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REGIONAL NEW-FIRM FORMATION IN UZBEKISTAN AFTER THE 2017 REFORMS: PERSISTENCE IN SCALE, CONVERGENCE IN INTENSITY, AND RECOMPOSITION TOWARD TRADE

Abstract: Uzbekistan's 2017 economic liberalisation was followed by a roughly threefold increase in new-business registration, but whether that national surge reshaped the regional structure of entrepreneurship has not been tested. This study builds a 224-observation region-year panel (14 regions, 2010-2025) from the National Statistics Committee's Unified State Register of Enterprises and Organisations and estimates beta-convergence on two pre-registered outcomes: new firms per year (levels) and new firms per 1,000 registered enterprises (formation intensity). On the pre-registered intensity outcome, convergence is robust: $\beta = -0.990$ (HC3 SE 0.367, $p = 0.007$, $R\text{-squared} = 0.537$), negative in 14 of 14 leave-one-out fits. On the levels outcome the estimate is negative but inconclusive-underpowered ($\beta = -0.235$, $p = 0.053$), with a minimum detectable effect of 0.311 that exceeds the observed coefficient. Rank-stability analysis resolves the apparent tension: the absolute ordering of regions is frozen (Spearman $\rho = +0.93$), while the intensity ordering reshuffles completely ($\rho = -0.02$) and its dispersion compresses. Sectoral decomposition shows the boom was compositionally narrow: wholesale and retail trade gained 9.07 percentage points of share and accounts for 41.5 per cent of the national surge, while construction, manufacturing and finance lost share. The post-2017 period is therefore best described as persistence in scale, convergence in intensity, and recomposition toward trade. No causal attribution to the reforms is claimed.

Keywords: new firm formation; regional convergence; Uzbekistan; entrepreneurship; economic reform

1. Introduction

Where new firms are created, and whether that geography changes when policy changes, is one of the durable questions in regional economics. The stakes are practical: if entrepreneurship concentrates permanently in a capital region, liberalisation can raise national firm counts while leaving the regional structure of opportunity untouched. The empirical literature on mature economies suggests exactly this kind of stickiness. Armington and Acs [2] show that regional variation in new firm formation is explained by industrial density, population growth and income growth, all of which are slow-moving. Andersson and Koster [1] go further, documenting that regional start-up rates in Sweden are persistent and path-dependent, and that regions with high start-up rates exhibit the strongest persistence of all.

Uzbekistan after 2017 is an unusually clean setting in which to ask whether a large policy shock disturbs that structure. Following the change of government, the country undertook a broad liberalisation programme including currency convertibility, tax simplification and a reduction in licensing and inspection burdens. National new-business registration rose from 32,747 in 2016 to 96,743 in 2019, and has since plateaued in the 80,000-100,000 range. A shock

of that size is rare, and it offers a natural test: did the surge redistribute entrepreneurship across the country's regions, or did it simply scale up the existing hierarchy?

The literature offers a theoretical reason to expect institutional reform to matter. Carbonara, Santarelli and Tran [4], using instrumental-variable GMM across 115 countries, find that constitutional provisions protecting the right to conduct business are positively associated with new business density. Tonoyan, Strohmeier, Habib and Perlitz [11] describe the institutional baseline such reforms act against in transition economies, where weak legal enforcement and closed networks sustain corrupt dealing. Reform of the kind Uzbekistan undertook is therefore a plausible driver of entry, even though establishing that causally is beyond what the present data can support.

What does not exist is a quantitative regional treatment of the Uzbek case. Three close-neighbour studies define the frontier. Tadjiev, Ataev, Akhmetshin and Vasilev [10] assess the effectiveness of Uzbekistan's entrepreneurship-support reforms, but at national and institutional level with no panel estimation. Nizaeva [9] studies regulatory and institutional drivers of small-firm growth across Central Asia using Enterprise Survey data, but the design is a four-country firm-level cross-section whose outcome is employment growth rather than entry, and it contains no within-Uzbekistan regional dimension. Asadov and Bozorov [3] analyse the 2017-2025 reform period in Russian-language policy-narrative form, without firm-entry estimation. A search across English and Russian-language sources returns no published work that estimates new-firm formation across Uzbekistan's regions over time using the official business register.

One boundary on the question should be fixed at the outset. This study measures entry, not durability. Huggins, Prokop and Thompson [5] show that human capital, growth motivation and local conditions explain firm survival within regions, which is a distinct outcome from formation; a region that creates many firms is not thereby shown to sustain them. Nothing below speaks to survival.

This study fills that gap. It contributes, first, a 224-observation region-year panel covering all 14 regions from 2010 to 2025, built from the national business register; second, a pre-registered test of beta-convergence on two distinct outcomes, formation levels and formation intensity, which turn out to behave very differently; third, a rank-stability analysis that reconciles those two results; and fourth, a sectoral decomposition of the national surge that has no counterpart in the existing literature. The analysis plan was fixed in writing before any confirmatory result was produced.

The paper proceeds as follows. Section 2 describes the data, the pre-registered design and the validity checks. Section 3 reports the descriptive series, the convergence estimates, the rank-stability results and the sectoral decomposition. Section 4 interprets these against the persistence literature and states the study's limits. Section 5 concludes.

2. Data and method

The study asks how new-business formation evolved across Uzbekistan's 14 regions following the 2017 reforms, whether initially lagging regions caught up, and how the sectoral composition of new firms shifted over the same period. It is designed to describe and test patterns of regional convergence, not to establish that the reforms caused them.

Data come from the Unified State Register of Enterprises and Organisations (USREO) maintained by the National Statistics Committee of the Republic of Uzbekistan, accessed through the committee's own SDMX interface. Three region-by-year series were retrieved (newly created enterprises, newly created small businesses, and registered small businesses, 2010-2025) together with three national sector-by-year series classified by NACE section

(2013-2025). One scope constraint should be stated plainly: the register publishes new-business creation by region and by sector, but not as a combined region-by-sector cross-tabulation. The two dimensions are therefore analysed as marginals, with the region-by-time panel as the spine of the study and the national sector-by-time series as a second lens. Regional coverage comprises the 12 provinces, the Republic of Karakalpakstan and the city of Tashkent, referred to throughout as the 14 regions.

The design is observational and descriptive-comparative, built around a single national policy episode in 2017. The unit of analysis is the region-year. The panel covers 14 regions over 16 years (2010-2025), giving 224 observations. Two outcomes were pre-registered. The first is the count of newly created enterprises per region per year, used in levels and in logs. The second is the formation rate, defined as newly created enterprises per 1,000 registered enterprises in the same region and year, which normalises for regional size and is the standard start-up-rate outcome in the regional entrepreneurship literature. The principal estimator is a beta-convergence regression in which the growth of formation between the pre-reform period (2013-2016) and the post-reform period (2018-2024) is regressed on the initial pre-reform level, separately for each outcome. A negative coefficient indicates that regions starting lower grew faster. Supporting specifications are a two-way fixed-effects panel model of log formation on a post-2017 indicator with region and year fixed effects, an event study around 2017, a rank-stability analysis, and a national sectoral decomposition. Because the design has only 14 clusters, the fixed-effects specification is tested with a wild-cluster bootstrap rather than asymptotic clustered standard errors.

The pre-registered hypothesis is beta-convergence: the null is that the coefficient on the initial level is zero, and the alternative is that it is negative, meaning initially lower regions grew faster. The hypothesis was stated for both outcomes before estimation. A null result was pre-committed to be reported as a bounded or inconclusive finding according to the design's power, never as evidence of no effect.

All analysis was carried out in Python using pandas for data assembly, statsmodels for estimation, and scipy for rank statistics. Beta-convergence models are estimated by ordinary least squares with HC3 heteroskedasticity-robust standard errors, which are appropriate at this sample size. The fixed-effects specification uses a wild-cluster bootstrap with 9,999 Rademacher replications and the null imposed. Three analysis scripts and seven derived datasets are retained: they regenerate every number reported below.

The panel was assembled from the raw register extracts and verified to contain 14 regions across 16 years with no missing cells. Pre-period (2013-2016) and post-period (2018-2024) means were computed per region for each outcome, and growth was calculated as the log ratio of post to pre. The transition year 2017 is excluded from both windows so that the comparison is not contaminated by the partial-year effect of reforms enacted during it. Before interpreting any coefficient, four validity checks were run: a Jarque-Bera test of residual normality, a Breusch-Pagan test for heteroskedasticity, a full influence diagnostic reporting Cook's distance and leverage for every region, and a leave-one-out re-estimation dropping each region in turn. A minimum detectable effect at 80 per cent power was computed for each specification so that any null could be classified as bounded or as underpowered rather than being read as absence of effect.

This study uses only aggregate, publicly published official statistics. No human participants were involved, no survey or interview was conducted, and no personal or identifying data of any kind was accessed or processed. Informed consent was therefore not

applicable. All source data are openly available from the National Statistics Committee of the Republic of Uzbekistan, and all analysis code and derived datasets are retained so that every reported figure can be reproduced.

3. Results

The national series establishes the scale of the episode. New-enterprise creation was roughly flat between 2010 and 2016, fluctuating between 21,890 and 34,326 per year. It then rose sharply: 41,013 in 2017, 55,011 in 2018 and 96,743 in 2019, a 2.95-fold increase over the 2016 base. The series has since settled onto an 80,000-100,000 plateau. All 14 regions grew; none contracted.

Table 1 – Newly created enterprises in Uzbekistan, national totals by year, 2010–2025

Year	New enterprises
2010	34,326
2011	32,715
2012	21,890
2013	27,819
2014	26,933
2015	27,915
2016	32,747
2017	41,013
2018	55,011
2019	96,743
2020	95,311
2021	102,804
2022	93,611
2023	88,787
2024	79,667
2025	87,775

Table 2 – Regional formation before and after the reforms (period means)

Region	Pre 2013–16	Post 2018–24	Pre rate	Post rate
Andijan	2,143	5,830	96.9	186.3
Bukhara	1,683	5,409	136.7	239.4
Fergana	2,577	7,491	145.2	219.4
Jizzakh	1,203	4,138	141.9	242.6
Karakalpakstan	1,327	4,245	129.0	240.8
Kashkadarya	1,719	6,270	93.7	247.0
Khorezm	1,365	5,166	129.7	261.7
Namangan	1,696	5,213	113.2	212.1
Navoi	822	4,298	121.4	298.7
Samarkand	2,116	8,368	146.8	264.6
Surkhandarya	1,459	4,881	134.1	269.6
Syrdarya	964	2,358	138.9	195.5
Tashkent city	7,066	16,145	168.5	196.7
Tashkent region	2,717	7,609	130.4	193.4

Validity checks pass. Residual normality is not rejected (Jarque-Bera = 1.31, $p = 0.519$) and homoskedasticity is not rejected (Breusch-Pagan LM = 3.22, $p = 0.073$); HC3 standard errors are used regardless. The influence diagnostic identifies three regions that carry disproportionate weight in the levels specification: Syrdarya (Cook's D = 0.689), Navoi (0.584) and the city of Tashkent (leverage = 0.606). This matters for interpretation and is reported rather than removed.

On the levels outcome, the convergence coefficient is negative but does not clear conventional significance: $\beta = -0.235$, HC3 SE = 0.122, $t = -1.93$, $p = 0.053$, R-squared = 0.345, $N = 14$. The leave-one-out analysis shows the sign is stable, negative in 14 of 14 fits with β ranging from -0.319 to -0.151, but significance is not: p is below 0.05 in only 2 of 14 fits, and the result swings from $p = 0.436$ when the city of Tashkent is dropped to $p = 0.003$ when Syrdarya is dropped. The design's minimum detectable effect at 80 per cent power is 0.311, larger in absolute value than the observed coefficient of 0.235. The levels result is therefore classified as inconclusive and underpowered. It is not evidence that convergence in levels is absent.

On the pre-registered formation-intensity outcome the picture is different and much sharper. Regressing growth in new firms per 1,000 registered enterprises on the initial log intensity gives $\beta = -0.990$, HC3 SE = 0.367, $t = -2.70$, $p = 0.007$, R-squared = 0.537, $N = 14$. Leave-one-out re-estimation returns a negative coefficient in 14 of 14 fits, significant at the 5 per cent level in 13 of 14, with β ranging from -1.265 to -0.801. This is the outcome that corresponds to the start-up-rate measure used in the benchmark regional literature, and on it convergence is robust.

Table 3 – Beta-convergence estimates, pre-registered outcomes (N = 14)

Outcome	β	HC3 SE	t	p	R^2
Formation levels	-0.235	0.122	-1.93	0.053	0.345
Formation intensity	-0.990	0.367	-2.70	0.007	0.537

The rank-stability analysis reconciles the two results. On the levels outcome, the Spearman correlation between each region's pre-period and post-period rank is +0.93 ($p < 0.001$): the absolute ordering of regions is essentially frozen, with the city of Tashkent dominant before and after. On the intensity outcome, the same correlation is -0.02 ($p = 0.95$), meaning the ordering is completely reshuffled, and the cross-regional dispersion of log intensity compresses from 0.158 to 0.146. Navoi moves from 11th to 1st on formation intensity, Kashkadarya from 14th to 5th, and the city of Tashkent falls from 1st to 11th. Both patterns are real and they describe different things: which regions are biggest, and how intensively each region is creating firms relative to its existing business stock.

Table 4 – Rank stability and dispersion, pre-period versus post-period

Outcome	Spearman ρ	p	σ pre	σ post
Formation levels (new firms per year)	+0.93	<0.001	0.527	0.438

Formation intensity (per 1,000 stock)	-0.02	0.946	0.158	0.146
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The two-way fixed-effects interaction between the post-2017 indicator and the initial level is negative but not significant ($c = -0.152$, wild-cluster $p = 0.277$ with 9,999 replications and 14 clusters). This is the panel expression of the levels claim, and its null is consistent with the underpowered levels result rather than contradicting the intensity result. An earlier pipeline specification that returned $p = 0.000$ was a small-cluster artefact and is not reported as a result.

The sectoral decomposition shows the boom was compositionally narrow. Wholesale and retail trade including motor-vehicle repair rose from 26.11 per cent to 35.18 per cent of new firms, a gain of 9.07 percentage points, and alone accounts for 41.51 per cent of the entire national increase in new-firm creation. Construction lost 4.37 percentage points of share, manufacturing lost 4.04, and financial and insurance activities lost 2.18, contracting to 0.32 times its 2016 count in absolute terms. The Herfindahl-Hirschman index of sectoral concentration rose from 1,396 to 1,624: the composition of new firms became more concentrated over the boom, not more diversified.

Table 5 – Sectoral composition of new firms, largest movers, 2016 versus 2024

Sector (NACE section)	2016 (%)	2024 (%)	Change (pp)	Share of surge (%)
Wholesale and retail trade; vehicle repair	26.11	35.18	+9.07	41.51
Agriculture, forestry and fisheries	10.25	11.44	+1.19	12.28
Other service activities	2.23	3.38	+1.14	4.17
Education	1.92	2.93	+1.01	3.63
Information and communication	2.89	3.68	+0.79	4.23
Financial and insurance activities	2.51	0.34	-2.18	-1.18
Manufacturing	19.25	15.22	-4.04	12.40
Construction	9.30	4.93	-4.37	1.88

4. Discussion

The central result is that two standard measures of the same phenomenon tell opposite stories, and that the difference is substantive rather than technical. Measured by how many firms are created, Uzbekistan's regional hierarchy did not move: the pre-period and post-period rankings correlate at 0.93, and the city of Tashkent remained dominant throughout a national tripling. Measured by how intensively each region creates firms relative to its existing stock, the hierarchy inverted: the rank correlation is effectively zero, dispersion narrowed, and regions that began least intensive, notably Navoi and Kashkadarya, ended most intensive.

This refines rather than contradicts the persistence literature. Andersson and Koster [1] established that regional start-up rates are persistent and path-dependent in Sweden. Our levels

result is consistent with that stickiness under a very large shock. But their persistence finding concerns start-up rates, and it is precisely on the rate outcome that we observe robust convergence and a complete reshuffle. The reasonable reading is that persistence in the absolute scale of regional entrepreneurship can coexist with rapid convergence in its intensity, and that a study reporting only one of the two outcomes would draw a confident but incomplete conclusion. Kangasharju [7] is relevant here as well: he documents that while long-run beta-convergence in Finland runs at roughly 2 per cent per year, short-run beta is unstable. Our eight-year window is short by that standard, which is one reason the levels estimate is fragile and the design was checked for power rather than read at face value.

The sectoral result carries a caution that should not be buried. The surge was concentrated in low-capital retail trade, which accounts for over 40 per cent of the national increase. La Porta and Shleifer [8] document that informal firms account for up to half of economic activity in developing countries. A registration boom concentrated in exactly the sector where informal activity is most common may therefore partly reflect the formalisation of pre-existing trade rather than the creation of genuinely new economic activity. The available data cannot distinguish these, and we do not claim to. The finding is that registered entry recomposed toward trade; whether that entry is new or newly visible is an open question and a natural target for follow-up work with firm-level or survey data.

Several limits bound what can be concluded. First, no causal attribution to the 2017 reforms is possible. There is no control group, and the event study shows a non-flat pre-trend with five of six pre-2016 coefficients significant, so the timing of the change cannot be pinned to 2017. Throughout, the language is that the surge coincides with or follows the reforms, never that it was caused by them. Second, the levels outcome is underpowered at $N = 14$ and is reported as inconclusive; the convergence claim rests on the intensity outcome, which is robust. Third, the modifiable areal unit problem applies directly to this design. Beta-convergence estimates depend on the spatial partition chosen, and 14 administrative regions is a coarse and politically determined partition; a finer district-level partition could give different estimates. Fourth, the rate denominator is the registered stock, which itself grows during the boom. This deflates the measured rate in fast-growing regions and therefore biases against finding rate convergence where growth was strongest, which makes the reported convergence result conservative. Fifth, nothing here resolves at region-by-sector level, because that cross-tabulation is not published.

It is worth noting that stickiness of this kind is not peculiar to transition economies. Iammarino, Rodríguez-Pose and Storper [6] document persistent regional inequality across Europe and argue that regions follow several distinct performance modes rather than converging uniformly. Uzbekistan's frozen levels hierarchy sits comfortably alongside that evidence, which suggests the pattern reflects general features of economic geography rather than anything specific to the reform episode studied here.

Within those limits the implication for policy is straightforward. Reform-era liberalisation in Uzbekistan appears to have broadened participation in firm creation, in the sense that lagging regions caught up on formation intensity, without redistributing where economic mass sits. If the policy objective is regional balance in absolute terms, an intensity-based catch-up is a weaker achievement than headline national growth suggests. The concentration of that catch-up in retail trade, together with the absolute contraction of new financial and manufacturing firms, further suggests that the composition of the boom deserves as much policy attention as its size.

5. Conclusion

This study built the first region-by-time panel of new-firm formation for Uzbekistan and used it to test whether the post-2017 surge changed the country's regional entrepreneurial structure. Three findings emerge. National new-firm creation roughly tripled between 2016 and 2019 and every region participated. On the pre-registered formation-intensity outcome, initially lower-intensity regions converged robustly on the rest ($\beta = -0.990$, $p = 0.007$, negative in all 14 leave-one-out fits), while the absolute hierarchy of regions remained frozen (rank correlation 0.93). The boom was compositionally narrow, with retail trade contributing over 41 per cent of the national increase while construction, manufacturing and finance all lost share. The period is best summarised as persistence in scale, convergence in intensity, and recomposition toward trade.

The main limitations are the absence of any causal identification, an underpowered levels specification that is reported as inconclusive rather than null, sensitivity of the spatial estimates to the administrative partition used, and the inability to separate genuinely new entry from the formalisation of existing informal trade.

Three extensions follow naturally. A district-level partition would test how far the convergence result depends on the choice of spatial units. Firm-level or survey data would allow new entry to be distinguished from formalisation, which is the single largest interpretive ambiguity in the present results. And a comparative design covering other Central Asian transition economies would place Uzbekistan's episode in context and open the possibility of a genuine counterfactual, which the single-country design here cannot provide.

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МАЗМҰНЫ – СОДЕРЖАНИЕ – CONTENT

ӘЛЕУМЕТТІК-ЭКОНОМИКАЛЫҚ ЖӘНЕ ҚҰҚЫҚ ҒЫЛЫМДАРЫ - СОЦИАЛЬНО-ЭКОНОМИЧЕСКИЕ И ЮРИДИЧЕСКИЕ НАУКИ - SOCIO-ECONOMIC AND LEGAL SCIENCES

Төлегенов Тимур Сейфуллаулы

**ДИНАМИКА ТУРИСТСКИХ ПОТОКОВ И ЭФФЕКТИВНОСТЬ ИНФРАСТРУКТУРЫ
ТУРКЕСТАНА: ОТ ЭКСТЕНСИВНОГО РОСТА К СМАРТ-УПРАВЛЕНИЮ 10**

Alexander Gorevoy

**WHICH INEQUALITY STATISTICS SURVIVE AN ADMINISTRATIVE BOUNDARY CHANGE?
EVIDENCE FROM KAZAKHSTAN, 2010–2023 14**

Rakhimov Djalil

**DOES THE SHIFT TO CASHLESS PAYMENTS GO TOGETHER WITH FASTER GROWTH IN
HOUSEHOLD CREDIT? EVIDENCE FROM THE REGIONS OF KAZAKHSTAN, 2023-2025 26**

Kazhgerey Asan

**HOW MANY FOOD BASKETS DOES AN AVERAGE WAGE BUY? WAGES AND FOOD PRICES IN
THE 20 REGIONS OF KAZAKHSTAN, 2024-2026 37**

Tagimova Alua

**WHO WAS LEFT BEHIND? EDUCATION AND FINANCIAL INCLUSION IN KAZAKHSTAN AND
THREE CENTRAL ASIAN NEIGHBOURS, 2021-2024 44**

Wei Wei, Mynzhanova Gulzhakan, Niyetalina Gaukhar

**DIGITAL–PHYSICAL INTEGRATION AND ECONOMIC PERFORMANCE IN INDUSTRIAL
INTEGRATED ENERGY SYSTEMS: A SCENARIO-BASED ANALYSIS OF SMART GRID
CONTROL, BATTERY ENERGY STORAGE, AND DIGITAL TWINS 51**

Xu Fumin, Wei Wei, Ruziyeva Elvira, Moldabekova A.

**FROM CULTURAL RESOURCES TO GLOBAL CONSUMER VALUE: THE BRIDGE–IMC MODEL
AND THE INTERNATIONALIZATION OF BLACK MYTH: WUKONG UNDER THE BELT AND
ROAD INITIATIVE 64**

Ibraimkhan Alikhan

**WHICH CRIMES CAN A 14-YEAR-OLD BE TRIED FOR? THE LIST IN ARTICLE 15 OF
KAZAKHSTAN'S CRIMINAL CODE COMPARED WITH 30 OTHER JURISDICTIONS 80**

Yerboluly Madi

**DID IMPORTED CARS REALLY GET CHEAPER? CHINESE CARS AND THE AVERAGE
CUSTOMS VALUE OF PASSENGER CARS IMPORTED INTO KAZAKHSTAN, 2015-2025 91**

Салимбаев Ербол Аманжолович

**АНАЛИЗ ИНВЕСТИЦИОННОЙ АКТИВНОСТИ КАК ИНДИКАТОР ИЗМЕНЕНИЙ
ПОТЕНЦИАЛЬНОГО СПРОСА НА КОНСАЛТИНГОВЫЕ УСЛУГИ 99**

Rambergenov Ramil

**REGIONAL NEW-FIRM FORMATION IN UZBEKISTAN AFTER THE 2017 REFORMS:
PERSISTENCE IN SCALE, CONVERGENCE IN INTENSITY, AND RECOMPOSITION TOWARD
TRADE 107**

Abdesh Dinara

**FROM A WOMEN'S LEAD TO A MEN'S LEAD: THE GENDER GAP IN DIGITAL PAYMENTS IN
KAZAKHSTAN AND THREE CENTRAL ASIAN NEIGHBOURS, 2021-2024 116**

Amangeldi Aidana

**DID SMALL BUSINESS IN KAZAKHSTAN REALLY SHRINK IN 2026? THE NEW TAX CODE,
REGIONAL TAX RATES AND THE FALL IN THE NUMBER OF INDIVIDUAL ENTREPRENEURS 124**

Cheng Che	
BUILD, BUY, OR PARTNER? ENTRY MODE SELECTION AND RISK GOVERNANCE FOR WIND POWER INVESTMENT IN KAZAKHSTAN	133
Wang Liang	
FROM CAPACITY EXPANSION TO SYSTEM VALUE: COORDINATED DEVELOPMENT OF RENEWABLE ENERGY, GRID FLEXIBILITY AND ENERGY STORAGE IN KAZAKHSTAN	146
Chen Jun	
CONSTRUCTION-PERIOD CREDIT RISK MANAGEMENT FOR LARGE INFRASTRUCTURE PROJECT FINANCE IN KAZAKHSTAN	159
Alniyaz Danial	
HOW MUCH FUEL DOES A HYBRID REALLY SAVE? A SAME-MODEL COMPARISON OF HYBRID AND GASOLINE CARS IN US FUEL ECONOMY	173

ТЕХНИКАЛЫҚ ҒЫЛЫМДАР - ТЕХНИЧЕСКИЕ НАУКИ - TECHNICAL SCIENCE

Nurmakhan Almira	
ADVANTAGES OF FIBER OPTIC COMMUNICATION OVER TRADITIONAL COPPER CABLES	180
Kozhabai Bereke	
SECURITY CHALLENGES IN IOT-BASED TELECOMMUNICATION NETWORKS	188
Azamatuly Yerassyl	
WHY AI-GENERATED CODE FAILS A BENCHMARK: A FAILURE ANALYSIS OF THREE OPEN LANGUAGE MODELS ON 30 HUMANEVAL+ TASKS	197
Nurzhan Sanzhar	
A FEW SHELLS, A FEW OPERATORS: WHERE LOW EARTH ORBIT IS CROWDED IN AN ALTITUDE-INCLINATION MAP OF 16,620 ACTIVE SATELLITES	206
Askarbek Nurislam	
CAN THE WEATHER TELL WHICH DAYS IN ASTANA WILL BE POLLUTED? CLASSIFYING PM2.5 EXCEEDANCE DAYS WITH MACHINE LEARNING AND CHECKING THE DATA AGAINST A GROUND MONITOR	212
Iliyas Arman	
SHOOTING ON THE MOVE: HOW MUCH AIM A ROBOT LOSES BY IGNORING ITS OWN VELOCITY, AND WHETHER A VIRTUAL-TARGET CORRECTION RECOVERS IT	223
Ануар Әлімжан Бахытжанұлы, Сексенбаева Айша Курманбековна	
СРАВНИТЕЛЬНЫЙ АНАЛИЗ СТАНДАРТОВ И МЕТОДИК ОБУЧЕНИЯ КИБЕРБЕЗОПАСНОСТИ: NICE FRAMEWORK, ECSF И ПРАКТИКО- ОРИЕНТИРОВАННЫЕ ТЕХНОЛОГИИ	229
Mukhamedzhan Yerganat	
GROWTH OF GITHUB DEVELOPER COMMUNITIES IN KAZAKHSTAN, UZBEKISTAN AND KYRGYZSTAN, 2020-2026: EVIDENCE FROM THE GITHUB INNOVATION GRAPH	239

ПӘНДЕР АРАЛЫҚ ҒЫЛЫМДАР – МЕЖДИСЦИПЛИНАРНЫЕ НАУКИ – INTERDISCIPLINARY SCIENCES

Albiyev Asser	
HOW MUCH OF AN ARTICLE COUNT IS HUMAN WORK? DECOMPOSING THE CREATION OF FIVE WIKIPEDIAS, 2010–2025	251
Amangeldy Nurbolat	
HOW MUCH OF KAZAKHSTAN'S URBAN BUILT STOCK PREDATES ITS SEISMIC CODES, AND WHERE DOES THAT STOCK SIT RELATIVE TO HAZARD?	261

Torekhan Sabrina

WHERE ALMATY WALKS ITS OWN WAY: INFORMAL SHORTCUTS IN OPENSTREETMAP AND THE DETOURS THEY AVOID	267
---	------------

ӘЛЕУМЕТТІК ЖӘНЕ ГУМАНИТАРЛЫҚ ҒЫЛЫМДАР - СОЦИАЛЬНО-ГУМАНИТАРНЫЕ НАУКИ - SOCIAL SCIENCES AND HUMANITIES

Мұқатаева Айзат Амантайқызы, Стамбекова Жанат Байғазықызы, Слямханова Гүлім Болатқызы, Қызырбек Аяулым Ерболқызы

ЖАСАНДЫ ИНТЕЛЛЕКТ ДӘУІРІНДЕГІ ҒЫЛЫМИ ТАНЫМ: ПОППЕР, КУН ЖӘНЕ ЛАКАТОС ИДЕЯЛАРЫ ТҮРҒЫСЫНАН ТАЛДАУ	272
--	------------

Мұқатаева Айзат Амантайқызы, Сапарханова Мадина Төлегенқызы, Окенова Аружан Муратхановна, Тұрсынғазыева Ақерке Ерболатқызы

ШӘКӘРІМ ФИЛОСОФИЯСЫНДАҒЫ ЕРКІНДІК ЖӘНЕ МОРАЛЬДЫҚ ТАҢДАУ МӘСЕЛЕСІ	282
---	------------

Komekova Saida

DO UNHAPPY REVIEWERS MIX IN MORE RUSSIAN? STAR RATINGS AND KAZAKH-RUSSIAN CODE-SWITCHING IN 175,002 ONLINE REVIEWS	291
---	------------

Zhumagali Yerbol

DOES A BIGGER MODEL CLOSE THE GAP? KAZAKH-LANGUAGE ACCURACY ON KAZAKHSTAN-SPECIFIC VERSUS UNIVERSAL SCHOOL SUBJECTS IN SMALL OPEN-WEIGHT LANGUAGE MODELS	304
---	------------

Abdrakhmanova Madina

DOES A MEDAL BUY ATTENTION? WIKIPEDIA VIEWS OF KAZAKHSTAN'S ATHLETES BEFORE AND AFTER THE PARIS 2024 OLYMPIC	308
---	------------

ПЕДАГОГИКАЛЫҚ ЖӘНЕ ПСИХОЛОГИЯЛЫҚ ҒЫЛЫМДАР – ПЕДАГОГИЧЕСКИЕ И ПСИХОЛОГИЧЕСКИЕ НАУКИ – PEDAGOGICAL AND PSYCHOLOGICAL SCIENCES

Kaldarbek Mergen

FAMILY OR SCHOOL? SOCIOECONOMIC COMPOSITION AND MATHEMATICS ACHIEVEMENT IN KAZAKHSTAN, PISA 2022 AND 2025	316
--	------------

Zhenis Adilzhan

WHICH OLYMPIAD PROBLEMS DO STUDENTS TAKE TO THE BOARD? CHOICES AND DEFENCES IN THE 8TH-GRADE LEAGUE OF KARAGANDY MATHBATTLES 2026	323
--	------------

Базарбаева Айнура Бектуровна

ДЕТСКИЙ ФОЛЬКЛОР И ПОДВИЖНЫЕ ИГРЫ КАК ИНСТРУМЕНТЫ ФОРМИРОВАНИЯ ОСНОВ ПРАВОВОЙ КУЛЬТУРЫ У ДЕТЕЙ СТАРШЕГО ДОШКОЛЬНОГО ВОЗРАСТА	330
---	------------

БИОЛОГИЯ ҒЫЛЫМДАР - БИОЛОГИЧЕСКИЕ НАУКИ - BIOLOGICAL SCIENCES

Bazhenova Diana

GROWTH DYNAMICS OF STERLET (<i>Acipenser ruthenus</i> L.) REARED IN A RECIRCULATING AQUACULTURE SYSTEM	333
---	------------

ТУРИСТИЧЕСКИЕ И СПОРТИВНЫЕ НАУКИ - ТУРИСТІК ЖӘНЕ СПОРТ ҒЫЛЫМДАРЫ - TOURISM AND SPORTS SCIENCES

Төлеп Жазира Маратқызы

ГАСТРОНОМИЯЛЫҚ ФЕСТИВАЛЬДЕРДІҢ ТУРИСТІК ДЕСТИНАЦИЯ ТАРТЫМДЫЛЫҒЫН ҚАЛЫПТАСТЫРУДАҒЫ РӨЛІ МЕН ДАМУ ҮРДІСТЕРІ	340
--	------------

ЕСТЕСТВЕННЫЕ НАУКИ - ЖАРАТЫЛЫСТАНУ ҒЫЛЫМДАРЫ - NATURAL SCIENCES

Нургельдина Асель Ермаковна, Серикбаева Жанерке Алимжановна

ШЕКАРАСЫЗ ФИЗИКА: ӘР ЕЛДЕГІ ФИЗИКАЛЫҚ БІЛІМДІ САЛЫСТЫРУ 347