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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 – Telekommunikasiya va kompyuter tizimlari, telekommunikasiya 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

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MUNDARIJA • СОДЕРЖАНИЕ • CONTENTS

MUNDARIJA

AHOLI DAROMADLARI VA TURMUSH DARAJASI: O‘ZARO BOG‘LIQLIK NAZARIYASI 9
Abidova Shahnoza Abduvaliyevna
THE IMPACT OF BUY NOW, PAY LATER SERVICES ON E-COMMERCE SALES 12
Maxmudova Munisaxon Abbos qizi
ROUTE-LEVEL PROFITABILITY ZONES IN RAILWAY PASSENGER TRANSPORT 16
Eshboyev Ulugbek Farxodovich
AHOLI DAROMADLARI VA TURMUSH DARAJASI: O‘ZARO BOG‘LIQLIK NAZARIYASI 20
Abidova Shahnoza Abduvaliyevna
ОПЕРАЦИОННАЯ ЭФФЕКТИВНОСТЬ КАК ДРАЙВЕР ESG-ТРАНСФОРМАЦИИ ПРЕДПРИЯТИЙ ПОЛИМЕРНОЙ УПАКОВКИ В УСЛОВИЯХ РАЗВИВАЮЩИХСЯ ЭКОНОМИК: ЭМПИРИЧЕСКОЕ ОБОСНОВАНИЕ НА ПРИМЕРЕ ООО «SIRDARYO MEGA LUKS» 23
Ташпулатов Дильмурад Рустамович
PREPARING STATE-OWNED COMMERCIAL BANKS FOR PRIVATIZATION: INSTITUTIONAL TRANSFORMATION, CORPORATE GOVERNANCE, AND CAPITAL MARKET READINESS IN UZBEKISTAN .. 28
Salamov Islam Tashkazakovich
RAQAMLI TO‘LOVLAR ORQALI YASHIRIN IQTISODIYOT KO‘LAMINI QISQARTIRISH: XITOY TAJRIBASI VA MAKROFISKAL SABOQLAR 34
Shonazarov Ashurali Akabayevich
DIGITAL FACTORS INFLUENCING THE DEVELOPMENT OF THE SERVICE SECTOR IN TASHKENT CITY 37
Abdikayumov Bekzod Turdiniyozovich
METALLARGA MEXANIK ISHLOV BERISH JARAYONLARINI KOMPYUTER MODELLASHTIRISH ASOSIDA OPTIMALLASHTIRISH VA SAMARADORLIGINI OSHIRISH 41
Usmonov Abbos Valijon o‘g‘li
IMPROVING THE MECHANISM FOR EXPERT ASSESSMENT AND CERTIFICATION OF FOOD SAFETY BASED ON QUESTIONNAIRE SURVEYS 45
Mahamatova Maftuna Shukrullo qizi
BEYOND FINANCIAL METRICS: RAILWAY TRANSPORT EFFICIENCY 48
Kurambayev Alisher Saburbayevich
TRANSFORMATSIYALASHUV SHAROITIDA TIJORAT BANKLARINING KREDIT PORTFELINI BOSHQARISHNING NAZARIY ASOSLARI 53
Jo‘rayev Eldor Berdibekovich
OPTIMIZING SCHOOL MANAGEMENT THROUGH TERRITORIAL CLUSTERING TO ENSURE AN INCLUSIVE EDUCATION ENVIRONMENT: INTERNATIONAL EVIDENCE AND AN IMPLEMENTATION FRAMEWORK FOR UZBEKISTAN 58
Rajapova Guldona Usman kizi
OPTIMIZATION OF THE FOOD SUPPLY AND DELIVERY SYSTEM IN TASHKENT REGION 62
Mavlanov Sobirjon Pardabayevich
RAQAMLI BANK EKOTIZIMIDA SUN’IY INTELLEKT VA KATTA MA’LUMOTLAR ASOSIDA MIJOZLARGA XIZMAT KO‘RSATISH MODELINI TAKOMILLASHTIRISH 65
Eshqobulova Charos O‘roq qizi
RAQAMLI MOLIYAVIY MUHITDA BANK MIJOZLARINING XAVFSIZ XULQ-ATVORI VA MOLIYAVIY KOMPETENSIYALARINI SHAKLLANTIRISH 67
Eshqobulova Charos, Babanazarova Gulzar
ASSESSING DIGITAL ADAPTATION IN SMALL BUSINESSES IN THE REPUBLIC OF KARAKALPAKSTAN. 70
Babanazarova Gulzar Ziuatdinovna

INSTITUTIONAL ENVIRONMENT AND ACADEMIC STAFF WORK EFFICIENCY: HUMAN RESOURCE MANAGEMENT PERSPECTIVES 73
Sultonboyeva Munira, Sultanova Kamila
ЭКСЕРГЕТИЧЕСКИЙ АНАЛИЗ СИСТЕМ ЭЛЕКТРОСНАБЖЕНИЯ КАК ИНСТРУМЕНТ ПОВЫШЕНИЯ ЭНЕРГОЭФФЕКТИВНОСТИ ПРИ ПРОВЕДЕНИИ ЭНЕРГОАУДИТА 79
Anarbaev A.I., Bahodirova M.T.
SCENARIO FORECASTING OF AI-DRIVEN EFFICIENCY IN UZBEKISTAN'S TEXTILE INDUSTRY TO 2030 83
Madrahimova Onajon Javlon qizi
TIJORAT BANKLARIDA TASHQI AUDIT JARAYONLARINI RAQAMLASHTIRISH VA AUDIT DALILLARINING ISHONCHLILIGINI OSHIRISH 85
Ziyodullayeva Nargiza Yusuf qizi
MINTAQA IQTISODIY SALOHIYATIDAN SAMARALI FOYDALANISH ASOSIDA EKSPORT SAMARADORLIGINI OSHIRISHNING USTUVOR YO'NALISHLARI 89
Xudoyberdiyeva Asila
LABOUR PRODUCTIVITY, STRUCTURAL CHANGE, AND BAUMOL'S "COST DISEASE" IN THE SERVICE SECTOR: A SECTORAL ANALYSIS OF THE UZBEKISTAN ECONOMY 94
Xasanov Axmadjon Shodiyorovich
ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В ПРОЕКТИРОВАНИИ СТРЕСС-СЦЕНАРИЕВ ЛИКВИДНОСТИ: ОТ ФИКСИРОВАННЫХ ПОРОГОВЫХ ЗНАЧЕНИЙ К ДИНАМИЧЕСКОМУ МОДЕЛИРОВАНИЮ 103
Курбонов Илхом Жумакулович
ARTIFICIAL INTELLIGENCE AND BIG DATA IN MODERN BANKING: FROM RISK DETECTION TO DECISION-MAKING 107
Parpiyeva Ra'no
PUL-KREDIT SIYOSATIDA INSTITUTSIONAL NOMUVOFIQLIK: MA'MURIY VA MONETAR SIYOSATNING ASOSIY YO'NALISHLARI 110
Muxammadiyev Tuychi Jumma o'g'li
THE IMPA INTEGRAL INDEX AS A TOOL FOR EVALUATING THE EFFECTIVENESS OF EDUCATIONAL SERVICES MARKETING 113
Umarov Shuhrat Bahodir o'g'li
EKSPORTNI MOLIYALASHTIRISH NAZARIYALARI 116
Qarshiyev Daniyar Eshpulatovich
ИНСТИТУЦИОНАЛЬНО-РЕСУРСНАЯ РАМКА ESG-ТРАНСФОРМАЦИИ ПРЕДПРИЯТИЙ ПОЛИМЕРНОЙ УПАКОВОЧНОЙ ИНДУСТРИИ: ТЕОРЕТИКО-МЕТОДОЛОГИЧЕСКИЙ ПОДХОД К ИДЕНТИФИКАЦИИ И КОЛИЧЕСТВЕННОЙ ОЦЕНКЕ ОТРАСЛЕВЫХ РИСКОВ 120
Медведев Никита, Ташпулатова Амира, Ташпулатов Дильмурад
TIJORAT BANKLARIDA JINOIY DAROMADLARNI LEGALLASHTIRISHGA QARSHI KURASHISHDA SUN'IY INTELLEKT TEXNOLOGIYALARIDAN FOYDALANISH 123
Rustamov Sunnatillo Rustamovich
LEGAL FOUNDATIONS OF GREEN FINANCING IN THE ACTIVITIES OF BUSINESS ENTITIES 127
Makhtimova Zarafshon Olloyorovna
YASHIL ENERGETIKA INFRATUZILMASIDAGI MUAMMOLAR 130
Jabborov Xurshid To'ramurod o'g'li
RAQAMLI TA'LIM MUHITIDA HAMKORLIKDA O'RGANISHNI TASHKIL ETISHNING PEDAGOGIK SHARTLARI 134
Choriyeva Lobar, Safarov Azamat
ТЕНДЕНЦИИ ФОРМИРОВАНИЯ КОНКУРЕНТНОЙ СРЕДЫ НА РЫНКЕ ОБРАЗОВАТЕЛЬНЫХ УСЛУГ РЕСПУБЛИКИ УЗБЕКИСТАН 136
Кахрамонова Азиза, Джалилов Джамшид
YASHIL IQTISODIYOT SHAROITIDA O'ZBEKISTON SANOATINI BARQAROR RIVOJLANTIRISHNING IQTISODIY MEXANIZMLARI 139
Isoqova Aziza Alisher qizi

MUNDARIJA • СОДЕРЖАНИЕ • CONTENTS

MUNDARIJA • СОДЕРЖАНИЕ • CONTENTS

TIJORAT BANKLARI FAOLIYATIDA NODEPOZIT MOLIYAVIY RESURSLARNING AHAMIYATI 142
Ziyodilloyev Xushnud Rahimboyevich
MILLIY KADRLAR ZAXIRASIGA KIRITISH TIZIMINI TAKOMILLASHTIRISH YO'NALISHLARI 146
G'aniyev Elyor Sobirjonovich
MODA BRENDLARINI BOSHQARISHDA MARKETING MENEJMENTI VA ISTE'MOLCHILAR XULQ-ATVORINING O'ZARO TA'SIRINI BAHOLASH 150
Abdumajitova Adolat Bahrom qizi
MECHANISMS FOR IMPROVING THE USE OF DIGITAL TECHNOLOGIES IN THE SOCIAL PROTECTION SYSTEM 155
Mukhtorov Ulugbek Khayotjonovich
PROSPECTS FOR A UNIFIED DIGITAL MONITORING SYSTEM LINKING THE TIERS OF TRADE AND INVESTMENT GOVERNANCE 158
Imamov Javokhir
THE ROLE OF INTERGOVERNMENTAL TRANSFERS IN MITIGATING REGIONAL INEQUALITY IN UZBEKISTAN: EMPIRICAL ASSESSMENT AND DIRECTIONS FOR IMPROVEMENT 162
Hakimov Feruz Xurshid ugli
O'ZBEKISTONDA DAVLAT XARIDLARI TIZIMI SAMARADORLIGINI OSHIRISHNING HUQUQIY ASOSLARI, AMALDAGI HOLAT VA ISLOHOT YO'NALISHLARI 165
Israilova Soxiba To'lqin qizi
DIRECTIONS FOR ENSURING THE SUSTAINABILITY OF LOCAL BUDGETS THROUGH FISCAL DECENTRALIZATION IN UZBEKISTAN 169
Mahmudov Sarvar Tolibjonovich
AKSIYADORLIK JAMIYATLARIDA KORPORATIV KONFLIKTLARNI ERTA ANIQLASH VA ULARNING MOLIYAVIY OQIBATLARINI PROGNOZ QILISH INDIKATORLARI 175
Xolikova Saboxat Abdukarim qizi
YEVROPA MAMLAKATLARIDA VENCHUR BOZORI HOLATI TAHLILI 178
Abduraximova Shahruzaxon Sarvar qizi
O'ZBEKISTON RESPUBLIKASIDA YASHIL MOLIYALASHTIRISHNI RIVOJLANTIRISH YO'NALISHLARI . 184
Qorriyeva Shohnoza Saparboyevna
АНАЛИТИЧЕСКИЙ УЧЁТ ПРОИЗВОДСТВЕННЫХ И ЭКСПЛУАТАЦИОННЫХ ЗАТРАТ ПО ТЕХНОЛОГИЧЕСКИМ ПРОЦЕССАМ И ЦЕНТРАМ ОТВЕТСТВЕННОСТИ НА ПРЕДПРИЯТИЯХ ГОРНОДОБЫВАЮЩЕЙ ПРОМЫШЛЕННОСТИ 187
Ойбекова С. К.
IQTISODIY SUDLARDA YARASHTIRUV VA MEDIATSIYA JARAYONLARIDA HUQUQLARNI SUISTE'MOL QILISHNING OLDINI OLISH HAMDA INSTITUTSIONAL ISLOHOTLAR 191
Ungarov Akram Botirqul o'g'li
ФИНАНСОВО-ЭКОНОМИЧЕСКАЯ ЦЕННОСТЬ ЛОКАЛЬНОЙ МЕДИЦИНСКОЙ СТАТИСТИКИ ДЛЯ ПРОГНОЗИРОВАНИЯ АПТЕЧНОГО СПРОСА 196
Пулатова Фируза Сафар кизи
KORPORATIV MOLIYANING IQTISODIY MAZMUNI, FUNKSIYALARI VA TASHKIL ETISH TAMOYILLARI 198
Jumatova Gulzar Maxmud qizi
TURISTIK KORXONALARDA MEHNAT UNUMDORLIGINI OSHIRISHNING BOSHQARUV OMILLARI 201
Yoriyeva Farangiz Murodilloyevna
FOND BOZORIDA AN'ANAVIY VA RAQAMLI SAVDO TIZIMLARINING QIYOSIY XUSUSIYATLARI 204
Saidkobil Murodov
O'ZBEKISTONDA RAQAMLI TRANSFORMATSIYA SHAROITIDA YOSHLAR TADBIRKORLIGINI MOLIYALASHTIRISH MEXANIZMLARINI TAKOMILLASHTIRISH 206
Valiev Umid Gulamovich
ИНСТРУМЕНТЫ ГОСУДАРСТВЕННОЙ ПОДДЕРЖКИ И СТИМУЛИРОВАНИЯ «ЗЕЛЁНОГО» СТРОИТЕЛЬСТВА 208
Тожиева Дильфуза Бобомуратовна

KORXONALARDA PUL OQIMLARINI BOSHQARISH STRATEGIYASINING TO‘LOVGA QOBILLIKKA TA’SIRI. 211
Askarov Ziyodulla Usmanalievich
BUDGET MANAGEMENT AND FINANCIAL EFFICIENCY ASSESSMENT OF PROJECTS IN IT COMPANIES.... 217
Aziza Shokirova
THE RELATIONSHIP BETWEEN REGIONAL DEMOGRAPHIC POTENTIAL AND ECONOMIC DEVELOPMENT INDICATORS IN UZBEKISTAN 220
Berdimbetova Amina
COMPETITION AND COMPETITIVENESS AS DISTINCT OBJECTS OF MANAGEMENT: IMPLICATIONS FOR SMALL ENTREPRENEURIAL ENTITIES 223
Akhmadjanov Abrorbek Akbarjon ugli
METHODOLOGY FOR SELECTING PARAMETRIC AND NONPARAMETRIC TESTS IN THE ASSESSMENT OF REGIONAL BUSINESS INDICES 226
Saidova Marhabo Xabibullo qizi
MAHALLA INDIKATIV KO‘RSATKICHLARINI KLASTERLASHNING GIBRID ALGORITMI VA DASTURIY MODULI 230
Allamuradov Norbobo Tursun o‘g‘li
LTL YUK TASHISH TIZIMLARIDA DINAMIK MARSHRUTLASH ALGORITMI VA DASTURIY MAJMUASI . 232
Hamzayev Ulug‘bek Habibulla o‘g‘li
KICHIK BIZNES SUBYEKTLARINI KREDITLASHNING ILMIY-NAZARIY ASOSLARI 234
Ergashev Iskandar Urunovich
IFRS ADOPTION CHALLENGES AND OPPORTUNITIES FOR COMMERCIAL BANKS IN UZBEKISTAN 236
Aminov Shovkat Uktam ugli
РОЛЬ ГОСУДАРСТВЕННОГО БЮДЖЕТА В ДОСТИЖЕНИИ ЦЕЛЕЙ УСТОЙЧИВОГО РАЗВИТИЯ..... 238
Хазраткулова Лола Нармуминовна
INSTITUTIONAL PATHWAYS FOR EXPANDING ISLAMIC FINANCE IN THE REAL SECTOR OF UZBEKISTAN: EVIDENCE, INTERNATIONAL BENCHMARKS, AND POLICY PRIORITIES 242
Sevara R. Hakimova
INSTITUTIONAL BARRIERS TO THE FORMATION OF COMPETITIVE ADVANTAGES OF SMALL BUSINESSES IN THE DIGITAL ENVIRONMENT 249
Xujayeva Malika Akbarovna
DIRECTIONS FOR IMPROVING THE MANAGEMENT SYSTEM OF TOURIST CLUSTERS IN UZBEKISTAN..... 251
Pulotov Azimjon Avazkhanovich
O‘ZBEKISTONDA YER UCHASTKALARINI ELEKTRON AUKSION SAVDOLARIGA CHIQARISH MEXANIZMLARINI HUDUDIY TABAQALASHTIRISH ASOSIDA TAKOMILLASHTIRISH 258
Ubaydov Mirshod Ismailovich
IMPROVING ECONOMIC ANALYSIS METHODS IN THE STRATEGIC MANAGEMENT SYSTEM FOR E-COMMERCE DEVELOPMENT IN UZBEKISTAN 262
Amankulova Mukhlisa Narsafar kizi
СОВЕРШЕНСТВОВАНИЕ ФИНАНСОВОГО МЕХАНИЗМА ESG-ФИНАНСИРОВАНИЯ ПРЕДПРИЯТИЙ: СТИМУЛЫ ОБЛИГАЦИЙ, ПРИВЯЗАННЫХ К УСТОЙЧИВОМУ РАЗВИТИЮ 266
Г. Б. Сагдуллаева
AHOLI DEMOGRAFIK JARAYONLARINI IFODALOVCHI KO‘RSATKICHLAR VA ULARNING HOLATINI BAHOLOVCHI KOEFFITSIYENTLARNI STATISTIK USULLAR ASOSIDA TAHLIL QILISH 268
Siroj Zarina Rustambekovna
TURIZM SOHASINI DAVLAT TOMONIDAN MOLIYAVIY QO‘LLAB-QUVVATLASH AMALIYOTINI TAKOMILLASHTIRISH 272
Karimova Dilafruz Sadriddin qizi

MUNDARIJA • СОДЕРЖАНИЕ • CONTENTS

DIGITAL IDENTIFICATION AS AN INFRASTRUCTURAL FOUNDATION FOR FINANCIAL INCLUSION IN UZBEKISTAN 275
Doniyor Eshmurotov
YOSHLARNI RAQAMLI XIZMATLAR EKSPORTIGA JALB ETISHNING STRATEGIK BOSHQARUV MEXANIZMLARINI TAKOMILLASHTIRISH 278
Palvonova Sevara Baxromovna
IMPROVING THE CAPITAL MANAGEMENT SYSTEM OF COMMERCIAL BANKS BASED ON CREDIT RISK, ECL, AND CAPITAL BUFFERS 281
M. Sa'dullaeva

IMPROVING THE CAPITAL MANAGEMENT SYSTEM OF COMMERCIAL BANKS BASED ON CREDIT RISK, ECL, AND CAPITAL BUFFERS

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Abstract. This study proposes an integrated bank capital-management framework linking credit portfolio quality, IFRS 9 expected credit losses (ECL), capital buffers and risk-adjusted return on capital (RAROC). Business Development Bank's 2024 financial data indicate that ECL allowances represented 7.32% of total assets and 84.28% of equity, reflecting the scale of credit risk relative to the capital base. The proposed ECL–capital buffer–RAROC framework incorporates the author-defined Capital Buffer Pressure Coefficient (KBBK = ΔECLstress/BKB) and a dual-trigger decision matrix based on early-warning zones. It aims to support timely risk identification, efficient capital allocation, risk-based pricing, concentration management and forward-looking ICAAP capital planning.

Keywords: bank capital, capital efficiency, IFRS 9, ECL, credit risk, capital buffer, RAROC, ICAAP, stress testing, early warning.

Annotatsiya. Mazkur tezisda kredit portfeli sifati, IFRS 9 bo'yicha kutilayotgan kredit yo'qotishlari (ECL), kapital buferlari va riskni hisobga olgan holda kapital rentabelligini (RAROC) o'zaro bog'lovchi integratsiyalashgan bank kapitalini boshqarish mexanizmi taklif etilgan. Biznesni rivojlantirish bankining 2024-yilgi moliyaviy ma'lumotlariga ko'ra, ECL zaxiralari jami aktivlarning 7,32 foizini va o'z kapitalining 84,28 foizini tashkil etgan. Tadqiqotda ECL–kapital buferi–RAROC modeli, muallif tomonidan taklif etilgan kapital buferiga bosim koeffitsiyenti (KBBK = ΔECLstress/BKB) hamda erta ogohlantirish zonalariga asoslangan ikki mezonli qaror qabul qilish matritsasi ishlab chiqilgan. Taklif etilgan mexanizm kredit risklarini o'z vaqtida aniqlash, kapitalni samarali taqsimlash, riskka asoslangan narxlash, konsentratsiya riskini boshqarish va ICAAP doirasida kapitalni istiqbolli rejalashtirishga qaratilgan.

Kalit so'zlar: bank kapitali, kapital samaradorligi, IFRS 9, ECL, kredit riski, kapital buferi, RAROC, ICAAP, stress-testlash, erta ogohlantirish.

INTRODUCTION

The expected credit loss (ECL) model under IFRS 9 requires credit losses to be recognised proactively as risk deteriorates, rather than only after default [5]. Consequently, portfolio quality, Stage 2 and Stage 3 exposures, restructuring, concentration, PD, LGD and EAD affect not only accounting allowances but also capital planning, pricing and risk-appetite decisions. This highlights the importance of integrating credit-risk assessment with capital management.

The bank-level data used in this study indicate that, at Business Development Bank JSCB, ECL allowances amounted to 7.32% of total assets and 84.28% of equity in 2024. These ratios should be interpreted as analytical indicators of the scale and pressure of credit risk relative to the capital base, not as amounts "lost" directly from capital. Part of the estimated ECL may already have been recognised as an allowance in the financial statements; charging it against capital in full a second time would be methodologically incorrect.

The study aims to integrate credit portfolio quality, ECL, capital buffers and risk-adjusted profitability into a unified management framework; develop a measure of additional capital pressure under stress; and link early-warning signals to capital allocation and RAROC-based management decisions [8].

The Basel Committee defines capital buffers as additional capital above minimum requirements to absorb losses during periods of stress [2]. Stress testing is a key means of assessing the sufficiency of financial resources under severe but plausible scenarios [3]. The ECB's ICAAP guidance emphasises forward-looking identification of all material risks, adequate capital coverage and the inclusion of stress scenarios in multi-year capital planning [4].

The reviewed literature suggests opportunities for closer integration of ECL, capital buffers and RAROC within a unified management framework. Further methodological development could clarify how additional ECL arising from portfolio deterioration affects the available capital buffer and informs subsequent RAROC-based capital allocation decisions. This study contributes to methodological development through the proposed ECL–capital buffer–RAROC (EKR) framework and KBBK coefficient.

The study employs systems analysis, comparative analysis, financial-ratio analysis, scenario stress testing, risk-adjusted profitability analysis and the construction of an original management algorithm. The analysis draws on the 2024–2025 financial indicators of Business Development Bank JSCB, the bank's publicly available financial statements and international prudential and accounting standards [1–7].

A simplified risk-component expression for expected credit losses in credit segment *i* is:

$ECL = \Sigma (PD_i \times LGD_i \times EAD_i \times DF_i)$

where PD is the probability of default; LGD is the loss given default; EAD is the exposure at default; and DF is the discount factor. In practical IFRS 9 measurement, Stage 1 uses 12-month ECL, Stage 2 uses lifetime ECL, and Stage 3 uses lifetime ECL for credit-impaired assets, incorporating probability-weighted forward-looking scenarios [5].

To measure stress-induced pressure on capital, the study proposes using incremental ECL under a stress scenario rather than charging the entire baseline ECL to capital again:

$\Delta ECL_{stress} = ECL_{stress} - ECL_{base}$

The available capital buffer (BKB) is defined as the monetary difference between the bank's actual regulatory capital and the capital threshold required by internal policies or regulatory requirements. The proposed Capital Buffer Pressure Coefficient (KBBK) is therefore:

$KBBK = \Delta ECL_{stress} / BKB$

A KBBK value of 1 denotes the point at which incremental ECL under stress equals the available capital buffer. When KBBK exceeds 1, additional stress losses may exceed the available buffer, and capital restoration or de-risking measures should be considered. The internal warning threshold should be calibrated using the bank's risk-appetite statement and historical backtesting; it does not replace prudential requirements.

To assess risk-adjusted profitability, the following operational expression of RAROC is applied:

RAROC = (Net income after risk − ECL − operating expenses) / Economic capital

Under the proposed approach, allocating additional capital to a segment or product is appropriate only when two conditions are met simultaneously: RAROC is not below the bank's approved hurdle rate, and KBBK does not exceed its critical threshold. Profitability and capital resilience are thus combined in a single decision matrix.

1. Empirical Pressure of Credit Risk on Capital Efficiency

According to the bank-level data used in this study, ECL allowances in 2024 equalled 7.32% of total assets and 84.28% of equity. These figures indicate a substantial scale of credit risk relative to the capital base. They are not regulatory capital adequacy ratios and should instead be treated as relative indicators of the risk burden in capital-efficiency analysis.

2. Integrated ECL–Capital Buffer–RAROC Management Framework

Where credit risk, allowances, capital buffers and product- or segment-level profitability are monitored by separate functions, closer coordination may help improve the timeliness and consistency of management decisions. The author therefore proposes the EKR framework, which integrates eight consecutive stages, from credit portfolio migration to feedback into the capital plan.

Segment the credit portfolio by Stage 1, Stage 2 and Stage 3 exposures, restructuring status and concentration.

Estimate ECL using PD, LGD, EAD and forward-looking scenarios.

Calculate incremental stress loss: ΔECL_{stress}.

Determine the available capital buffer (BKB) and KBBK.

Assess risk-adjusted profitability using RAROC and economic capital.

Classify exposures into target, warning and critical zones.

Make decisions on limits, pricing, capital allocation, loan restructuring and recovery, costs and KPIs.

Backtest and recalibrate limits, and incorporate the results into ICAAP and capital planning.

3. KBBK and the Dual-Trigger Management Matrix

Assessing capital pressure alone may not fully capture capital allocation efficiency, as segments with relatively low risk may still offer opportunities for more effective capital utilisation. Therefore, RAROC relative to its hurdle rate serves as the second trigger, creating a four-case decision matrix.

4. Linking Operating Expenses and Risk-Adjusted Profitability to Capital Decisions

The EKR framework therefore proposes incorporating at least three indicators jointly into business budgets and KPIs: (i) the RAROC–hurdle spread; (ii) KBBK; and (iii) ECL-adjusted cost-to-income. This supports bank units in balancing business growth and accounting profitability with risk-adjusted value creation.

SCIENTIFIC NOVELTY AND ORIGINAL PROPOSALS

First, a methodology has been developed to move from the separate management of credit portfolio quality, IFRS 9 ECL, the available capital buffer and RAROC to a unified ECL–capital buffer–RAROC framework. It combines credit migration → ECL → stress losses → capital buffer → RAROC → risk zone → management

decision → backtesting in a single algorithm.

Second, to avoid double-counting baseline ECL against capital, the Capital Buffer Pressure Coefficient, KBBK = ΔECLstress/BKB, is proposed to compare incremental stress losses with the available capital buffer. KBBK > 1 is identified as the economic boundary of critical buffer pressure, while the warning threshold is calibrated according to risk appetite and backtesting results.

Third, a KBBK–RAROC dual-trigger decision matrix is developed to complement capital-allocation decisions based on capital adequacy and profitability indicators. It distinguishes four management situations involving capital expansion, repricing, de-risking or capital restoration.

Fourth, the study proposes integrating operating expenses, ECL and the cost of economic capital into RAROC calculations by product, branch and customer segment, and linking the RAROC–hurdle spread, KBBK and ECL-adjusted cost-to-income to unit budgets and KPIs. This supports selective capital allocation to activities that generate risk-adjusted economic value while promoting sustainable business growth.

Attributing any observed improvement in profitability in 2025 directly to the proposed mechanism would require separate counterfactual or panel analysis. The empirical ratios presented in this study, based on the data used in the analysis and the bank's publicly available reports, illustrate capital pressure arising from risk, but measuring causal effects remains a task for future research. Any reported implementation of the proposed mechanism should be supported by relevant internal documentation or formal confirmation.

CONCLUSIONS AND RECOMMENDATIONS

1. Improving capital efficiency in commercial banks involves combining capital strengthening and compliance with prudential requirements with the integrated management of credit portfolio migration, ECL, capital buffers and risk-adjusted profitability.
2. For implementation, the EKR framework should first be tested in pilot segments and then gradually integrated into ICAAP, capital planning, transfer pricing, budgeting and KPI systems.
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