

ISBN 978-1-64655-852-0



XCIH INTERNATIONAL CORRESPONDENCE SCIENTIFIC AND PRACTICAL CONFERENCE
**EUROPEAN RESEARCH: INNOVATION IN SCIENCE,
EDUCATION AND TECHNOLOGY**

THE ABBEY CHURCH OF SAINT PETER AND SAINT PAUL, BATH



Google[™]
scholar

e SCIENTIFIC ELECTRONIC
LIBRARY
LIBRARY.RU



LONDON, GREAT BRITAIN, August 11-12, 2026

ISBN 978-1-64655-852-0

UDC 08

**XCIII INTERNATIONAL
CORRESPONDENCE SCIENTIFIC AND
PRACTICAL CONFERENCE «EUROPEAN
RESEARCH: INNOVATION IN SCIENCE,
EDUCATION AND TECHNOLOGY»**

**August 11-12, 2026
London, United Kingdom**

INTERNATIONAL CONFERENCE
PRINTED IN THE UNITED STATES OF AMERICA
2026

**EUROPEAN RESEARCH: INNOVATION IN SCIENCE, EDUCATION AND TECHNOLOGY /
COLLECTION OF SCIENTIFIC ARTICLES. XCIII INTERNATIONAL CORRESPONDENCE
SCIENTIFIC AND PRACTICAL CONFERENCE (London, United Kingdom, August 11-12, 2026).
London. 2026**

EDITOR: EMMA MORGAN
TECHNICAL EDITOR: ELIJAH MOORE
COVER DESIGN BY DANIEL WILSON

CHAIRMAN OF THE ORGANIZING COMMITTEE: VALTSEV SERGEI
CONFERENCE ORGANIZING COMMITTEE:

Abdullaev K. (PhD in Economics, Azerbaijan), *Aliyeva V.* (PhD in Philosophy, Republic of Uzbekistan), *Akbulaev N.* (D.Sc. in Economics, Azerbaijan), *Alikulov S.* (D.Sc. in Engineering, Republic of Uzbekistan), *Anan'eva E.* (D.Sc. in Philosophy, Ukraine), *Asaturova A.* (PhD in Medicine, Russian Federation), *Askarhodzhaev N.* (PhD in Biological Sc., Republic of Uzbekistan), *Bajtasov R.* (PhD in Agricultural Sc., Belarus), *Bakiko I.* (PhD in Physical Education and Sport, Ukraine), *Bahor T.* (PhD in Philology, Russian Federation), *Baulina M.* (PhD in Pedagogic Sc., Russian Federation), *Blejh N.* (D.Sc. in Historical Sc., PhD in Pedagogic Sc., Russian Federation), *Bobrova N.A.* (Doctor of Laws, Russian Federation), *Bogomolov A.* (PhD in Engineering, Russian Federation), *Borodaj V.* (Doctor of Social Sciences, Russian Federation), *Volkov A.* (D.Sc. in Economics, Russian Federation), *Gavrilenkova I.* (PhD in Pedagogic Sc., Russian Federation), *Garagonich V.* (D.Sc. in Historical Sc., Ukraine), *Glushhenko A.* (D.Sc. in Physical and Mathematical Sciences, Russian Federation), *Grinchenko V.* (PhD in Engineering, Russian Federation), *Gubareva T.* (PhD in Laws, Russian Federation), *Gutnikova A.* (PhD in Philology, Ukraine), *Datij A.* (Doctor of Medicine, Russian Federation), *Demchuk N.* (PhD in Economics, Ukraine), *Divnenko O.* (PhD in Pedagogic Sc., Russian Federation), *Dmitrieva O.A.* (D.Sc. in Philology, Russian Federation), *Dolenko G.* (D.Sc. in Chemistry, Russian Federation), *Esenova K.* (D.Sc. in Philology, Kazakhstan), *Zhamuldinov V.* (PhD in Laws, Kazakhstan), *Zholdoshev S.* (Doctor of Medicine, Republic of Kyrgyzstan), *Zelenkov M.YU.* (D.Sc. in Political Sc., PhD in Military Sc., Russian Federation), *Ibadov R.* (D.Sc. in Physical and Mathematical Sciences, Republic of Uzbekistan), *Il'inskih N.* (D.Sc. Biological, Russian Federation), *Kajrakbaev A.* (PhD in Physical and Mathematical Sciences, Kazakhstan), *Kaftaeva M.* (D.Sc. in Engineering, Russian Federation), *Klinkov G.T.* (PhD in Pedagogic Sc., Bulgaria), *Koblanov Zh.* (PhD in Philology, Kazakhstan), *Kovaljov M.* (PhD in Economics, Belarus), *Kravcova T.* (PhD in Psychology, Kazakhstan), *Kuz'min S.* (D.Sc. in Geography, Russian Federation), *Kulikova E.* (D.Sc. in Philology, Russian Federation), *Kurmanbaeva M.* (D.Sc. Biological, Kazakhstan), *Kurpajanidi K.* (PhD in Economics, Republic of Uzbekistan), *Linkova-Daniels N.* (PhD in Pedagogic Sc., Australia), *Lukienko L.* (D.Sc. in Engineering, Russian Federation), *Makarov A.* (D.Sc. in Philology, Russian Federation), *Macarenko T.* (PhD in Pedagogic Sc., Russian Federation), *Meimanov B.* (D.Sc. in Economics, Republic of Kyrgyzstan), *Muradov Sh.* (D.Sc. in Engineering, Republic of Uzbekistan), *Musaev F.* (D.Sc. in Philosophy, Republic of Uzbekistan), *Nabiev A.* (D.Sc. in Geoinformatics, Azerbaijan), *Nazarov R.* (PhD in Philosophy, Republic of Uzbekistan), *Naumov V.* (D.Sc. in Engineering, Russian Federation), *Ovchinnikov Ju.* (PhD in Engineering, Russian Federation), *Petrov V.* (D.Arts, Russian Federation), *Radkevich M.* (D.Sc. in Engineering, Republic of Uzbekistan), *Rakhimbekov S.* (D.Sc. in Engineering, Kazakhstan), *Rozyhodzhaeva G.* (Doctor of Medicine, Republic of Uzbekistan), *Romanenkova Yu.* (D.Arts, Ukraine), *Rubcova M.* (Doctor of Social Sciences, Russian Federation), *Rumyantsev D.* (D.Sc. in Biological Sc., Russian Federation), *Samkov A.* (D.Sc. in Engineering, Russian Federation), *San'kov P.* (PhD in Engineering, Ukraine), *Selitrenikova T.* (D.Sc. in Pedagogic Sc., Russian Federation), *Sibircev V.* (D.Sc. in Economics, Russian Federation), *Skipko T.* (D.Sc. in Economics, Ukraine), *Sopov A.* (D.Sc. in Historical Sc., Russian Federation), *Strekalov V.* (D.Sc. in Physical and Mathematical Sciences, Russian Federation), *Stukalenko N.M.* (D.Sc. in Pedagogic Sc., Kazakhstan), *Subachev Ju.* (PhD in Engineering, Russian Federation), *Sulejmanov S.* (PhD in Medicine, Republic of Uzbekistan), *Tregub I.* (D.Sc. in Economics, PhD in Engineering, Russian Federation), *Uporov I.* (PhD in Laws, D.Sc. in Historical Sc., Russian Federation), *Fedos'kina L.* (PhD in Economics, Russian Federation), *Khiltukhina E.* (D.Sc. in Philosophy, Russian Federation), *Cuculjan S.* (PhD in Economics, Republic of Armenia), *Chiladze G.* (Doctor of Laws, Georgia), *Shamshina I.* (PhD in Pedagogic Sc., Russian Federation), *Sharipov M.* (PhD in Engineering, Republic of Uzbekistan), *Shevko D.* (PhD in Engineering, Russian Federation).

PROBLEMS OF SCIENCE

PUBLISHED WITH THE ASSISTANCE OF NON-PROFIT ORGANIZATION

«INSTITUTE OF NATIONAL IDEOLOGY»

VENUE OF THE CONFERENCE:

7 GRACECHURCH STREET, LONDON, EC3V 0DR, UNITED KINGDOM

TEL. OF THE ORGANIZER OF THE INTERNATIONAL CONFERENCE:

**+ 44 20 38076399 (LONDON, UNITED KINGDOM). FOR PARTICIPANTS FROM EUROPE
+1 617 463 9319 (BOSTON, USA). FOR PARTICIPANTS FROM NORTH AND SOUTH AMERICA.
+7 915 814 0951 (RUSSIAN FEDERATION). FOR PARTICIPANTS FROM THE CIS, GEORGIA,
ESTONIA, LITHUANIA, LATVIA.**

THE CONFERENCE WEBSITE:

[HTTPS://INTERNATIONALCONFERENCE.RU](https://INTERNATIONALCONFERENCE.RU)

PUBLISHED BY ARRANGEMENT WITH THE AUTHORS

Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

<https://creativecommons.org/licenses/by-sa/4.0/deed.en>

Contents

TECHNICAL SCIENCES.....	4
<i>Kadirova N.B., Abdurahimov A.A., Salixanova D.S. (Republic of Uzbekistan) COMPARATIVE ASSESSMENT OF THE FATTY ACID COMPOSITION OF SOY MILK AND COW'S MILK / Кадирова Н.Б., Абдурахимов А.А., Салиханова Д.С. (Республика Узбекистан) СРАВНИТЕЛЬНАЯ ОЦЕНКА ЖИРНОКИСЛОТНОГО СОСТАВА СОЕВОГО И КОРОВЬЕГО МОЛОКА.....</i>	4
ECONOMICS.....	7
<i>Nagiyev K.Z. (Republic of Azerbaijan) DEMOGRAPHIC ASPECTS OF SUSTAINABLE DEVELOPMENT IN THE NAKHCHIVAN AUTONOMOUS REPUBLIC / Нагиев К.З. (Азербайджанская Республика) ДЕМОГРАФИЧЕСКИЕ АСПЕКТЫ УСТОЙЧИВОГО РАЗВИТИЯ НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ.....</i>	7
<i>Mirsoatov A.K. (Republic of Uzbekistan) A RISK-BASED GOVERNANCE FRAMEWORK FOR RESPONSIBLE ARTIFICIAL INTELLIGENCE IN SYSTEMICALLY IMPORTANT BANKS / Мирсоатов А.К. (Республика Узбекистан) РИСК-ОРИЕНТИРОВАННАЯ МОДЕЛЬ УПРАВЛЕНИЯ ОТВЕТСТВЕННЫМ ИСКУССТВЕННЫМ ИНТЕЛЛЕКТОМ В СИСТЕМНО ЗНАЧИМЫХ БАНКАХ.....</i>	10
<i>Sulaymanov A.I. (Republic of Uzbekistan) ASSESSING COMMERCIAL BANK READINESS FOR LONG-TERM FINANCING: AN INTEGRATED INDEX FOR UZBEKISTAN / Сулайманов А.И. (Республика Узбекистан) ОЦЕНКА ГОТОВНОСТИ КОММЕРЧЕСКОГО БАНКА К ПРИВЛЕЧЕНИЮ ДОЛГОСРОЧНОГО ФИНАНСИРОВАНИЯ: ИНТЕГРАЛЬНЫЙ ИНДЕКС ДЛЯ УЗБЕКИСТАНА</i>	16
<i>Pulatov D.A. (Republic of Uzbekistan) A SECTORAL DIGITAL COMPETENCY MODEL FOR COMMERCIAL BANK EMPLOYEES IN UZBEKISTAN / Пулатов Д.А. (Республика Узбекистан) ОТРАСЛЕВАЯ МОДЕЛЬ ЦИФРОВЫХ КОМПЕТЕНЦИЙ РАБОТНИКОВ КОММЕРЧЕСКИХ БАНКОВ УЗБЕКИСТАНА</i>	21
PEDAGOGICAL SCIENCES.....	27
<i>Sisyan A.B., Sisyan S.B. (Republic of Armenia) VOLUNTEERING AS A MEANS OF STUDENT SOCIALIZATION / Сисян А.Б., Сисян С.Б. (Республика Армения) ВОЛОНТЕРСКАЯ РАБОТА КАК СРЕДСТВО СОЦИАЛИЗАЦИИ СТУДЕНТОВ</i>	27
POLITICAL SCIENCES	30
<i>Kadyrov A.K. (Republic of Uzbekistan) FROM ECONOMIC INSTRUMENTS TO STRATEGIC PARTNERSHIP: POLITICAL MECHANISMS OF UZBEKISTAN–SAUDI ARABIA COOPERATION / Кадыров А.К. (Республика Узбекистан) ОТ ЭКОНОМИЧЕСКИХ ИНСТРУМЕНТОВ К СТРАТЕГИЧЕСКОМУ ПАРТНЕРСТВУ: ПОЛИТИЧЕСКИЕ МЕХАНИЗМЫ СОТРУДНИЧЕСТВА УЗБЕКИСТАНА И САУДОВСКОЙ АРАВИИ</i>	30

TECHNICAL SCIENCES

COMPARATIVE ASSESSMENT OF THE FATTY ACID COMPOSITION OF SOY MILK AND COW'S MILK

Kadirova N.B.¹, Abdurahimov A.A.², Salixanova D.S.³
(Republic of Uzbekistan)

¹Kadirova Nafisaxon Bannobovna – Doctor of Technical Sciences, Professor,
FERGANA STATE TECHNICAL UNIVERSITY,
FERGANA,

²Abdurahimov Ahror Anvarovich – Doctor of Technical Sciences, Professor,
TASHKENT INSTITUTE OF CHEMICAL TECHNOLOGY,

³Salixanova Dilnoza Sayidakbarovna – Doctor of Technical Sciences, Professor,
INSTITUTE OF GENERAL AND INORGANIC CHEMISTRY OF THE ACADEMY OF SCIENCES OF THE
REPUBLIC OF UZBEKISTAN,
TASHKENT,
REPUBLIC OF UZBEKISTAN

Abstract: the thesis presents a comparative analysis of the fatty acid composition of cow's milk, industrial soy milk and soy milk obtained by the proposed technology. The results show that cow's milk is characterized by a higher proportion of saturated fatty acids, whereas soy milk samples contain a higher level of unsaturated fatty acids, including linoleic, oleic and γ -linolenic acids.

Keywords: soy milk, cow's milk, fatty acids, gas chromatography, unsaturated fatty acids, nutritional value.

СРАВНИТЕЛЬНАЯ ОЦЕНКА ЖИРНОКИСЛОТНОГО СОСТАВА СОЕОВОГО И КОРОВЬЕГО МОЛОКА

Кадирова Н.Б.¹, Абдурахимов А.А.², Салиханова Д.С.³
(Республика Узбекистан)

¹Кадирова Нафисахон Баннобовна – профессор, доктор технических наук,
Ферганский государственный технический университет,
г. Фергана,

²Абдурахимов Ахрор Анварович – профессор, доктор технических наук,
Ташкентский химико-технологический институт,

³Салиханова Дилноза Сайидакбаровна – профессор, доктор технических наук,
Институт общей и неорганической химии Академии наук Республики Узбекистан,
г. Ташкент,
Республика Узбекистан

Аннотация: в статье рассмотрены особенности жирнокислотного состава соевого и коровьего молока, определяющие их пищевую ценность, биологическую активность и технологическое значение. Проведено сравнение коровьего молока, соевого молока промышленного производства и соевого молока, полученного по предложенной технологии. Установлено, что коровье молоко отличается высоким содержанием насыщенных жирных кислот, тогда как соевое молоко характеризуется преобладанием ненасыщенных жирных кислот, в том числе линолевой, олеиновой и γ -линоленовой кислот.

Ключевые слова: соевое молоко, коровье молоко, жирные кислоты, газовая хроматография, насыщенные жирные кислоты, полиненасыщенные жирные кислоты, пищевая ценность.

Жирнокислотный состав соевого и коровьего молока имеет важное значение при оценке их пищевой ценности, усвояемости, биологической активности и влияния на организм человека. По составу жирных кислот данные виды молока существенно различаются. В

коровьем молоке преобладают насыщенные жирные кислоты, тогда как в соевом молоке больше представлены ненасыщенные жирные кислоты, особенно линолевая и олеиновая кислоты [1].

В жировой фазе коровьего молока основное место занимают пальмитиновая, миристиновая, стеариновая и олеиновая кислоты [2]. Кроме того, в составе молочного жира присутствуют короткоцепочечные жирные кислоты масляная, капроновая, каприловая и каприновая, формирующие характерные вкус и аромат молочных продуктов. В соевом молоке основными жирными кислотами являются линолевая, олеиновая, пальмитиновая и линоленовая кислоты, что соответствует особенностям растительных масел [3].

Определение жирнокислотного состава соевого молока является важным элементом контроля качества, так как позволяет оценить наличие индивидуальных омега-3, омега-6 и омега-9 кислот, а также их потенциальные биоактивные свойства. В исследовании были сопоставлены образцы соевого молока с массовой долей жира 3,20 %, полученного по предложенной технологии, и промышленного соевого молока российского производства с жирностью 1,5 %. Сравнительный анализ жирнокислотного состава проводился методом газовой хроматографии.

Результаты анализа жирной фазы коровьего молока, промышленного соевого молока и соевого молока, полученного по предложенной технологии, представлены в таблице 1. Полученные данные свидетельствуют о том, что по содержанию отдельных жирных кислот опытный образец соевого молока в ряде случаев превосходит контрольный образец промышленного соевого молока.

Таблица 1. Жирнокислотный состав жировой фазы альтернативных растительных молочных продуктов и коровьего молока.

Показатели	Коровье молоко	Соевое молоко (Россия)	Соевое молоко (Узбекистан)
Насыщенные жирные кислоты			
Масляная (C4:0)	2,688±0,086	-	-
Капроновая (C6:0)	1,935±0,106	-	-
Каприловая (C8:0)	1,268±0,088	-	-
Каприновая (C10:0)	3,043±0,225	-	-
Лауриновая (C12:0)	3,477±0,192	-	-
Миристиновая (C14:0)	11,207±0,379	0,101±0,379	0,107±0,279
Пентадекановая (C15:0)	-	0,090±0,379	0,092±0,179
Пальмитиновая (C16:0)	26,466±0,519	12,420±0,119	12,460±0,120
Маргариновая (C17:0)	-	0,902±0,120	0,101±0,130
Стеариновая (C18:0)	13,906±0,687	3,866±0,187	3,856±0,177
Арахидовая (C20:0)	0,176±0,010	0,276±0,010	0,278±0,010
Бегеновая (C22:0)	0,010±0,002	0,210±0,002	0,220±0,002
Лигноцериновая (C24:0)	-	0,010±0,002	0,010±0,002
Мононенасыщенные жирные кислоты			
Деценовая (C10:1)	0,248±0,019	-	-
Миристолеиновая (C14:1)	0,952±0,072	-	-
Пальмитолеиновая (C16:1)	1,098±0,041	0,122±0,112	0,121±0,111
Олеиновая (C18:1) ω-9	26,764±1,235	31,060±0,001	31,090±0,002
Эйкозеновая (C20:1) ω-9	-	0,269±0,371	0,277±0,372
Полиненасыщенные жирные кислоты			
Линолевая (C18:2) ω-6	3,171±0,116	50,684±0,010	51,406±0,010
γ-линоленовая (C18:3) ω-3	0,681±0,040	31,066±0,010	31,066±0,010
Другие	2,353±0,002	-	0,011±0,002

Σ насыщенных	64,174±0,102	17,875±0,012	17,124±0,022
Σ мононенасыщенных	29,62±0,012	31,441±0,032	31,448±0,036
Σ полиненасыщенных	3,852±0,001	50,684±0,052	51,406±0,025
Σ ω-3	0,681±0,012	31,066±0,042	31,066±0,023
Σ ω-6	3,171±0,116	50,684±0,022	51,406±0,045
Σ ω-9	26,764±1,235	31,329±0,023	31,369±0,069

При оценке содержания насыщенных жирных кислот установлено, что их суммарная доля в коровьем молоке значительно выше и составляет 64,174 %, тогда как в соевом молоке промышленного производства данный показатель равен 17,875 %, а в опытном образце соевого молока 17,124 %. Это подтверждает выраженное отличие молочного жира животного происхождения от жировой фазы растительного молочного продукта. В составе коровьего молока выявлены масляная, капроновая, каприловая, каприновая и лауриновая кислоты, которые в образцах соевого молока не обнаружены. Наиболее высокие значения среди насыщенных кислот в коровьем молоке отмечены для пальмитиновой, стеариновой и миристиновой кислот. В опытном образце соевого молока содержание стеариновой кислоты составило 3,856 %, что ниже соответствующего показателя коровьего молока. По содержанию мононенасыщенных жирных кислот соевое молоко характеризовалось несколько более высокими значениями по сравнению с коровьим молоком. Сумма мононенасыщенных жирных кислот в опытном образце составила 31,448 %, при этом содержание олеиновой кислоты достигло 31,090 %. Данный показатель выше, чем в коровьем молоке, где доля олеиновой кислоты составила 26,764 %. Наиболее существенные различия выявлены по полиненасыщенным жирным кислотам. В опытном образце соевого молока суммарная доля полиненасыщенных жирных кислот составила 51,406 %, тогда как в коровьем молоке данный показатель был равен 3,852 %. Высокое содержание линолевой кислоты ω-6 и γ-линоленовой кислоты ω-3 свидетельствует о высокой пищевой и биологической ценности соевого молока, полученного по предложенной технологии.

Таким образом, сравнительный анализ показал, что коровье молоко отличается высоким содержанием насыщенных жирных кислот, являющихся важным энергетическим компонентом, однако их избыточное потребление может способствовать повышению уровня холестерина в крови. Соевое молоко, напротив, характеризуется высоким содержанием ненасыщенных жирных кислот, что повышает его значение как функционального и диетического продукта. Полученные результаты подтверждают перспективность применения предложенной технологии получения соевого молока с улучшенным жирнокислотным составом.

Список литературы / References

1. Белиц Х.-Д., Грош В., Шиберле П. Химия пищевых продуктов. М.: Профессия, 2012. 1112 с.
2. Нечаев А.П., Траубенберг С.Е., Кочеткова А.А. Пищевая химия. СПб.: ГИОРД, 2015. 672 с.
3. Christie W.W. Gas Chromatography and Lipids: A Practical Guide. Bridgwater: The Oily Press, 1989. 307 p.

DEMOGRAPHIC ASPECTS OF SUSTAINABLE DEVELOPMENT IN THE NAKHCHIVAN AUTONOMOUS REPUBLIC

Nagiyev K.Z. (Republic of Azerbaijan)

*Nagiyev Kazim Zeynalovich - Doctor of Philosophy in Economics,
NAKHCHIVAN STATE UNIVERSITY,
Leading researcher
INSTITUTE OF NATURAL RESOURCES,
NAKHCHIVAN, REPUBLIC OF AZERBAIJAN*

Abstract: Sustainable development is a process that encompasses improving people's quality of life, developing intellectual human potential, comprehensively modernizing the production and service sectors, ensuring food security through these transformations, enhancing the quality of public services, conserving oil, natural gas, and other natural resources through the use of environmentally efficient alternative energy sources, protecting the environment from pollution, and ensuring the continuous and balanced development of ecological, economic, and social systems.

At the present stage, the measures implemented to ensure sustainable development in the Nakhchivan Autonomous Republic have created positive trends in population dynamics. This article examines changes in the population of the Nakhchivan Autonomous Republic and analyzes statistical data on the urban and rural population as well as the population by sex. The findings indicate that, under the influence of demographic, socio-economic, national-cultural, and other factors, positive changes have occurred in the population size of the Autonomous Republic.

Keywords: industry, agriculture, transport, population, men, women.

ДЕМОГРАФИЧЕСКИЕ АСПЕКТЫ УСТОЙЧИВОГО РАЗВИТИЯ НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ

Нагиев К.З. (Азербайджанская Республика)

*Нагиев Казим Зейналович — доктор философии по экономике,
Нахчыванский Государственный Университет,
Ведущий научный сотрудник
Института Природных Ресурсов,
г. Нахчыван, Азербайджанская Республика*

Аннотация: устойчивое развитие представляет собой процесс, включающий повышение качества жизни населения, формирование интеллектуального человеческого потенциала, комплексную модернизацию сфер производства и услуг, обеспечение продовольственной безопасности, повышение качества предоставляемых населению услуг, экономию нефти, природного газа и других природных ресурсов за счёт использования экологически эффективных альтернативных источников энергии, защиту окружающей среды от загрязнения, а также обеспечение непрерывного и сбалансированного экологического, экономического и социального развития. На современном этапе реализуемые в Нахчыванской Автономной Республике меры по обеспечению устойчивого развития способствовали формированию положительных тенденций в динамике численности населения. В статье исследуются изменения численности населения Нахчыванской Автономной Республики, а также анализируются статистические данные о городском и сельском населении и его распределении по полу. Результаты исследования показывают, что под влиянием демографических, социально-экономических, национально-культурных и других факторов в автономной республике произошли положительные изменения в численности населения.

Ключевые слова: *промышленность, сельское хозяйство, транспорт, население, мужчины, женщины.*

Introduction

The Nakhchivan region, an ancient and eternal land of Azerbaijan with a rich history, culture, and centuries-old traditions of statehood, is regarded as one of the cradles of human civilization and has historically been one of the major centers of trade, craftsmanship, science, and culture in the East.

The Nakhchivan Autonomous Republic, an integral part of the Republic of Azerbaijan, is situated in the southwestern part of the Lesser Caucasus and in the southeastern part of the Transcaucasian Plateau. Its territory extends 158 km from northwest to southeast and 75 km from north to south. It borders the Republic of Armenia to the north and northeast (246 km), the Islamic Republic of Iran to the south and southwest (204 km), and the Republic of Türkiye to the southwest (15 km), with a total border length of 465 km. The territory of the Nakhchivan Autonomous Republic covers 5.5 thousand square kilometres, with a population of 472.4 thousand people as of 1 January 2026. Of the total population, 167.5 thousand people (35.5%) reside in urban areas, while 304.9 thousand people (64.5%) live in rural areas. Men account for 235.8 thousand people (49.9%) and women for 236.6 thousand people (50.1%). The population density is 85.9 persons per square kilometre. According to the 2019 Population Census, Azerbaijanis constitute 99.7% of the population of the Autonomous Republic, while the remaining population consists of Russians, Kurds, and representatives of other ethnic groups. In 2019, life expectancy was 76.6 years for men and 80.7 years for women. The Nakhchivan Autonomous Republic comprises its capital city, Nakhchivan, which is a major industrial, scientific, and cultural center, together with seven administrative districts: Sharur, Babek, Ordubad, Julfa, Kangarli, Shahbuz, and Sadarak. These administrative units include six cities (Nakhchivan, Ordubad, Julfa, Sharur, Shahbuz, and Babek), nine settlements, and 203 rural residential localities [2 p. 14].

Main Part

Following the restoration of the independence of the Republic of Azerbaijan, significant changes occurred in the socio-economic life of both the country and the Nakhchivan Autonomous Republic, which is an integral part of Azerbaijan. As in the rest of the country, economic achievements in the Autonomous Republic have created new opportunities for social development. Compared with the corresponding period of 2023, the gross domestic product (GDP) increased by 3.1% to reach 1,539,514.5 thousand manats. GDP per capita also increased by 2.5% compared with the corresponding period of 2023, reaching 3,277.0 manats [4].

Despite having remained under blockade for more than 30 years, the sustainable development of the Nakhchivan Autonomous Republic has been evident not only in the economic sphere but also in other sectors. At the present stage, the measures undertaken to ensure sustainable economic development have also generated positive trends in population growth.

According to the results of the first national population census conducted in independent Azerbaijan on 27 January 1999, the population of the Nakhchivan Autonomous Republic amounted to 354.1 thousand people. Of these, 95.1 thousand people (26.9%) lived in urban areas, while 259.0 thousand people (73.1%) resided in rural areas. At that time, men accounted for 174.5 thousand people (49.3%) and women for 179.6 thousand people (50.7%) of the total population.

According to official statistical data as of 1 January 2026, the population of the Nakhchivan Autonomous Republic reached 472.4 thousand people. Of these, 167.5 thousand people (35.5%) live in urban areas, whereas 304.9 thousand people (64.5%) reside in rural areas. Men constitute 235.8 thousand people (49.9%) of the population, while women account for 236.6 thousand people (50.1%).

Table 1. Population of the Nakhchivan Autonomous Republic by Sex (at the beginning of the year, thousand persons).

years	Population size (thousand people)	including		For the whole population, in percentage		including		For the whole population, in percentage	
		city	village	city	village	men	women	men	women
1991	307,2	89,9	217,3	29,3	70,7	151,0	156,2	49,2	50,8
1992	315,1	91,5	223,6	29,0	71,0	154,9	160,2	49,2	50,8
1993	320,8	91,8	229,0	28,6	71,4	157,8	163,0	49,2	50,8
1994	326,1	92,5	233,6	28,4	71,6	159,1	167,0	48,8	51,2
1995	331,9	93,3	238,6	28,1	71,9	163,4	168,5	49,2	50,8
1996	337,8	94,2	243,6	27,9	72,1	166,3	171,5	49,2	50,8
1997	343,0	94,5	248,5	27,6	72,4	168,9	174,1	49,2	50,8
1998	348,0	94,3	253,7	27,1	72,9	171,2	176,8	49,2	50,8
1999	354,1	95,1	259,0	26,9	73,1	174,5	179,6	49,3	50,7
2000	358,8	96,2	262,6	26,8	73,2	177,0	181,8	49,3	50,7
2001	363,1	97,1	266,0	26,7	73,3	179,2	183,9	49,4	50,6
2002	366,9	97,8	269,1	26,7	73,3	181,1	185,8	49,4	50,6
2003	370,4	98,9	271,5	26,7	73,3	181,6	188,8	49,0	51,0
2004	373,9	110,1	263,8	29,4	70,6	186,0	187,9	49,7	50,3
2005	377,8	110,9	266,9	29,4	70,6	187,3	190,5	49,6	50,4
2006	382,1	111,6	270,5	29,2	70,8	189,7	192,4	49,6	50,4
2007	386,0	112,3	273,7	29,1	70,9	191,7	194,3	49,7	50,3
2008	391,8	114,2	277,6	29,1	70,9	193,0	198,8	49,3	50,7
2009	397,3	115,4	281,9	29,0	71,0	197,8	199,5	49,8	50,2
2010	402,4	116,7	285,7	29,0	71,0	200,0	202,4	49,7	50,3
2011	410,1	119,5	290,6	29,1	70,9	204,2	205,9	49,8	50,2
2012	418,5	121,7	296,8	29,1	70,9	208,2	210,3	49,7	50,3
2013	427,2	123,9	303,3	29,0	71,0	212,5	214,7	49,7	50,3
2014	435,3	127,2	308,1	29,2	70,8	216,7	218,6	49,8	50,2
2015	439,8	128,2	311,6	29,1	70,9	219,1	220,7	49,8	50,2
2016	444,4	131,0	313,4	29,5	70,5	221,6	222,8	49,9	50,1
2017	449,1	132,4	316,7	29,5	70,5	224,1	225,0	49,9	50,1
2018	452,8	133,6	319,2	29,5	70,5	226,0	226,8	49,9	50,1
2019	456,1	134,5	321,6	29,5	70,5	227,7	228,4	49,9	50,1
2020	459,6	135,6	324,0	29,5	70,5	229,6	230,0	50,0	50,0
2021	461,7	163,4	298,3	35,4	64,6	230,6	231,1	49,9	50,1
2022	463,1	164,0	299,1	35,4	64,6	231,4	231,7	50,0	50,0
2023	465,7	165,0	300,7	35,4	64,6	232,6	233,1	49,9	50,1
2024	468,6	166,2	302,4	35,5	64,5	234,0	234,6	49,9	50,1
2025	470,9	167,1	303,8	35,5	64,5	235,1	235,8	49,9	50,1
2026	472,4	167,5	304,9	35,5	64,5	235,8	236,6	49,9	50,1

Note: The table was compiled by the author based on the statistical data of the State Statistical Committee of the Nakhchivan Autonomous Republic.

As can be seen from the above table, during the 27-year period covering 1999–2026, the population of the Nakhchivan Autonomous Republic increased by 118.3 thousand people, or 33.4%, rising from 354.1 thousand to 472.4 thousand. During the same period, the urban

population increased by 72.4 thousand people, or 76.1%, from 95.1 thousand to 167.5 thousand, while the rural population increased by 45.9 thousand people, or 17.7%, from 259.0 thousand to 304.9 thousand. The number of men increased by 61.3 thousand people, or 35.1%, from 174.5 thousand to 235.8 thousand, whereas the number of women increased by 57.0 thousand people, or 31.7%, from 179.6 thousand to 236.6 thousand. The increase in the population of the Nakhchivan Autonomous Republic is associated with changes in demographic development indicators resulting from the existing socio-economic, national-cultural, and other factors prevailing in the Autonomous Republic.

Conclusion

The Nakhchivan Autonomous Republic, an integral part of the Republic of Azerbaijan and an ancient homeland of the Azerbaijani people, has been inhabited by Azerbaijani Turks for thousands of years. They laid the foundations of a strong tradition of statehood and, through great sacrifices during different historical periods, preserved the existence of this ancient land. In the modern era, they have continued to demonstrate determination in its development and have achieved significant successes.

The conducted research demonstrates that the economic achievements attained in the Nakhchivan Autonomous Republic have created new opportunities for social development. Sustainable development covering all sectors of the economy, comprehensive advancement of the social sphere and the healthcare system, improvement in the scope and quality of public utilities, services, and social infrastructure, restoration of industrial enterprises and establishment of new production facilities, implementation of comprehensive measures for the development of the agricultural sector, creation of new jobs, enhancement of employment, reduction of poverty, and the successful implementation of other socio-economic policies have collectively resulted in positive changes in the population dynamics of the Autonomous Republic.

References / Список литературы

1. *Muradov Sh.M.* Human Potential: Main Trends, Realities and Problems. Baku: Elm Publishing House, 2004, 660 p.
2. *Nagiyevev K.* Changes in the Population Number and Their Dynamics at the Modern Stage of the Nakhchivan Autonomous Republic. Polish Journal of Science, No. 79, 2024. Warsaw, Poland, pp. 14–15. DOI: 10.5281/zenodo.13943347.
3. State Statistical Committee of the Nakhchivan Autonomous Republic. Official statistical data. nstat.gov.az.
4. State Statistical Committee of the Nakhchivan Autonomous Republic. (2024). Socio-Economic Development: January–December 2024. Published on 22 January 2025, 144 p.

A RISK-BASED GOVERNANCE FRAMEWORK FOR RESPONSIBLE ARTIFICIAL INTELLIGENCE IN SYSTEMICALLY IMPORTANT BANKS

Mirsoatov A.K. (Republic of Uzbekistan)

*Mirsoatov Alisher Kudratullaevich – Chairman of the Board,
JSC NATIONAL BANK FOR FOREIGN ECONOMIC ACTIVITY OF THE REPUBLIC OF UZBEKISTAN,
TASHKENT, REPUBLIC OF UZBEKISTAN*

Abstract: *The article develops a risk-based governance framework for the responsible use of artificial intelligence in credit and investment decision-making by systemically important banks. The research combines institutional analysis, comparative regulatory analysis, process mapping and a lifecycle approach to model risk. The proposed framework links board accountability, data governance, independent validation, explainability, fairness, human oversight, cyber resilience and*

third-party risk within a single governance architecture. Artificial-intelligence systems are divided into four materiality tiers, from critical decision models to low-risk assistance tools, with differentiated approval and monitoring requirements. An original Responsible AI Governance Index is proposed for diagnosing organisational maturity, while mandatory control gates prevent a high aggregate score from compensating for critical weaknesses in data quality, validation or customer protection. The framework is adapted to Uzbekistan's 2026 reforms, including alternative AI-based scoring for small and medium-sized businesses and the enhanced prudential importance of domestic systemically important banks. Its practical application can support a supervisory taxonomy, a standard model passport, controlled regulatory-sandbox testing and phased implementation in banks.

Keywords: *responsible artificial intelligence, systemically important bank, credit decision, investment decision, model risk, explainability, fairness, human oversight, data governance, regulatory sandbox.*

РИСК-ОРИЕНТИРОВАННАЯ МОДЕЛЬ УПРАВЛЕНИЯ ОТВЕТСТВЕННЫМ ИСКУССТВЕННЫМ ИНТЕЛЛЕКТОМ В СИСТЕМНО ЗНАЧИМЫХ БАНКАХ Мирсоатов А.К. (Республика Узбекистан)

*Мирсоатов Алишер Кудратуллович – председатель правления,
АО «Национальный банк внешнеэкономической деятельности республики Узбекистан»,
г. Ташкент, Республика Узбекистан*

Аннотация: *в статье разработана риск-ориентированная модель управления ответственным применением искусственного интеллекта при принятии кредитных и инвестиционных решений системно значимыми банками. Исследование объединяет институциональный и сравнительно-правовой анализ, картирование процессов и подход, основанный на жизненном цикле модельного риска. Предлагаемая модель связывает ответственность совета банка, управление данными, независимую валидацию, объяснимость, справедливость, человеческий контроль, киберустойчивость и риски внешних поставщиков в единую архитектуру управления. Системы искусственного интеллекта распределяются по четырём уровням существенности — от критически значимых моделей принятия решений до низкорисковых вспомогательных инструментов — с дифференцированными требованиями к утверждению и мониторингу. Предложен авторский индекс зрелости управления ответственным искусственным интеллектом, дополненный обязательными контрольными условиями, не позволяющими компенсировать критические недостатки качества данных, валидации или защиты клиентов высоким итоговым баллом. Модель адаптирована к реформам Узбекистана 2026 года, включая альтернативный скоринг малого и среднего бизнеса на основе искусственного интеллекта и усиление пруденциальной роли системно значимых банков.*

Ключевые слова: *ответственный искусственный интеллект, системно значимый банк, кредитное решение, инвестиционное решение, модельный риск, объяснимость, справедливость, человеческий контроль, управление данными, регулирующая песочница.*

Introduction. Artificial intelligence is moving from an auxiliary analytical technology to an infrastructure of financial decision-making. Banks use machine learning to assess borrower risk, detect fraud, forecast cash flows, price products, monitor portfolios, rank investment projects and generate early-warning signals. The economic advantage is clear: a model can process more variables, react faster to new information and identify non-linear relationships that conventional scorecards may overlook. The same characteristics, however, create new channels of risk. A highly accurate model may be unstable outside its training sample, rely on legally or ethically problematic

proxy variables, reproduce historical exclusion, become dependent on a single technology provider or generate explanations that are technically plausible but economically misleading.

These risks are especially material in systemically important banks. Their size, interconnectedness, substitutability and role in payment and credit intermediation mean that a failure of automated decision systems can affect not only one institution but also borrowers, markets and financial stability. The Central Bank of Uzbekistan identified seven domestic systemically important banks for 2026; together they represented 64 percent of banking-system assets as of 1 October 2025 [2]. A common error in a credit model, common dependence on the same vendor or simultaneous retraining on similarly distorted data may therefore produce correlated portfolio decisions and amplify cyclical movements.

Uzbekistan's policy agenda makes the issue immediate rather than theoretical. Presidential Resolution No. PP-204 of 26 May 2026 provides for the introduction, from 1 December 2026, of an alternative scoring model using artificial-intelligence technologies within a digital financial platform, as well as an "AI maslahatchi" programme for entrepreneurs [1]. These measures can expand access to finance for small and medium-sized businesses, including firms with limited conventional credit histories. Their success nevertheless depends on whether banks can establish governance that is proportionate to the economic significance of each AI use case.

Research problem and methods. The research problem is the absence of an integrated governance method that translates broad principles of responsible artificial intelligence into specific decision rights, control gates and measurable requirements for systemically important banks in an emerging financial market. The article applies institutional analysis to determine responsibility within the bank; comparative regulatory analysis to synthesise international practices; process mapping to structure the AI lifecycle; and a risk-based method to differentiate controls according to materiality. The proposed result is methodological: it is intended for subsequent calibration using supervisory data, model inventories, validation reports and bank-level pilot projects.

Conceptual basis. Responsible artificial intelligence in banking should be understood as a system of economic, organisational and technological arrangements under which an AI-assisted decision remains lawful, explainable, contestable, secure and compatible with the bank's risk appetite and financial stability. "Explainable" means that the bank can provide an economically meaningful reason for a decision; "contestable" means that an affected customer or employee can request review; and "compatible with risk appetite" means that the expected return from automation is not achieved by accepting unmeasured model, conduct or concentration risk.

The international regulatory architecture supports a lifecycle and proportional approach. The Financial Stability Board's 2026 consultation report presents twelve sound practices covering organisation-wide governance, development and deployment stages, cyber and information-technology risks, and third-party dependencies [4]. The Prudential Regulation Authority treats model risk as a risk discipline in its own right and expects model identification, classification, governance, development, independent validation and risk mitigation [5]. The NIST AI Risk Management Framework organises responsible practice around the functions Govern, Map, Measure and Manage [6], while the Basel Committee's principles for effective risk-data aggregation emphasise accuracy, completeness, timeliness and adaptability of risk information [7].

Existing research also demonstrates why predictive performance alone is insufficient. Interpretable models can be preferable to post-hoc explanations in high-stakes decisions [10]. Machine-learning credit models may improve prediction, but they can change the allocation of credit and distribution of errors across groups [11, 12]. Explainability techniques are useful for identifying drivers of default, yet an explanation must be stable, faithful to the model and understandable to the decision-maker [13]. Consequently, responsible AI governance must link statistical performance to financial, legal and social consequences.

Governance architecture. The proposed architecture begins with explicit board accountability. The board approves the bank's AI risk appetite, defines prohibited or restricted use cases, receives aggregate reports on material models and ensures that incentives do not reward rapid deployment at the expense of control quality. Senior management converts the risk appetite into policies, budgets and organisational responsibilities. A specialised AI and Model Risk Committee should coordinate

the chief risk officer, chief data officer, chief information officer, compliance function, internal audit, business units and customer-protection specialists. This committee does not replace existing credit or investment committees; it verifies that AI-assisted processes meet the additional requirements created by model complexity, data dependence and automation.

Operational responsibility follows the three-lines model. The first line — model owners, business units and developers — is responsible for intended use, data quality, documentation and ongoing performance. The second line — an independent model-risk and compliance function — sets methodology, challenges assumptions, validates models and aggregates portfolio-wide exposure. The third line — internal audit — evaluates whether governance is effective in practice, including the quality of board reporting, exceptions, vendor controls and remediation. Independence is substantive only when validators have sufficient authority, competence, data access and freedom from commercial delivery deadlines.

The central governance instrument is a complete AI inventory. It should include internally developed models, vendor models, embedded analytics, generative-AI tools and rule-based systems whose outputs materially influence decisions. Each inventory record should contain the owner, purpose, users, data sources, affected customers, model version, approval date, dependencies, risk tier, validation status, performance thresholds, fallback process and retirement date. Without an inventory, the bank cannot identify aggregate exposure to a common dataset, algorithm, cloud provider or external foundation model.

Table 1. Risk tiers for AI systems in a systemically important bank.

Tier	Typical use and potential impact	Minimum control requirements	Approval and monitoring
I — Critical	Automated or strongly influential credit approval, limit setting, pricing, provisioning, investment selection, capital or liquidity decisions; material customer or prudential impact.	Full data lineage; independent validation; explainability and fairness testing; stress testing; human override; customer appeal; fallback process; vendor exit plan.	Board-approved policy; AI and Model Risk Committee approval; pre-deployment parallel run; continuous monitoring and quarterly formal review.
II — Material	Early-warning systems, collection prioritisation, fraud decisions, portfolio segmentation, project ranking and advisory outputs that can materially change exposure or customer treatment.	Documented purpose; validation; stability and drift tests; reason codes; override rules; security and third-party assessment.	Senior committee approval; monthly indicators and at least semi-annual revalidation.
III — Controlled support	Forecasting, marketing selection, operational optimisation, document classification and internal analytical support with limited direct decision authority.	Owner, inventory record, data-quality checks, performance testing, user guidance and escalation route.	Business and risk-function approval; periodic monitoring proportionate to use.
IV — Low-risk assistance	Drafting, search, summarisation and productivity tools whose outputs are reviewed before use and do not determine customer or prudential outcomes.	Approved environment; confidentiality restrictions; user training; logging and prohibition on entering protected data into unapproved tools.	Local owner approval; annual inventory confirmation and incident-based review.

Risk tiering and control gates. Table 1 operationalises proportionality. The tier is determined by decision authority, financial materiality, number and vulnerability of affected persons, reversibility, degree of automation, data sensitivity and systemic interconnectedness. A model used only as one analytical input may still be Tier I when human reviewers routinely accept its output without meaningful challenge. Conversely, a technically complex model may be Tier III when its output has limited economic consequence and is independently reviewed.

Tiering must be complemented by mandatory control gates. Before development, the bank confirms a legitimate purpose, a documented economic hypothesis and an accountable owner. Before validation, data lineage, representativeness and legal basis must be demonstrated. Before deployment, the model must pass predictive-performance, calibration, stability, explanation, fairness, cyber-security and operational-resilience tests. Before material changes, revalidation is required. Before retirement, the bank preserves documentation and ensures that dependent processes have a safe replacement. A failed critical gate cannot be offset by strong results in unrelated areas.

Responsible AI Governance Index. For comparative diagnosis, the article proposes a Responsible AI Governance Index (RAIGI) composed of six normalised dimensions: governance and accountability (G); data governance and lineage (D); model-lifecycle management and validation (M); explainability and fairness (E); human oversight and customer protection (H); and technology, cyber and third-party resilience (T). Each component is scored from 0 to 1 using documented evidence rather than management opinion.

$$RAIGI = 0.20G + 0.20D + 0.20M + 0.15E + 0.15H + 0.10T.$$

The initial weights reflect the central role of governance, data and model control; they are not presented as universal constants. For practical use, they should be calibrated through expert elicitation, analytic hierarchy procedures and empirical testing against incidents, validation findings and portfolio outcomes. The aggregate index is accompanied by gate constraints: a Tier I system cannot be classified as adequately governed when any of D, M or H is below a bank-defined minimum. This design prevents “compensatory scoring”, in which excellent documentation masks weak data or nominal human oversight.

The index has three applications. At bank level, it identifies organisational bottlenecks and supports a phased investment plan. At model level, the same dimensions can be converted into a model passport and approval checklist. At supervisory level, aggregated scores and exceptions can support risk-based inspections without forcing every institution to use identical technology. The index should not become a compliance label detached from outcomes; it must be linked to observed errors, customer complaints, overrides, drift events, incidents and remediation time.

Explainability, fairness and human control. In credit and investment decisions, explainability has at least three audiences. Model developers need technical diagnostics; bank committees require economic explanations of risk drivers; customers need concise and actionable reasons for an adverse decision. A single global importance chart does not satisfy all three. The bank should test whether explanations are faithful to the actual model, stable under small changes and consistent with the approved economic rationale. For high-impact decisions, inherently interpretable models or constrained model architectures should be considered when they achieve comparable risk performance.

Fairness should not be reduced to one statistical indicator. The bank must examine data coverage, approval rates, error rates, pricing, limit assignment and subsequent performance across legally and economically relevant groups and regions. A difference does not automatically prove discrimination, because underlying risk may differ; however, unexplained or unstable differences require investigation. Proxy variables deserve particular attention: location, device, transaction pattern or business-network information may indirectly encode protected characteristics or regional disadvantage. The proper response is a documented causal and economic review, not mechanical deletion of every correlated variable.

Human oversight is meaningful only when a reviewer has competence, time, information and authority to disagree with the model. The bank should monitor both excessive overrides and the

absence of overrides. A zero-override rate can indicate automation bias, while very high overrides may show that the model is not useful or that business incentives conflict with risk policy. Every override of a Tier I model should record the reason, responsible officer and outcome, creating feedback for recalibration and training.

Third-party and concentration risk. Vendor models and cloud services can accelerate adoption but may weaken transparency and create concentration risk. Contractual access to documentation, performance data, incident reporting, audit rights, data location, subcontractors and exit arrangements should be proportionate to materiality. The bank remains accountable even when a model is supplied externally. For systemically important banks, the supervisor should also monitor sector-wide dependence on the same vendor, dataset or foundation model, because an operational failure or hidden bias can propagate across institutions.

Application to Uzbekistan. A practical implementation sequence for Uzbekistan may begin with a common taxonomy and inventory template for domestic systemically important banks. The second stage is a controlled pilot of alternative AI scoring in “shadow mode”: the model generates decisions, but conventional committees retain authority while differences and outcomes are observed. The third stage introduces limited production use with predefined exposure caps, customer explanations, appeal channels and a challenger model. The fourth stage expands use only after validation across regions, sectors and business sizes and after the bank demonstrates operational fallback.

The Central Bank’s National Strategy for Financial Technology Development for 2026–2030 and regulatory-sandbox mechanism provide an institutional platform for testing innovative solutions [3]. The sandbox should not exempt high-impact models from prudential and customer-protection requirements. Its value lies in controlled scope, temporary parameters, enhanced reporting and a clear graduation or termination decision. A standard supervisory model passport could include intended use, risk tier, data map, performance and fairness metrics, validation opinion, human-control design, material vendors, incident history and portfolio exposure.

For small and medium-sized business scoring under Resolution No. PP-204, special attention should be paid to firms without conventional credit histories. Alternative data can reduce information asymmetry, but incomplete digital footprints may be interpreted incorrectly as risk. The bank should distinguish “absence of data” from “negative data”, assess regional and sectoral representativeness and provide an alternative manual route when automated evidence is insufficient. This creates a direct link between responsible AI and financial inclusion.

Discussion and limitations. The framework contributes by integrating prudential model risk, customer protection and organisational accountability rather than treating them as separate compliance topics. Its principal limitation is that the proposed index and tier thresholds require empirical calibration. The methodology should be tested on actual model inventories and decision outcomes, with confidentiality-preserving supervisory data. Further research should estimate how governance maturity affects default prediction, approval quality, complaint rates, operational losses and capital consumption.

Conclusion. Responsible artificial intelligence in a systemically important bank is not a property of an algorithm; it is a property of the entire decision system. Effective governance therefore requires board accountability, a complete inventory, materiality-based tiering, independent validation, control gates, explainability, fairness review, meaningful human oversight, operational resilience and management of third-party concentration. The proposed governance index converts these requirements into a diagnostic structure while preserving non-negotiable safeguards for critical models. Applied to Uzbekistan’s 2026 reforms, the framework can help ensure that AI-based scoring expands financing and improves decision quality without transferring hidden model risk to customers, bank capital or the financial system.

1. On Further Measures to Enhance the Accessibility of Financial Services and Expand Support for Small and Medium-Sized Businesses: Resolution of the President of the Republic of Uzbekistan No. PP-204 of 26 May 2026. URL: <https://lex.uz/docs/8238385>.
2. Central Bank of the Republic of Uzbekistan. Domestic Systemically Important Banks for 2026. 4 November 2025. URL: <https://cbu.uz/en/financial-stability/press-releases/2982192/>.
3. Central Bank of the Republic of Uzbekistan. National Strategy for the Development of Financial Technologies for 2026–2030. 2026. URL: <https://cbu.uz/en/fintech/strategy/>.
4. Financial Stability Board. Sound Practices for Responsible Adoption of Artificial Intelligence (AI): Consultation Report. Basel, 2026. URL: <https://www.fsb.org/uploads/P100626.pdf>.
5. Bank of England, Prudential Regulation Authority. SS1/23: Model Risk Management Principles for Banks. Updated April 2026. URL: <https://www.bankofengland.co.uk/prudential-regulation/publication/2023/may/model-risk-management-principles-for-banks-ss>.
6. National Institute of Standards and Technology. Artificial Intelligence Risk Management Framework (AI RMF 1.0). NIST AI 100-1. Gaithersburg, 2023. DOI: 10.6028/NIST.AI.100-1.
7. Basel Committee on Banking Supervision. Principles for Effective Risk Data Aggregation and Risk Reporting. Basel: Bank for International Settlements, 2013.
8. Regulation (EU) 2024/1689 of the European Parliament and of the Council laying down harmonised rules on artificial intelligence. Official Journal of the European Union, 2024.
9. European Banking Authority. Follow-up Report on the Use of Machine Learning for Internal Ratings-Based Models. Paris, 2023.
10. Rudin C. Stop Explaining Black Box Machine Learning Models for High Stakes Decisions and Use Interpretable Models Instead // *Nature Machine Intelligence*. 2019. Vol. 1. P. 206–215. DOI: 10.1038/s42256-019-0048-x.
11. Fuster A., Goldsmith-Pinkham P., Ramadorai T., Walther A. Predictably Unequal? The Effects of Machine Learning on Credit Markets // *The Journal of Finance*. 2022. Vol. 77, No. 1. P. 5–47. DOI: 10.1111/jofi.13090.
12. Bartlett R., Morse A., Stanton R., Wallace N. Consumer-Lending Discrimination in the FinTech Era // *Journal of Financial Economics*. 2022. Vol. 143, No. 1. P. 30–56. DOI: 10.1016/j.jfineco.2021.05.047.
13. Bussmann N., Giudici P., Marinelli D., Papenbrock J. Explainable Machine Learning in Credit Risk Management // *Computational Economics*. 2021. Vol. 57. P. 203–216. DOI: 10.1007/s10614-020-10042-0.

ASSESSING COMMERCIAL BANK READINESS FOR LONG-TERM FINANCING: AN INTEGRATED INDEX FOR UZBEKISTAN

Sulaymanov A.I. (Republic of Uzbekistan)

*Sulaymanov Akrom Isamiddinovich - Independent Researcher
TASHKENT BRANCH OF PLEKHANOV RUSSIAN UNIVERSITY OF ECONOMICS
TASHKENT, REPUBLIC OF UZBEKISTAN*

Abstract: *The paper develops an integrated methodology for assessing the readiness of commercial banks in Uzbekistan to attract long-term financing. Readiness is interpreted as a multidimensional capacity to obtain, service and productively allocate long-term debt and hybrid resources without an excessive increase in liquidity, refinancing, currency and capital risks. The proposed Long-Term Financing Readiness Index combines five blocks: financial stability, asset quality, liquidity and funding structure, market readiness, and resilience to financial risks. The methodology integrates regulatory filters, normalisation of indicators, expert weights determined by the analytic hierarchy process, stress testing and sensitivity analysis. Banks are classified into four readiness*

groups, for each of which a differentiated set of financing instruments is recommended. The index can be used by banks, regulators and the emerging Tashkent International Financial Centre as a diagnostic and pre-investment screening tool.

Keywords: commercial banks; long-term financing; bank readiness; integrated index; liquidity; refinancing risk; credit rating; Uzbekistan.

ОЦЕНКА ГОТОВНОСТИ КОММЕРЧЕСКОГО БАНКА К ПРИВЛЕЧЕНИЮ ДОЛГОСРОЧНОГО ФИНАНСИРОВАНИЯ: ИНТЕГРАЛЬНЫЙ ИНДЕКС ДЛЯ УЗБЕКИСТАНА

Сулайманов А.И. (Республика Узбекистан)

*Сулайманов Акром Исамиддинович - соискатель
Ташкентский филиал РЭУ им. Г.В. Плеханова
г. Ташкент, Республика Узбекистан*

Аннотация: в статье разработана интегральная методика оценки готовности коммерческих банков Узбекистана к привлечению долгосрочного финансирования. Готовность трактуется, как многомерная способность банка привлекать, обслуживать и эффективно размещать долгосрочные долговые и гибридные ресурсы без чрезмерного роста рисков ликвидности, рефинансирования, валютного и капитального риска. Предложенный индекс объединяет пять блоков: финансовую устойчивость, качество активов, ликвидность и структуру ресурсов, рыночную готовность и устойчивость к финансовым рискам. Методика предусматривает регулятивные фильтры, нормирование показателей, экспертное определение весов методом анализа иерархий, стресс-тестирование и анализ чувствительности. Банки распределяются на четыре группы готовности, для каждой из которых предлагается дифференцированный набор инструментов финансирования.

Ключевые слова: коммерческие банки; долгосрочное финансирование; готовность банка; интегральный индекс; ликвидность; риск рефинансирования; кредитный рейтинг; Узбекистан.

Long-term financing is a structural condition for the ability of a commercial bank to perform maturity transformation, finance investment projects and maintain stable lending during periods of market stress. A bank that funds long-term loans mainly with short-term and behaviourally unstable liabilities faces a persistent refinancing problem: assets remain on the balance sheet while liabilities must be repeatedly renewed under uncertain price and liquidity conditions. International banking theory therefore links the quality of funding not only to its volume, but also to maturity, currency, concentration, contractual stability and sensitivity to market shocks [1-3].

For Uzbekistan, this issue has acquired additional importance as commercial banks expand investment lending, interact more actively with international financial institutions and enter foreign debt markets. The establishment of the Tashkent International Financial Centre under Presidential Decree No. UP-48 of 30 March 2026 creates an institutional basis for new channels of debt, green and Islamic financing. However, the centre is at the formation stage, and its impact cannot yet be treated as an observed statistical result. The immediate methodological task is therefore to determine which banks are actually ready to use the new infrastructure and which deficiencies must be corrected before market entry [4].

Existing bank assessments usually focus on a single dimension: capital adequacy, liquidity, credit rating or compliance with disclosure requirements. Such partial diagnostics are insufficient for long-term financing. A bank may have strong capital ratios but weak asset quality; it may be liquid in the short term but retain a substantial maturity gap; or it may have acceptable financial indicators but lack audited international reporting, investor relations and experience in issuing

securities. Consequently, readiness should be evaluated as a system of mutually dependent financial, market and risk-management characteristics.

The purpose of this study is to develop an integrated Long-Term Financing Readiness Index for commercial banks in Uzbekistan and to establish a logical correspondence between the level of readiness and the set of financing instruments available to a bank. The research combines systemic and comparative analysis, index methods, expert assessment, the analytic hierarchy process, stress testing and sensitivity analysis. The methodological design is based on the principle that a bank is ready not merely when it can attract resources, but when it can service them, withstand adverse shocks and allocate them to assets whose profitability and maturity are consistent with the structure of the funding.

The first block of the index is financial stability. It includes the regulatory capital adequacy ratio, Tier 1 capital adequacy, return on assets, return on equity and net interest margin. Capital indicators reflect the bank's loss-absorbing capacity, while profitability indicators show whether the institution can cover the full cost of long-term borrowing. A high nominal capital ratio should not automatically compensate for structurally weak profitability, because market funding generates fixed servicing costs and exposes the bank to repricing risk.

The second block is asset quality. It comprises the non-performing loan ratio, coverage of problem assets by provisions, concentration of large credit exposures and sectoral diversification of the loan portfolio. Investors evaluate not only current profitability but also the probability that asset deterioration will reduce future cash flows. The inclusion of concentration is especially important because a bank with a small number of large borrowers can experience a rapid decline in credit quality even when the average non-performing loan indicator initially appears acceptable.

The third block covers liquidity and the funding structure. It includes the liquidity coverage ratio, the net stable funding ratio, the share of long-term liabilities, the maturity gap between assets and liabilities and creditor concentration. The net stable funding ratio is particularly relevant because it relates the available amount of stable funding to the required stable funding of assets over a one-year horizon [5]. Nevertheless, regulatory compliance should be supplemented by a detailed maturity ladder. A bank may satisfy an aggregate standard and still face a concentration of repayments within a narrow period.

The fourth block is market readiness. It includes the availability and quality of an international credit rating, experience in bond issuance, the completeness and timeliness of financial disclosure, audited financial statements prepared under international standards and established relations with international financial institutions. These indicators determine the transaction cost and speed of market entry. Transparent reporting and a consistent investor-relations policy reduce information asymmetry and enable investors to compare the bank with domestic and foreign peers.

The fifth block measures resilience to financial risks. It covers the open foreign-exchange position, interest-rate risk, refinancing risk, stress-test results and the availability of hedging instruments. This block prevents the index from rewarding an apparently cheap but excessively risky funding structure. Foreign-currency borrowing can lower the nominal coupon but increase the effective cost after exchange-rate depreciation and hedging expenses. Similarly, a floating-rate instrument can create pressure on the net interest margin when international rates rise.

The methodology uses two types of indicators. For a benefit indicator, a higher value improves readiness; examples are capital adequacy, profitability and the share of stable funding. For a cost indicator, a lower value is preferable; examples are non-performing loans, maturity gaps and creditor concentration. Indicators are normalised within a comparable group of banks, while hard regulatory floors are applied before aggregation. A bank that violates a mandatory capital or liquidity requirement cannot be assigned to the highest readiness group regardless of its score on other dimensions.

$$I_LTF(i) = \sum (w_j \times z_ij), \quad \sum w_j = 1$$

where $I_LTF(i)$ is the readiness index of bank i ; z_ij is the normalised value of indicator j for bank i ; and w_j is the weight of indicator j . Weights should be determined through the analytic hierarchy process with the participation of banking supervisors, treasury and risk-management

specialists, institutional investors and independent auditors. The stability of the result is then tested by changing the weights and the stress assumptions.

Table 1. Structure of the Long-Term Financing Readiness Index and management responses.

Readiness block	Core diagnostic indicators	Main risk identified	Recommended management response
Financial stability	Regulatory and Tier 1 capital adequacy; ROA; ROE; net interest margin	Insufficient loss absorption or inability to cover the full funding cost	Capital plan; profitability improvement; limits on expensive or subordinated instruments
Asset quality	NPL ratio; provision coverage; large-exposure concentration; sector diversification	Deterioration of cash flows and investor confidence	Portfolio remediation; provisioning; concentration limits; sector rebalancing
Liquidity and funding	LCR; NSFR; long-term-liability share; maturity gap; creditor concentration	Liquidity pressure and refinancing peaks	Maturity-ladder limits; diversified creditors; longer tenors; liquidity buffer
Market readiness	Credit rating; issuance experience; IFRS audit; disclosure quality; relations with IFIs	High information asymmetry and transaction cost	Rating roadmap; investor relations; standard data room; audited disclosure
Risk resilience	FX position; interest-rate risk; refinancing risk; stress tests; hedging capacity	Unexpected increase in effective funding cost	Hedging policy; stress limits; currency matching; contingency funding plan

Source: developed by the author on the basis of the dissertation research.

The classification procedure should combine absolute regulatory conditions with relative benchmarking. After the mandatory filters are applied, banks may be divided into four groups according to the distribution of index values and the stability of those values under stress. The high-readiness group includes banks with strong scores in all five blocks and limited sensitivity to adverse scenarios. Such banks may use international senior bonds, green and social bonds, sukuk and, where justified, subordinated instruments. The sufficient-readiness group can enter syndicated lending and domestic or regional bond markets, while simultaneously improving disclosure and hedging capacity.

Banks with limited readiness should primarily use long-term credit lines of international financial institutions, risk-sharing facilities and smaller private placements. These instruments provide not only funding but also technical assistance, covenants and monitoring that can accelerate institutional development. Banks in the low-readiness group should first implement a corrective programme covering capital, asset quality, liquidity, reporting and risk management. Direct access to volatile international markets would otherwise increase rather than reduce financial vulnerability.

Stress testing is an obligatory component of the index. At a minimum, the bank should be assessed under scenarios of higher international interest rates, depreciation of the national currency, shortening of available maturities, deterioration of the credit rating, higher hedging costs and temporary closure of external capital markets. The index must be recalculated after each shock. A bank whose classification falls by two or more categories under a moderate scenario should not be considered ready for a large market issue even if its baseline score is high.

The proposed index can be incorporated into a bank's medium-term funding strategy. The diagnostic stage identifies the weakest block; the management stage determines corrective measures; the instrument-selection stage links the readiness profile to a financing matrix; and the post-transaction stage compares the expected and actual effect on funding cost, maturity, liquidity,

capital and long-term lending. This transforms the index from a static rating into a management cycle.

For the Tashkent International Financial Centre, the methodology can serve as a standardised pre-investment screening tool. A common assessment template would make banks more comparable, reduce duplication in investor due diligence and create a transparent pipeline of potential issuers and borrowers. The centre should not replace supervisory judgement or a credit rating. Its role is to provide a structured diagnostic language that connects bank fundamentals, market infrastructure and appropriate financing instruments.

The main practical advantage of the index is its differentiation. It avoids the assumption that the same instrument is suitable for every bank. A state-owned systemically important bank, a large private bank, a medium-sized universal bank and a bank specialising in small-business lending have different balance-sheet structures, investor bases and risk-bearing capacities. The methodology allows common principles to be maintained while weights, benchmarks and instrument recommendations are adapted to the peer group.

The study concludes that readiness for long-term financing is a multidimensional characteristic that combines financial soundness, asset quality, stable funding, market transparency and risk resilience. The proposed integrated index creates a basis for diagnosing institutional gaps, selecting suitable instruments and sequencing reforms. Its pilot application to a panel of commercial banks for 2018-2025, followed by expert validation and stress testing, can support the development of a sustainable long-term funding market in Uzbekistan and the effective use of the emerging Tashkent International Financial Centre.

References / Список литературы

1. *Mishkin F.S.* The Economics of Money, Banking, and Financial Markets. 13th Global ed. Harlow: Pearson, 2022.
2. *Saunders A., Cornett M.M., Erhemjamts O.* Financial Institutions Management: A Risk Management Approach. 10th ed. New York: McGraw-Hill Education, 2021.
3. *Choudhry M.* The Principles of Banking. 2nd ed. Hoboken: John Wiley & Sons, 2022.
4. О мерах по созданию Международного финансового центра в городе Ташкенте: Указ Президента Республики Узбекистан от 30 марта 2026 года № УП-48.
5. Basel Committee on Banking Supervision. Basel III: The Net Stable Funding Ratio. Basel: Bank for International Settlements, 2014.
6. *Hull J.C.* Risk Management and Financial Institutions. 6th ed. Hoboken: John Wiley & Sons, 2023.
7. *Müller C., Ossandon Busch M., Sarmiento M., Pinzon-Puerto F.* Fragile Wholesale Deposits, Liquidity Risk, and Banks' Maturity Transformation. BIS Working Papers No. 1263. Basel: BIS, 2025.
8. *Baudino P., de Carvalho P., Svoronos J.-P.* Liquidity Stress Tests for Banks: Range of Practices and Possible Developments. FSI Insights No. 59. Basel: BIS, 2024.
9. Центральный банк Республики Узбекистан. Годовой отчёт за 2024 год. Ташкент, 2025.
10. European Bank for Reconstruction and Development. Uzbekistan Country Strategy 2024-2029. London: EBRD, 2024.

A SECTORAL DIGITAL COMPETENCY MODEL FOR COMMERCIAL BANK EMPLOYEES IN UZBEKISTAN

Pulatov D.A. (Republic of Uzbekistan)

*Pulatov Dilshod Akmal'yevich - Researcher,
TASHKENT BRANCH OF PLEKHANOV RUSSIAN UNIVERSITY OF ECONOMICS
TASHKENT, REPUBLIC OF UZBEKISTAN*

Abstract: *The article develops a sectoral model for aligning the digital competencies of commercial bank employees with job functions, responsibility and operational risk. The study combines human capital theory, job-function analysis, comparative review of professional development practices in ten Uzbek commercial banks, and an in-depth research design for Asia Alliance Bank JSC and Octobank JSCB. The model contains seven competency blocks, four proficiency levels and differentiated requirements for seven professional-functional groups. A multi-source assessment compares required and actual levels using self-assessment, practical tasks, managerial assessment, expert interviews and work-result evidence. Four types of gaps are distinguished: deficient, hidden, structural and prospective. The proposed digital professional profile converts diagnosis into an individual development trajectory with a target level, practical assignment, mentor, verification method and expected labor outcome. The model shifts bank training from uniform course provision to task-specific investment in productive digital human capital.*

Keywords: *digital competencies; human capital; commercial banks; professional development; competency gap; Uzbekistan.*

ОТРАСЛЕВАЯ МОДЕЛЬ ЦИФРОВЫХ КОМПЕТЕНЦИЙ РАБОТНИКОВ КОММЕРЧЕСКИХ БАНКОВ УЗБЕКИСТАНА

Пулатов Д.А. (Республика Узбекистан)

*Пулатов Дилишод Акмалъевич - научный соискатель,
Ташкентский филиал РЭУ им. Г.В. Плеханова,
г. Ташкент, Республика Узбекистан*

Аннотация: *в статье разработана отраслевая модель согласования цифровых компетенций работников коммерческих банков с трудовыми функциями, ответственностью и операционным риском. Исследование объединяет теорию человеческого капитала, анализ трудовых функций, сравнительное изучение практики профессионального развития в десяти коммерческих банках Узбекистана и углублённый исследовательский дизайн для АО «Asia Alliance Bank» и АКБ «Octobank». Модель включает семь блоков компетенций, четыре уровня владения и дифференцированные требования для семи профессионально-функциональных групп. Комплексная оценка сопоставляет требуемый и фактический уровни на основе самооценки, практических заданий, оценки руководителя, экспертного интервью и показателей труда. Выделены дефицитный, скрытый, структурный и перспективный разрывы. Цифровой профессиональный профиль преобразует диагностику в индивидуальную траекторию развития с целевым уровнем, практическим заданием, наставником, способом подтверждения и ожидаемым трудовым результатом.*

Ключевые слова: *цифровые компетенции; человеческий капитал; коммерческие банки; профессиональное развитие; компетентностный разрыв; Узбекистан.*

Introduction

Digital transformation changes banking work through remote identification, mobile services, automated lending, data analytics, open banking, cybersecurity tools and artificial intelligence.

These technologies do not merely replace isolated operations. They redistribute tasks between employees and information systems, increase the importance of exception handling and judgement, and make the quality of human decisions visible in operational risk. Human capital theory treats education and training as investment because present expenditure can generate future productivity and income [1, 2]. In digital banking, however, the return on technology depends on complementary employee competencies and organizational redesign. Research on automation and digital transformation therefore emphasizes that technologies create value when they are combined with new tasks, capabilities and work processes [3, 4].

The scale of digital banking in Uzbekistan makes this complementarity economically important. In 2025, transactions conducted by individuals through mobile banking applications reached UZS 645.6 trillion, 1.6 times the previous-year level. Remote deposits amounted to UZS 99.3 trillion, online microloans to UZS 38.6 trillion, and remote loan repayments to UZS 46.7 trillion [10]. The spread of digital channels means that employee competence affects not only service speed, but also data quality, consumer protection, cybersecurity, credit decisions and continuity of operations. At the same time, global forecasts indicate that 39.0% of core skills may change by 2030 and that 59 of every 100 workers will require training or retraining [7].

The practical problem is that professional development is often measured by the number of courses, training hours and certificates. These indicators describe activity, not productive capability. A completed course does not show whether the employee can use a banking system safely, interpret an automated recommendation, communicate with a digital client, identify a suspicious operation or manage a technology-enabled change. Workplace research defines digital competence as a multidimensional combination of knowledge, skills, attitudes and responsible behavior rather than a narrow technical skill [5, 6]. Accordingly, a bank requires a sector-specific model that links competence to a concrete labor function and an observable work outcome.

The purpose of this article is to develop such a model for commercial banks in Uzbekistan and to show how it can be used to diagnose competency gaps and construct individual professional development trajectories. The contribution is methodological. It integrates seven content blocks, four proficiency levels, professional-functional differentiation and multi-source verification in one management cycle. It also distinguishes a lack of employee capability from a lack of organizational conditions, which is essential for avoiding unnecessary training expenditure.

Methodology

The study uses a systemic and reproduction approach to professional development, job-function analysis, a competency-based approach, comparative analysis, content analysis of corporate documents, benchmarking, questionnaires, practical assignments, managerial assessment, expert interviews and case analysis. The research design has three levels. The sector level examines digitalization and human-capital requirements in the banking system of Uzbekistan. The organizational level compares professional development practices in ten commercial banks. The applied level is designed for in-depth use at Asia Alliance Bank JSC and Octobank JSCB and connects the strategy of the bank, the work of a professional-functional group and the profile of an individual employee.

The comparative analysis indicates that Uzbek banks conduct training and professional development, but the connection between training programs, job functions, verified competency gaps and measurable labor outcomes remains incomplete. This conclusion does not imply that all banks use identical practices. It identifies a common methodological weakness: training demand is frequently formulated at the level of a broad topic, whereas investment effectiveness must be evaluated at the level of a specific capability required for a specific task.

The proposed model therefore begins with the work process. For each position, the bank identifies the employee's main labor functions, the digital systems and data used, the decision consequences, the risk of error and the evidence by which successful performance can be observed. Only then is the required competence level defined. This sequence prevents the competence framework from becoming a generic catalogue disconnected from production.

Structure of the sectoral model

The model includes seven interrelated competency blocks. They cover the technological, analytical, client, product, decision, security and change-management dimensions of contemporary banking work. Each block is interpreted through observable labor behavior rather than through knowledge alone.

Table 1. Content blocks of the sectoral digital competency model.

Competency block	Economic and labor content	Examples of observable outcomes
Operational systems	Reliable use of core banking, workflow and service systems in accordance with the employee's role.	Shorter operation time; fewer repeated entries; correct process routing.
Data and analytics	Collection, validation, interpretation and communication of data for operational and managerial decisions.	Higher data quality; faster analysis; better substantiation of decisions.
Digital customer interaction	Service, communication and problem resolution through remote and omnichannel environments.	Higher first-contact resolution; fewer complaints; consistent digital service.
Financial technologies and products	Understanding and application of digital payments, lending, deposits, platforms and related product logic.	Correct product selection; accurate explanation; lower processing error.
Artificial intelligence and decision-making	Responsible use and critical evaluation of automated recommendations and models.	Documented human review; justified overrides; fewer uncritical decisions.
Security	Protection of information, identification of threats and compliance with access and incident procedures.	Fewer security violations; faster escalation; safer data handling.
Change management	Adoption, communication and stabilization of new digital processes, roles and standards.	Shorter adaptation; higher use of new systems; lower resistance and rework.

Competence in each block is assessed on four levels. The initial level reflects guided execution of simple digital tasks. The practical level means independent performance of standard tasks. The advanced level covers complex cases, interpretation and process improvement. The expert level includes design, governance, mentoring and responsibility for high-risk decisions. A four-level scale is sufficiently differentiated for development decisions while remaining understandable to managers and employees.

The main feature of the model is differentiation by professional-functional group. Equal requirements for all employees would produce both overtraining and undertraining. Front-office workers need strong digital client, operational, fintech and security competencies, but do not require the same analytical or model-governance depth as risk specialists. Data analysts and risk employees need high levels in analytics and artificial-intelligence-supported decision-making. Information-technology and information-security employees require expert capability in systems, security and change. Managers require the ability to coordinate digital change across functions.

Table 2. Differentiated requirements by professional-functional group.

Professional-functional group	Priority requirements on the four-level scale
Front office and contact center	Operational systems - 3; digital customer interaction - 3; fintech and products - 3; security - 3.
Credit specialists	Operational systems - 3; data and analytics - 3; fintech and products - 3; AI and decision-making - 3; security - 3.
Risk management	Data and analytics - 4; AI and decision-making - 4; security - 4; change management - 3.
Internal control and audit	Security - 4; operational systems - 3; analytics - 3; AI and decision-making - 3; change management - 3.
IT and information security	Operational systems - 4; fintech and products - 4; security - 4; change management - 4.
Data analytics specialists	Data and analytics - 4; AI and decision-making - 4; operational systems - 3; security - 3.
Heads of units	Change management - 4; operational systems, analytics, digital client, fintech, AI and security - 3.

Comprehensive assessment and gap diagnosis

A valid diagnosis must compare the required level with evidence of actual capability. Reliance on a single test is insufficient because a worker may know the correct answer but fail to apply it in a live process. Conversely, low self-confidence may coexist with strong performance. The proposed assessment therefore combines self-assessment, a practical assignment, the direct manager's assessment, an expert interview and documented work results. The exact weights can be adapted to the risk profile of the function, but evidence that directly reflects workplace application should receive greater weight in high-risk processes.

For employee i and competency j , the actual level can be represented as $A_{ij} = \sum(w_k x_{ijk})$, where x_{ijk} is the standardized result from evidence source k , w_k is its weight, and the weights sum to one. The required level is R_{ij} . The quantitative gap is $G_{ij} = \max(0, R_{ij} - A_{ij})$. This calculation is not a substitute for professional judgement. It creates a transparent basis for discussing why development is needed and what result must be achieved.

The quantitative gap is supplemented by a qualitative classification. This is necessary because identical numerical gaps can have different causes. A deficient gap means that actual capability is below the current job requirement. A hidden gap occurs when formal knowledge is acceptable but the competence is not transferred to work. A structural gap exists when the employee has the capability but lacks access, authority, data quality, managerial support or a suitable process. A prospective gap refers to a capability that will be required after the introduction of a new technology or work function.

Table 3. Types of competency gaps and corresponding development decisions.

Gap type	Diagnostic interpretation	Appropriate response
Deficient	The actual level is below the requirement of the current labor function.	Targeted course, guided practice, mentoring and reassessment against the same task.
Hidden	Knowledge is present, but it is not reliably applied in the workplace.	Workplace assignment, managerial support, feedback and transfer verification.

Gap type	Diagnostic interpretation	Appropriate response
Structural	Capability exists, but organizational or technological conditions prevent its use.	Process redesign, access, data, authority or system correction rather than additional training alone.
Prospective	A future technology or job function will create a new requirement.	Advance reskilling, simulation and staged introduction before deployment.

The complete diagnostic cycle is: definition of labor functions; establishment of the required level; multi-source assessment of the actual level; identification of the magnitude and type of gap; prioritization; selection of a development measure; workplace application; and reassessment. The cycle converts competency assessment from a one-time human-resource event into a continuous management process.

Digital professional profile and individual trajectory

The digital professional profile integrates the employee's position, labor functions, required competencies, actual levels, identified gaps, target levels and expected work outcomes. It is not intended to become a permanent label or a disciplinary rating. Its purpose is to organize development decisions and to make expectations transparent. Access to individual results should therefore be limited, and employees should be able to review the evidence and request correction when data are inaccurate.

An individual professional development trajectory is constructed from the profile. It specifies the competence to be developed, the target level, the learning form, a practical assignment, the mentor or supervisor, the verification method, the deadline and the expected labor result. For example, a credit specialist with a hidden gap in AI-supported decision-making may not need another general course on artificial intelligence. The appropriate trajectory may be a supervised review of a defined set of model recommendations, documentation of overrides, feedback from risk management and confirmation that decision quality has improved.

This approach also permits different responses to the same topic. A front-office employee may require a practical module on digital identity and customer communication; a risk specialist may require advanced model interpretation; an internal auditor may require evidence-tracing and control testing; a manager may require change-governance and accountability. The unit of planning is thus not the course title but the productive capability.

Discussion

The proposed model extends general digital-competence frameworks by introducing sectoral and functional differentiation. DigComp 2.2 provides a valuable common language for knowledge, skills and attitudes [6], while workplace reviews show that digital competence is contextual and role-dependent [5]. Banking requires an additional layer because the same technology can have different economic and risk consequences across functions. The model therefore relates competence to responsibility, error risk and observable labor outcomes.

The classification of gaps has a direct economic implication. If a structural gap is incorrectly diagnosed as a deficient gap, the bank may repeatedly finance training without changing performance. If a hidden gap is treated as successful learning because the employee passed a test, the bank will overestimate its human capital. If prospective gaps are ignored until deployment, adaptation costs and operational disruption increase. Accurate classification improves the targeting of development resources and makes it possible to distinguish learning problems from work-organization problems.

The model also supports internal professional mobility. A transparent profile shows which competencies are transferable and which gaps separate an employee from a new role. This can shorten adaptation, strengthen retention and reduce external recruitment costs. In the context of Uzbekistan's expanding labor force and the high economic value of skilled financial-sector labor, such internal mobility can help banks use human capital more productively [9, 10].

The study has limitations. The article presents a methodological model and an applied research design; it does not claim that all banks have completed employee-level measurement or that the

proposed framework has already produced causal effects. Bank-level implementation should anonymize research data, establish measurement dates, define comparison groups where feasible and separate observed results from scenario assumptions. Required levels and evidence weights should be reviewed as technologies, regulations and job functions change.

Conclusion

The sectoral digital competency model creates a coherent link between banking strategy, labor functions, employee capability and professional development. Its seven blocks cover operational systems, data and analytics, digital customer interaction, financial technologies and products, artificial intelligence and decision-making, security and change management. Four proficiency levels and differentiated requirements prevent the use of a uniform standard for economically different jobs.

The multi-source assessment method improves the reliability of diagnosis by combining knowledge, practical behavior, managerial judgement and work-result evidence. The distinction between deficient, hidden, structural and prospective gaps prevents training from being used as a universal remedy. The digital professional profile and individual trajectory then translate diagnosis into a target level, a workplace task, support, verification and an expected labor outcome. For commercial banks in Uzbekistan, this approach provides a practical basis for investing in digital human capital according to job requirements rather than according to the number of available courses.

References / Список литературы

1. *Schultz T.W.* Investment in Human Capital // *The American Economic Review*. - 1961. - Vol. 51, No. 1. - P. 1-17. - URL: <https://www.jstor.org/stable/1818907>.
2. *Becker G.S.* Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. - 3rd ed. - Chicago: University of Chicago Press, 1993. - 412 p.
3. *Acemoglu D., Restrepo P.* Automation and New Tasks: How Technology Displaces and Reinstates Labor // *Journal of Economic Perspectives*. - 2019. - Vol. 33, No. 2. - P. 3-30. - DOI: 10.1257/jep.33.2.3.
4. *Vial G.* Understanding Digital Transformation: A Review and a Research Agenda // *Journal of Strategic Information Systems*. - 2019. - Vol. 28, No. 2. - P. 118-144. - DOI: 10.1016/j.jsis.2019.01.003.
5. *Oberlander M., Beinicke A., Bipp T.* Digital Competencies: A Review of the Literature and Applications in the Workplace // *Computers & Education*. - 2020. - Vol. 146. - Article 103752. - DOI: 10.1016/j.compedu.2019.103752.
6. *Vuorikari R., Kluzer S., Punie Y.* DigComp 2.2: The Digital Competence Framework for Citizens. - Luxembourg: Publications Office of the European Union, 2022. - DOI: 10.2760/115376.
7. World Economic Forum. The Future of Jobs Report 2025. - Geneva: World Economic Forum, 2025. - URL: <https://www.weforum.org/publications/the-future-of-jobs-report-2025/>.
8. International Labour Organization. Generative AI and Jobs: A Refined Global Index of Occupational Exposure. - Geneva: ILO, 2025. - DOI: 10.54394/HETP0387.
9. OECD. OECD Skills Outlook 2025: Building the Skills of the 21st Century for All. - Paris: OECD Publishing, 2025. - DOI: 10.1787/26163cd3-en.
10. Central Bank of the Republic of Uzbekistan. Annual Report 2025. - Tashkent: Central Bank of the Republic of Uzbekistan, 2026. - 86 p. - URL: <https://cbu.uz/>.
11. United Nations Development Programme. Digital Economy of Uzbekistan: The State of Digital Entrepreneurship and Artificial Intelligence. - Tashkent: UNDP Uzbekistan, 2025.
12. *Abdurakhmanov K.Kh.* Labor Economics: Theory and Practice. - Moscow: Plekhanov Russian University of Economics, 2019. - 661 p.

VOLUNTEERING AS A MEANS OF STUDENT SOCIALIZATION

Sisyan A.B.¹, Sisyan S.B.² (Republic of Armenia)

¹Sisyan Armenuhi Beniaminovna - Lecturer of Armenian,
DEPARTMENT OF ARMENIAN LANGUAGE,
YEREVAN STATE MEDICAL UNIVERSITY,

²Sisyan Susanna Beniaminovna - Candidate of Pedagogical Sciences, Associate Professor,
DEPARTMENT OF PEDAGOGY,
KH. ABOVYAN ARMENIAN STATE PEDAGOGICAL UNIVERSITY,
YEREVAN, REPUBLIC OF ARMENIA

Abstract: in the article we have presented the study and analysis of student volunteer work, the trends in the development of student volunteer work in the context of the socialization process, and have emphasized that volunteer work is the basis for the development of social skills, the formation of responsibility and an active civic position. It also contributes to the development of civic consciousness, civic education and patriotic values. Volunteering gives students the opportunity to be directly involved in the process of developing their profession. For this purpose we conducted a summary of the results of the research work and the proposed practical and pedagogical paths, which are based on modern approaches to university didactics, development, and social learning.

Keywords: volunteerism, socialization, initiative, psychological skills, responsibility, student volunteer work, integration of educational elements.

ВОЛОНТЕРСКАЯ РАБОТА КАК СРЕДСТВО СОЦИАЛИЗАЦИИ СТУДЕНТОВ

Сисян А.Б.¹, Сисян С.Б.² (Республика Армения)

¹Сисян Арменуи Бениаминовна - преподаватель армянского языка,
кафедра армянского языка,
Ереванский государственный медицинский университет,

²Сисян Сусанна Бениаминовна - кандидат педагогических наук, доцент,
кафедра педагогики,
Армянский государственный педагогический университет им. Х. Абовяна,
г. Ереван, Республика Армения

Аннотация: в статье представлены исследование и анализ волонтерской работы студентов в контексте процесса их социализации, а также тенденции развития студенческого волонтерства. Мы подчеркивали, что волонтерская работа является основой для развития социальных навыков, формирования ответственности и активной гражданской позиции. Она также способствует развитию гражданского сознания, гражданского воспитания и патриотических ценностей. Волонтерство дает студентам возможность непосредственно участвовать в процессе развития своей профессии. В этом контексте обобщены результаты проведенного нами исследования и предложены педагогические направления, основанные на современных подходах к университетской дидактике, развитию и социальному обучению.

Ключевые слова: волонтерство, социализация, инициативность, психологические навыки, ответственность, волонтерская работа студентов, интеграция образовательных элементов.

Volunteering is a unique opportunity for students to apply their theoretical knowledge in practice, where they can gain new knowledge and skills by working with various professionals in the labor market. It contributes to the development of civic awareness, civic education, and patriotic values.

According to the International Labor Organization, volunteer work is “unpaid, non-compulsory work, that is, time given freely by individuals to perform work that is performed, either through an organization or directly, for others outside their household.” Volunteering is voluntary, unpaid activity for the benefit of society and individual citizens. In informal terms, volunteering is unpaid work to help anyone in dire need. [1] Many volunteers are specifically trained in the fields in which they work, such as medicine, education, or emergency services. Others offer their services on an as-needed basis, such as during natural disasters.[5] Regardless of the profession, the student's socialization process continues and deepens during his/her student years, when he/she, having already recognized the behavioral models accepted by society in the family, at school, and in other platforms of peer relations, and having mastered the principles of social interaction, forms his/her own social skills, value orientations, and behavioral strategies. In this context, volunteering is seen as an effective tool for socialization. It promotes the active participation of the individual in public life, develops a sense of responsibility, initiative and the ability to find creative solutions to problem situations. Volunteering thus not only strengthens social ties, but also contributes to the holistic development of the individual as a mature and socially integrated unit [2, p. 3]. Volunteer participation in various initiatives significantly contributes to public welfare, while simultaneously forming a culture of mutual assistance and social responsibility. The role of volunteering is especially important in terms of the social and professional self-expression of young people. It offers a platform through which young people, regardless of their chosen profession, can discover and develop their abilities in areas where they feel interested and have potential. Although young people often have motivation and initiative, a lack of professional preparation can limit their full participation. Volunteering in this regard acts as a means of practical learning and self-development, through which it is possible to acquire valuable skills and experience .

Students' involvement in socially significant unpaid activities contributes to the formation of a desire to take responsibility not only for their own lives, but also for the well-being of the entire society [3].

At the same time, volunteer work contributes to the professional development of students by providing them with real-world experience that enables them to broaden their horizons, improve their cultural level, and develop social intelligence and creative abilities [4].

- We have conducted research within the framework of this topic, the goal of which is to study student volunteer work and propose practical ways to increase its effectiveness. The following tasks arose from the proposed goal:

- 1. to present the features of university students' volunteer work,
- 2. to study the trends in the development of students' volunteer work during the academic years,

- 3. to propose practical ways to increase the effectiveness of students' volunteer activities.

To solve the research problems, we used the following methods:

- Questionnaire survey method.
- Interview method.
- Mathematical calculation methods for analyzing research results (recording, scale compilation).

The research was conducted at Yerevan State Medical University and Armenian State Pedagogical University. 54 students from the mentioned universities participated in the research.

Results The research allowed us to make sure that volunteer work undoubtedly contributes to the development of students' self-confidence, self-esteem, adaptability, initiative, teamwork, and social responsibility. It, unlike volunteer work performed by other groups in society, exhibited a number of features. First of all, it provided students with direct contact with different social groups, which helped develop social sensitivity and responsibility. Second, volunteering gave students the opportunity to apply the theoretical knowledge they had acquired in practice, strengthening their self-esteem, initiative, and professional orientation.

As a result of the analysis of the research work carried out by us within the framework of the problem, we developed practical ways to increase the effectiveness of students' volunteer work,

which are based on the theory of higher education, the psychology of personal development, and modern approaches to social learning. They are aimed at the purposeful organization of students' volunteer activities, the stimulation of this process, and increasing its effectiveness. These ways are:

1. Formation of a motivational environment
2. Integration of educational elements into volunteering
3. Organization of reflexive activities
4. Application of active learning methods
5. Formation of sociocultural cooperation
6. Introduction of mechanisms for recognizing and encouraging volunteer experience

As a result of the research, we have also put forward some recommendations aimed at the development of volunteering.

1. Creation of a center for organizing volunteer work at a university
2. Development of systematic training and preparation programs for volunteering
3. Recognition and encouragement of the value of volunteering
4. Clear description of volunteering and definition of functions
5. The importance of developing trust and cooperation
6. Improvement of awareness and information platforms
7. Promotion of students' intrinsic motivation
8. Combining student internships and volunteer work
9. Development of methods for evaluating volunteering.

Conclusions

As a result of the analysis of the research work carried out by us, we have made the following conclusions:

1. Through volunteering, students participate in various programs, which helps them gain real work experience, develop teamwork skills and improve their social communication skills.
2. As a result of our surveys and interviews, we found out that volunteering is not limited only to the provision of public services, but also contributes to the development of the student's personality, creating a supportive environment for their professional and social growth.
3. The proposed pedagogical paths are based on modern approaches to university didactics, development and social learning and can contribute to the active involvement of students in volunteer work, exchange of experience and the formation of the psychological capabilities of a 21st century specialist.

References / Список литературы

1. Кудринская Л.А. Добровольческий труд: опыт теоретической реконструкции. Автореф. Дис. доктор. социол. наук: 22.00.03. М., 2006.
2. Богданова Е.В. Подготовка будущих социальных педагогов к волонтерской деятельности // Идеи и идеалы. – 2010. – № 1 (3). – с. 35.
3. Мороз А.В. Зарубежный опыт деятельности волонтеров неправительственных организаций по профилактике девиантного поведения подростков: Метод. пособие / А.В. Мороз. – М.: Изд-во ИСПС РАО, 2005. – 110 с.
4. Никитина Л.Е. Социальная педагогика: вопросы теории и практики. – Ярославль: ДИА-пресс, 2001. – 216 с.
5. Wilson John (2000). «Volunteering». Annual Review of Sociology.: /annurev.soc.26.1.215. Benefits of Volunteering». Corporation for National and Community Service..12.02.2025, p.20.[in English].

POLITICAL SCIENCES

FROM ECONOMIC INSTRUMENTS TO STRATEGIC PARTNERSHIP: POLITICAL MECHANISMS OF UZBEKISTAN–SAUDI ARABIA COOPERATION

Kadyrov A.K. (Republic of Uzbekistan)

*Kadyrov Alisher Kadyrovich - Head of Department,
INSTITUTE FOR STRATEGIC AND REGIONAL STUDIES UNDER THE PRESIDENT OF THE REPUBLIC
OF UZBEKISTAN,
TASHKENT, REPUBLIC OF UZBEKISTAN*

Abstract: *The article develops a political-science interpretation of contemporary Uzbekistan–Saudi Arabia relations by examining how investments, energy projects, transport links, and technology initiatives become resources of strategic partnership. The analysis combines the concepts of complex interdependence, economic statecraft, economic diplomacy, and interregionalism. It distinguishes political mechanisms from economic instruments and proposes a sequential model linking political initiative, diplomatic agreement, legal institutionalization, financing, project implementation, public value, and political trust. The study argues that the strategic quality of bilateral relations depends not on the nominal value of announced projects, but on institutional continuity, legal certainty, implementation capacity, localization, technology transfer, and integration with the Central Asia–Gulf Cooperation Council dialogue. The article concludes with policy priorities for strengthening coordination and evidence-based monitoring.*

Keywords: *Uzbekistan, Saudi Arabia, strategic partnership, economic diplomacy, political mechanisms, economic instruments, interregionalism, Central Asia, Gulf Cooperation Council.*

ОТ ЭКОНОМИЧЕСКИХ ИНСТРУМЕНТОВ К СТРАТЕГИЧЕСКОМУ ПАРТНЕРСТВУ: ПОЛИТИЧЕСКИЕ МЕХАНИЗМЫ СОТРУДНИЧЕСТВА УЗБЕКИСТАНА И САУДОВСКОЙ АРАВИИ Кадыров А.К. (Республика Узбекистан)

*Кадыров Алишер Кадырович - заведующий отделом
Институт стратегических и региональных исследований при Президенте Республики Узбекистан,
г. Ташкент, Республика Узбекистан*

Аннотация: *в статье дается политологическая интерпретация современных отношений Узбекистана и Саудовской Аравии, исследуется, как инвестиции, энергетические проекты, транспортные связи и технологические инициативы становятся ресурсами стратегического партнерства. Анализ сочетает в себе концепции сложной взаимозависимости, экономического управления государством, экономической дипломатии и межрегионализма. В нем проводится различие между политическими механизмами и экономическими инструментами и предлагается последовательная модель, связывающая политическую инициативу, дипломатическое соглашение, правовую институционализацию, финансирование, реализацию проекта, общественную ценность и политическое доверие. В исследовании утверждается, что стратегическое качество двусторонних отношений зависит не от номинальной стоимости объявленных проектов, а от институциональной преемственности, правовой определенности, возможностей реализации, локализации, передачи технологий и интеграции с диалогом Совета сотрудничества Центральной Азии и стран Персидского залива. Статья завершается изложением политических приоритетов для усиления координации и мониторинга, основанного на фактических данных.*

Ключевые слова: *Узбекистан, Саудовская Аравия, стратегическое партнерство, экономическая дипломатия, политические механизмы, экономические инструменты,*

Introduction

The contemporary international system is increasingly shaped by the interaction of diplomacy, investment, infrastructure, energy, and technology. Economic resources are no longer confined to commercial exchange; they may also create long-term political commitments, alter the structure of interdependence, and expand the foreign-policy autonomy of partner states. This transformation is particularly visible in relations between Central Asian states and the Arab Gulf, where investment funds, energy companies, transport operators, and technology firms operate alongside heads of state, foreign ministries, intergovernmental commissions, and multilateral institutions.

Uzbekistan–Saudi Arabia relations provide an instructive case. Diplomatic relations established in 1992 created a formal basis for cooperation, but the partnership acquired a qualitatively different scale after the intensification of high-level dialogue and investment diplomacy. During the Uzbek President's state visit to Saudi Arabia in August 2022, the parties adopted a joint statement on the further expansion of full-scale partnership and signed fifteen documents covering energy, customs, civil aviation, tourism, agriculture, healthcare, labor relations, and other areas [8]. In 2023, bilateral relations became embedded in the broader Central Asia–Gulf Cooperation Council (GCC) framework, whose joint statement linked political and security dialogue with trade, investment, transport, food, energy and water security, green technologies, education, and cultural cooperation [9].

The research problem is therefore not whether economic cooperation exists, but under what institutional conditions it becomes a durable political resource. Announced investment volumes alone cannot demonstrate strategic partnership. A political-science assessment must examine the continuity of dialogue, legal status of agreements, assignment of responsible institutions, implementation of projects, distribution of benefits, localization, technology transfer, and capacity to generate regional connectivity. The purpose of this article is to systematize the political mechanisms and economic instruments of Uzbekistan–Saudi Arabia cooperation and to explain the sequence through which they may produce strategic political effects.

Theoretical framework: interdependence, economic statecraft, and interregionalism

Complex interdependence provides the first analytical foundation. Keohane and Nye emphasized that international relations are conducted through multiple channels and that the hierarchy between security and economic issues is not fixed [1]. In the Uzbek–Saudi case, relations are simultaneously conducted through presidential diplomacy, ministerial consultations, business councils, energy companies, investment institutions, airlines, educational contacts, and religious and humanitarian exchanges. These channels create a dense relationship in which interruption in one sphere may affect the credibility of cooperation in others.

Economic statecraft offers a second perspective. Baldwin defined it as the use of economic means in the service of foreign-policy objectives [2]. This does not imply that every investment project is politically motivated in a narrow sense. Rather, the political importance of an economic instrument depends on its capacity to create incentives, institutional commitments, reputational effects, and long-term mutual dependence. Okano-Heijmans similarly conceptualizes economic diplomacy as a field where commercial and strategic objectives intersect [3]. From this perspective, a power-purchase agreement, infrastructure concession, investment fund, or aviation agreement can simultaneously perform economic and diplomatic functions.

The third perspective is interregionalism. Hettne and Söderbaum understand regionalization as a process involving states, institutions, firms, and social actors rather than merely geographic proximity [4]. The Central Asia–GCC dialogue represents an emerging interregional structure: it connects bilateral partnerships to collective political coordination and sectoral cooperation. Buzan and Wæver's concept of regional security complexes also suggests that security and development processes in one region increasingly interact with those in another through energy markets, transport corridors, political crises, and transnational risks [5].

Based on these approaches, strategic partnership may be defined as an institutionalized relationship in which long-term national interests are coordinated through regular political

dialogue, legally supported commitments, diversified economic instruments, and mechanisms for implementation and risk management. This definition excludes purely declarative cooperation and differentiates a strategic partnership from a temporary concentration of commercial contracts.

Political mechanisms and economic instruments

Political mechanisms are the institutions, procedures, and diplomatic practices through which interests are formulated, coordinated, and converted into decisions. In Uzbekistan–Saudi Arabia relations, they include summit diplomacy, foreign-ministry consultations, the Intergovernmental Commission, the Business Council, international treaties, sectoral road maps, parliamentary contacts, and the Central Asia–GCC strategic dialogue. Economic instruments are the material and organizational means through which cooperation is implemented: direct investment, project finance, public–private partnerships, power-purchase agreements, aviation links, infrastructure concessions, technology projects, localization measures, and training programs.

Mechanism or instrument	Primary function	Potential political effect
High-level diplomacy and joint statements	Defines common priorities and authorizes sectoral negotiations	Signals political commitment and reduces uncertainty
Intergovernmental Commission and Business Council	Coordinates ministries, firms, and project pipelines	Creates continuity beyond individual visits
International treaties and sectoral agreements	Establishes legal obligations and responsible authorities	Increases predictability and implementation discipline
Investment and energy projects	Mobilizes capital and modernizes infrastructure	Builds long-term interdependence and reputational stakes
Aviation, transport, and digital infrastructure	Expands mobility, data flows, and business connectivity	Broadens the social and regional constituency of partnership
Central Asia–GCC dialogue	Connects bilateral cooperation to interregional priorities	Transforms national projects into platforms for regional coordination

The distinction between documents is analytically important. A joint political statement expresses intention and strategic direction; an international treaty creates legal obligations; a memorandum of understanding records areas of cooperation but may not provide enforceable commitments; an investment agreement establishes project-specific rights and obligations; and a commercial contract regulates implementation between concrete entities. Treating all signed documents as equivalent exaggerates institutional maturity. A credible analysis must follow each initiative through the stages of announcement, signature, legal approval, financing, construction, and operation.

A sequential model of strategic transformation

The transformation of an economic instrument into a political resource can be represented as a sequence: political initiative → diplomatic agreement → legal institutionalization → financing → project implementation → public value → political trust → strategic partnership. Each transition is conditional. Political declarations without legal or financial follow-up remain symbolic. Legally sound projects that fail to create local value may generate infrastructure but not broad social support. Projects that deliver public value, develop skills, and survive political or market shocks are more likely to reinforce trust and partnership.

The 2022 state visit illustrates the first stages of this sequence. The joint statement and fifteen documents provided political authorization and sectoral direction; agreements and contracts worth more than USD 14 billion were announced, including energy and infrastructure cooperation [8]. The 2023 Central Asia–GCC summit widened the strategic context by identifying shared priorities in supply-chain resilience, transport, energy, water, green technologies, education, and security [9]. By October 2025, the official portfolio of Uzbek–Saudi projects had exceeded USD 27 billion, while ACWA Power projects were valued at USD 15 billion; the official report also referred to USD 2 billion in Saudi investment developed during 2025 and more than sixty weekly flights [10]. These figures demonstrate scale, but the political significance lies in the diversification from energy toward data centers, artificial intelligence, water infrastructure, strategic minerals, utilities, and a new international airport.

Saudi Vision 2030 reinforces this convergence. The strategy presents the Kingdom as an investment powerhouse and a hub connecting three continents, emphasizing private-sector partnership, economic diversification, digital infrastructure, and international economic ties [7]. Uzbekistan’s demand for capital, energy modernization, technology, transport access, and skills therefore intersects with Saudi Arabia’s search for international investment opportunities and strategic economic partnerships. Yet complementarity does not automatically guarantee symmetry. Uzbekistan must ensure that projects support national industrial development, local suppliers, workforce training, and technological capabilities rather than functioning as isolated enclaves.

Institutional conditions for sustainable partnership

First, implementation monitoring should become as important as agreement signing. A joint digital register could classify commitments by legal status and project stage, identify responsible institutions, and publish verified implementation milestones. This would reduce the gap between the political visibility of announcements and the administrative complexity of delivery.

Second, diversification must be evaluated substantively. A partnership is not diversified merely because projects are listed under different sectors. The analysis should consider the number of independent investors, the distribution of financing instruments, the geographic spread of projects, the participation of Uzbek firms, and the development of non-energy areas. Water management, digital infrastructure, health, education, and logistics can broaden the partnership’s political and social foundations.

Third, localization and knowledge transfer should be treated as diplomatic outcomes. Requirements for local procurement, training, research cooperation, and technology transfer create domestic constituencies that value the partnership. They also reduce vulnerability to external financing cycles. In this sense, human-capital development is not a secondary social benefit but a condition for durable strategic interdependence.

Fourth, bilateral initiatives should be aligned with the Central Asia–GCC agenda. The 2023 joint statement explicitly connects the two regions through transport, logistics, green energy, innovation, education, climate resilience, and security cooperation [9]. Projects implemented in Uzbekistan may acquire broader political value when they support regional power reliability, transport mobility, digital connectivity, or transferable regulatory experience. Such regionalization should be evidence-based and should not assume that every national project automatically produces a regional effect.

Finally, risk management must be institutionalized. Dependence on a small number of large projects or companies can create concentration risk. Geopolitical tensions in the Middle East, changes in capital costs, contractual disputes, environmental concerns, and insufficient public communication may affect the legitimacy and continuity of cooperation. Strategic partnership therefore requires not only expansion but also resilience, transparency, and mechanisms for early warning.

Conclusion

Uzbekistan–Saudi Arabia relations demonstrate how contemporary international partnerships are constructed through the interaction of diplomacy and material cooperation. High-level political dialogue creates opportunities, but economic instruments become strategic only when they are legally institutionalized, financed, implemented, and converted into public value. The proposed

classification and sequential model show that the decisive variables are continuity, implementation capacity, diversification, localization, technology transfer, and regional alignment.

References / Список литературы

1. *Keohane R.O., Nye J.S.* Power and Interdependence. 4th ed. Boston: Longman, 2012.
2. *Baldwin D.A.* Economic Statecraft. Princeton: Princeton University Press, 1985.
3. *Okano-Heijmans M.* Conceptualizing Economic Diplomacy: The Crossroads of International Relations, Economics, IPE and Diplomatic Studies // *The Hague Journal of Diplomacy*. 2011. Vol. 6, No. 1–2. P. 7–36.
4. *Hettne B., Söderbaum F.* Theorising the Rise of Regionness // *New Political Economy*. 2000. Vol. 5, No. 3. P. 457–472.
5. *Buzan B., Wæver O.* Regions and Powers: The Structure of International Security. Cambridge: Cambridge University Press, 2003.
6. *Coates Ulrichsen K.* The Gulf States in International Political Economy. London: Palgrave Macmillan, 2016.
7. Saudi Vision 2030. Overview. URL: <https://www.vision2030.gov.sa/en/overview> (accessed 11 July 2026).
8. President of Uzbekistan. A New Era in the Uzbek-Saudi Relations. 17 August 2022. URL: <https://president.uz/en/lists/view/5433>.
9. GCC. Joint Statement of the GCC–Central Asia Summit. Jeddah, 19 July 2023. URL: <https://www.gcc-sg.org/en/MediaCenter/News/Pages/news2023-7-19-5.aspx>.
10. President of Uzbekistan. Further Expansion of Full-Scale Partnership with Saudi Arabia. 15 October 2025. URL: <https://president.uz/en/lists/view/8569>.

XCIH INTERNATIONAL CORRESPONDENCE SCIENTIFIC AND PRACTICAL CONFERENCE
EUROPEAN RESEARCH:
INNOVATION IN SCIENCE, EDUCATION AND TECHNOLOGY
August 11-12, 2026
London, United Kingdom



**LIBRARY OF
CONGRESS (USA)**



**INTERNATIONAL CONFERENCE
EUROPEAN RESEARCH**

TEL. OF THE ORGANIZER OF THE INTERNATIONAL CONFERENCE:
+ 44 1223 976596 (CAMBRIDGE, UNITED KINGDOM). FOR PARTICIPANTS FROM EUROPE.
+1 617 463 9319 (BOSTON, USA). FOR PARTICIPANTS FROM NORTH AND SOUTH AMERICA.
+7 915 814 5109(RUSSIAN FEDERATION). FOR PARTICIPANTS FROM THE CIS, GEORGIA,
ESTONIA, LITHUANIA, LATVIA.

**COLLECTION OF SCIENTIFIC ARTICLES
PUBLISHED BY ARRANGEMENT WITH THE AUTHORS**



You are free to:

Share – copy and redistribute the material in any medium or format
Adapt – remix, transform, and build upon the material for any purpose, even commercially.
Under the following terms: Attribution – You must give appropriate credit,
provide a link to the license, and indicate if changes were made.
You may do so in any reasonable manner,
but not in any way that suggests the licensor endorses you or your use.
ShareAlike – If you remix, transform, or build upon the material, you must
distribute your contributions under the same license as the original.

ISBN 978-1-64655-852-0
INTERNATIONAL CONFERENCE
PRINTED IN THE UNITED STATES OF AMERICA