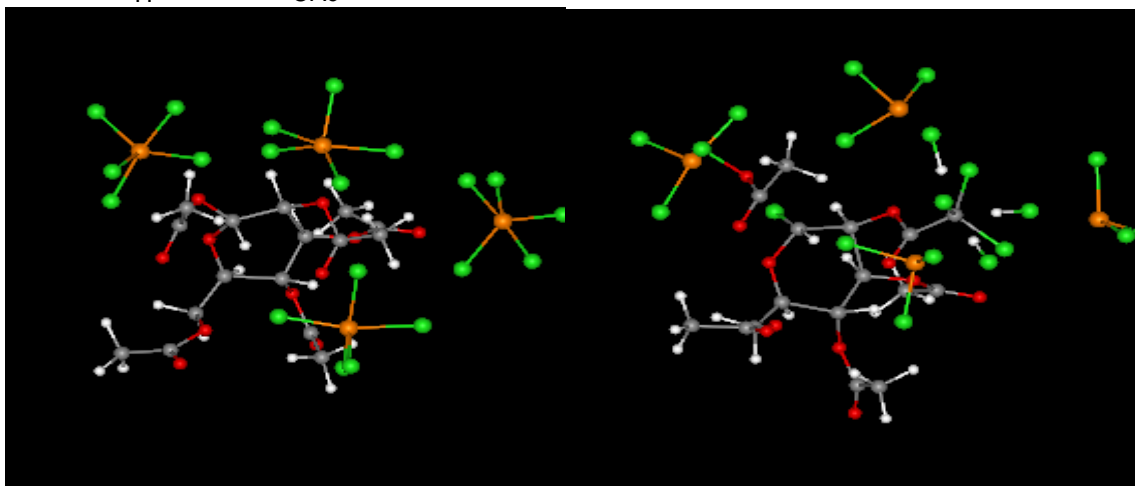
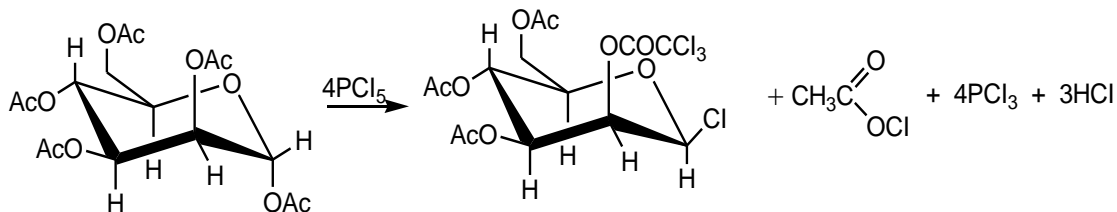


Figure 4: Initial condition

Figure 5: Final condition

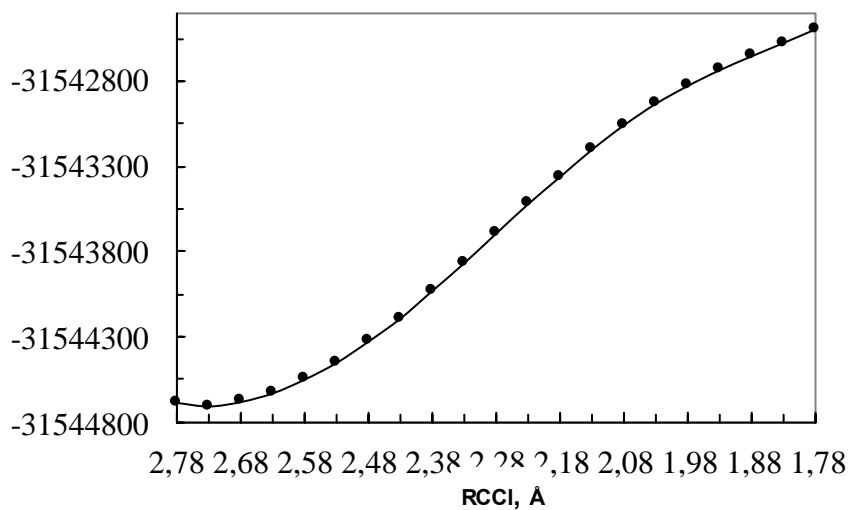


Figure 6: The dependence of the change in the energy system between the distance between the chlorine and carbon atoms  $R_{C-Cl}$

- Interaction with  $PCl_5$ 's three molecules with the formation of acetylchloride, chlorhydrate and hydrogen:

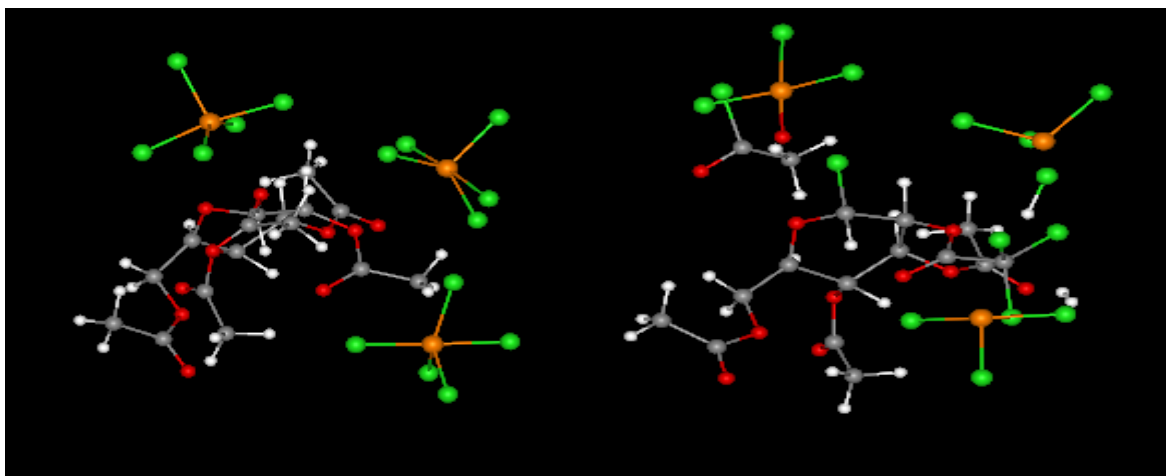
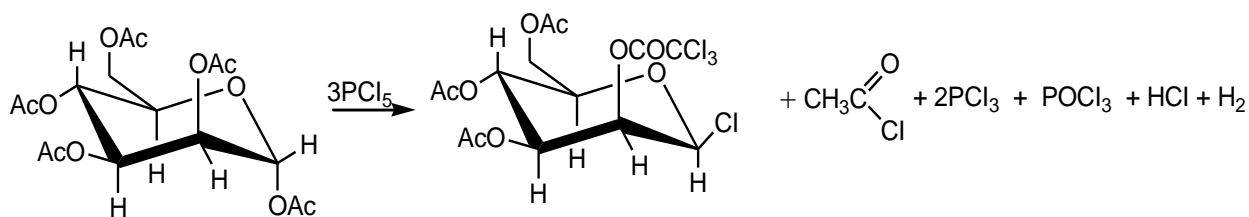
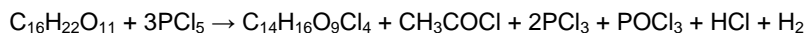


Figure 7: Initial condition

Figure 8: Final condition

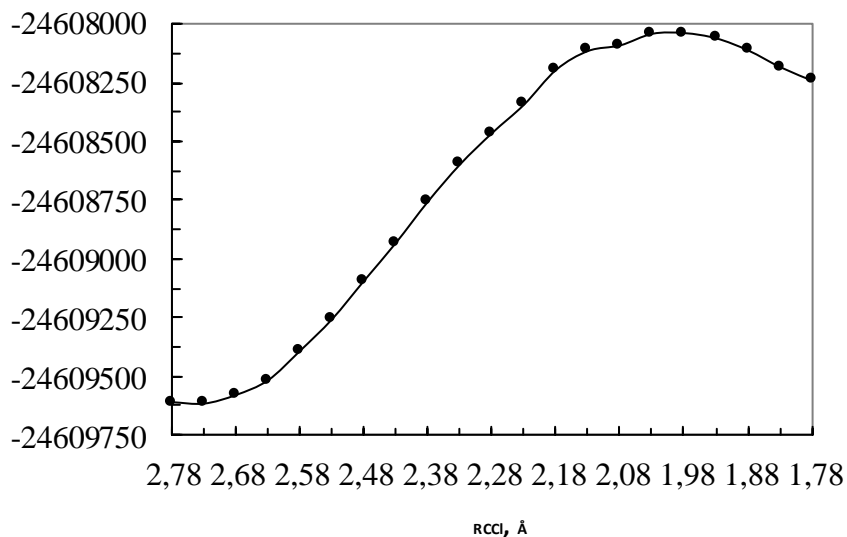


Figure 9: The dependence of the change in the energy system between the distance between the chlorine and carbon atoms R<sub>C-Cl</sub>

- Interaction with PCl<sub>5</sub>'s three molecules with the formation of acetylhypochloride, chlorhydrate and hydrogen:

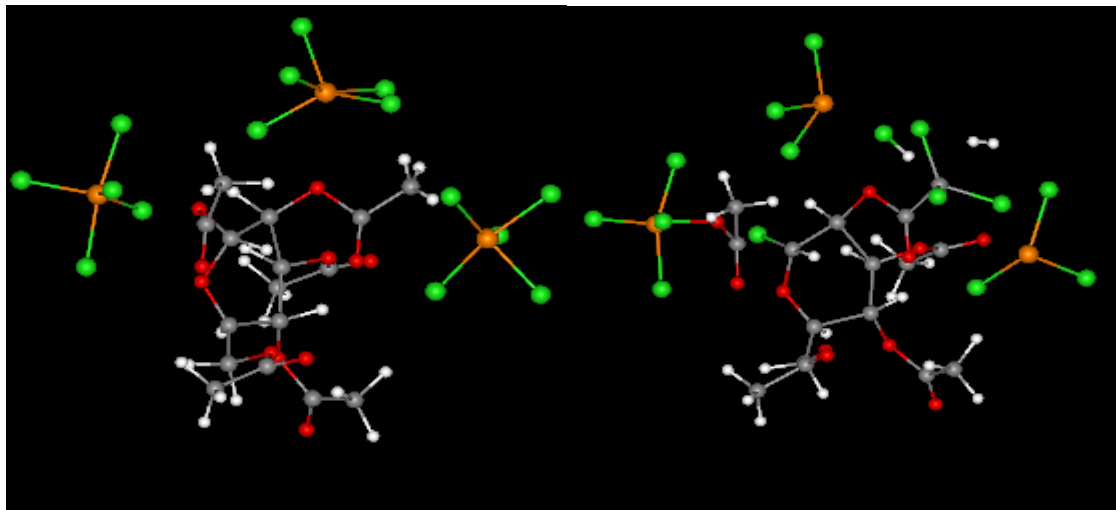
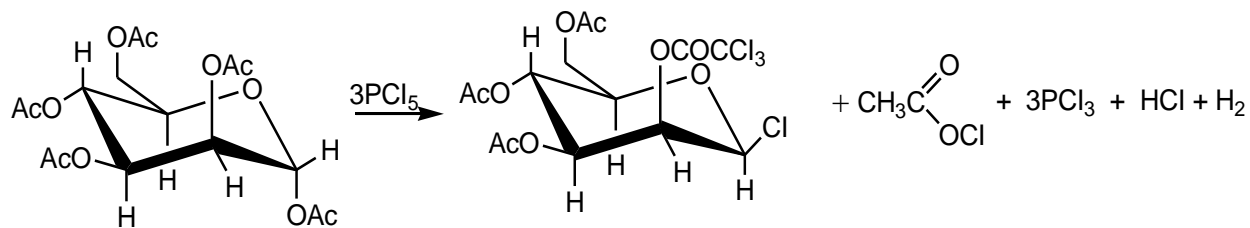
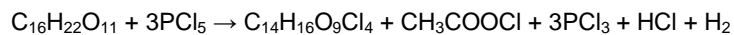


Figure 10: Initial condition

Figure 11: Final condition

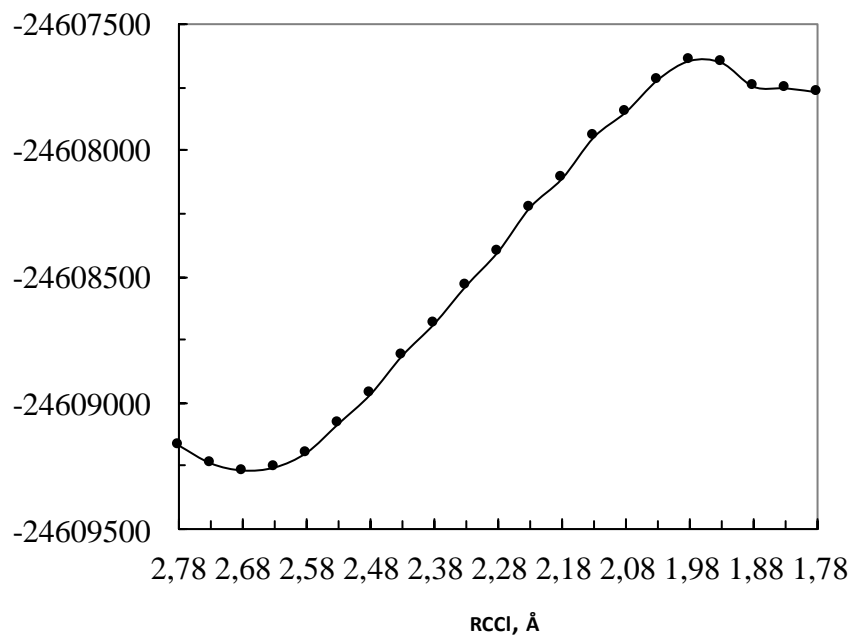


Figure 12: The dependence of the change in the energy system between the distance between the chlorine and carbon atoms  $R_{C-Cl}$

For the full description of the reaction, calculations were performed by the DFT-Density Functional Theory. The energy change  $\Delta E$  of the system was calculated at the time of the  $R_{C-Cl}$  linking distance change to the distance of the

$R_{C-Cl}$ , as well as the meanings of charge on the atoms ( $q_i$ ), dipole moments ( $\mu$ ) and the pyramidal rows ( $P_{ij}$ ). In order to maintain a pyranosyl structure, some valent and dihedral angles have been preserved in a continuous range of calculations. In the 3rd synthesis variant of 1-chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose with the interaction of three molecular with by the molecular calculations carried out by density functionality method is clearly seen that this scheme can be conducted. The system's energy increases, then decreases (the process is endothermic). Activation energy  $\Delta E \# = 1578.16$  KJ/mole. Considering that the system is represented by 8 reaction centers, the mentioned activation energy should be divided into 8 ones. In this case an average energy of activation calculated on one reaction center is  $\Delta E \# \text{ aver} = 1578.16$  KJ/mol/8 = 197.27 KJ/mol, which means that a reaction can be occurred in accordance with this scheme.

## Experimental part:

### 2,3,4,6 -Tetra-O-acetyl- $\beta$ -D-glucopyranose (2).

From Glucose pentaacetate (m.t.128-130<sup>0</sup>), 2,3,4,6-Tetra-O-acetyl- $\alpha$ -D-glucopyranosyl bromide was obtained, which after precipitation from chloroform and petroleum ether had m.t. 87-88<sup>0</sup>,  $[\alpha]_D^{16} + 198.7^0$ . 10g (0,024 mol) of 2,3,4,6 -Tetra-O-acetyl- $\alpha$ -D-glucopyranosyl bromide was dissolved in 50 ml of chloroform. The resulting solution was added 6.64 g of silver carbonate and shaken for 3 hours. The filtered solution was evaporated to dryness. From the residue of substance, it was purified by ether. The yield of the substance was 6.54 g (77%). T. m. 101-102<sup>0</sup>,  $[\alpha]_D^{16} + 84.5^0$  (chloroform).

### 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl- $\alpha$ -D-mannopyranose (4).

A mixture of 10 g (0,028mol) of pentaacetyl mannose, 20 g of  $PCl_5$  and 7 g of  $AlCl_3$  was placed in a flask with a reverse chiller equipped with a calcium chloride tube and heated in a water bath for 3 hours, with a continuous yellowish solution formed by prolonged evolution of hydrogen chloride. After finishing the heating, the liquid was distilled under reduced pressure, first at room temperature and then at 80-90<sup>0</sup>. The oily product remaining in the flask was dissolved in 100 ml of amyl alcohol, from which a precipitate precipitated after cooling, which was extracted with ether. After drying and evaporation of the ether and recrystallization from methanol, 7 g (58.08%) of 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl-D-mannopyranose substance were obtained. T.m.134-136<sup>0</sup>,  $[\alpha]_D^{17} + 16.2^0$  (chloroform).  $R_f$  0.48. Found, %: C 34.2, H 3.0, Cl 31.3;  $C_{14}H_{16}O_9Cl_4$ . Calculated, %: C 35.74, H 3.40, Cl 30.21.

### 1-Chloro-3,4,6-tri-O-acetyl- $\beta$ - D-mannopyranose (5).

100 ml of absolute ether saturated with dry ammonia at 0<sup>0</sup>C T were added to 6 g (0.012 mol) of 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose. After 5 minutes of shaking, dissolution of 1-Chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose. After a few hours, crystals were formed, which after strong cooling were filtered off. The resulting filtrate was evaporated to dryness. For purification, the substance was recrystallized from ethyl alcohol, yielding 3 g (73.61%) pure crystals. T. m. 151-152<sup>0</sup>.  $[\alpha]_D^{20} + 17.1^0$  (ethyl acetate). The resulting 1-Chloro-3,4,6-tri-O-acetyl-  $\beta$ -D-mannopyranose is dissolved in ether, benzene, chloroform, acetone.  $R_f$  0.61. Found, %: C 33.1, H 3.2, Cl 30.5;  $C_{14}H_{16}O_9Cl_4$ . Calculated, %: C 44.37, H 5.23, Cl 10.9.

### 1,3,4,6-Tetra-O-acetyl- $\alpha$ -D-mannopyranose (6).

A mixture of 3.8 g (0.011mol) of 1-Chloro-3,4,6-tri-O-acetyl- $\beta$ -D-mannopyranose (5) was dissolved in 90-100 ml of absolute ether, 3 g of dry silver acetate was added and the resulting mixture was shaken for 2 hours in the cold (up to a negative sample in the solution for halogen). After filtration, the ether was distilled, and white crystals of 1,3,4,6-Tetra-O-acetyl- $\alpha$ -D-mannopyranose were obtained. For purification, the substance was recrystallized from ethyl alcohol 3 g (73.61%).T .m. 131<sup>0</sup>.  $[\alpha]_D^{20} + 80,2^0$  (chloroform).  $R_f$  0.39. Found, %: C 37.1, H 6.22;  $C_{14}H_{20}O_{10}$ . Calculated, %: C 48,27, H 5.74.

### 2-O-( $\beta$ -D-glucopyranosyl)- $\alpha$ -D-mannopyranose octaacetate (7).

A mixture of 2g (0.005 mol) of 2,3,4,6-tetra-O-acetyl- $\beta$ -D-glucopyranose and 2 g (0.005 mol) of 1,3,4,6-tetra-O-acetyl- $\alpha$ -D-mannopyranose was dissolved in 80 ml of dry chloroform. The resulting solution, after addition of 3 g of fused zinc chloride and 0.8 g of chlorine tin, was shaken for 5 hours. The solution was then filtered off from the precipitate, 3 g of phosphorus anhydride was added and shaken again for 10 hours. The filtered solution was evaporated under reduced pressure to dryness. From the residue, the disaccharide octaacetate was extracted with dry ether. The purification substance was recrystallized from ethyl alcohol. Obtained 3,5g (89,9%) of the substance. T. m.  $144^{\circ}$ .  $[\alpha]_D^{20} +34,3^{\circ}$  (ethyl alcohol).  $R_f$  0.55. Found, %: C 48.7, H 7.3;  $C_{28}H_{38}O_{19}$ . Calculated, %: C 49,55. H 5.60.

### 2-O-( $\beta$ -D-glucopyranosyl)- $\alpha$ -D-mannopyranose (8).

2.5 g (0.003 mol) of the disaccharide octaacetate was dissolved in 70 ml of dry chloroform. To the resulting solution, after cooling to  $-10^{\circ}\text{C}$ , 1 g of sodium in 50 ml of dry chloroform was added. The mixture was left to cool and shake for 50 minutes, and the syrup-like mass gradually emerged from the solution. Then 60 ml of chilled water was added to the reaction mixture and shaken vigorously. After the residual neutralization of the liquid with dilute acetic acid, the alcohol layer is evaporated in vacuo to dryness, the residue was dissolved in 2 ml of glacial acetic acid and left to stand for three days, and the disaccharide gradually crystallized. The purification substance was recrystallized from ethyl alcohol. Obtained 1,125g (89, 2%) of the substance. T. m.  $149-151^{\circ}$ .  $[\alpha]_D^{20} +32,6^{\circ}$  (water).  $R_f$  0.62. Found, %: C 46.3, O 52.2;  $C_{12}H_{22}O_{11}$ . Calculated, %: C 42.1, O 51.4.

The research of samples of structural-morphological elemental structure has been performed by JSM-6510LV scanning electronic microscope of a Japanese company JSOL equipped with English company OXFORD INSTRUMENTS's energy-dispersive micro roentgen-spectral X-Max N analyzer. Surface electronic images have been obtained both secondary (SEI) and reflected (BES) electrons using 20 kW accelerator voltage. In some cases, with the purpose of reducing a surface charge, covering of samples was occurring with the Pt, about 10 nm layer, with JEC-3000FC equipment of the Japanese company JEOL vacuum covering equipment.

The structure of the synthesized disaccharide was determined by physicochemical methods of investigation: an investigation of the structural-morphological elemental composition by an electron microscope, with a definite rotation, infrared spectrum. Analysis showed that it has the empirical formula  $C_{12}H_{22}O_{11}$  (fig.13).

In infrared spectrum the absorption spectrum is observed in  $3416\text{ cm}^{-1}$  area, characterized for hydroxyl groups; For the C-O-C group is typical in  $1052-1287\text{ cm}^{-1}$  area; and for the  $\text{CH}_2$  group is typical in  $1414,32-1572,20\text{ cm}^{-1}$  area (fig.14).

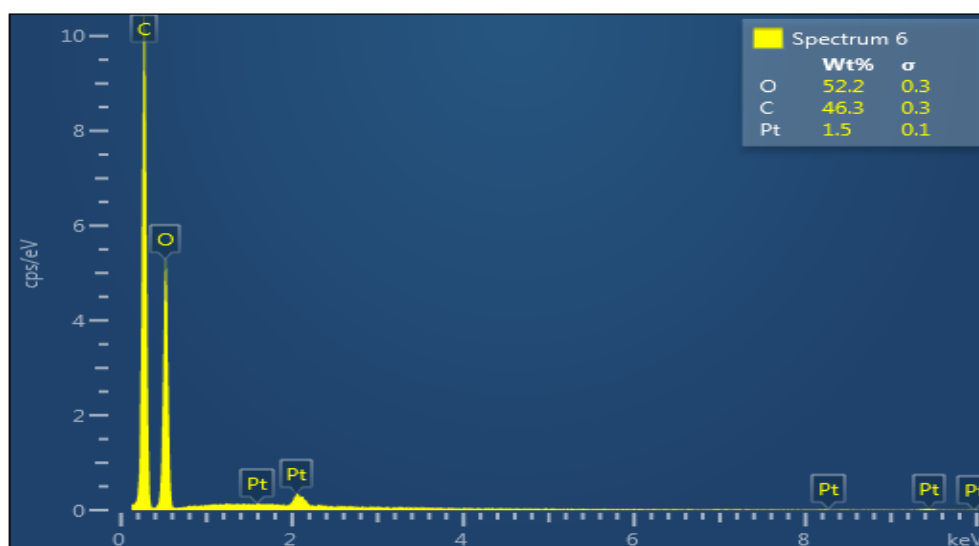
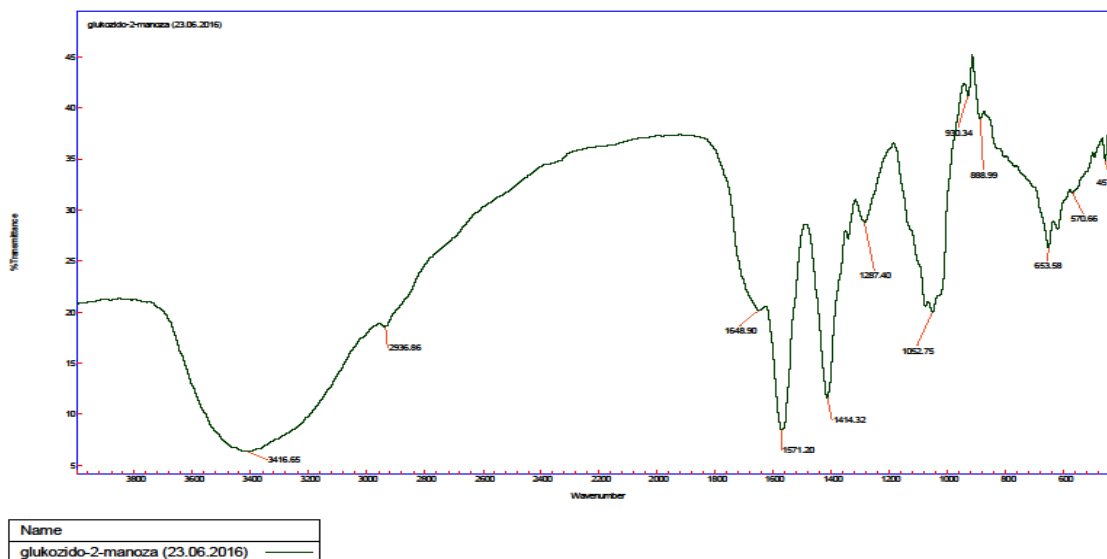


Figure 13: Structural-morphological elemental composition 2-O-( $\beta$ -D-glucopyranosyl)- $\alpha$ -D-mannopyranose

## Agilent Resolutions Pro



**Figure 14:** Infrared spectrum 2-O-(β-D-glucopyranosyl)-α,D-mannopyranose

## CONCLUSION

A new 2-O-(β-D-glucopyranosyl)-α,D-mannopyranose disaccharide was synthesized.

In the result of theoretical calculation relevant recommendations have been confirmed and obtained for 2-O-(β-D-glucopyranosyl)-α,D-mannopyranose final synthesis at all stages.

In comparison with discussed mechanisms activation energies of 2-O-(β-D-glucopyranosyl)-α,D-mannopyranose synthesis is obviously energetic preference of process occurrence with the second mechanism. Theoretical calculations have been performed by semi-perpendicular quantum-chemical AM1 and DFT methods.

Four variants are proposed for the complete mapping and description of the reaction of 1-chloro-2-O-trichloroacetyl-3,4,6-tri-O-acetyl-β-D-mannopyranose and synthesised products.

Theoretical calculations have been performed gradually by semi-perpendicular quantum-chemical AM1 and DFT methods for full description of synthesized disaccharide of 2-O-(β-D-glucopyranosyl)-α-D-mannopyranose reaction. It is shown: From the compatibility of the proposed four-way activation energy of the chlorination reaction of α-D-mannose pentaacetate, it is obvious that the energy preference for the appearance of the process with the third scheme - in interaction with three molecules of PCl<sub>5</sub> with the formation of acetyl chloride, hydrocarbon and hydrogen.

The interest of scientists in research laboratories will lead to the results of quantum-chemical calculation that will be interesting in the future in the synthesis of acetylated and free disaccharides for a complete description of final products.

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## THEORETICAL ASPECTS OF INNOVATIVE ECONOMICS

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### ABSTRACT

In the article it is studied the main theoretical topics of innovative economics, its gnoseology; it is investigated interrelation among economic growth, new technological structure and creative business in the country; it is highlighted some basic directions of formation of clusters. On the basis of main characteristics of development of science and innovations in leading developed countries. The article gives recommendations about transfer to modern innovative model of Georgian economical growth.

**Keywords:** intellectual potential, innovative economics, innovative production, human capital, scientific systems, education, science, knowledge economics, technological structure, creative work.

### 1. INTRODUCTION

Economic growth and strong positions of the state in global economy today depends not only on the geographic location of the country or reserves of natural resources, but also such factors, as intellectual potential, utilization of modern technologies in production, leading scientific-technical processing and commercialization of innovative solutions in different fields.

In the economy of modern Georgia, transfer to the modern model of economic growth is performed, were necessary. Extremely low level of innovative activity is still maintained. The purposes related with the stimulation of development of the economy of the country and innovative technologies and institutional support are performed in the scales required at the level of essential challenges from high-developed countries.

The effect received from the introduction of innovation processing countrywide is in fact insignificant; there are no close ties and contacts between science and business, which speaks about ineffective functioning of the national innovation system.

Since 2013, economy of the country (Georgia) entered the phase of reduction of GDP growth rates, which is the result of worsening economic activity, these factors deteriorated the discussions as in the scientific circles, so – in direction to the creation of new model of selection of direction of economic policy at the level of the government of the country, and economic development.

In the abundance of all opinions originated in course of this discussion, we consider it purposeful to identify two directions:

1. Economic policy of the country shall be based on the promotion of demand inside the country;
2. Economic policy of the government shall be based on construction of competitive economy, through improvement of institutional quality and external openness.

In any case, way out of the created situation exists in solving the problems existed in the field of innovative policy, as well as the required resource and time expenditures. Under the conditions of global competitiveness, in the process of creation and introduction of innovative production of Georgian companies, they shall be focused on the global markets and this factor shall become the most important one in the development of Georgia.

### 2. REVIEW OF THE LITERATURE

The necessity of transfer to innovative way of development highlighted scientist- economists` interest to the problems of innovative economics theory and practice. It is approved by the number of publications dedicated to the given theme during the last decades. Scientific discussions about this topic reflect the research of innovative directions of economic growth, elaboration of hopeful scientific basis, complete usage of intellectual potential of the country.

We have learned a of serious scientific works on the point of strategic development of innovative economics. Among them we highlight Chicava L. 2006; Kleiton M., Cristensen. 2004; Taker Robert B. 2006; Davtian M., Shcherbakova T., Karzakova I. 2014; Khargadon E. 2007; Gorfinkel B. 2009 and so on.

### 3. MAIN PART

#### 3.1. For Determination of Innovative Economy

Innovative economy – this is the economy of the countries, where most of the organizations are engaged in innovative activities (production and utilization of innovative products), and innovative production shall exceed half of the total amount or be close to it. 60-80% of industrial entities are engaged in the innovative activities of the developed countries and more than a half of service organisations. The sector of innovative economy was originated in the leading countries in the field of industry, from the period of the first scientific-technical revolution and since that period it was developed into the dominated sector of the economy with high technologies and high labour production.

- Innovative economy in general is the economy with the ability to use any innovation (patent, licenses, know-how, attracted and own technologies etc.) useful to the society effectively;
- Innovative economy is the general innovative system (infrastructure) in the country, supporting realization of the ideas of scientists and their implementation in the innovative products;
- Innovative economy is the one being able to accumulate, increase positive, creative human capital and prevent accumulation of its negative, destructive element;
- Innovative economy was and is being created and developed along with and parallel to the growth of the quality and price of human capital and human capital is the main factor of its development.

Innovative economy is comprised of the venture scientific-technical and technological business as important element, risk-consuming business scientific originations, inventions, in view of the realization of large and average technological innovations. Venture scientific-technical and technological business, in view of the entrepreneurship is directed towards making high profit, and in view of the development process – of natural technologies and new strong companies – in creation of global high-technological leaders.

Main element of the infrastructure of innovative system is technology park, which is based on the achievements of global venture business and experience, specialists of global level, transparency and competition, investments of business-angels (private investors with the experience of working in venture business), representing approximately half of entire investments.

In general, innovative activities in the development of modern economy is comprised of more than half of the entities and it is applied to all kinds of economic activities. Competitiveness stimulates entrepreneurs and the management forms new products, innovative products, in order to maintain and extend their niche at the market, increase profit. Hence, free competitiveness is main precondition (driver of innovation and innovative production. Competitiveness according to the activities of all kinds stimulates entrepreneurs and management to create innovative products.

Free competitiveness is the growth of knowledge, innovation generation and main stimulator for creation of effective innovative production.

Replacement of physical capital takes place in the innovative economy, in the form of the share in the main factor of development of human capital and national wealth. This process took and takes place at each stage of development of economy and society. However, it became determining factor at the stage of post-industrial economy, and especially the economy of the knowledge.

Currently, modern post-industrial innovation economy of the developed countries is characterised with:

- High index of economic freedom providing independence of labour and its dislocation, market independence, safety of people, protection of private ownership, free competitiveness, rational and scientifically justified participation of state in the economy, high demand on the innovations from the side of the economy and competition, including according to the quality and efficiency;
- High and competitive quality of life, human capital is outflown where they offer better comfort for working and living to the demanded and competitive specialists;
- High and competitive quality and size of the accumulated national HC determining opportunity of economy and state in the innovative activities and the effectiveness of innovative system;

- High innovative activity of organization (60-80%) and, correspondingly, high share of the innovative and science intensive production and service;
- Replacement of physical capital with human capital in the national wealth. In the leading countries having innovative economies share of HC in the national wealth amounts to 70-80%;
- Free competitiveness in the economic and other activities, supporting effective innovations in all fields of the economy and life;
- Abundance and competitiveness of innovations, including market selection of the most effective of them; abundance and competitiveness of innovations give rise to the condemnation of false innovations, reducing risks on the entrepreneurs, at the expense of their distribution, rising efficiency of the sector of innovations of the economy;
- Initiative of new markets, which also represents significant kind of innovative activities.

Innovative economy includes six main components: 1. Education; 2. Science; 3. Human capital, high quality in the form of high quality and the specialists of high qualification; 4. Innovative system including legislative base and material component of innovative system (centres of transfer of technologies, business incubators, technological parks, technological polices, innovative centres, clusters, territories of introduction of high technologies, venture business etc.); 5. Innovative industry of realizer of innovations; 6. Favourable environment of labour and living of innovators of HC functioning. (Melnikov O., Larina V., Gakin N. 2015).

Further stage and order of the economy of post-industrial innovation is knowledge economy and society. For creation of innovative system, modern education, knowledge production and the environment producing knowledge are required; innovation oriented industrial environment requires initiation of knowledge and intellectual property, and then cooperation of self-supporting processes, through trading partnership and production, diffusion of technologies and venture business.

In view of the sciences and innovations, leading countries are characterised with:

- Supremacy of law, high level of personal safety of people and business;
- High quality of life;
- Social stability;
- Active and competent elite;
- High indexes of economic independence;
- High level of development of fundamental science;
- High level of science of applied nature;
- Strong intellectual centres of technological development in the country – existence of technological parks;
- Significant sector of economy of knowledge;
- Strong synergetic effect in every field of intellectual activities of a human;
- Existence of developed and effective innovative system supported by the state;
- Existence of the developed and effective venture system supported by the state;
- Attractive investment climate and high investment ratings;
- Favourable industrial climate;
- Diversified economy and industry;
- Competitive production at the technological markets of the world;
- Effective state regulation of development of economy and country;
- Existence of transnational corporations providing competitive technological and scientific development of the country;
- Low inflation (as a rule, below 3%).

Existence of the named factors and terms conditions generation of innovations and effective mechanisms of their bringing to the level of competitive production.

Foundation to the post-industrial innovative economies and information society is represented by the supremacy of legislation, high quality of human capital and life and effective industrial society existed in the past, and the economy consistently transformed into the post-industrial innovative economy.

Effectiveness of the innovative system of the country and innovative sector of the economy significantly determines competitiveness of the country itself.

In the annual rating of competitiveness of the countries concluded by Switzerland Research Centre IMD, top ten of the

leading 59 countries of the countries include: Hong-Kong, USA, Switzerland, Singapore, Sweden, Canada, Taiwan, Norway, Germany, and United Arab Emirates.

Getting United Arab Emirates into the Top Ten is conditioned by huge profitableness of the Country from oil and air, as well as their reserves, high diversification of economy (10% of GDP of the country comes on the field of oil and gas), 70% of employees are non-residents of the country, which include selected qualified engineers, physicians, teachers, researchers and workers.

Other countries include those with high share of innovative economy and venture business, creative class and large share of high technologies and high technological, and high share of science intensive products in GDP and export. (Florida R. 2007).

High stage of post-industrial development of innovative economy and further stage of economy and public development of the leading countries of the world include knowledge economy. Often the term "knowledge economy" is used as the synonym of innovative economy, however the sector of innovative economy was originated inside the industrial economy.

Quite strong sector of knowledge economy under the modern conditions exists and is being developed in the USA, Japan, Australia, Canada, Germany, France, Great Britain, Switzerland and Israel. Knowledge economy is the one main production of which is knowledge, innovations and high technologies.

Main factor of formation and development of knowledge economy is creative innovative human capital. The process of development of knowledge economy foresees rising quality of human capital, quality control, and knowledge production, high technologies, innovations and high-quality service. Large share of investments are performed by the developed countries into the human capital. This grants them decisive priority in the scientific, innovative, and intellectual development, as well as forwarding growth of the quality of living of population. .(Qoqiauri L., Qoqiauri N. 2015).

Leading countries of the world created conditions standing close to the optimal ones for rapid and effective reflection of scientific ideas in particular goods and products. Fundamental studies large investments in scientific systems (HC) and the technologies of new nature created by them provide their leadership among leading countries of the world.

Due to the best conditions for high quality of living and intellectual work, in the leading country in the field of global economy and science – USA, inflow of strong flow of high qualified, human capital takes place, thus giving additional competitive priority to the USA.

High-quality human capital, along with the knowledge production is provided with extremely less expenses due to the strong flow of HC for USA, thus reducing expenses on high technologies of innovations and production of innovation products of high additional value.

The countries of post-communist domain, including Georgia, will be to create effective industrial economy gradually with the competitive markets. Industrialization process, the process of creating effective economy has not been completed in Georgia yet. At the same time, relatively high positions in the fields of science, education, medicine, safety and especially in the moral state of society are lost.

### **3.2.Negative Trends in the Economy of Georgia**

From the point of innovative development of economy of Georgia negative trends are observed, which may be explained as by geopolitical, so – economic reasons. From geopolitical point of view, this is violated territorial integrity of the country, and from economic point of view this is devaluation of the national currency, reduced incomes from export, reduced import of goods and entirely worsening of structure of payment balance.

Reduction of real salary, adverse reaction of the labour market take place on the reduction of demand; herewith, the level of unemployment was increased. The level of poverty was significantly increased at the background of devaluation of real income, which extended the deficiency between provided and less provided family farming.

Main reasons of the condition created in the economy and prevention of economic growth at the base of existed economic model may be formulated as follows:

- Inconformity between the mechanisms of funding and the reasons of sustainable development was formed;

- Ineffective utilization of domestic consumer demand on the import of the latest with the reason of orientation and on the other hand, its restriction with the mandatory payments per consumer crediting, at the expense of extremely high interest rates;
- Weak development-utilization of scientific potential complicating or making import substitution impossible per particular directions.

At the background of large-scaled import, innovations of existed scientific potential is not transferred into the processing and production of new products.

### 3.3.Science, Innovations and Technological Order

Outcomes of science and scientific researches and processing are the grounds of forming modern creative economy, taking into account new kinds of economic sectors and fields.

Currently, efficiency of Georgian economy and the objective for rising profitableness is the main and prior objective of the managing force of the country. Main line of solving this task, necessity for development pre-emptive development of science of fundamental and applied nature and rapid introduction of its processing in the production of goods and services.

Given reason and objectives, logically originated from the set goal and future of our country depends on the solution of, foresees particular integrated indicators, based on which we may analyse and evaluate successfulness of performance of the set goals, form new model of technological order.

There are five technological orders known (Gorfinkel B., Popadiuk T. 2014)

- The first technological order (1785+855), which is based on the utilization of water energy and hence the technologies being introduced in the economy;
- The second technological order (1830-1890) was based the rapid development and mechanisation of railway transport and industrial production (leading factor: steam engine, machine tools);
- The third technological order (1880-1940) is related in the first place with the rapid development of electric energetics, chemical industry and machine engineering (leading factor – electric engine, metal);
- The fourth technological order (1930-1990) – this essentially is the era of massive production, which, in the first place is related with new synthesis materials, production of which were commenced from the oil and gas, as well as the identification of available computer technologies (including internet-technologies). Main factor: engines of internal combustion, petrochemistry).
- Under the modern conditions, economically high-developed countries started formation of the sixth technological order and transformation to it (this technological order is being formed with us within the framework of the fifth technological order), which is based on the new processing, biotechnologies, processing and development of new technologies, and the systems of artificial intellect, further development of global networks, including creation of business-communities.

Under the modern conditions, multiple scientific works were dedicated to the fact that in the economically developed countries (in the first place in the USA, Great Britain, France, Germany, Japan and some other countries) they are transferred to the economies of the type based on the information and managerial technologies. Products of such economies are innovations or new technological inventions, or new models, new methods of business development.

In the beginning of the last century, extremely rapid growth of creative activity is being noticed in USA. Growth of investments took place in the scientific studies and processing and correspondingly, giving rise to the amount of the persons engaged in the creative work.

In general, there is nothing new here. People were engaged in the creative work since antique era, however distinction of modernity exists in the fact that this activity moved to the center from the peripheries of entire economic infrastructure.

USA is the example of the growth of creative economy, for example in Florida:

- Systemic investments in the form of expenditures on the scientific-research and experimental-construction works was increased from 5 billion US Dollars in 1950 to 250 billion US Dollars in 2010;
- Amount of the patents issued annually in the USA in 1900-1950 was increased from 25000 to 43000, and in 2010

the figure reached 150 000;

- Amount of people engaged in the creative technical works (scientists, engineers) was increased from 42000 to 625000 in 1950 and in 2010 it reached 5 million.

Creative economy in the economically high-developed countries and especially USA reached modern scales and it influences greatly upon economic growth, mostly through respective infrastructure. This is the set of social institutions, social structures of creativity, created for these reasons. They include:

- New systems of creativity in the field of technologies and industry (subsidizing universities, by transferring emphasis to the developed system of venture capital);
- New models of producing goods and rendering service (technologies of zero reserves, technologies of total quality, Startup of firms);
- General social, and cultural and geographical terms favorable for creativity of any kind.

Scientists pay great attention to the survey of new directions of economic development – Creative Economy. This is the economy of mind, intellect, knowledge, skill, innovations, main resources of which are intellectual-creative resources of human (person) in which the intellect represents Main capital, and creative actions, identified through the creative energy of market subjects – “Turnover” capital. (Taker Robert B. 2006).

It is noteworthy that one of the most effective forms of extension of innovation market is social and innovation orientation, which are actively used by European countries. In this case, social orientation provides extension of demand at the internal market and the quality required for development of innovations of labor resources, as for the innovative orientation – on its segment, which is supported and provided with domestic innovations, as technological, so social, and ecological ones.

Transferring to the innovative type of economy is of great importance in the scientific-research and experimental-construction works for creating national innovation system of development. In its essence these are prospective innovations, allowing achievement of competitiveness of the country at the global level and maintaining profitable and required specialization in the system of international distribution of labor (Table 1).

Table 1

Year	Denmark	Island	Norway	Finland	Sweden	European Union (27)
1985	1,25%	0,74%	1,48%	1,58%	2,88%	–
1999	2,10%	2,39%	1,65%	3,21%	3,62%	–
2015	2,98%	2,40%	1,65%	3,55%	3,41%	2,17

**Source:** Antyumina N. 2015, Importance of the Experience of North European Countries for Economic Theory and Policy // Ekonomika, No. 8; pg. 51-59 (in Russian).

Given factors in general confirm and explain the reason for supporting innovation development direction of the European countries. Priorities of the state economic policy in these countries is being essentially formed based on the neoliberal ideology, which foresees minimum involvement of state into the regulation of the economic processes. The state is actively involved in the economy in these countries, thus allowing establishment of national innovation systems and implementation of the transfer to the innovation direction of development.

### 3.4. Forming Future Economy in Georgia

One of the most important tasks faced by our country is determination of the fields of technologies of science holding maximum potential required for formation of economy of the future.

Achievement of economic growth and rising quality of life of population is impossible without implementation of complex modernization of the most complex social-economical task and increasing innovative activities of industrial subjects (Kashin Zakhar. 2009).

Modern innovation policy foresees taking into account regional specificity, active involvement of regions in the processes of formation and realization of the mechanisms of stimulation of innovation activities. (Gokhberg. 2015).

Territorial clusters occupy significant place in the innovation policy of the new generation, which play the role of the instrument of accumulation and structuring local "players". They represent separate elements of the regional innovation system (business, science, education) for the purpose of implementation of the joint projects, which are able to increase competitive abilities of participants of the cluster.

Increasing competitive abilities of business in the cluster is provided through effective interaction of the organization located close to each other, innovations, technologies, know-hows, and availability of specialized service and high-qualified staff, as well as reduction of transactional expenses. Formation and development of clusters represent the mechanism of activation of the processes of effective and foreign economic integration of attracting direct foreign investments. (Azoev G. 2012).

Inclusion of national clusters in creation of the price makes it possible to rise essentially the level of national technological base, accelerate economic growth at the expense of strengthening of international competitive abilities of the entities included in the cluster.

Main term for creating effective clusters in the country (Georgia) is state assistance. Main attention of the state today shall be oriented towards creation of the innovation infrastructure. Identification of strong private investment of Georgia at the market of nanoindustries in Georgia is the matter of future and in the closest years it is unreal to speak about them.

According to the optimistic scenario, by the year 2020 particular fluctuation will be achieved at the market of innovative production; hence, future innovation structure of the country might be oriented towards formation of the clusters of nanoindustries.

Main problems of forming clusters include following:

- Restricted amount of these innovative projects, which may be realized within the framework of the cluster;
- It is impossible to achieve critical abundance of these innovative projects, which are able to transfer development of the territory to the stage of clustering;
- Existence of the complex programs for clustering in the regions;
- Insufficient use of institutional assistance of clusters, especially at the initial stage of their formation;
- Uncertainty, obscurity of the target markets and particular purchasers of the products, which should be produced inside the clusters.

One of the lines of solving the problems related with the formation of clusters may be formation of the technological platforms, as the model of the system of horizontal partnership, created for commercialization of the innovative products to be produced inside the clusters.

#### 4. CONCLUSION

1. Main lines of structural activities in the closest perspective shall become introduction of the policy, which shall be directed towards increasing capital investments into the innovation production, within the formation of the innovation clusters in the regions. Under the conditions of maintenance of the level of life of the population, this latest is significant and mandatory term of the successful structural midterm and long-term policy of the government of the country;
2. Structural and sectorial changes performed in the economically developed countries of the world and in the first place – western states in direction to the high-technological production, determine the development vectors of other countries, including Georgia. This requires new managerial methods of approaches for responding to the given challenges;
3. In multiple countries of Post-Communist domain, one of the methods include creation of clusters. This makes it possible to:
  - rise competitive abilities as in regional economies, so – in entire countries;
  - improve interaction of economic institutes of business and state;
  - use effectively intellectual-creative resources of the organizations involved in the performance of unified business assignments;
  - increase Gross Domestic Product of territorial units and entire country, as well as increasing profitableness of labor.

All these prevent promotion of modernization of the fields at the expense of transferring innovation knowledge and technologies, within the framework of the unified information-technological domain.

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## UNIQUENESS AND SYSTEM PROPERTIES OF ARCHITECTURAL SPACE

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### ABSTRACT

Emergency of theories and approaches in studying of structures, processes of complex structures' development and self-arrangement had considerable impact on traditional mechanical concepts in architecture. So that to analyze architectural systems, such as volumetric and spatial structures of a city, including social, functional, economical and objective components, there are the means appearing which allow working with their complexity. Sciences dealing with complexity by means of systematization, inherent with architectural environment, allow analyzing it as a unified organized entirety, complied with certain consistent patterns. The article deals with the problem of architectural environment's complexity from instrumental and methodological point of view. The aim of this article is in description of interactions of concepts of uniqueness and systematization in investigations of architectural environment that facilitates discovering tendencies in ideas development of city's space in general. A list of architectural environment's attributes complying with systematic patterns has been discovered. Internationalization issue in the context of saving architectural environment's uniqueness has been specified. The way how systematic concept of space and city's components is reflected upon its completeness is illustrated on the examples of unique features of architectural environment.

**Keywords:** architectural space, complexity, city, planning, system.

### INTRODUCTION

In many aspects interaction of traditional and universal under globalization effects became a central issue both in architecture and other spheres of human activity. Normally, by 'globalization' we basically mean exchange acceleration of information, fund, goods, blurring of distinction, cultural, political mutual effect of different countries. In this context the main problem for architects becomes an issue of external impact on architectural space that makes architects choose between space reflection of consequences of cultural, ideological, social processes of homogeneity rise and saving of shapes, decorative elements, techniques of traditional environmental filling for diversity increasing and simplification of identity construction among city residents. However, there are less explicit representations of globalization which detect diversity increasing in appearance of new architectural combinations [3]. We may state that universalism in architecture started to express at the beginning of the XX c. through international style which in utopian forms appeals in reply on industrial progress to create a universal 'machine for life' complying with it. By the middle of the XX c. modernism became a global-scaled phenomenon, with its rationality, scientific innovativeness and progress. It is the very reverse of the policy of saving local identity, it became clear that standardized architectural space could not form self-consciousness as a result of cultural, behavioral, space interaction. Le Corbusier considered regionalism as an enemy of modern architecture. But as long ago as in 30s review process started. Such architects as Frank Lloyd Wright, Alvar Aalto, Luis Barragan were worried of merging of architectural language and used historical and national motives combined with contemporaneity that lead to generation of regionality. Also, it is worth mentioning of symbiosis conception proposed by Kisho Kurokawa which was present in metabolism theory in 1960s and urged to combine traditions and up-to-date techniques. In his opinion, hybrid architecture could combine features of different cultures and fit perfectly into architectural space, and being extant, to a certain extent, this idea would not run out of its importance.

### BASIC MATERIAL OF RESEARCH

As of today, globalization impact on architecture can be traced both through implementation of computer technologies and software, methodologically bringing architectural activity at the same level all over the world and through multi-international cosmopolitan space structures. Nowadays they can be traced to the following forms: shopping centers, malls, transport hubs, skyscrapers spread all over the world and generating changes in space perception among end

consumers [10]. Space identity and effect made on residents by the space in general (Figure 1), are still unsolved issues which solving depends on constant improvement of architectural space conception.

In order to clarify the situation with traditional and universal in architecture, it is necessary to find out the content of facility of architectural space absorbing both these phenomena. Guided by scientific knowledge, an architect creates a necessary methodological base, design tools that incorporated empirical and theoretical knowledge and form their own perception of 'architectural space' concept content. Faced with difficulty and multi-element unit which facility of architectural space has, theorists had to divide it into much minor and convenient for analysis aspects characterizing the facility in general, or for narrow-focused purpose – restricting in space, time and territory for simplification of tasks solving. Principal division into two types of investigations referring to objective-spatial, material constituent and search for new behavior patterns, perception, subjects' interaction and spatial environmental situation affecting aesthetics and psychology spheres. As, for example, functional-spatial conception of patterns proposed by Kr. Alexander, determined as stable functional elements of spatial city structure, well-known semiotic conceptions considering architectural facilities and their surroundings as storage devices for certain scope of information strictly built by language consistencies common to them; or mental models of Kevin Lynch investigating urban space communications by sociological surveys [1].

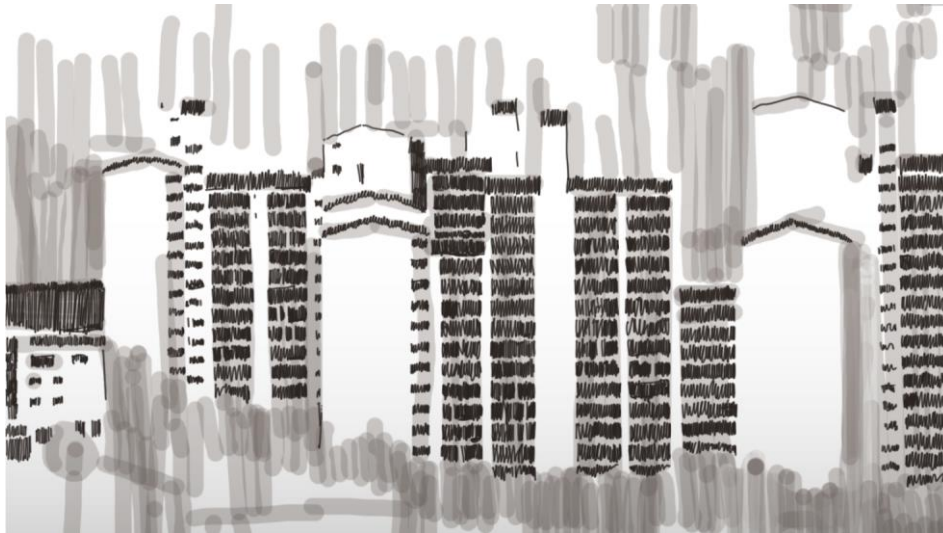


Figure 1. Example of identity loss in the architecture of residential buildings

System approach allowed to embrace architectural facilities in all complexity of their interconnections. Such view on space brings together architecture and urban planning theory. Building is considered as a unit of integral space. Thus, understanding of architectural space became impossible without understanding of structure and consistencies of city as a system. Comparison of city with an organism takes place not at simple analogy level, city serves as a system developing by the integral laws of matter existence representing processes of self-organization [9] (Figure 2). Earlier accepted forms, values, assessment criteria, characteristics of architectural facilities are changed. Integrity characterizes a system with features appearing as a result of its components' interaction. Hegel states as yet: "but further, although the whole is equal to the parts it is not equal to them as parts; the whole is reflected unity, but the parts constitute the determinate moment or the otherness of the unity and are the diverse manifold. The whole is, therefore, in the parts only equal to itself, and the equality of the whole and the parts expresses only the tautology that the whole as whole is equal not to the parts but to the whole". System approach transferred integrity principle from sphere of philosophic musings into tools of scientific analysis.



Nest of a sociable weaver

The ancient city of Al-Ula, Saudi Arabia

Figure 2. Similarity of animal and human settlements

Further theoretical revamp in understanding of cities as spatial social-economical systems occurs due to actions of so-called 'new science about cities'. United by common problem of rapid urbanization growth and achievement of stable city development, dozens of laboratories, faculties and universities such as University college of London, Massachusetts Institute of Technology, Santa Fe Institute, Delft University of Technology and others set an aim to form understanding, development of theories about cities through implementation of computer quantity approaches, One the first theory of urban complexity was developed by Peter Allen in 1981 and showed that cities have features of complex systems such as openness, chaotic and dynamic nature, non-linearity. They are applied to mathematical models developed for studying life forms and other structures. Different theories of urban complexity reflect different aspects of city studying. Investigators believe that theories of urban complexity can be used not only by politicians and urbanists in order to achieve ecological stability. Also, other architects and another specialists related to city studying can use the theories as a conceptional base for analysis of architectural space from system point of view.

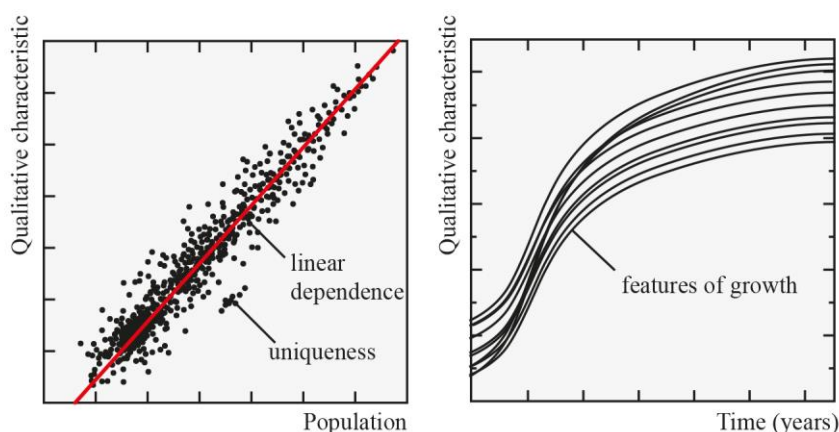


Figure 3. Graphs of the dependence of cities quantitative indicators

An example of how system integrated perception of city determines universal and individual peculiarities of urban space can be urban scaling theory formed by investigation group of Santa Fe Institute headed by G. West. It was found out

that regardless of their individual visual characteristics, planning structure, cities represent saving effect in resources consuming (double city expanding saves 15% of resources). In the same way saving effect can be also observed in life forms from single-celled organisms to large mammals, thought here efficiency ratio is 25%. Herewith, social-economical values such as salary, amount of patents, ideas made in city, amount of criminals – systematically increase by 15%. All these refer to quantity indexes and despite the fact that each city has its own unique aspects, its own history, culture and geography, West states that any quantity indexes from 80% to 90% are independent on geography, history, culture and politics. Effect of individuality factors is limited to 10%-20% from all that happens in urban system [2]. The uniqueness can be represented as a minor deflection from mathematical consistencies of social networks interactions inscribed into urban infrastructure (Figure 3).

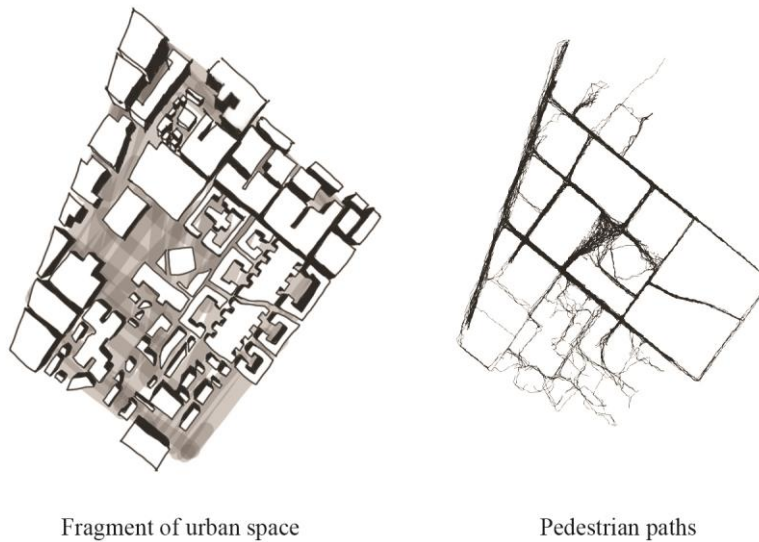


Figure 4. Modeling the social activity of architectural space

This knowledge can be mastered by implementation of modeling means as such tools help create integral and adequate perception of space in the processes happening in it in contrast to traditional approaches. Normally, at macro level analysis of space is carried out by such parameters as compositional, functional, communicational – one of the most important parameters responsible for quantitative assessment of spatial activity. Social activity in pedestrian and public spaces is paid a great attention as it is at the same time a systemically important component of architectural space design and quality criterion of obtained social-spatial integrity [4]. Speaking of movement, Michael Batty points out that it was generated not in design, but it was influenced by rising interest to complexity studying which can be observed in many spheres including sociology.

In social activity Portugali sees the very reason of urban space complexity. If imagine a city as asset of elements: parks, roads, doors, - it will be a large-scaled variety – a simple system. It is a human as this system's component, his/her behavior makes the system unpredictable. Such duality of urban space makes an average resident equal to a designer, an architect as a human is a part of this organized complicated system, creates it by his/her movement, existing in it. Infrastructure, houses, roads, transport systems are secondary in comparison to all people's dynamic interaction [5].

That is why there is a great number of modelling means directed into analysis and detecting information about human activity in urban space. In order to detect information about social-spatial dynamics, GPS-trackers are usually used as well as social networks data, information gathered from sensors of various types, mobile phones and other devices of space monitoring [8]. Also, architects can get quantitative information how people use building spaces as the models can be used on different scales (Figure 4).

In using complexity principle, Nicos Salingaros sees solutions of many architectural problems too, including aspect of tradition, he says that architects should use knowledge about complexity, understanding how it will reflect on architectural form, surface and space: "an architect needs to understand complexity: its intentional generation, and how

to manage emergent complexity as a design tool. It is essential to stop using complexity as a metaphor detached from reality, in a random process without any underlying reasoning, and adopt instead a practitioner's perspective" [6].

## CONCLUSION

Taking into account the consistencies detected in urban complexity theories, their imagination of universal and individual co-existing in the same plane, the existing discussion about globalization and traditionalism in architecture is added with question regarding the necessity of implementation of system knowledge into the process of architectural design. In rapidly, and sometimes suddenly, uncontrolled growing cities developing in contravention of urban policy, solving the problems related to architectural space are necessary to be considered in the dynamics that is impossible without modelling means of urban space and theoretical base of urban complexity. Although, there is an opinion that architecture does not require intensive informatization, that data can provide with wrong perception about quality of design result [7]. Methodology can sometimes turn out to be useless even if it is perfectly accurate. Nobody prevents from combining modelling with traditional design means, or refuse them. But adequacy degree of the solutions made by an architect depends on how well local spatial situation is studied, on quantity and quality of the information obtained by an architect and on type of design means he uses. That is why further methodological optimization of these data is required for their implementation into architectural process.

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**Mikhail Z. Vaynshteyn**

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**Shaklo Miralimova**

Academy of Science. Institute of Microbiology. PhD in BS.

Representation of Azerbaijan International Diaspora Center in Georgia is publishing scientific papers of scientists on Website and in Referred Journals with subjects which are mentioned below:

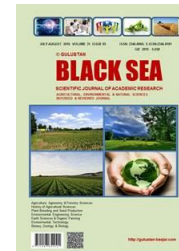
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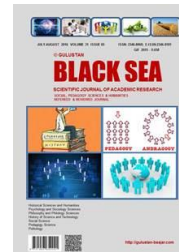
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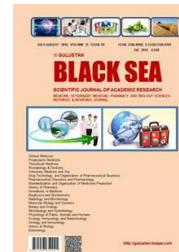
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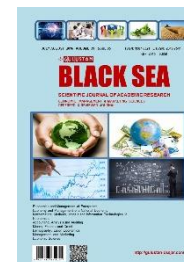
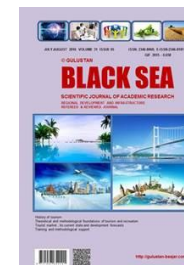
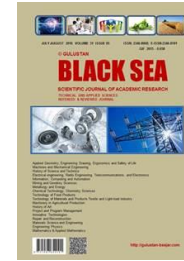
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