

# MUHANDISLIK

## & IQTISODIYOT

# №4

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

# 2026 APREL



Milliy nashrlar

OAK: <https://oak.uz/pages/4802>

05.00.00 - Texnika fanlari  
08.00.00 - Iqtisodiyot fanlar



Google Scholar

OPEN ACCESS

ULRICHSWEB™  
GLOBAL SERIALS DIRECTORY

Academic Resource Index  
ResearchBib

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INTERNATIONAL CENTRE

CYBERLENINKA

OpenAIRE

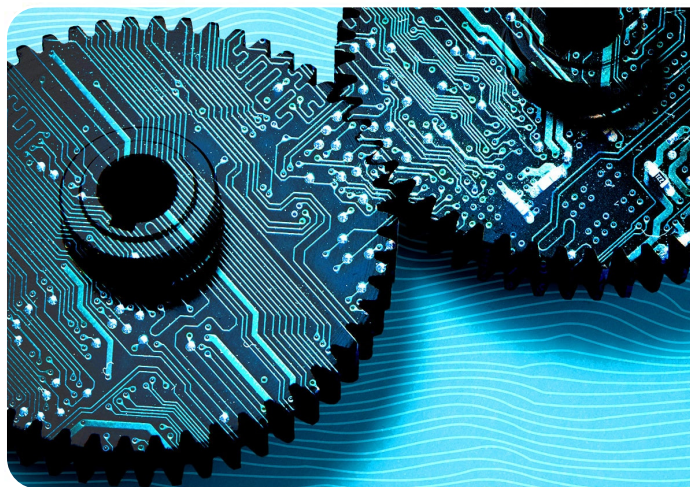
ROAD

INDEX COPERNICUS INTERNATIONAL

BASE

Crossref

НАУЧНАЯ ЭЛЕКТРОННАЯ БИБЛИОТЕКА LIBRARY.RU



ISSN: 3060-463X

РЭУ.РФ  
РОССИЙСКИЙ ЭКОНОМИЧЕСКИЙ УНИВЕРСИТЕТ  
ИМЕНИ Г.В. ПЛЕХАНОВА  
ТАШКЕНТСКИЙ ФИЛИАЛ



# **muhandislik** **& iqtisodiyot**

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

Elektron nashr, 2026-yil, aprel.

## **Bosh muharrir:**

**Zokirova Nodira Kalandarovna**, iqtisodiyot fanlari doktori, DSc, professor

## **Bosh muharrir o'rinbosari:**

**Shakarov Zafar G'afarovich**, iqtisodiyot fanlari bo'yicha falsafa doktori, PhD, dotsent

## **Tahrir hay'ati:**

**Abduraxmanov Kalendar Xodjayevich**, O'z FA akademigi, iqtisodiyot fanlari doktori, professor

**Sharipov Kongratbay Avezimbetovich**, texnika fanlari doktori, professor

**Maxkamov Baxtiyor Shuxratovich**, iqtisodiyot fanlari doktori, professor

**Abduraxmanova Gulnora Kalandarovna**, iqtisodiyot fanlari doktori, professor

**Shaumarov Said Sanatovich**, texnika fanlari doktori, professor

**Turayev Bahodir Xatamovich**, iqtisodiyot fanlari doktori, professor

**Nasimov Dilmurod Abdulloyevich**, iqtisodiyot fanlari doktori, professor

**Allayeva Gulchexra Jalgasovna**, iqtisodiyot fanlari doktori, professor

**Arabov Nurali Uralovich**, iqtisodiyot fanlari doktori, professor

**Maxmudov Odiljon Xolmirzayevich**, iqtisodiyot fanlari doktori, professor

**Xamrayeva Sayyora Nasimovna**, iqtisodiyot fanlari doktori, professor

**Bobonazarova Jamila Xolmurodovna**, iqtisodiyot fanlari doktori, professor

**Irmatova Aziza Baxromovna**, iqtisodiyot fanlari doktori, professor

**Bo'taboyev Mahammadjon To'ychiyevich**, iqtisodiyot fanlari doktori, professor

**Shamshiyeva Nargizaxon Nosirxuja kizi**, iqtisodiyot fanlari doktori, professor,

**Xolmuxamedov Muhsinjon Murodullayevich**, iqtisodiyot fanlari nomzodi, dotsent

**Xodjayeva Nodiraxon Abdurashidovna**, iqtisodiyot fanlari nomzodi, dotsent

**Amanov Otabek Amankulovich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD), dotsent

**Toxirov Jaloliddin Ochil o'g'li**, texnika fanlari bo'yicha falsafa doktori (PhD)

**Qurbonov Samandar Pulatovich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Zikriyoyev Aziz Sadulloyevich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Tabayev Azamat Zaripbayevich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Sxay Lana Aleksandrovna**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD), dotsent

**Ismoilova Gulnora Fayzullayevna**, iqtisodiyot fanlari nomzodi, dotsent

**Djumaniyazov Umrbek Ilxamovich**, iqtisodiyot fanlari nomzodi, dotsent

**Kasimova Nargiza Sabitdjanovna**, iqtisodiyot fanlari nomzodi, dotsent

**Kalanova Moxigul Baxritdinovna**, dotsent

**Ashurzoda Luiza Muxtarovna**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Sharipov Sardor Begmaxmat o'g'li**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Tursunov Ulug'bek Sativoldiyevich**, iqtisodiyot fanlari doktori (DSc), dotsent

**Bauyetdinov Majit Janizaqovich**, Toshkent davlat iqtisodiyot universiteti dotsenti, PhD

**Botirov Bozorbek Musurmon o'g'li**, Texnika fanlari bo'yicha falsafa doktori (PhD)

**Sultonov Shavkatjon Abdullayevich**, Kimyo fanlari doktori, (DSc)

**Jo'raeva Malohat Muhammadovna**, filologiya fanlari doktori (DSc), professor.

**Yusupov Maxamadamin Abduxamidovich**, iqtisodiyot fanlari nomzodi (DSc), professor

**Kalonova Moxigul Baxritdinovna**, iqtisodiyot fanlari nomzodi (PhD), dotsent

**Mirzayev Kulmamat Djanzakovich**, iqtisodiyot fanlari nomzodi (DSc), professor.

**Karimova Nilufar Sadirdin qizi**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Norboyev Odil Abrayevich**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD), dotsent

**Nasimov Dilmurod Abdulloyevich**, iqtisodiyot fanlari doktori (DSc), professor

**Mirzayev Kulmamat Djanzakovich**, iqtisodiyot fanlari doktori (DSc), professor

**Karimova Nilufar Sadirdin qizi**, iqtisodiyot fanlari bo'yicha falsafa doktori (PhD)

**Pardaev Umidjon Uralovich**, iqtisodiyot fanlari doktori (DSc), professor

**Xolmirzayev Ulug'bek Abdulazizovich**, Iqtisodiyot fanlari doktori (DSc)

# **muhandislik** **& iqtisodiyot**

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

- 05.01.00 – Axborot texnologiyalari, boshqaruv va kompyuter grafikasi
- 05.01.01 – Muhandislik geometriyasi va kompyuter grafikasi. Audio va video texnologiyalari
- 05.01.02 – Tizimli tahlil, boshqaruv va axborotni qayta ishlash
- 05.01.03 – Informatikaning nazariy asoslari
- 05.01.04 – Hisoblash mashinalari, majmualari va kompyuter tarmoqlarining matematik va dasturiy ta'minoti
- 05.01.05 – Axborotlarni himoyalash usullari va tizimlari. Axborot xavfsizligi
- 05.01.06 – Hisoblash texnikasi va boshqaruv tizimlarining elementlari va qurilmalari
- 05.01.07 – Matematik modellashtirish
- 05.01.11 – Raqamli texnologiyalar va sun'iy intellekt
- 05.02.00 – Mashinasozlik va mashinashunoslik
- 05.02.08 – Yer usti majmualari va uchish apparatlari
- 05.03.02 – Metrologiya va metrologiya ta'minoti
- 05.04.01 – Telekommunikatsiya va kompyuter tizimlari, telekommunikatsiya tarmoqlari va qurilmalari. Axborotlarni taqsimlash
- 05.05.03 – Yorug'lik texnikasi. Maxsus yoritish texnologiyasi
- 05.05.05 – Issiqlik texnikasining nazariy asoslari
- 05.05.06 – Qayta tiklanadigan energiya turlari asosidagi energiya qurilmalari
- 05.06.01 – To'qimachilik va yengil sanoat ishlab chiqarishlari materialshunosligi
- 05.08.03 – Temir yo'l transportini ishlatish
- 05.08.06 – "G'ildirakli va gusenisali mashinalar va ularni ishlatish" (texnika fanlari)
- 05.09.01 – Qurilish konstruksiyalari, bino va inshootlar
- 05.09.04 – Suv ta'minoti. Kanalizatsiya. Suv havzalarini muhofazalovchi qurilish tizimlari
- 10.00.06 – Qiyosiy adabiyotshunoslik, chog'ishtirma tilshunoslik va tarjimashunoslik
- 10.00.04 – Yevropa, Amerika va Avstraliya xalqlari tili va adabiyoti
- 08.00.01 – Iqtisodiyot nazariyasi
- 08.00.02 – Makroiqtisodiyot
- 08.00.03 – Sanoat iqtisodiyoti
- 08.00.04 – Qishloq xo'jaligi iqtisodiyoti
- 08.00.05 – Xizmat ko'rsatish tarmoqlari iqtisodiyoti
- 08.00.06 – Ekonometrika va statistika
- 08.00.07 – Moliya, pul muomalasi va kredit
- 08.00.08 – Buxgalteriya hisobi, iqtisodiy tahlil va audit
- 08.00.09 – Jahon iqtisodiyoti
- 08.00.10 – Demografiya. Mehnat iqtisodiyoti
- 08.00.11 – Marketing
- 08.00.12 – Mintaqaviy iqtisodiyot
- 08.00.13 – Menejment
- 08.00.14 – Iqtisodiyotda axborot tizimlari va texnologiyalari
- 08.00.15 – Tadbirkorlik va kichik biznes iqtisodiyoti
- 08.00.16 – Raqamli iqtisodiyot va xalqaro raqamli integratsiya
- 08.00.17 – Turizm va mehmonxona faoliyati

Ma'lumot uchun, OAK  
Rayosatining 2024-yil 28-avgustdagi 360/5-son qarori bilan "Dissertatsiyalar asosiy ilmiy natijalarini chop etishga tavsiya etilgan milliy ilmiy nashrlar ro'yxati"ga texnika va iqtisodiyot fanlari bo'yicha "Muhandislik va iqtisodiyot" jurnali ro'yxatga kiritilgan.

**Muassis:** "Tadbirkor va ishbilarmon" MChJ

**Hamkorlarimiz:**

1. Toshkent shahridagi G.V.Plexanov nomidagi Rossiya iqtisodiyot universiteti
2. Toshkent davlat iqtisodiyot universiteti
3. Toshkent irrigatsiya va qishloq xo'jaligini mexanizatsiyalash muhandislari instituti" milliy tadqiqot universiteti
4. Islom Karimov nomidagi Toshkent davlat texnika universiteti
5. Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti
6. Toshkent davlat transport universiteti
7. Toshkent arxitektura-qurilish universiteti
8. Toshkent kimyo-texnologiya universiteti
9. Jizzax politexnika instituti



# MUNDARIJA

STRATEGIC INTEGRATION OF BUSINESS PLANNING AND FORECASTING IN INDUSTRIAL ENTERPRISES.....	11
<b>Sharipov K.A., Ismatullayev T.R.</b>	
ВКЛАД БАНКОВСКОЙ СИСТЕМЫ В СОЦИАЛЬНО-ЭКОНОМИЧЕСКОЕ РАЗВИТИЕ МАХАЛЛЕЙ РЕСПУБЛИКИ КАРАКАЛПАКСТАН: МЕХАНИЗМЫ, ДИНАМИКА И СТРАТЕГИЧЕСКИЕ ОРИЕНТИРЫ .....	21
<b>Бабаназарова Гульзар Зиуатдиновна</b>	
BUDJET TASHKILOTLARIDA XARAJATLARNI REJALASHTIRISH VA MOLIVAVIY NAZORATNI TASHKIL ETISH.....	27
<b>Karayev Payzillaxon Yusufxonovich</b>	
FERMER XO'JALIKLARINI MOLIVAVIY QO'LLAB-QUVVATLASHDA SUBSIDIYA AMALIYOTINI TAKOMILLASHTIRISH.....	32
<b>Xakimov Zafar Ibragimovich</b>	
IQTISODIY O'SISHGA ERISHISHDA DAVLAT INNOVATSION VA INVESTITSION SIYOSATINING O'RNI .....	38
<b>Xaydarova Yorqinoy Asqar qizi</b>	
QURILISH SANOATIDA KORXONALARNI MOLIVALASHTIRISHNING NAZARIY KONSEPSIYALARI VA ZAMONAVIY YONDASHUVLARI.....	44
<b>Igitov Jurabek Kuzibekovich</b>	
ОСОБЕННОСТИ ВЫБОРА СТРАТЕГИИ РАЗВИТИЯ ПРЕДПРИЯТИЙ МЕТАЛЛУРГИЧЕСКОГО КОМПЛЕКСА .....	50
<b>Абдуллаева Матлуба Нематовна, Акбарова Муфаррах Мухитдиновна</b>	
СОВЕРШЕНСТВОВАНИЕ СИСТЕМЫ КОМПАЕНС-КОНТРОЛЯ В КОМПАНИЯХ С ГОСУДАРСТВЕННЫМ УЧАСТИЕМ В УЗБЕКИСТАНЕ .....	56
<b>Халтурдиев Айтмурат Маратович</b>	
O'ZBEKISTONDA RAQAMLI IQTISODIYOTNING ICHKI BELGILARI .....	64
<b>Saatova Lolaxon Ergashevna</b>	
INNOVATSION YONDASHUVLAR ASOSIDA OZIQ-OVQAT KORXONALARIDA RAQOVBATBARDOSHLIKNI OSHIRISH MEKANIZMLARI .....	71
<b>Pulatov Abdullo</b>	
MAJBURIY IJRO ETISH CHORALARINI TAKOMILLASHTIRISH: MILLIY VA XORIJIY TAJRIBA.....	76
<b>Axmedov Zafarjon Zokirjon</b>	
МОДЕЛЬ ИНТЕГРИРОВАННОЙ СИСТЕМЫ ESG-ТРАНСФОРМАЦИИ И ЭКОНОМИЧЕСКИЕ МЕХАНИЗМЫ ЕЁ РЕАЛИЗАЦИИ НА ПРЕДПРИЯТИИ ПО ПРОИЗВОДСТВУ ПОЛИМЕРНОЙ УПАКОВКИ .....	80
<b>Ташпулатов Дильмурад Рустамович</b>	
KORPORATIV KORXONALARDA KAPITALNI BUDJETLASHTIRISH JARAYONINI TAKOMILLASHTIRISH YO'LLARI.....	85
<b>Latipova Shaxnoza Maxmudovna</b>	
INNOVATSION MENEJMENTDA KOMMUNIKATSIYA VA TASHKILY MOSLASHUVCHANLIKNING ROLI: O'ZBEKISTON SHAROITI MISOLIDA .....	92
<b>Atamatov Abdualil Salomovich</b>	
QAYTA TIKLANUVCHI ENERGIYA MANBALARINING AHAMIYATI VA UNING SALOHİYATINI BELGILOVCHI OMILLAR .....	97
<b>Qodirov Baxodir Tursunovich, To'rayev Qaxramon Zokirjonovich</b>	



NAMANGAN VILOYATIDA AYOLLAR TADBIRKORLIK FAOLIYATINI RIVOJLANTIRISHDA TADBIRKORLIK MUHITINI BAHOLASH .....	103
<b>Raximova Moxigul Isroiljonovna</b>	
O'ZBEKISTON IQTISODIYOTIGA TO'G'RIDAN-TO'G'RI XORIJIY INVESTITSİYALARNI JALB ETISH BILAN BOG'LIQ MUAMMOLAR VA ULARNI BARTARAF ETISH YO'LLARI .....	107
<b>Davitova Shaxzoda Doniyor qizi</b>	
ANALYSIS OF THE FORMATION OF MARKET DEMAND AND THE ESTABLISHMENT OF EQUILIBRIUM IN A MARKET ECONOMY .....	112
<b>Kamilova Nargiza</b>	
BO'LAJAK FIZIKA O'QITUVCHILARINI NANOTEXNOLOGIYA SOHASIDAGI BILIMLARNI TAQDIM ETISHGA VA O'QITISHGA TAYYORLASH METODIKASI .....	115
<b>Sottarov Abdulvali Umirqulovich</b>	
INTEGRATING AI INTO STRATEGIC MANAGEMENT IN HIGHER EDUCATION INSTITUTIONS .....	120
<b>Uktamova Durdona Bakhtiyor qizi, Sultonali Umaraliyevich Mekhmonov</b>	
BARQAROR RIVOJLANISH SHAROITIDA IJTIMOYIY HISOBOTLAR VA ULARNING AHAMIYATI .....	130
<b>Sayfullayev Mexroj Sayfullayevich</b>	
SANOAT KLASTERINING IQTISODIY SAMARADORLIGINI BAHOLASHNING USLUBIY JIHATLARI.....	135
<b>Satvoldiyev Ulugbek Kamilovich</b>	
RAQAMLI TRANSFORMATSIYA SHAROITIDA TIJORAT BANKLARI LIKVIDLIGINI BOSHQARISHNI TAKOMILLASHTIRISHNING INNOVATSION YONDASHUVLARI .....	140
<b>Yangiboev Rustam Berdiyrovich</b>	
MINTAQA IQTISODIY O'SISH DRAYVERLARINI RIVOJLANTIRISHDA MOLIYAVIY XAVFLARNI BOSHQARISH MEKANIZMLARI.....	145
<b>Turopova Nigora Xolmurod qizi</b>	
ЭКОЛОГИЯ ТУРИСТА КАК МЕТОД СОЗДАНИЯ КОМФОРТНОЙ И УСТОЙЧИВОЙ СРЕДЫ ДЛЯ ПУТЕШЕСТВЕННИКОВ.....	149
<b>Наурызбаев Алиакбар Рустамович</b>	
BINO VA INSHOOTLARNI BARPO ETISHDA PREFABRIKATSIYALASHGAN HAMDA MODULLI QURILISH TIZIMLARINI AQLLI BOSHQARUV ASOSIDA TAKOMILLASHTIRISH .....	152
<b>Solijonov Javoxirmirzo Obidjon o'g'li</b>	
RAQAMLI TRANSFORMATSIYA SHAROITIDA AKSIYADORLIK TIJORAT BANKLARIDA KORPORATIV BOSHQARUVNI XALQARO STANDARTLAR ASOSIDA TAKOMILLASHTIRISH .....	163
<b>Saidaxmedova Aida Mirzayevna</b>	
O'ZBEKISTONDA KO'CHAT YETISHTIRISHNING HOZIRGI HOLATI VA RIVOJLANISH TENDENSIYALARI.....	169
<b>Abdufarmonov Farrux Faxriddinovich</b>	
O'ZBEKISTONDA EKSPORTGA YO'NALTIRILGAN QISHLOQ XO'JALIGI MAHSULOTLARI SIFATI VA XALQARO STANDARTLARGA MUVOFIQLIGI TAHLILI .....	174
<b>Safarova Muxabbat Radjabovna</b>	
TIJORAT BANKLARI DEPOZIT SIYOSATI VA DEPOZIT BAZASI DINAMIKASINING BANK LIKVIDLIGIGA TA'SIRI .....	178
<b>Sulaymanov Samandarboy Adhambek o'g'li</b>	
RAQAMLI IQTISODIYOT SHAROITIDA ISLOMIY MOLIYANING BANK TIZIMIGA INTEGRATSIYASI: MUAMMOLAR, IMKONIYATLAR VA TRANSFORMATSIYA YO'NALISHLARI .....	186
<b>Adilov Zuxriddin Marip o'g'li</b>	
SAMARQAND VILOYATI SANOATINING HUDUDIY TARKIBINI TAKOMILLASHTIRISHNING AYRIM MASALALARI.....	190
<b>Uralov Eliboy Omonovich</b>	



DIVERSIFIKATSIYALASHUV ASOSIDA QURILISH TARMOG' I RIVOJLANISHINI KO'P OMILLI BOG'LANISHLAR ASOSIDA MODELLASHTIRISH.....	194
<i>Yembergenova Aynur Aydosbaevna</i>	
ЩЕБЕНОЧНО-МАСТИЧНЫЙ АСФАЛЬТОБЕТОН В КИТАЕ: СОСТАВ, СВОЙСТВА, ИННОВАЦИИ И ПЕРСПЕКТИВЫ РАЗВИТИЯ.....	201
<i>Карабаев Абдужаббор Мелиевич, Занг Хайфей</i>	
TADBIRKORLIK FAOLIYATIDA SUBYEKTIV RISKNI SHAKLLANTIRUVCHI KOGNITIV OMILLAR VA ULARNI BOSHQARISH MEKANIZMLARI .....	205
<i>Abduxamid Abdumalikovich Bektemirov</i>	
HOMILADOR AYOLLAR UCHUN MAXSUS KIYIMLARNI LOYIHALASHDA ISTE'MOLCHILAR TALABLARINI O'RGANISH .....	211
<i>D.Sattarova, U.Vakhidova, D.Madiyarovna</i>	
O'ZBEKISTON RESPUBLIKASIDA AHOLI DAROMADLARIGA TA'SIR ETUVCHI STATISTIK INDIKATORLAR TIZIMINING METODOLOGIK ASOSLARI VA ULARNING TAHLILYI IMKONIYATLARI .....	217
<i>Atayev Jaxongir Erkinovich</i>	
KICHIK BIZNES INVESTITSION KREDITLARINI TIJORAT BANKLARI TOMONIDAN MOLIYALASHTIRISH.....	221
<i>M.O.Yuldoshova</i>	
HUDUDNING "YASHIL IQTISODIYOT" ASOSIDA RIVOJLANISHINI TADQIQ ETISH: KO'RSATKICHLAR TIZIMI VA BAHOLASH USULLARI .....	226
<i>Shomirzayev Abdug'affor Abdujabbor o'g'li</i>	
O'ZBEKISTONDA SUV XO'JALIGI TIZIMIDAGI QAYTA TIKLANUVCHI HAVZALAR .....	231
<i>To'rayev Rasul Nortojiyevich, Seytov Aybek Jumabayevich, Uteuliyev Niyatbay Uteuliyevich, Haydarova Roziya Davronovna</i>	
KORXONALAR IQTISODIY BARQARORLIGINING NAZARIY MODELLARI VA SINERGETIK YONDASHUV ASOSIDA BAHOLASH MEKANIZMLARI .....	236
<i>Iminova Nargizaxon Akramovna</i>	
TIJORAT BANKLARINING INVESTITSIYA SIYOSATI VA QIMMATLI QOG'OZLAR PORTFELINI BOSHQARISH STRATEGIYALARI .....	241
<i>Abduvaliyev Sanjar Abdurahmonovich</i>	
PAHTA VA MEVA-SABZAVOT YETISHTIRUVCHI FERMERLARDA TAVAKKALCHILIK XULQ-ATVORINING QIYOSIY TAHLILI: ISTIQBOL NAZARIYASI ASOSIDA.....	249
<i>Tadjiyev Abdusame Abduhamidovich</i>	
ФОРМИРОВАНИЕ МАРКЕТИНГОВОЙ СТРАТЕГИИ ОБРАЗОВАТЕЛЬНОЙ ОРГАНИЗАЦИИ В СОВРЕМЕННЫХ УСЛОВИЯХ.....	253
<i>Алиев Абдулазиз Исмаилович, Кахрамонова Азиза Шухрат кизи</i>	
QQS TIZIMI SAMARADORLIGINI XALQARO INDIKATORLAR ASOSIDA BAHOLASH .....	259
<i>Eshkarayev Bobir Chariyevich</i>	
QISHLOQ XO'JALIGIDA OZIYQ-OVQAT XAVFSIZLIGINI TA'MINLASHNING INNOVATSION USULLARI .....	265
<i>Tadjimirzayev Anvar Abduvoxiidovich, Batirova Raxima Abdujabborovna</i>	
O'ZBEKISTON RESPUBLIKASI TIJORAT BANKLARIDA KREDIT RISKINI BOSHQARISH MEKANIZMINING AMALIY TAHLILLARI.....	273
<i>Hamroyev Sherzod Axtamovich</i>	
ПРОГНОЗИРОВАНИЕ ПОТРЕБИТЕЛЬСКОГО СПРОСА С ИСПОЛЬЗОВАНИЕМ МЕТОДОВ МАШИННОГО ОБУЧЕНИЯ В РОЗНИЧНОЙ ТОРГОВЛЕ УЗБЕКИСТАНА.....	280
<i>Тен Марина Владимировна</i>	
O'ZBEKISTON SANOATIDA MAHALLIYLASHTIRISH DASTURLARINING IMPORT O'RNINI BOSISHDAGI SAMARADORLIGI TAHLILI .....	287
<i>Sobitova Ra'no Solidjonovna</i>	



NEFT-GAZ LOYIHALARIDA DAVLAT VA INVESTOR MANFAATLARINI MUVOFIQLASHTIRISHNING FISKAL-BOJXONA MEXANIZMLARI.....	290
<b>Mansurov Obid Zaynidinovich</b>	
QURILISH KORXONALARI FAOLIYAT SAMARADORLIGINI BAHOLASH INSTRUMENTLARI .....	296
<b>Yahyoyev To'liqin Ismatulla o'g'li</b>	
QASHQADARYO VILOYATIDA TURIZMNI RIVOJLANTIRISHDA TRANSPORT INFRATUZILMASINING TA'SIRI.....	300
<b>Jahongir Ruziboyevich Qosimov, Narzullayeva Charos</b>	
O'ZBEKISTON RESPUBLIKASI TIJORAT BANKLARIDA KREDIT PORTFELINING SEKTORLAR KESIMIDAGI RISKLARI VA ULARNI TAKOMILLASHTIRISH YO'LLARI.....	306
<b>Norova Nozima Nabiyeвна</b>	
AVTOMOBIL SANOATI KORXONALARIDA BREND STRATEGIYASINI BOSHQARISHNING ZAMONAVIY MODELLARI.....	312
<b>Boboyev L Kadruxja Djuraxodjayeвich</b>	
HUDDUD EKSPORT SALOHİYATINI STATISTIK TADQIQ ETISHDA RCA INDEKSIDAN FOYDALANISH.....	318
<b>Xurramov Ramazon Allayor o'g'li</b>	
СОВРЕМЕННЫЕ КОНЦЕПЦИИ И ТЕНДЕНЦИИ РАЗВИТИЯ УПРАВЛЕНИЯ СТРАТЕГИЕЙ БРЕНДОВ В АВТОМОБИЛЬНОЙ ПРОМЫШЛЕННОСТИ .....	325
<b>Бобоев Л Кадрухжа Джураходжаевич</b>	
HUDDUDLARDA UY-JOY QURILISHI JARAYONINI TASHKIL ETISHNING QONUNIYATLARI VA TAMOIYILLARI.....	331
<b>Usmanov Mirumar Abdulla o'g'li</b>	
OYNALI FASAD TIZIMLARINI MONTAJ QILISHNING ZAMONAVIY TEXNOLOGIYALARI .....	339
<b>Inamov Boxodir Nizamovich, Ozodxo'jayev G'aybulla Sherzodxo'ja o'g'li</b>	
KLASSIK SHIFRLASH ALGORITMLARINING XUSUSIYATLARINI NEYRON TARMOQ ORQALI O'RGANISH.....	344
<b>Davlatov Mirzo-Ulug'bek Bobir o'g'li, Allanov Orif Menglimuratovich, Turdibekov Baxtiyor Baxodir o'gli</b>	
АЛГОРИТМ АДАПТАЦИИ ПАРАМЕТРОВ СИСТЕМ ИДЕНТИФИКАЦИИ ДИНАМИЧЕСКИХ ОБЪЕКТОВ.....	350
<b>Сидиков Исамиддин Хакимович, Алимова Гулчехра Рахимжоновна, Ибрагимов Беғовот Шералиевич</b>	
ELEKTRON HUKUMATNING BARQAROR RIVOJLANISHI: QOZOG'ISTON VA O'ZBEKISTON TAJRIBASINING QIYOSIY TAHLILI.....	355
<b>Umarova Durdona Abdumannabovna</b>	
UY-JOY FONDI BOSHQARUVINING TASHKILY-IQTISODIY MEXANIZMLARINI TAKOMILLASHTIRISH.....	360
<b>Aminova Naima Umar qizi</b>	
RAQAMLI IQTISODIYOT RIVOJI VA UNI TARTIBGA SOLISHDA MUVOZANATLI REGULYATIV SIYOSAT YURITISH.....	365
<b>Davlatov Ulug'bek Baxodirovich</b>	
HUDDUDIY SANOAT ISHLAB CHIQRISHNI INNOVATSION RIVOJLANTIRISH TENDENSIYALARI .....	370
<b>Avliyaqulov Xudoyberdi</b>	
O'ZBEKISTONDA AHOLINI UY-JOY BILAN TA'MINLASH DASTURLARIDA MAVJUD MUAMMOLAR.....	374
<b>Xannarov Komiljon Karimovich</b>	
DAVLAT FUQAROLIK XIZMATINING JOZIBADORLIGINI OSHIRISH VA DAVLAT FUQAROLIK XIZMATCHILARINI MOTIVATSİYALASHGA OID TEXNOLOGIYALAR.....	380
<b>Bekmurodov Navruz Ergashevich</b>	



FORECASTING AND PROMISING DIRECTIONS OF INNOVATIVE INDUSTRIAL AND INVESTMENT DEVELOPMENT IN THE KASHKADARYA REGION.....	393
<b>Sattorov Shohruh</b>	
ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ ИСПЫТАТЕЛЬНЫХ ЛАБОРАТОРИЙ НА ОСНОВЕ РАСШИРЕННОЙ РИСК-ОРИЕНТИРОВАННОЙ МОДЕЛИ С ВЕСОВЫМИ КОЭФФИЦИЕНТАМИ.....	400
<b>Загидуллина Карина Рафаиловна</b>	
РОЛЬ ФИНАНСОВОЙ ГРАМОТНОСТИ В РАЗВИТИИ ЖЕНСКОГО ПРЕДПРИНИМАТЕЛЬСТВА.....	405
<b>Viktoriya Kan</b>	
HUDUDLARDA SANOAT MAHSULOTLARI ISHLAB CHIQRISH JARAYONLARINI STATISTIK BAHOLASH.....	410
<b>Nizomov Maxmud Minvarovich</b>	
ЭФФЕКТИВНОСТЬ И ПРАКТИЧЕСКОЕ ЗНАЧЕНИЕ МЕТОДОЛОГИИ SWOT-АНАЛИЗА ПРИ ФОРМИРОВАНИИ КОРПОРАТИВНОЙ СТРАТЕГИИ.....	414
<b>Махмудов Суннатжон Абдужаббор ўғли</b>	
QURILISH MATERIALLARI SANOATI KORXONALARI BOSHQARUVI STRATEGIYALARINI SAMARALI TASHKIL ETISH.....	419
<b>Ubaydullayev Muhammadjon Abdusamad o'g'li</b>	
TRANSFORMATSION YETAKCHILIK VA XODIMLARNING INNOVATSION XULQ-ATVORI: KORPORATIV TASHKILOTLARDA EMPIRIK TADQIQOT.....	423
<b>Alimov Bobirjon</b>	
EKSPORTBOP QISHLOQ XO'JALIGI MAHSULOTLARI QIYMAT ZANJIRIDA LOGISTIKA XARAJATLARINI OPTIMALLASHTIRISHNING IQTISODIY MEKANIZMLARI.....	432
<b>Toxirov Shodibek Jo'ra o'g'li, G.M.Abdulxayeva</b>	
ELEKTRON SAVDODA YASHIRIN IQTISODIY FAOLIYATNI QISQARTIRISHDA MOLIVAVIY NAZORAT MEKANIZMLARINI RIVOJLANTIRISH.....	437
<b>Iskandarova Munisa Hasan qizi</b>	
MAMLAKAT INNOVATSION FAOLLIGIGA TA'SIR ETUVCHI ASOSIY OMILLARNING NAZARIY VA USLUBIY TAHLILI.....	441
<b>Azimov Bobir Fattohevich</b>	
O'ZBEKISTON MAHALLIY BYUDJETLARINING O'ZIGA XOSLIGI VA UNING DAROMAD MANBALARINI KUCHAYTIRISH MEKANIZMINING ROLINI OSHIRISH MASALALARI.....	445
<b>Safarmurodova Marjona To'raqulovna</b>	
DAVLAT OLIY TA'LIM MUASSALARIDA MOLIVAVIY MUSTAQILLIK SHAROITIDA RAQOBATBARDOSHLIKNI TA'MINLASH VOSITALARI.....	450
<b>Adizov Bobir Baxtiyorovich</b>	
SIRKULAR IQTISODIYOT SOHASIDA ILG'OR XORIJIY TAJRIBALAR VA ULARNI O'ZBEKISTON SHAROITIDA QO'LLASH IMKONIYATLARI.....	457
<b>Narzullayev Elmurod Shuxrat o'g'li</b>	
QORAQALPOG'ISTON RESPUBLIKASIDA ETNOTURIZMNI RIVOJLANTIRISH IMKONIYATLARI VA UNING IJTIMOY-IQTISODIY AHAMIYATI.....	462
<b>Kunnazarova Orazxan</b>	
YANGI O'ZBEKISTON SHAROITIDA INVESTITSION FAOLLIK MEKANIZMI SAMARADORLIGINI OSHIRISHNING NAZARIY JIHATLARI.....	468
<b>Asadova Shaxzoda Zabikhillo qizi</b>	
MINTAQA IMIJI VA INVESTITSIYA OQIMLARI O'RTASIDAGI BOG'LIQLIK (XORAZM VILOYATI MISOLIDA).....	472
<b>Ibodullayev Dilshod Ibragimovich</b>	
INSON KAPITALI BARQAROR RIVOJLANISH MANBAI SIFATIDA.....	480
<b>Alimova Oydin Baxtiyorovna</b>	



STUDYING THE FACTORS INFLUENCING INNOVATIVE APPROACHES TO REGIONAL EXPORT EFFICIENCY .....	486
<b>Qurbanov Feruz Baxramovich</b>	
KICHIK BIZNES SUBYEKTLARIGA XORIJIY INVESTITSİYALAR JALB ETISH MEKANIZMLARI .....	491
<b>Xakimov Akbar Anvarovich</b>	
XORIJIY DAVLATLARDA KICHIK BIZNES VA XUSUSIY TADBIRKORLIKNI DAVLAT TOMONIDAN QO'LLAB QUVVATLASHNING ILG'OR TAJRIBALARI VA ULARNI MAMLAKATIMIZDA QO'LLASH XUSUSIYATLARI .....	496
<b>Rajapov Xayrulla Bekdurdiyevich, Atabayeva Mexribon Atabayevna</b>	
ENHANCING LIQUIDITY MANAGEMENT EFFICIENCY IN JOINT-STOCK COMPANIES USING THE GEOMETRIC BROWNIAN MOTION (GBM) MODEL.....	503
<b>Kurbonov Xayrilla</b>	
ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ НАЛОГОВОЙ СИСТЕМЫ УЗБЕКИСТАНА.....	508
<b>Тажибаева Кызларгул Ажиниязовна</b>	
YOSHLAR BANDLIGI VA JINOYATCHILIK O'RTASIDAGI O'ZARO BOG'LIQLIKNI TAHLIL QILISH (O'ZBEKISTON MISOLIDA).....	514
<b>Xusniddinova Gulnoza Ulug'bek qizi</b>	
ГОСУДАРСТВЕННАЯ ПОЛИТИКА РАЗВИТИЯ ЦИФРОВОЙ ЭКОНОМИКИ: МЕЖДУНАРОДНЫЙ ОПЫТ И НАЦИОНАЛЬНЫЕ ОСОБЕННОСТИ .....	520
<b>Зарекеев Ажинияз Абатович</b>	
СОВЕРШЕНСТВОВАНИЕ ОРГАНИЗАЦИОННО-ЭКОНОМИЧЕСКИХ МЕХАНИЗМОВ РАЗВИТИЯ МАЛОГО И СРЕДНЕГО БИЗНЕСА В БУХАРСКОЙ ОБЛАСТИ .....	527
<b>Некова Фатима Борисовна</b>	
DAVLAT INVESTITSIYA SIYOSATINI MODERNIZATSIYA QILISH VA LOYIHALAR SAMARADORLIGINI BAHOLASH TIZIMINI TAKOMILLASHTIRISH.....	533
<b>Kenjaev Ikrom Ergashboevich</b>	
BARQAROR IQTISODIY RIVOJLANISHDA YASHIL INVESTITSİYALARNING XALQARO AHAMIYATI.....	536
<b>Siddikov Anvarbek Mamasoliyevich</b>	
“SANOAT 5.0 VA BIZNES JARAYONLARINI BOSHQARISHDA SUN'IY INTELLEKTNI QO'LLASH IMKONIYATLARI” .....	540
<b>Lutpidinov Shuxrat Zakirdjanovich</b>	
REINVENTING MANAGEMENT SYSTEMS TO DRIVE EFFICIENCY IN INDUSTRIAL ENTERPRISES.....	545
<b>Kodirov Bekzod Khomidjonovich</b>	
TIJORAT BANKLARI TOMONIDAN MOLIYAVIY INVESTITSİYALARNI JALB QILISH SHAKLLARI.....	549
<b>Primova Dilafuz To'liqinovna</b>	
TO'QIMACHILIK SANOATINING MILLIY IQTISODIYOTDA TUTGAN O'RNI, O'ZIGA XOS XUSUSIYATLARI VA ILMIY-NAZARIY ASOSLARI .....	556
<b>Shoyimov Adiz Sadredinovich</b>	
ISHLAB CHIQARISH KLASTERLARINING HUDUDIY INNOVATSION RIVOJLANISHGA TA'SIRINI BAHOLASH.....	564
<b>Turaeva Nargiza Rustamovna</b>	
SAMARQAND VILOYATIDAGI HUDUDIY OLIY TA'LIM MUASSASALARIDA RESURS SALOHİYATINI INTEGRATSİYALASHGAN BAHOLASH METODLARI TAHLILI.....	570
<b>Meliboyev Ibrohim</b>	
VIDEO-ANALITIKA ASOSIDA YONG'IN XAVFSIZLIK TIZIMLARINI AVTOMATLASHTIRISHNING TAKOMILLASHTIRILGAN YONDASHUVLARI .....	575
<b>Shermuhhammad Mo'minov, Tojimirzayeva Xayrixon Abdushukur qizi</b>	



DEVELOPMENT OF «GREEN» AGRICULTURAL SERVICES IN THE CONTEXT OF THE DIGITAL ECONOMY DEVELOPMENT IN UZBEKISTAN .....	580
<b>Mirzaev Kulmamat Djanzakovich</b>	
NAMANGAN VILOYATIDA XIZMAT KO'RSATISH SOHALARINING HUDUDiy IXTISOSLASHUV DARAJASI .....	586
<b>Tohirov Jahongir Muzaffar o'g'li</b>	
ELEKTR TA'MINOTIDAGI UZILISHLAR TUFAYLI YUZAGA KELADIGAN BEVOSITA VA BILVOSITA IQTISODIY YO'QOTISHLARNI HISOBLASH METODOLOGIYASI.....	593
<b>Oltiboyeva Feruza Ulug'bek qizi</b>	
QISHLOQ XO'JALIGIDA INNOVATSION TADBIRKORLIKNI RIVOJLANTIRISH YO'NALISHLARI VA UNING IQTISODIY SAMARADORLIGI.....	598
<b>Matrasulov Baxodir Erbutayevich</b>	
ЦИФРОВАЯ ТРАНСФОРМАЦИЯ НАЛОГОВОГО АДМИНИСТРИРОВАНИЯ 3.0: ПЕРЕХОД К ИНТЕЛЛЕКТУАЛЬНЫМ НАЛОГОВЫМ СИСТЕМАМ В УЗБЕКИСТАНЕ И СТРАНАХ СНГ .....	604
<b>Дамир Рустамович Абдулов</b>	
KICHIK BIZNES RIVOJLANISHIGA HUDUDiy SALOHiyAT TA'SIRINI BAHOLASH METODOLOGIYASI VA MAHALLIY BOSHQARUV MEXANIZMLARINING INTEGRATSIYALASHGAN TAHLILI.....	609
<b>Ubaydullayev Akmal Tulkinboyevich</b>	
AVTONOM ROBOTLASHGAN TIZIMLARNI RIVOJLANTIRISH UCHUN HARAKATNI QAYD ETISH MA'LUMOTLARIGAGA ASOSLANGAN RAQAMLI EGIZAK PLATFORMASI .....	614
<b>Fazluddin Xusnuddinov Zuxruddin o'g'li, Jamshid Inoyatxodjayev Shuxratullayevich, Jasurxo'ja Xolxo'jayev Muxtor o'g'li</b>	
HUDUDiy IQTISODIY RIVOJLANISHDA KICHIK BIZNESNING O'RNI: NAMANGAN VILOYATI MISOLIDA.....	620
<b>Jo'rayev Ilhomjon Kamolidinovich</b>	
IPO O'TKAZISH BOSQICHLARI: XALQARO ILMIY ADABIYOTLAR ASOSIDAGI TAHLIL VA O'ZBEKISTON UCHUN XULOSALAR .....	626
<b>Sabirova Nozima Normat qizi</b>	
YASHIL OBLIGATSIYALAR BOZORINI RIVOJLANTIRISHNING XALQARO TAJRIBASI VA O'ZBEKISTONDA AMALIYOTGA JORIY ETISH ISTIQBOLLARI .....	630
<b>Meliqo'ziyeva Dilrabo Muxitdin qizi</b>	
A CROSS-SECTIONAL ANALYSIS OF GLOBALIZATION, EDUCATION, AND TECHNOLOGY'S IMPACT ON IQ LEVELS ACROSS 63 COUNTRIES WORLDWIDE .....	635
<b>Bahodirova Durdonaxon Tolib kizi, Abdullaxonova Dinora Xursandbek qizi</b>	



# A CROSS-SECTIONAL ANALYSIS OF GLOBALIZATION, EDUCATION, AND TECHNOLOGY'S IMPACT ON IQ LEVELS ACROSS 63 COUNTRIES WORLDWIDE

**Bahodirova Durdonaxon Tolib kizi**

Tashkent State University of Economics,  
Master's student in World Economy  
ORCID: 0009-0007-1676-424X  
Email: durdona.baxodirova@gmail.com

**Abdullaxonova Dinora Xursandbek qizi**

Tashkent State University of Economics,  
Master's student in World Economy  
ORCID: 0009-0007-3340-0413  
Email: dinaraabdullakhonova@gmail.com

**Abstract.** This study examines the impact of globalization, education, and technological development on IQ levels across 63 countries using cross-sectional data. The analysis includes key indicators such as GDP per capita, foreign direct investment, trade openness, PISA scores, Human Capital Index, research and development expenditure, internet speed, and the Global AI Index. A robust regression model is applied to estimate the relationships. The results reveal that GDP per capita and PISA scores are the most significant determinants of cognitive performance at the 1% level. FDI and HCI show significant but negative effects, while R&D has a weak positive impact. Technological variables are not statistically significant. The findings suggest that cognitive development is mainly driven by economic and educational factors rather than technological advancement alone.

**Keywords:** globalization, IQ, human capital, education, economic development, technology.

**Annotatsiya.** Ushbu tadqiqotda 63 ta mamlakat kesimida globalizatsiya, ta'lim va texnologik rivojlanishning IQ darajalariga ta'siri o'rganildi. Tahlilda aholi jon boshiga YaIM, to'g'ridan-to'g'ri xorijiy investitsiyalar (FDI), savdo ochiqligi, PISA natijalari, Inson kapitali indeksi (HCI), ilmiy-tadqiqot va rivojlantirish xarajatlari (R&D), internet tezligi hamda Global sun'iy intellekt indeksi (GAI) kabi ko'rsatkichlar qo'llanildi. Baholash uchun robust regressiya usuli ishlatildi. Natijalar shuni ko'rsatdiki, aholi jon boshiga YaIM va PISA natijalari IQning eng muhim omillari hisoblanadi (1% darajada). FDI va HCI manfiy, ammo statistik jihatdan ahamiyatli ta'sir ko'rsatadi, R&D esa ijobiy, lekin kuchsiz ta'sirga ega. Texnologik ko'rsatkichlar esa statistik ahamiyatga ega emas. Natijalar kognitiv rivojlanish asosan iqtisodiy va ta'lim omillari bilan belgilanishini ko'rsatadi.

**Kalit so'zlar:** globalizatsiya, IQ, inson kapitali, ta'lim, iqtisodiy rivojlanish, texnologiya.

**Аннотация.** В данном исследовании анализируется влияние глобализации, образования и технологического развития на уровень IQ в 63 странах на основе перекрестных данных. В анализ включены такие показатели, как ВВП на душу населения, прямые иностранные инвестиции (FDI), открытость торговли, результаты PISA, индекс человеческого капитала (HCI), расходы на исследования и разработки (R&D), скорость интернета и глобальный индекс искусственного интеллекта (GAI). Для оценки взаимосвязей используется робастная регрессия. Результаты показывают, что ВВП на душу населения и результаты PISA являются наиболее значимыми факторами когнитивного развития (на уровне 1%). FDI и HCI имеют значимое, но отрицательное влияние, в то время как R&D оказывает слабое положительное воздействие. Технологические показатели статистически незначимы. Полученные результаты свидетельствуют о том, что когнитивное развитие в большей степени определяется экономическими и образовательными факторами.

**Ключевые слова:** глобализация, IQ, человеческий капитал, образование, экономическое развитие, технологии.

## INTRODUCTION

Globalization has been characterized by the growing interdependence of world economies through the increasing integration of trade, finance and technology. The objective of globalization is to optimize the movement of capital, human and innovative knowledge across countries so that productivity can grow and develop via its man-power [1]. Cognitive performance is significantly contingent on economic development. Countries with higher levels of income, often measured by GDP per capita, are able to invest more in education, healthcare and infrastructure. These investments lead directly to human capital and cognitive development improvements [2]. Wealthier nations often have greater access to quality education, better living conditions and learning environments that affect the intelligence quotient.

Education is another major predictor of cognitive ability. International comparisons show that there are huge differences in countries when it comes to schools - as seen in the Programme for International Student Assessment (PISA) Countries with better PISA scores show better analytical skills, problem-solving and cognitive performance overall [3]. The differences underscore the role of educational systems in producing intellectual outcomes and productivity spillovers over the long term.

The technological field has also become an important aspect of globalization. The internet, digital platforms, and artificial intelligence will transform knowledge production and dissemination. Digital resources could give way to new educational and skill lessons for one person, which can impact cognitive performance [4]. But how technology actually functions is predicated on strong institutions and quality of education systems.

However, globalization has not served all countries equally. This benefit is greater in developed economies that generally have an advanced infrastructure and institutional capacity, while developing countries tend to have deficiencies such as the poor education system and access to technology [5]. This causes unequal cognitive development among countries. Hence, the primary purpose of this study is to examine how globalization, education and technological features affect IQ levels in 63 countries. Empirically, this research is novel in its integrative consideration of numerous facets of globalization within the same empirical model.

## LITERATURE REVIEW

Academics have been increasingly interested in the links between globalization, economic development, education and cognitive performance in recent years. The process of globalization is indeed well acknowledged as multi-dimensional, covering aspects of economic integration, technological diffusion and the expansion of knowledge networks that have contributed to human capital formation, cognitive skills development [1,7]. There exists a substantial body of literature attributing cognitive outcomes to the effect of economic growth. Low GDP per capita and his/her higher level are associated with access to education, health care, nutrition are important determined factors for cognitive ability [2,6]. Investments in education improve cognitive skills, and cognitive skills then support the long-run economic growth [2]. Similarly, Rohde et al. found that cognitive ability is generally stronger across countries with higher income levels as those countries are characterized by better living conditions and therefore more educational attainment.

Indicators of globalization, such as foreign direct investment (FDI) and trade openness are also significant in cognitive development. Foreign Direct Investment [FDI] is the financial independent stability of a company through which it is free to coordinate its management systems and provides technology and financial support to know-how in order to transfer advanced technologies, managerial knowledge as well as innovation leads improvement in productivity affecting human capital upgrade[7]. According to UNCTAD, knowledge transfer due to FDI inflows leads the receiver country to improve its industrial development and educational indicators [7]. And trade openness expands the exposure of domestic firms to foreign markets and ideas, facilitating knowledge spillovers and multinational involvement [17].

Education is widely acknowledged as the most significant predictor of cognitive performance. On the one hand, state tests administered internally do not offer valuable insights especially compared to international assessments such as Programme for International Student Assessment (PISA) which take place every three years. Countries with higher PISA scores exhibit greater analytical skills, improved problem-solving abilities, and overall cognitive performance according to OECD studies [3]. In addition, Barro and Lee [8] highlight that development in human capital to represent years of schooling and education equalization is closely related to intelligence growth and productivity.

In 2018, the World Bank released an important yardstick for every nation's leaders—the Human Capital Index (HCI), which combines indicators of education and health to generate a measure of how productive future generations will be. Several studies have found a positive relationship between HCI levels and cognitive abilities, as well as economic outcomes [11]. Add to Cart Becker's human capital theory provides additional evidence for this relationship by emphasizing the value of education and skills as a means of increasing individual productivity and intellectual potential [15].



Technical development in recent years has also proven to be a significant component affecting cognitive performance. The increasing availability of internet access and digital technologies are changing how people learn and develop skills. Zhang et al. [4] show that better internet access leads to more learning through increased availability of information. Likewise, Acemoglu and Restrepo[9] suggest that advances in technology especially artificial intelligence may disrupt labor markets and education systems, thereby shaping cognitive skill development. However, evidence from empirical studies on the technology effect is still mixed. Some studies highlight the positive role of digital technologies, while others state that technology alone will not improve cognitive outcomes without strong institutional frameworks and education systems [5]. Rodrik [5] argues that globalization and technological advancement shape inequality in the absence of sufficient institutional capacity of countries for those transitions.

A related body of literature has explored the link between globalization and inequality in cognitive development. Thus, rich countries benefit more from globalisation given that they possess superior infrastructure and properly developed institutions, while poorer states are constrained by structure, with limited access to education and technology [16]. And so, we see massive differences in terms of cognitive performance between countries. In-depth literature has been produced so far, yet there are still research gaps. First, most studies address individual components like education or income, rather than simultaneously take into account the joint impacts of economic, educational and technological factors. Second, few studies incorporate several dimensions of globalization simultaneously into one empirical model. Third, cross-country comparative analyses based on a wider set of indicators are still comparatively few and far between. Integrating economic, educational and technological variables into one model provides a more nuanced understanding of the drivers of cognitive development.

## RESEARCH METHODOLOGY

The research will analyse the impact of trade variables including trade and foreign direct investments across countries on cognitive performance for different countries, as measured in IQ scores. It also aims to explore the role of cognitive scores assessed by educational and technological metrics like PISA scores, Human Capital Index (HCI), Global AI Index (GAI), R&D expenditure, and global internet speed on IQ level. Mathematically, the regression model takes the following general form:

$$IQ = \alpha + \beta^0 + \beta^1 \cdot Trade + \beta^2 \cdot FDI + \beta^3 \cdot GDP \text{ per capita} + \beta^4 \cdot PISA + \beta^5 \cdot HCI + \beta^6 \cdot GAI + \beta^7 \cdot R\&D \text{ expenditure} + \beta^8 \cdot Internet \text{ Speed} + \epsilon \quad (1)$$

Where, in equation 1, the variable IQ is dependent variable, while the independent variables consist on trade, FDI, GDP per capita, PISA score, HCI, GAI, R&D expenditure, and internet speed,  $\alpha$  is the intercept,  $\beta^1, \beta^2, \beta^3, \dots, \beta^8$  are the estimated coefficients for each independent variable,  $\epsilon$  is the error term. The model is estimated using robust regression to correct for heteroskedasticity and ensure reliable results [8].

Table 1: Data Sources and Measurement

Variables	Description of Variables	Sources
Intelligence Quotient (iq)	It measures the cognitive ability (Lynn/Becker dataset)	World Population Review
Trade (trade)	Measured by the sum of a country's exports and imports as a percentage of GDP	World Bank
Foreign Direct Investment (fdi)	Measured by the net inflows of foreign direct investment	World Bank
Gross Domestic Product Per capita (gdp_per_capita)	Reflects the total economic output per person within a country, measured in dollars.	World Bank
Programme for International Student Assessment (pisa)	Assesses the quality of public education systems across countries	OECD
Human Capital Index (hci)	Measured by factors such as education, health, and skills.	World Bank
Global Artificial Intelligence Index (gaii)	Measures a country's performance and readiness in artificial intelligence (AI).	Tortoise Media
Research and Development Expenditure (RandD_expenditure)	Measures the total spending on research and development activities within a country.	World Bank
Internet Speed (internet_speed)	Measures the average internet connection speeds across countries.	World Population Review

## ANALYSIS AND RESULTS

This study aimed at quantifying the effects of globalization, education and technology on IQ level of different countries. This section is intended to report the results of such econometric process as descriptive statistics, Breusch-Pagan/Cook-Weisberg test for heteroskedasticity, Spearman correlation and Robust regression.

**Table 2. Descriptive Statistics of the variables**

Variable	Obs	Mean	Std. Dev.	Min	Max
IQ	63	4.529	.075	4.366	4.668
FDI	63	15.854	1.312	13.103	19.67
GDP per capita	63	10.086	.93	7.586	11.762
PISA	63	7.19	.124	6.913	7.381
HCI	63	-.367	.099	-.528	-.223
Trade	63	33480.272	139565.49	66.742	1013367.9
GAI	63	62.36	11.874	37.2	88.16
Internet speed	63	126.558	62.787	14.81	297.62
RandD expenditure	63	1.492	1.25	.08	5.56

Descriptive statistics for the variables utilized in this analysis are presented in Table 2. GDP per capita and trade show the most variation across countries, which reflects the high variance in levels of economic development. This is reinforced as we look at the relatively lower variation (and therefore more stable distributions across sample) in the two outcoming measures IQ and PISA scores. On the contrary, indicators of technology, like the speed of internet connectivity and R&D expenditure follow a median distribution which means some countries are more technologically well-endowed.

**Table 3. Spearman correlation analysis**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) iq	1.000								
(2) fdi	0.243	1.000							
(3) gdp_per_ca~a	0.589	0.423	1.000						
(4) pisa	0.844	0.484	0.638	1.000					
(5) hci	0.822	0.307	0.774	0.845	1.000				
(6) trade	0.297	0.732	0.322	0.432	0.241	1.000			
(7) gail	0.668	0.604	0.843	0.793	0.755	0.540	1.000		
(8) internet_speed	0.298	0.443	0.465	0.414	0.364	0.391	0.564	1.000	
(9) RandD_expendit~e	0.740	0.391	0.753	0.777	0.763	0.501	0.858	0.479	1.000

Spearman rho = 0.479

The results of Spearman correlation are shown in Table 3. The results show a strong positive correlation (0.844) between IQ and PISA scores, as well as between IQ and Human Capital Index (0.822), indicating the importance of education for cognitive development. The average IQ also has a notable positive correlation with GDP per capita (0.589), indicating the role of economic development. On the other hand, both FDI and trade are relatively weakly correlated with IQ, suggesting lack of a direct impact on cognitive performance. Very high correlations between independent variables (such as GAI with R&D) can diagnose potential multicollinearity, which is corrected through robust estimation of the regression. Some independent variables (e.g., GAI and R&D) have a high correlation, suggesting potential multicollinearity; however, this is handled by means of robust regression estimation.

Breusch Pagan/Cook Weisberg test for heteroskedasticity

Assumption: Normal error terms

Variable: Fitted values of iq

H0: Constant variance

$\chi^2(1) = 2.70$

Prob >  $\chi^2 = 0.1006$

According to the Breusch-Pagan test heteroskedasticity is not present ( $p > 0.05$ ), which indicates that the assumption of constant variance is satisfied. However, robust regression is used to reflect reliability within the estimates.



Table 4. Robust regression analysis

In_IQ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
In_FDI	-.008	.004	-2.13	.04	-.016	0	**
In_gdp_per_capita	.03	.008	3.89	0	.014	.045	***
In_PISA	.495	.057	8.70	0	.379	.611	***
In_HCI	-.167	.079	-2.10	.044	-.328	-.005	**
In_trade	.001	0	0.95	.347	0	0	
In_GAI	.001	.001	0.14	.89	-.001	.002	
In_internet_speed	0	0	0.06	.953	0	0	
In_RandD_expenditure	.008	.005	1.86	.072	-.001	.018	*
<b>base Africa</b>	.	.	.	.	.	.	
Asia	-.046	.024	-1.92	.064	-.096	.003	*
Europe	-.068	.024	-2.82	.008	-.117	-.019	***
Latin America	-.099	.028	-3.47	.001	-.156	-.041	***
Middle East	-.128	.027	-4.65	0	-.184	-.072	***
North America	-.051	.029	-1.74	.091	-.111	.009	*
Oceanica	-.059	.029	-2.04	.049	-.118	0	**
Constant	.784	.424	1.85	.074	-.079	1.646	*
Mean dependent var	4.520		SD dependent var	0.076			
R-squared	0.951		Number of obs	48			
F-test	45.643		Prob > F	0.000			

\*\*\* p<.01, \*\* p<.05, \* p<.1

Robust regression results are shown in Table 4. The model is statistically significant (Prob > F = 0.000) and exhibits high explanatory power ( $R^2 = 0.951$ ). Both GDP per capita and PISA scores have strong positive effects on IQ ( $p < 0.01$ ), suggesting that economic development and education are the main determinants of IQ levels. Both factors of FDI and HCI present significant but inversely oriented correlations ( $p < 0.05$ ), indicating indirect or structural influences. R&D expenditure has a weak positive impact (at 10% level). Neither trade, internet speed nor Global AI Index are statistically significant. These regional variables show variation in cognitive outcomes between regions.

It shows that economic development and education prove to be the major drivers of cognitive performance between countries. The significant positive influence of GDP per capita means that as the level of income grows, it promotes better education and healthcare access, in addition to elevated living conditions which help in cognitive development [6].

The results also underscore the importance of education in determining intellectual skills. The powerful association with PISA scores indicates that educational quality is one of the most significant predictors of cognitive performance: better education systems yield higher levels of cognitive skills [3]. The signs of the coefficients imply that FDI and HCI may not affect IQ positively but indeed indirectly or through some structural channels unique to each country. While FDI is widely viewed as a contributor to economic growth, the extent of its benefits on cognitive development is contingent upon the economy's absorptive capacity and institution quality [7].

Above chart results indicate that access to technology does not convert and enhance cognition. This aligns well with the need for technology to be properly integrated into education systems if meaningful processes of learning are to result [4]. The findings imply that the impact of globalization on cognitive development is indirect, working through economic and educational pathways rather than via direct technological mechanisms.

## CONCLUSION AND POLICY RECOMMENDATIONS

This analysis here based on 63 countries shows that globalization, education and technological factors are relevant for IQ levels. The findings highlight the importance of economic development and educational quality among determinants of cognitive ability. Income level (measured in terms of GDP per capita) and overall level of educational attainment as measured by PISA both show strong positive effects illustrating how much income and general education matter in producing intelligent citizens. FDI and HCI have a less pronounced or indirect relationship, whereas technology indicators do not display a statistically significant impact.

The implication of these results is that globalization also promotes human cognition, but only indirectly through higher economic growth and better education system, not as a result of technological progress.



The findings of the study lead to several policy recommendations. First, governments need to invest in their education systems as improving the quality of education is critical for cognitive development and human capital. Second, policies to boost economic growth and income levels should be stronger because GDP per capita has a direct positive effect on cognitive performance. Third, foreign direct investment must flow into sectors that foster transfer of technology and skills to the local economy, so that its benefits spread beyond enhancing growth to building capacity. Lastly, the technology progress must be well implanted into education systems. Of course, access to digital technologies is not enough, they must be used properly to help people learn how to think.

### Reference

1. Keohane, R. O., & Nye, J. S. (2020). *Power and Interdependence*. New York: Longman.
2. Hanushek, E. A., & Woessmann, L. (2021). Education and Economic Growth. *Economics of Education Review*, 84, 102146.
3. OECD. (2020). *PISA 2018 Results*. Paris: OECD Publishing.
4. Zhang, Y., Wang, L., & Chen, H. (2021). Internet access and educational outcomes. *Computers & Education*, 172, 104251.
5. Rodrik, D. (2021). Why Does Globalization Fuel Inequality? *Journal of Economic Perspectives*, 35(4), 3–24.
6. Rohde, N., Tang, K. K., & Rao, P. (2020). The effect of economic growth on cognitive development. *Economics & Human Biology*, 37, 100866.
7. UNCTAD. (2023). *World Investment Report 2023*. Geneva: United Nations.
8. Barro, R. J., & Lee, J. W. (2021). Education matters: Global schooling dataset. *Journal of Development Economics*, 150, 102615.
9. Acemoglu, D., & Restrepo, P. (2020). Artificial intelligence and jobs. *Journal of Economic Perspectives*, 34(1), 3–30.
10. Wooldridge, J. M. (2020). *Introductory Econometrics: A Modern Approach*. Boston: Cengage Learning.
11. World Bank. (2020). *Human Capital Index 2020 Update*. Washington, DC: World Bank.
12. IMF. (2023). *World Economic Outlook*. Washington, DC: International Monetary Fund.
13. Aghion, P., & Howitt, P. (2021). *Endogenous Growth Theory*. Cambridge, MA: MIT Press.
14. Lucas, R. E. (2020). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42.
15. Becker, G. S. (2021). *Human Capital: A Theoretical and Empirical Analysis*. Chicago: University of Chicago Press.
16. Gonzalez, R., & O'Neill, B. (2023). Global inequality and human capital development. *World Development*, 162, 106103.
17. Baldwin, R. (2020). *The Great Convergence: Information Technology and the New Globalization*. Harvard University Press.
18. Friedman, T. (2020). *The World is Flat*. New York: Farrar, Straus and Giroux.
19. UNESCO. (2022). *Global Education Monitoring Report*. Paris: UNESCO.
20. Sianesi, B., & Van Reenen, J. (2021). The returns to education: A review of evidence. *Economic Journal*, 131(635), 301–345.
21. Autor, D. (2022). The work of the future. *Journal of Economic Perspectives*, 36(2), 3–30.
22. World Bank. (2022). *World Development Indicators*. Washington, DC: World Bank.
23. Tortoise Media. (2022). *Global AI Index Report*. London: Tortoise Media.
24. OECD. (2023). *FDI Statistics Report*. Paris: OECD Publishing.
25. UNDP. (2022). *Human Development Report*. New York: United Nations Development Programme.

# **muhandislik**

# **& iqtisodiyot**

ijtimoiy-iqtisodiy, innovatsion texnik,  
fan va ta'limga oid ilmiy-amaliy jurnal

**Ingliz tili muharriri:** Feruz Hakimov

**Musahhih:** Zokir Alibekov

**Sahifalovchi va dizayner:** Abdurahmon Qurbonov

---

**2026. № 4**

---

© Materiallar ko'chirib bosilganda "Muhandislik va iqtisodiyot" jurnali manba sifatida ko'rsatilishi shart. Jurnalda bosilgan material va reklamalardagi dalillarning aniqligiga mualliflar ma'sul. Tahririyat fikri har vaqt ham mualliflar fikriga mos kelmasligi mumkin. Tahririyatga yuborilgan materiallar qaytarilmaydi.

"Muhandislik va iqtisodiyot" jurnali 26.06.2023-yildan  
O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi  
Axborot va ommaviy kommunikatsiyalar agentligi tomonidan  
№S-5669245 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.  
**Litsenziya raqami: №095310.**

**Manzilimiz: Toshkent shahri Yunusobod  
tumani 15-mavze 19-uy**





+998 93 718 40 07



<https://muhandislik-iqtisodiyot.uz/index.php/journal>



[t.me/yait\\_2100](https://t.me/yait_2100)